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Water Rights, Water Quality & Water Solutions in the West

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LID STORMWATER RETROFITTING

APPLICATION TO RESIDENTIAL AREAS AROUND PUGET SOUND

by Amalia Leighton, PE, SvR Design Company (Seattle, WA)

INTRODUCTION

Municipalities and counties in Washington State are developing policies, regulations, and programs to retrofit their communities with **l**ow **i**mpact **d**evelopment (LID) or **g**reen **s**tormwater **i**nfrastructure (GSI) facilities to manage stormwater runoff for flow control and/or water quality treatment as required by upcoming revisions to their National Pollutant Discharge Elimination System permits. Cities must begin to focus on reducing and treating runoff from previously developed areas if the ecological health of Puget Sound is to improve. Improved stormwater management is especially important in residential areas — typically the largest geographic areas in Western Washington cities — where surface runoff largely remains uncontrolled and untreated. According to the 2009 State of the Sound report prepared by the Puget Sound Partnership, surface water loading through runoff from the built environment in the Puget Sound Basin constitutes the greatest ongoing detriment to the health of Puget Sound.

This article will highlight some of the LID and green stormwater infrastructure policies, regulations, and programs that are being implemented by the cities of Kirkland, Shoreline and Seattle in residential (mostly single family) land uses. It will also examine the upcoming changes to LID regulations included in the Washington State Department of Ecology's (Ecology's) draft National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permits, which cover discharges from separate storm sewers for general stormwater management. These NPDES permits provide conditions for municipalities/counties that operate stormwater management systems as required by the State of Washington Water Pollution Control Law and the federal Clean Water Act.

NPDES COVERAGE UPDATE

At this time, Ecology is working with cities and counties in Western Washington to update their coverage under their NPDES permits. The new permits will require LID on both public and private property. Ecology proposed that Phase I cities and counties (Seattle, Tacoma, King County, Snohomish County, Pierce County and Clark County) adopt and begin implementing LID in their municipal codes and design standards by December 31, 2014. Phase II communities would have to adopt site-scale design standards by December 31, 2015 and updated municipal development codes by December 31, 2016. The current permits are set to expire this year.

To support the requirement in the NPDES permits, Ecology has updated the Stormwater Management Manual for Western Washington to provide guidance to

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Existing Residential

Rain Gardens

The Water Report
(ISSN 1946-116X)
is published monthly by
Envirotech Publications, Inc.
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Eugene, OR 97402

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Subscription Rates:
$249 per year
Multiple subscription rates available.

Postmaster: Please send address corrections to
The Water Report,
260 North Polk Street,
Eugene, OR 97402

municipalities and counties as they update their stormwater codes and standards. The NPDES permits for the Phase II communities require community permitting agencies to use aspects of the Stormwater Management Manual for Western Washington as minimum requirements for compliance with stormwater regulations. Cities typically meet this requirement by adopting the Stormwater Management Manual for Western Washington in their development code to outline the requirements for construction stormwater and flow control and water quality requirements for development. Phase I Communities have historically developed their own manuals that typically meet or exceed the requirements of the Stormwater Management Manual for Western Washington. The Stormwater Management Manual for Western Washington identifies the requirements for LID and provides guidance to assist the cities in determining infiltration rates and modeling for LID facilities using the Western Washington Hydrology Model (WWHM). WWHM is a continuous hydrologic model with LID modules that can be used to test and develop LID strategies. WWHM is available for free download from Ecology's website (see below).

The draft NPDES permits were recently sent out for review and public comment. Most of the jurisdictions responded and Ecology is reviewing the comments and will release revised permits in June of 2012. Comments on the draft Stormwater Management Manual for Western Washington are also being reviewed and a final manual is set to be released in the summer of 2012 around the same time the NPDES permits are issued.

In anticipation of the upcoming changes to the municipal NPDES permits, local jurisdictions in Western Washington have been planning, designing and implementing retrofit LID facilities. The predominant land use in many cities in Western Washington is residential, typically single family dwellings. If jurisdictions covered under the NPDES permit are going to meet their permit requirements, they must begin to focus on the residential areas that were developed before stormwater runoff and treatment controls were required. Approximately 65% of the City of Seattle is residential single family, the City of Kirkland is 47%, and the City of Shoreline is 70%. The Puget Sound Basin (i.e., the area that drains into Puget Sound) encompasses approximately 1.6 million acres and is home to 115 cities. The existing residential areas in these cities have typically been developed with little or no stormwater management. With limited funding and political will to raise stormwater rates to completely retrofit neighborhoods, jurisdictions need to find other ways to develop or allow community programs to install LID and GSI facilities. As these regulations have been being developed over the last five years (since the previous round of NPDES permits), the State of Washington and local non-profits have developed resources for communities and residents wanting to implement LID and GSI best management practices for stormwater. These resources are designed to demonstrate to communities that these facilities really do work to reduce stormwater runoff and improve water quality.

GOVERNMENT AND NON-PROFIT RESOURCES

EXAMPLES OF ONGOING EFFORTS AROUND PUGET SOUND

Many government and non-profit programs have been developed to assist with design, funding, and installation of LID and GSI facilities that support the upcoming policies and regulations. These programs are helping the jurisdictions that they serve with public outreach and education about stormwater management and the need to improve the ecological health of Puget Sound.

Some interesting insights have arisen out of these efforts. For instance, outreach personnel are finding that neighborhood residents can better identify with practical terms such as "rain gardens" — as opposed to references to "low impact development facilities" or LID facilities. They have also found that the stewards of demonstration projects are often neighborhood members involved in community gardening or master gardener programs. A few of these agencies and non-profits are highlighted below.

Puget Sound Partnership

In 2007, Governor Christine Gregoire created the Puget Sound Partnership, a state agency to oversee the restoration of the environmental health of Puget Sound by 2020. The Puget Sound Partnership provided resources to local governments in the forms of technical guidance, trainings, and research to support LID implementation to benefit Puget Sound. In 2010, 36 local jurisdictions that participated in the 2005-2009 Local Regulation Assistance Project were surveyed to assess how the various municipalities were progressing toward the adoption and implementation of the LID recommendations from the Puget Sound Partnership. Additionally, a guidebook for integrating LID into development codes was developed to assist cities in identifying gaps and barriers in municipal codes. These reports are available on-line from the Puget Sound Partnership website included below.

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Transportation Projects

Transportation Improvement Board

The Washington State Transportation Improvement Board (TIB) was created by the State Legislature to distribute funding — mostly collected from the statewide gas tax — to cities and counties for transportation projects. The projects are distributed throughout the state. Cities and counties are required to submit an application describing their projects, which are then ranked against other projects submitted. Environmental measures incorporated into the proposed projects are identified in the applications, including how low impact development practices have been incorporated into the roadway projects. This requires cities to look at roadside drainage retrofits in a different way and consider how they can retrofit an existing roadside ditch into a bioretention or bioinfiltration swale. Additionally, many cities are proposing to install porous pavement in bike lanes, sidewalks and parking areas.

Rain Garden Support

12,000 Rain Gardens Campaign

Stewardship Partners is a non-profit that provides works to restore habitat, improve water quality, and protect open space. They have partnered with the Washington State University (WSU) Extension program to initiate a campaign to install 12,000 rain gardens around the Puget Sound region by 2016 — more specifically, 1,000 rain gardens in each of the 12 counties in the Puget Sound Basin. This program installs residential scale rain gardens for free using volunteers from the neighborhoods where they are constructing the facilities. WSU Extension offices provide resources and training in the extension programs' offices that are located in each county in the Basin. To provide examples of existing rain gardens, the WSU Extension program provides a list of rain gardens that have been installed in each county.

This very successful program benefits from organizing projects along the lines of "design-build" construction projects. Project partners do a simple percolation test to identify if onsite soils are infiltrative and design the rain gardens based on the existing conditions. Program success is also benefiting from finding neighborhood stewards to maintain the rain gardens and observe how they are functioning in the rain. Project organizers look to cluster rain gardens in neighborhoods to demonstrate the cumulative benefits of a series of rain gardens. To date the program has built rain gardens at parks, community gardens, schools, residential homes, and neighborhood scale businesses. Signage about the program and the benefits of the rain garden installations in the Puget Sound basin are provided by the program. More information is available from the 12,000 Rain Gardens website included below.

Sustainability Grants

Sustainable Rain Program

Sustainable Seattle, a non-profit group that was started in 1991, began their Sustainable Rain program to install rain gardens in Seattle. This program allows residents and businesses to apply to receive a $1,000 grant and utilizes volunteers to install a rain garden on their property. This program is successfully implementing rain gardens in diverse neighborhoods in Seattle and bringing stormwater management education to the community in a hands-on way. Rain gardens have been installed at community service centers and housing facilities that are publicly accessible and visible in the neighborhoods. More information is available from the Sustainable Seattle website included below.

MUNICIPAL LID PROJECTS

CASE STUDIES FROM CITIES IN THE PUGET SOUND BASIN

Municipal Lessons

The following case studies from Kirkland, Shoreline, and Seattle highlight success, challenges, and lessons learned from retrofitting residential areas with LID and GSI facilities.

Annexed Area Infrastructure

City of Kirkland - LID Facilities

The City of Kirkland is located east of Seattle and is adjacent to Lake Washington. Kirkland is a suburban city with a population of approximately 82,000 people. In 2011, an area of about seven square miles north of the City was annexed, thereby increasing the population by two-thirds. The newly annexed area is predominantly residential and does not have a formalized stormwater management infrastructure. Throughout Kirkland, wide residential streets with undeveloped shoulders offer opportunities to retrofit the public rights-of-way with LID facilities. At the same time, larger single-family parcels and limitations on impervious lot coverage also make LID facilities on private property feasible. City Council goals for urban tree canopy coverage of 40% city-wide also support stormwater management through maintenance and preservation of native land cover.

In 2008, Kirkland identified opportunities to incorporate LID facilities into the transportation projects identified in the Capital Improvement Program. The intent of that study was to identify the projects where stormwater management would be required based on the project descriptions. Many of the projects were

Residential Stormwater LID

located in residential areas where there was little or no existing stormwater infrastructure. For example, a sidewalk project along a "safe route to school" was implemented along a minor arterial in the Juanita neighborhood. Kirkland installed a porous pavement sidewalk and bioinfiltration cells and swales to control and collect the stormwater runoff from the adjacent roadway.

Kirkland has also been installing LID facilities such as rain gardens and swales in parks and school projects in residential areas. Installing LID facilities in public places allows municipalities to demonstrate what a LID facility looks like and how it functions. It supports public outreach and education efforts, as is required by the upcoming NPDES permits. At schools, Kirkland has approved the installation of rain gardens that collect and infiltrate stormwater runoff from pollutant generating bus pick up and drop off zones. Rain gardens, swales, and porous pavements have been installed at local parks to demonstrate how these facilities can collect runoff from parking areas, driveways, and buildings.

Kirkland Residential Street Before LID Project — SvR Design Company Photo

In 2010, Kirkland developed design standards and guidelines to assist with the citing and designing of LID facilities. Projects are required to evaluate the feasibility of using LID facilities to manage stormwater when drainage reviews are triggered by redevelopment activities. Kirkland continues to promote LID facilities in the private and public redevelopment projects throughout the community. More information is available from the City of Kirkland Low Impact Development website included below.

Kirkland Street with pervious concrete sidewalk — SxR Design Co. Photo

City of Shoreline - Greenworks Program

The City of Shoreline is 11.7 square miles of area located in King County north of Seattle, extending to the north County line. Seventy percent of the 53,000 people that live in Shoreline live in single-family homes. The City incorporated in 1995 and inherited the drainage system that had developed as residential growth occurred in what was then unincorporated King County. Similar to Kirkland, there are areas in Shoreline where there is no formal piped stormwater management system. Many residential streets have open ditches or no existing stormwater facilities. A three-mile length of Aurora Avenue, also known as State Route 99, runs through the center of the City. This portion of the arterial did not have sidewalks or a formal drainage system until recently — when Shoreline redesigned the entire corridor. Now nearly completed, the project includes porous pavements, stormwater planters, and a rain garden plaza adjacent to the project. Additionally, the newly constructed Shoreline City Hall includes a green roof, rain gardens, biofiltration and bioretention swales that were used to meet the stormwater requirements for redevelopment.

In 2010, Shoreline developed the Greenworks Program with goals to implement LID facilities within the public rights-of-way to improve runoff impacts and improve water quality. The intent of the program is to install a limited number of facilities each year that target drainage problems. To date, Shoreline has installed bioretention and bioinfiltration facilities. The 2012 Capital Improvement Program has a line item for the Greenworks Program. These facilities are going to be maintained by the City of Shoreline. However, many residents have expressed interest in assisting with maintenance efforts, so Shoreline provides homeowners on adjacent properties with a brochure that

Before: Shoreline Residential Street with shallow ditch – SvR Design Co. Photo

Shoreline Residential Street with Bioretention Swale – SvR Design Co. Photo

Before: Unimproved Shoreline Residential Street – SvR Design Co. Photo

Shoreline Residential Street with Porous Asphalt Walkway and Bioinfiltration Planting Area – SvR Design Company Photo

describes what maintenance activities are appropriate for the homeowner and what they should request the City to maintain.

Shoreline's Green Street Demonstration project is another pilot program that the City developed to implement LID facilities. After geotechnical analysis confirmed that the soils met Ecology's recommendations for adequate design infiltration rates of higher than 0.25 inches per hour, Shoreline opted to install LID facilities — including bioinfiltration cells and a porous asphalt walkway. In addition, the bioretention cells were incorporated into "chicanes" (traffic calming curb bulb outs that require cars to maneuver around them) to reduce impervious surfaces and increase infiltration areas. This project highlighted to the community that transportation projects at a residential scale can provide multiple benefits including: stormwater management; traffic calming; pedestrian infrastructure; vegetation enhancement; and parking management.

As part of the 2011 City of Shoreline Surface Water Master Plan update, the City's Surface Water Utility identified three goals for surface water management: 1) flood reduction; 2) water quality protection/improvement; and 3) stream/wetland enhancement. To meet the requirements of its new NPDES permit, Shoreline will be developing basin plans for each watershed that identifies areas that are feasible to incorporate LID and GSI to support these goals. This proactive approach to basin management will allow Shoreline to install LID facilities on a broader scale — with potentially basin-wide capital projects. The basin level analysis will allow the City to effectively model and subsequently monitor the benefits of retrofitting a large-scale area with LID and GSI. More information is available from the City of Shoreline Surface Water Utility website included below.

City of Seattle - Stormwater Manual

In 2009, Seattle worked with Ecology to develop a Seattle-specific stormwater management manual (Seattle Stormwater Manual) that identified more stringent thresholds to trigger flow control and water quality than the minimum requirements set out in Ecology's 2005 Stormwater Management Manual for Western Washington. A major component of the Seattle Stormwater Manual was that development in Seattle was required to use green stormwater infrastructure or GSI — defined as a drainage control facility that uses infiltration, evapotranspiration, or stormwater reuse — to the maximum extent feasible. Examples of green stormwater infrastructure include: permeable pavement; bioretention facilities; and green roofs. Seattle regulations now include design standards and specifications for materials, and apply to redevelopment projects as well as new development projects. Additionally, these regulations applied "internally" to City departments. For example, the Seattle Department of Transportation is required to install green stormwater infrastructure to the maximum extent feasible for sidewalk and trail projects in areas that require flow control. Seattle also now limits the percent of impervious surface coverage on single-family parcels and is working on policies and programs to increase tree canopy across the City (applicable to all zoning). These types of policies and regulations allow Seattle to be a leader for developers by providing functioning examples of how the facilities can be retrofitted to better serve the community.

Seattle also offers programs for individuals or groups that want to voluntarily retrofit their property and install green stormwater infrastructure through the RainWise Program. This program is targeted to the 65% of the City that is zoned for single-family land use. The RainWise program provides information for property owners about: planting trees; improving soil quality to improve absorption and infiltration; reducing pavement area; using permeable pavements; disconnecting downspouts; installing cisterns; and building rain gardens. The program offers rebates and training for property owners in specific areas of the City where stormwater management — specifically flow control and volume reductions — is being targeted to reduce stormwater inflow into combined sewer systems. Seattle provides information about residential scale infiltration tests,

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Retrofit Focus

facility sizing, and material specifications that must be referenced and used to design these facilities. This program is specifically targeted to focus on residential areas of the City where single-family homes are the predominant land use. This program will help Seattle retrofit these residential areas with GSI. More information is available from the City of Seattle websites included below.

CONCLUSION

Cities and counties in the Puget Sound Basin, large and small, all have an impact on the health of downstream waters. It is imperative that they begin to take significant actions and implement the policies and regulations for stormwater management and retrofit areas that remain uncontrolled and untreated. A majority of the pollutants found in Puget Sound come from the stormwater runoff from the areas that were developed before stormwater regulations provided requirements for flow control and water quality. With the vast majority of the land use dedicated to residential uses, jurisdictions in the Puget Sound Basin must identify ways to retrofit these areas of their communities with stormwater management facilities that are affordable and appropriate at a residential scale. Facilities need to be located on both public and private land. Maintenance of these facilities should be the shared responsibility of both the agencies and the land owners.

As agencies and non-profits continue to collaborate with cities on outreach and education about opportunities that support stormwater management retrofits, there will be more examples of what has been successful to improve the health of the downstream receiving water bodies over time. Many cities are monitoring downstream waters due to increased requirements in reporting and water quality testing. The information collected will inform the next round of NPDES permit updates. The more efforts that are put to basin scale applications of LID and GSI, the more we will see aggregate downstream improvements.

For Additional Information:
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Web Sites for referenced Policies and Programs

Washington State Department of Ecology:
2012 Municipal NPDES General Permit Reissuance:
www.ecy.wa.gov/programs/wq/stormwater/municipal/2012Reissuance.html
2012 Draft Stormwater Management Manual for Western Washington:
www.ecy.wa.gov/programs/wq/stormwater/wwstormwatermanual/2012draft/2012draftSWMMWW.html
Puget Sound Partnership: www.psp.wa.gov/
12,000 Rain Gardens: www.12000raingardens.org/index.phtml
Washington State Extension Rain Garden Program: http://raingarden.wsu.edu/index.html
Sustainable Seattle: www.sustainableseattle.org/programs/stewardshipdevelopment
City of Kirkland Low Impact Development: www.kirklandwa.gov/depart/Public_Works/Storm___Surface_Water/Development_and_Construction/Low_Impact_Development.htm
City of Shoreline Surface Water Utility: www.cityofshoreline.com/index.aspx?page=579
City of Seattle Stormwater Manual:
www.seattle.gov/dpd/Codes/StormwaterCode/DirectorsRules/default.asp
City of Seattle Rainwise Program: www.seattle.gov/util/rainwise

Amalia Leighton, PE is a civil engineer at SvR Design Company in Seattle, Washington. She has been involved with the planning, design, and implementation of many green stormwater infrastructure and low impact development (LID) facilities. In addition to working in the states of Washington and California, she recently worked with Montgomery County, Maryland to review and coordinate opportunities to retrofit LID in coordination with transportation projects in suburban communities. Amalia received her civil engineering degree from the University of Washington and is a registered engineer in the states of Washington and California. Amalia also serves on the Seattle Planning Commission.

Corps NWPs

ARMY CORPS NATIONWIDE PERMITS & CWA 401 WATER QUALITY CERTIFICATION

NEW NWPS BECOME EFFECTIVE THIS MONTH

by Merritt Frey, Habitat Program Director, River Network

INTRODUCTION

Nationwide Permits Reissued

Every five years the US Army Corps of Engineers (Corps) reissues a series of general wetland dredge and fill and stream alteration permits known as the Nationwide Permits (NWPs). These permits allow a wide variety of activities that may harm wetlands and streams. The list of activities is long and varied. For example, NWPs cover activities from Scientific Measurement Devices (NWP 5) to Mining Activities (NWP 44) to Hydropower Projects (NWP 17). The new round of NWPs was proposed in February 2011 and released as final in the February 21, 2012 Federal Register .

401 Certification

There are two ways in which NWPs may be modified to better address regional, local, or site-specific concerns. One is the Corps' "Regional Conditions" process, through which the Corps' District Offices may impose more localized standards. The other is the federal Clean Water Act (CWA) Section 401 Water Quality Certification Process (401 Certification), which is the focus of this article. In most cases, the 401 certification process is carried out by State and Tribal water quality agencies that have been delegated the authority to administer CWA programs by the US Environmental Protection Agency (EPA). Through the 401 certification process, States and tribes can review federal permits — including the NWPs — and certify them, place conditions on them, or deny them altogether.

This article presents an overview of how 401 certification can be used to address the shortcomings of some NWPs and to address State or Tribal concerns. The article includes an overview and survey of how various States applied 401 certification to the NWPs that went into effect in 2007 (2007 NWPs) and discusses how 401 certification might be applied to those NWPs now coming into effect (2012 NWPs).

BACKGROUND

General Permits

There are two basic types of permits issued under federal Clean Water Act (CWA) wetland and stream alteration permit program — individual and general permits. Individual permits are just what they sound like — each individual project receives a site-specific permit. General permits are developed and adopted in a generic format to include broad categories of similar activities (e.g., minor road crossings and utility line activities) as a means of streamlining the permitting process. Once a general permit is created, applicants simply apply to be covered under the general terms of the permit. NWPs are general permits. General permits are allowed for categories of activities if:

- the activities are similar in nature and in their impact on water quality and on the aquatic environment; and
- the activities will have only minimal adverse effects on water quality and on the aquatic environment separately or cumulatively.

See 40CFR230.7(a)

General Permit Drawbacks

General permits, including the NWPs, have some serious limitations from the conservation perspective. Primary among these issues is that general permits allow for little or no review of site-specific considerations and provide no public notice for individual projects. In addition, although each activity may be small, the cumulative impacts of "small" disturbances permitted under general permits have been severe in many watersheds.

As part of the NWP reissuance process each State will review each NWP under the 401 certification process. Through 401 certification, States review the NWPs for compliance with water quality standards and other policies, and may deny, modify, or certify with conditions based on that review. *See* www.rivernetwork.org/401 for more information about 401 certification.

2007 NATIONWIDE PERMITS 401 WATER QUALITY CERTIFICATION

401 Certification History

In this section we look back at the 401 certification of the 2007 NWPs to ascertain what history can tell us about what to expect in 401 certification of the 2012 round of NWPs. We first summarize several big picture actions by the States in the 2007 round — those States which denied certification of all the 2007 NWPs and those which certified all of the 2007 as written. We then summarize just a few of the most common "themes" found in the conditions placed on the 2007 NWPs by the remaining States. These themes include conditions related to: protecting impaired waters; protecting special categories of waters

Corps NWPs

(e.g. Outstanding National Resource Waters); protecting special types of waters (e.g. bogs or fens); limiting the size of the impact of projects under certified NWPs; limiting the types of activities allowed under certified NWPs; requiring special notification; and limiting the effect of "waivers" issued by the Corps.

Approved as Written

Approving all of the NWPs as written

Three States certified all forty-nine NWPs in 2007 without conditions. The reasons varied — from a State with regulations requiring automatic certification to a State that felt all of their concerns had been addressed in Regional Conditions.

Table A: 2007 NWPs — States Certifying as Written All NWPs

State	Description
Alaska	Alaska simply issued certification of all NWPs within days of the Army Corps' issuance of the permits.
Colorado	Colorado is required by state regulations to certify all general or Nationwide 404 permits without the addition of conditions. (5 CCR 1002-82)
Georgia	Georgia felt their concerns and needs were fully addressed by the Corps Regional Conditions on the NWPs, so certified all as written. This may have been made easier by the fact that the relevant Corps office has the same footprint as Georgia (i.e. the Regional Conditions only addressed one state, Georgia, and Georgia only had to work with one District office, Savannah).

Approaches Following Denial

Denying all of the NWPs

Eleven States denied certification of all forty-nine NWPs in the 2007 round. In the case of the NWPs, denials result in the use of one of two approaches: 1) alternative State-level general permits; or 2) individual 401 certification.

Programmatic General Permits

In eight of the States, NWPs were replaced with another (or several) State-level general permit(s). These permits were designed to cover many of the same activities, but could address more State-specific needs and conditions. These "Programmatic General Permits" were still issued by the Corps and as "general permits" and retained limitations similar to those of the NWPs (e.g. no individual public notice, no site-specific requirements).

Individual Certification

Three of the States denied general certification and simply required individual certification of each application under each of the NWPs. This is a different scenario than what usually plays out in a 401 certification denial. Usually, if a State denies certification of a proposed federal permit, the permit is simply not valid. In the case of NWPs, however, the Corps often still issues permit coverage but it is contingent on the applicant receiving an individual 401 certification from the State. If the State denies that individual 401 certification, the NWP coverage would not be valid. If the State does issue certification the permit is valid, subject to any conditions included by the State.

"Waived" Certifications

These States' process allowed for site-specific review and requirements and — depending on each State's policy — individual public notice and comment opportunities. However, in at least one of these States, river advocates reported that individual review did not actually occur regularly, which resulted in "waived" certifications.

Table B: 2007 NWP — States Denying Certification of All NWPs

State	Result
Connecticut	State uses a Programmatic General Permit in place of NWPs.
District of Columbia	State requires individual certification of all NWP applications.
Hawaii	State requires individual certification of all NWP applications.
Maine	State uses a Programmatic General Permit in place of NWPs.
Massachusetts	State uses a Programmatic General Permit in place of NWPs.
Minnesota	State uses a Regional General Permit in place of NWPs.
New Hampshire	State uses a Programmatic General Permit in place of NWPs.
Rhode Island	State uses a Programmatic General Permit in place of NWPs.
Tennessee	State requires individual certification of all NWP applications, which is done in conjunction with a state permit program
Vermont	State uses a Programmatic General Permit in place of NWPs.
Wisconsin	State uses several Regional General Permits in place of NWPs.

Corps NWPs

Impaired Watersheds

Approach Options

Impaired Waters: Summary of Conditions

Protecting impaired waters

Eleven States applied conditions to the 2007 NWPs designed to limit NWP activities in impaired watersheds (i.e., those watersheds not meeting water quality standards). These included watersheds with waters identified as water quality impaired under the CWA's Section 303(d) process ("303(d)-listed" waters), those with a pollution-limiting Total Maximum Daily Load (TMDL) management plan in place, or both. In most cases, States applied their impaired waters condition(s) as general conditions applicable to all or most of their certified NWPs. However, two States applied impaired waters condition(s) to just one NWP, and another State applied the condition to a large group — but not all — of their certified NWPs.

Most impaired waters conditions simply required individual certification for any activity or project that would (or could) impact a 303(d) listed waterbody or a waterbody with a TMDL in place. Other approaches included: requiring Best Management Practices (BMPs); notification of the water quality agency; or mitigation.

Table C
2007 NWPs: States Applying a 401 Condition Providing Preferential Protection for Impaired Waters

State	Description
Alabama	All NWPs were conditioned to require implementation of BMPs to "prevent to the maximum extent possible potential discharges of pollutants" that would impact impaired waterbodies (303(d) listed, TMDL in place, or otherwise Tier 1).
Arizona	All certified NWPs were conditioned to require individual certification for activities within a certain distance of the impaired reach and activities on tributaries to an impaired reach, within a certain distance of the impaired reach.
Idaho	All certified NWPs were conditioned in two ways that relate to impaired waters. First, for activities impacting 303(d) listed waters notification of the regional DEQ office is required, along with basic project information. For activities in a reach where a TMDL is in place, the condition requires work be conducted "in a manner consistent with the TMDL."
Indiana	Only NWP 27 received an impaired waters condition. This condition requires that the project be a component of a restoration program previously approved by the agency within a sub-watershed identified as impaired and the agency identified the activity as beneficial for reducing impairment in a TMDL, a watershed plan or an MOU with the applicant agency.
Kansas	All NWPs were conditioned to "strongly" encourage applicants with a project within a watershed with a TMDL to contact their watershed field coordinator.
Kentucky	Only NWP 13 received an impaired waters condition. This condition required that the activity "…not impact waters of the Commonwealth identified by the Kentucky Division of Water as impaired with the impairment source including channelization or habitat loss."
Mississippi	Nine NWPs were conditioned to require additional preconstruction notification information in 303(d) listed waters and those with a TMDL in place for sediment or biological impairment. Additional information included justification for why the impacts cannot be avoided, proposed BMPS, and compensatory mitigation.
Missouri	All certified NWPs were conditioned to require individual certification for any activities on a waterbody that is 303(d) listed.
North Carolina	A large group of NWPs was conditioned to require compliance with any requirements resulting from 303(d) of the Act.
South Carolina	All certified NWPs were conditioned to require individual certification of activities in areas with impaired uses.
Washington	All certified NWPs were conditioned to require individual certification for any project that might impact an impaired waterbody. This is parameter specific: "Individual 401 review is required by this condition for projects or activities authorized under NWPs if the project or activity may result in further exceedances of a specific parameter the waterbody is listed for on the state's list of impaired waterbodies (the 303(d) list)." Corps Seattle District. *Special Public Notice: Final Regional Conditions and Water Quality Certification and Coastal Zone Management Consistency Decisions for the 2007 Nationwide Permits in Washington State.* November 7, 2007. Page 82.

"Special" Categories' Conditions

Protecting "special" categories of waters

Eighteen States applied a condition or conditions to protect special categories of waters to the 2007 NWPs. The majority of States who used this approach applied the restriction to all certified NWPs as a general condition. The most common categories identified for special protection involved: certain categories under antidegradation policies (e.g. Outstanding National Resource Waters — sometimes Outstanding "State" Resource Waters, etc.); certain aquatic life designated use categories (e.g. cold water fishery); Wild and Scenic or Natural Rivers; and waters with trout or salmonid populations.

Corps NWPs

Individual Certification

"Special" Categories: Summary of Conditions

The most common condition was to deny the general certification of the NWP(s) in the identified waterbody categories, but to allow for individual certification on a project-by-project basis. Other approaches included requiring notification of the State agency or requiring other plans, permits, or written approvals to proceed with a project in these waters.

Table D

2007 NWPs: States Applying a 401 Condition Providing Preferential Protection for "Special" Categories of Waters

("All certified NWPs" means a general condition that was applied to all NWPs not denied, suspended, or otherwise revoked.)

State	Description
Arizona	Thirty-two NWPs were conditioned to require individual certification if a project impacts and is within a certain distance of an Outstanding Arizona Water or its tributaries.
Arkansas	All forty-nine NWPs were conditioned to require individual certification for projects in Extraordinary Resource Waters, Ecologically Sensitive Waters and Natural & Scenic Waters.
Delaware	Six NWPs were conditioned to require individual certification for projects in areas designated as "critical resource waters."
Indiana	All certified NWPs were conditioned to required individual certification for activities in salmonid waters, Outstanding State and/or National Resource Waters, Exceptional Use waters, "critical" wetlands and special aquatic sites.
Kansas	All forty-nine NWPs were conditioned to require a Project Water Quality Protection Plan be submitted to the agency if the activity occurs within one-half mile of an Outstanding National Resource Water, Exceptional State Water, or special Aquatic Life Support Use Water.
Kentucky	Twenty-four NWPs were conditioned to require individual certification on activities involving Outstanding State or National Resource Waters, Cold Water Aquatic Habitat, or Exceptional Waters.
Michigan	All certified NWPs (thirty-two) were conditioned to require that a state permit also be issued in areas such as: Designated Natural Rivers, Designated Trout Steams, Designated Critical Dune Areas, state wild and scenic rivers. (As well as other land-based designated special areas).
Missouri	All certified NWPs (thirty-eight) included a condition requiring individual certification for activities on or within two miles upstream of a designated state or national resource area.
Nebraska	All certified NWPs (forty-five) included a condition requiring individual certification for activities on designated State Resource Waters – Class A.
New Mexico	The state denied certification of all NWPs in Outstanding National Resource Waters.
New York	All certified NWPs (twenty-five) included a condition requiring individual certification for Wild and Scenic Rivers, tidal wetlands, Natural Heritage sites, and state-owned lands.
North Carolina	Written approval from the state is required to proceed under the conditioned NWPs if the activities impact Water Supply waters, High Quality Waters, or Outstanding Resource Waters.
North Dakota	Fifteen NWPs were conditioned to require individual certification in certain classes of waters (Class I rivers, Class IA rivers, and classified lakes).
Ohio	All certified NWPs (except for NWP 3, 20, 27, 32, 37-28, 45-47 or maintenance activities under 7 and 12) were conditioned to not allow temporary or permanent impacts to Exceptional Warmwater Habitat, Cold Water Habitat Seasonal Salmonid, or equivalent designation; waters with an antidegradation category of Superior High Quality Water, Outstanding National Resource Waters or Outstanding High Quality Waters; and "general high quality water bodies" which harbor threatened and/or endangered species.
Oklahoma	Seven NWPs (3, 13, 18, 41, 45-47) were denied certification in Critical Resource Waters (which include Outstanding Resource Waters, Outstanding Resource Waters watersheds, and High Quality Waters). Individual certification is required.
South Carolina	All certified NWPs were conditioned to bar general certification of activities in Outstanding National Resource Waters, Outstanding Resource Waters, Trout Waters and other special sites.
West Virginia	Required individual certification (7, 29, 33, 39, 45, 48) or notification (6, 12-14, 16-19, 27, 40-42) for projects in Waters of Special Concern, Outstanding National Resource Waters, certain naturally reproducing trout streams, and selected other streams.
Wyoming	Twenty-two NWPs were denied general certification in Class 1 "Outstanding Waters."

Protected Water Types

Protecting certain types of waters

Eleven States placed conditions on all or some of the NWPs that limited their applicability in certain types of waters (e.g., fens, bogs or lakes). There were two general approaches to defining these water types: 1) identifying a variety of waterbody (e.g. bog); or 2) identifying a specific river or basin. The most common condition was a simple requirement for individual certification of activities relating to the waterbody type (i.e. the general certification does not apply).

Corps NWPs

Categorical Conditions

Water Types: Summary of Conditions

States often combined the idea of protecting categories of waters — such as Outstanding National Resource Waters — with the idea of protecting types of waters, such as bogs. This was sometimes accomplished within the same general condition which required individual certification for "special" waters and went on to list both categories and types.

Table E
2007 NWPs: States Applying a 401Condition Providing Preferential Protection for Certain Types of Waters

State	Description
Arizona	All certified NWPs conditioned to require individual certification for activities impacting lakes.
Florida	Certain certified NWPs conditioned to not apply to activities in particular waterbodies.
Illinois	Two NWPs require individual certification if the project impacts a list of specific waters; two NWPs require individual certification if the project impacts bogs, fens or forested wetlands.
Indiana	All certified NWPs conditioned to require individual certification in "critical" wetlands or special aquatic sites.
Michigan	Certain certified NWPs were limited as to the type of waters where they could apply – such as not allowing impact to wetlands adjacent to the Great Lakes or "rare" wetland types.
Nebraska	Certain certified NWPs were limited as to the type of waters they could be used in – such as Category 1 Eastern Saline Wetlands in Lancaster and Saunders counties.
New Mexico	The state denied certification of all NWPs in perennial, intermittent and wetland surface waters (as well as in Outstanding National Resource Waters), but certified all the NWPs (subject to conditions) in all ephemeral waters.
New York	All certified NWPs were conditioned to not apply in "special waters," including types such as tidal wetlands.
South Carolina	All certified NWPs were conditioned to not apply in certain waterbody types, such as springheads. One permit-specific condition set limitations on a permit's use in "special aquatic sites, including wetlands" (NWP 23).
Washington	All certified NWPs (except for 20, 32, 38, and 47) were conditioned to require individual certification if the activity impacted a list of wetland types. The types are spelled out in detail on the certification.
West Virginia	All certified NWPs included a condition requiring individual certification for a variety of waterbody types (e.g. naturally reproducing trout streams in certain counties) and specific rivers or waters.

Limitations on size of impacts and/or types of activities allowable

These categories of conditions are harder to summarize than the previous types because the actual limits placed through conditions varied so broadly and the conditions were more likely to be placed on specific a NWP or NWPs, rather than on the entire group as a general condition. However, these types of conditions can be critical to limiting the impact of the NWPs and so can not be ignored. We summarize each idea generally here and provide some examples.

Limiting Impact

Limiting the size of a project's impact

Some, though not all, of the NWPs include limitations on the size of impact (e.g. X acres of wetlands filled or Y feet of stream altered) as determined by the Corps. However, many States opted to add additional size of impact limitations to their certifications. These conditions tended to be permit-specific, although States such as Ohio (see below) opted to apply a more general size of impact limitation. The conditions trigger the requirement for an individual certification by the State for any project with an impact exceeding the condition's threshold.

Trigger Thresholds

For example, Ohio's certification included a general condition applicable to any project on a stream:

> "Temporary or permanent impacts to streams are limited to 500 linear feet, of which no more than 200 linear feet can be impacts to intermittent or perennial streams [except for NWPs 3, 12, 13, 20, 21, 27, 32, 37, 38, 41, 45 and 47]. Impacts shall be measured linearly from upstream to downstream, including the length of permanent or temporary stream impoundments, when calculating the total length of stream impacts [except for NWP 12, for which impacts shall be measured bank-to-bank]…" Korleski, Chris, Director of Ohio Environmental Protection Agency, letter to the Corps Chief of Engineers, detailed in the March 12, 2007 Federal Register. July 6, 2007. Page 3.

Other States that included impact size on at least some of the NWPs included (but were not limited to): Arizona, Florida, Illinois, Indiana, Kentucky, Michigan, Mississippi, Missouri, Nebraska, New York, North Carolina, North Dakota, Ohio, Oregon, South Carolina, Texas, Washington and West Virginia.

Corps NWPs

Limiting Types of Actions

Limiting the allowable types of action under a NWP

This category includes a wide-ranging mix of conditions generalized into two groups: 1) very specific limitations on the types of tools or technologies which can be applied under a NWP; and 2) specific limitations on the types of activities under a NWP.

Limitations on the types of tools or technologies to be used tend to be permit-specific and detailed. For example, Montana certified NWP 12 (Utility Line Activities) only if the project installed fiber optic line and "…where a static or vibratory plow is used, there are less than 12 stream crossings or the crossing is done in the dry." Lovelace, Bonnie, Montana Department of Environmental Quality, letter to Allan Steinle, Corps Helena Regulatory Office. May 4, 2007. For all other projects under NWP 12, the State denied certification in order to allow them to consider water quality standard related conditions for activities that would not qualify for their review under the Montana Major Facilities Siting Act. This type of condition can be very useful for limiting the use of unnecessarily disruptive technologies.

Permit-Specific Limitations

Limitations on types of activities allowable under a NWP also tend to be permit-specific. The conditions may identify a group of activities which will not be allowed under the NWP, or limit the NWP to be only applicable to a group of activities. For example, NWP 42 (Recreational Facilities) lent itself to both approaches. At least two States (Michigan and Ohio) denied 401 certification on NWP 42 for golf courses and ski areas. Conversely, South Carolina certified NWP 42 only for projects related to nature or horse trails, bike paths, small bridges or walkways. In another example, Oregon denied certification for NWP 12 for utility line stations or permanent access roads which impact waters of the State. This type of condition can be very useful to narrow the certification to only those projects which will more likely have a "minimal" impact and thus are not likely to violate water quality standards, etc.

Notification Purposes

Requiring Notification

Many States preserved a "right-to-know" option by conditioning some or all of the NWPs to require notification of the State (and sometimes others) when a project is proposed. Several States applied this as a general condition to all certified NWPs (e.g., Georgia, Nevada, New Mexico) while others applied the condition to a group of NWPs or to certain waterbody categories.

The intended use of the notification conditions appears to vary — at times the States wanted notification early enough to influence permitting while at other times the motivation was more driven by monitoring needs or other implementation concerns. For example New Mexico's general condition on all certified NWPs appears to be focused on monitoring and inspection needs: "The SWQB must be notified at least 5 days before starting construction to allow time to schedule monitoring and inspections." Letter from Marcy Leavitt, New Mexico Environment Department to Donald Borda, Corps. March 29, 2007. Page 3. On the other hand, California required notification on eight of the NWPs and appeared to be interested in earlier notice, perhaps to allow the agency to weigh in on the projects: "Not later than 21 days prior to commencing work on the proposed activity, the applicant must submit to the appropriate Regional Water Board a notification containing at a minimum the information listed below…If the applicant is not notified by the Regional Water Board within 30 days of the postmarked date of the notification, the applicant may assume the project meets the conditions of certification and may proceed with the project." Letter from Dorothy Rice, California Water Resources Control Board, to Michael Jewell, Corps. May 1, 2007. Pages 3-4. (The condition goes on to spell out the detailed contents required in a notification.)

States that included some sort of notification requirements on some or all of the NWPs included (but were not limited to): California, Georgia, Illinois, Indiana, Mississippi, Nevada, New Mexico, Texas and West Virginia. *See* also "waivers" below.

Corps Waivers

Addressing Corps waivers

In the 2007 round of NWPs several States were clearly concerned with the Corps' ability to "waive" the project impact size limitations for certain NWP applicants. For example, Iowa conditioned all the 2007 NWP to require an individual certification in any case where the Corps' district engineer issued a wavier to allow a permittee to exceed the limits of a NWP. Corps Fact Sheet No. 6(IA). Effective date: March 19, 2007. Modified December 10, 2007. In another example, Missouri included a general condition on the 2007 NWPs as follows:

Individual Review

> "NWPs issued by the Army Corps of Engineers (Corps) for which the 300 linear feet threshold for stream impacts is waived by the district engineer on classified waterbodies as defined by 10 CSR 20-7.031 shall require individual water quality certification by the state." *State of Missouri General Conditions for Nationwide Permits*. (On file with the author)

This type of condition allows a State to be sure that larger projects (i.e. not "minimal") would receive individual review.

Corps NWPs

General Conditions Imposed

Basic Practices

Spills

Riparian Vegetation

Stream Channel

Fill Materials

BMP Plan

Inspections

Access

2012 NATIONWIDE PERMITS 401 WATER QUALITY CERTIFICATION

While the future needn't be limited by the past, many of the 401 certification themes applied to the 2007 NWPs are very applicable to the new 2012 NWPs. These types of conditions have been applied successfully in many States, and can perhaps be even better adapted to others. In this section, some of these ideas and themes are summarized.

General Conditions

General conditions are those which are applied by States to most or all of the NWPs through the 401 water quality certification process. In 2007, various States applied anywhere from zero to forty-three conditions to their 401 certified NWPs.

There is a suite of general conditions that are broadly applicable to the NWPs. Several categories of general conditions drawn from the 2007 round of NWPs are summarized here:

Housekeeping, Best Management Practices, Inspection, etc.

In terms of rationale, these conditions are largely self-explanatory and simply outline good, basic practices. The list is not exhaustive but reflects versions of the most commonly placed conditions in this category. The final three recommended conditions in this category are more specialized and were applied by a limited number of States, so we provide more background on those conditions.

1. All activities shall be conducted in a manner consistent with state water quality standards, 303(d) requirements, and any other appropriate requirements of state and federal law. This certification does not relieve the permittee from the responsibility to obtain all other permits, approvals, or authorizations which may be required by federal, state, or local law, including without limitation stormwater permits.
2. Measures to prevent and control spills of fuel, lubrications or any other toxic materials shall be taken. If a spill does occur, the permittee will immediately notify the agency. *Most States include the actual number or numbers the permittee must contact if a spill occurs. Many States' conditions included detailed spill prevention and reporting requirements.*
3. Removal of existing riparian vegetation shall be restricted to the minimum necessary for project construction. Removal of vegetation shall not be allowed where stream bank stability under normal flow conditions would be compromised. *See West Virginia 2007 NWP 401 certification.* Revegetation is required, and shall utilize native (and, where appropriate, flood tolerant) species, preferably those species providing soil stabilization and wildlife habitat benefits. Invasive, non-native species are prohibited. *See Missouri 2007 NWP 401 certification*
4. Heavy equipment shall not be used or operated within the stream channel. If in-stream work is unavoidable, it shall be preformed in such a manner as to minimize the duration of the disturbance, turbidity increases, substrate disturbance, bank disturbance, and riparian vegetation. To the maximum extent practicable, all in-stream work shall be preformed during low flow conditions. In-stream work may not be performed during the spawning season.
5. Only clean, nonpolluting fill shall be used. The following materials are not suitable for bank stabilization and shall not be used:
    a. Earthen fill, gravel, broken concrete and fragmented asphalt;
    b. Concrete with exposed rebar;
    c. Tires, vehicles or vehicle bodies, construction or demolition debris;
    d. Liquid concrete;
    e. Any material (such as treated wood) containing chemical pollutants (e.g.: creosote or pentachlorophenol). *See Missouri 2007 NWP 401 certification.*
6. Permittee shall create and implement a comprehensive best management practice plan for prevention and control of pollutants during and after project implementation, including measures that will be taken to ensure permanent revegetation or cover of disturbed areas. *See, Alabama 2007 NWPs certification*.
7. Permittee shall conduct — at a minimum — weekly inspections of the project site to ensure best management practices are functioning as intended and are well maintained. Any problems identified in these inspections must be remedied in a timely manner (i.e. generally hours or days, not weeks or months). If the problems result in a discharge to a water of the State, the agency must be notified within 24 hours.
8. Permittee shall provide access to the property for inspection and monitoring purposes. Agency staff shall, at reasonable times, have access to any records that must be kept under this certification and related permits.

Corps NWPs

Violations

Water Supply

Complexity

Stream Habitat Values

Impaired Water Conditions

Protection From Harm

Special Categories

9. All conditions established in this certification become part of the coverage issued under the relevant Nationwide Permit, and hence are enforceable through that permit and its associated mechanisms. In addition, in the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided through State processes. In response to a suspected or confirmed violation of any condition of this certification, the agency may require the holder of any permit or license subject to this certification to furnish, any technical or monitoring reports the agency deems appropriate.
10. If water supply intakes are located downstream of the project that may be affected by increased turbidity or suspended solids, the permittee shall notify the operator in writing before work is started. If the water supply operators recommend additional best management practices or monitoring, the permittee must consider those recommendations in their project design.
State sources: Kansas (notice and consultation), Kentucky (notice), and West Virginia (notice). *Rationale:* Drinking water suppliers may have special concerns and particular best management practices and/or monitoring may be required in order to protect the drinking water intake. Notification and consultation provides a necessary protection for public health and limits possible financial impacts at drinking water facilities.
11. Any project requiring more than one federal license or permit are not certified, and require individual certification.
State source: California. *Rationale:* This condition can address concerns about large or complicated projects by triggering individual review. Multiple federal licenses or permits (e.g. FERC license and a 404 permit) are used to indicate complexity. This is not a perfect indicator, but it is a reasonable connection and should not necessarily be triggered by numerous projects.
12. Any stream reconstruction activities shall restore or enhance the habitat values of the stream and adhere to "natural channel design principals" and/or bioengineering techniques.
State sources: Ohio (general condition applicable to streams), Illinois (on specific NWPs), Idaho (specific to bank stabilization), Oregon (in a very limited manner). *Rationale:* Requiring these types of approaches directs projects to use generally "softer" engineering techniques (e.g., root wads and vegetation instead of rip-rap) where appropriate. These techniques will generally help a project fit within the supposedly required "minimal impact" for coverage under a NWP.

Protecting Impaired Waters

As noted above, eleven States applied conditions to the 2007 NWPs designed to limit activities in impaired watersheds — 303(d) listed waters, those with a Total Maximum Daily Load in place, or both. In most cases, States applied their impaired waters condition(s) as general conditions applicable to all or most of their certified NWPs.

An example condition for the 2012 NWPs could read:

303(d)-listed impaired waters (also referred to as Category 5 waters on the most recent Integrated Report): For projects on a waterbody with an impaired reach, if the project impacts the listed waterbody within ½ mile downstream of an impaired reach to within 1 mile upstream of an impaired reach: individual certification required.

Tributaries to 303(d) impaired waters: For projects on a tributary to a waterbody listed as impaired, if the tributary mouth is on an impaired reach and the project impacts the tributary within 1 mile of its mouth: individual certification required.

Waters with a Total Maximum Daily Load in place for a related parameter (e.g. sediment, temperature, etc.) and their tributaries (within the same distances described above for 303(d) listed waters): individual certification required.

Rationale: Already impaired waters must be protected from additional harm, both for common sense reasons and for legal reasons. Common sense reasons include the threat to public health and wildlife if uses are additionally degraded, the additional cost of restoration (perhaps even creating a situation where money is spent on restoration under a TMDL only to lose some or all of that benefit to an activity allowed under a NWP). Legally, 401certification requires that a State certify a permit will comply with water quality standards and other policies — this is impossible to do for a general permit which will further degrade water quality in an already impaired watershed. Individual certification can be required to ensure the proposed activity won't further impair the water or violate the TMDL's loading allocations.

Protecting special categories of waters

Eighteen States applied a condition or conditions to protect special categories of waters to the 2007 NWPs. Most States using this approach applied the restriction to all certified NWPs as a general condition.

Corps NWPs

Special Categories of Waters

Generalized examples include:

Outstanding State or National Resource Waters: For projects on a waterbody with a designated reach or those on tributaries to a reach which may impact the designated reach, if the project may impact the waterbody within ½ mile downstream of the reach to within 1 mile upstream of an impaired reach: individual certification required.

Wild and Scenic Rivers: For projects on a waterbody with a designated reach or those on tributaries to a reach which may impact the designated reach, if the project may impact the waterbody within ½ mile downstream of the reach to within 1 mile upstream of an impaired reach: individual certification required.

Blue Ribbon Trout Streams (or your State's equivalent): For projects on a waterbody with a designated reach or those on tributaries to a reach which may impact the designated reach, if the project may impact the waterbody within ½ mile downstream of the reach to within 1 mile upstream of an impaired reach: individual certification required.

Waters designated as which harbor any threatened or endangered species: For projects on a waterbody with a designated reach or those on tributaries to a reach which may impact the designated reach, if the project may impact the waterbody within ½ mile downstream of the reach to within 1 mile upstream of an impaired reach: individual certification required.

Rationale: These categories of waters are those designated because they have outstanding values which have been specially identified as deserving protection and/or sensitive values needing protection. Individual review and certification will allow the State to provide more review of projects that might impact those values and to place additional conditions that may be needed in these special circumstances.

Waterbody Types

Protecting certain types of waters

Eleven States placed conditions on all or some of the NWPs that limited their applicability in certain types of waters.

For example:

For projects that impact fens, bogs, seeps or sedge meadows: individual certification is required.

Rationale: Some waterbody types are particularly sensitive, rare or valued in some States. In these cases, States should reserve the right to review proposed projects individually to ensure protection of the values found in these waters.

Corps Waivers Review

Notification and Waiver Concerns

When a State provides 401 certification of a particular NWP, it does so based on the Corps' NWP package. In some cases, that includes size of impact limitations for projects eligible for the NWP. However, in some cases those size limitations can be waived by a Corps district engineer. In those cases, the State's responsibility to certify that water quality standards and other requirements will be met depends on an individual review of the project. In other words, while a State might generally certify that projects impacting less than 300 linear feet of stream comply with standards, if the district engineer allows 700 linear feet to be impacted under a waiver, the State should reserve the right to review that much larger project for compliance with standards.

Example language:

NWPs issued by the Army Corps of Engineers (Corps) for which the 300 linear feet threshold for stream impacts or ½ acre of wetland impacts is waived by the district engineer shall require individual water quality certification by the state.

Denial History

Problematic NWPs

Due to the severe shortage of reliable data on the cumulative impacts of NWPs, it is hard to say exactly which NWPs cause the most harm. The impacts will also vary from State to State. However, a review of 2007 NWP 401 certification denials (and suspensions) provides some indication of which NWPs the States were most concerned about on the ground.

States must deny certification if they cannot be sure that water quality standards and other policies will be complied with under the general permit. Remember, if a State denies 401 certification, this usually simply triggers a requirement for individual certification of each application under the NWP. This allows the State to review if a specific proposal will actually comply with water quality standards and other requirements.

Corps NWPs

Problematic NWPs

The following chart shows the top ten most often denied NWPs from the 2007 round.

Table F: Top Ten 2007 NWPs Most Often Denied and/or Suspended

NWP#	NWP Name	Denied	Suspended	Total
17	Hydropower Projects	22	8	30
44	Mining Activities	19	8	27
43	Stormwater Management Facilities	15	9	24
16	Return Water From Upland Contained Disposal Areas	15	8	23
40	Agricultural Activities	14	9	23
34	Cranberry Production Activities	15	8	23
39	Commercial and Institutional Developments	13	9	22
21	Surface Coal Mining Operations	14	8	22
49	Coal Remining Activities	14	8	22
50	Underground Coal Mining Activities	14	8	22

Conditions History

Reviewing the history of which of the 2007 NWPs triggered the most action in terms of State-added conditions may also provide some indication of which NWPs warrant close attention.

Table G: 2007 NWPs Most Often Denied, Ssuspended or Conditioned

NWP #	NWP Name	Condition: General	Condition: Specific	Condition: Both	Denied or Suspended	Total Denied or Conditioned
29	Residential Developments	11	5	8	21	45
44	Mining Activities	11	2	4	27	44
43	Stormwater Management Facilities	10	2	8	24	44
16	Return Water From Upland Contained Disposal Areas	14	2	5	23	44
40	Agricultural Activities	13	2	6	23	44
39	Commercial and Institutional Developments	11	4	7	22	44
42	Recreational Facilities	10	4	12	18	44
18	Minor Discharges	15	4	8	17	44
17	Hydropower Projects	11	2	0	30	43
46	Discharges in Ditches	13	4	6	20	43
27	Aquatic Habitat Restoration, Establishment, and Enhancement Activities	12	5	10	16	43
3	Maintenance	15	5	9	14	43

Permit-Specific Conditions

Another way to look at this is to focus in on the NWPs which received permit-specific conditions — an indication that the States had a more particular concern or concerns to address with a specific NWP. The chart below summarizes those NWPs that most often received permit-specific conditions and a combination of general and permit-specific conditions.

Table H: 2007 NWPs Most Often Receiving Permit-Specific Conditions

NWP #	NWP Name	Permit-Specific or General and Permit-Specific Conditions Applied
12	Utility Line Activities	18
42	Recreational Facilities	16
13	Bank Stabilization	16
27	Aquatic Habitat Restoration, Establishment, and Enhancement Activities	15
3	Maintenance	14
29	Residential Developments	13
18	Minor Discharges	12
14	Linear Transportation Projects	12
41	Reshaping Existing Drainage Ditches	12
7	Outfall Structures and Associated Intake Structures	11
47	Pipeline Safety Program Designated Time Sensitive Inspections and Repairs	11
39	Commercial and Institutional Developments	11
32	Completed Enforcement Actions	10
33	Temporary Construction, Access, and Dewatering	10
38	Cleanup of Hazardous and Toxic Waste	10
46	Discharges in Ditches	10
45	Repair of Uplands Damaged by Discrete Events	10
43	Stormwater Management Facilities	10

Concerns with Specific NWPs

Corps NWPs

Bank Stabilization

NWP 13 (Bank Stabilization): This NWP was tied for second place as the most-often specifically conditioned 2007 NWP. To address concerns with NWP 13, State conditions might require the use of bioengineering approaches, as Idaho did in the 2007 round. Other conditions might address the fact that the Corps can remove impact limits based on use of bioengineering and other techniques. NWP 13 also allows the Corps' district engineer to waive the size of impact limitations (1/2 acre or 500 linear feet) on intermittent and ephemeral streams. A State could condition NWP 13 to require individual certification of any project receiving a waiver. A State could also condition NWP 13 to lower the allowable project impact size.

Return Water

NWP 16 (Return Water From Upland Contained Disposal Areas): NWP 16 ranked fourth on both the most denied and most denied/conditioned lists for the 2007 NWPs.

The Corps own description of this NWP states:

> "The return water from a contained disposal area is administratively denied as a discharge of dredged material by 33 CFR 323.2(d), even though the disposal itself occurs on the upland and does not require a section 404 permit. This NWP satisfies the technical requirement for a section 404 permit for the return water where the quality of the return water is controlled by the state through the section 401 certification procedures."

Since the NWP language itself notes that the control of the quality of the return water relies on the State's certification process, an individual certification would be required to ensure standards are achieved.

Hydropower

NWP 17 (Hydropower): This NWP was the most often denied of the 2007 NWPs. In the 2007 round, most States either denied/suspended NWP 17 or only applied general conditions. Only two States — Texas and North Carolina — included more specific conditions. Texas required **b**est **m**anagement **p**ractices (BMPs) for erosion control, sedimentation control, and post-construction **t**otal **s**uspended **s**olids (TSS) control. North Carolina's conditions were more extensive, but addressed similar issues and compliance with other laws (e.g. stormwater permits). Many States are likely to again deny certification for NWP 17 altogether. Alternatively, conditions to limit the size of the project's impact could be applied (i.e. length of stream or wetland acreage rather than the size of the facility as written by the Corps) in order to minimize damage without an individual certification.

Minor Discharges

NWP 18 (Minor Discharges): NWP 18 was tied for second as the most often denied or conditioned NWP in 2007. The one major concern with NWP 18 is that the categories to which it applies do not describe activities that are similar in nature, as required for a general permit. States which placed conditions on the 2007 version of NWP 18 focused on: limiting the types (or specific) waters where the NWP was applicable; limiting the categories or waters where the general certification was applicable (e.g. Delaware exempted "critical resource waters" from their general certification); and best management practices for managing stockpiling, sidecasting, etc.

Mountaintop Removal Mining

NWP 21 (Surface Coal Mining Operations): NWP 21 was tied for fifth most denied/suspended NWP in the 2007 round, but this underplays the controversy surrounding this NWP. In June 2010, the Corps actually suspended the use of NWP 21 in Appalachia, admitting that the NWP had been used to allow activities that have resulted in more than minimal environmental impacts. NWP 21 had been used to permit valley fills associated with mountaintop removal mining. The new NWP 21 includes a ban on valley fills and a 300 linear foot limit on stream loss (although that limit can be waived by the district engineer). A State could use their 401 authority to deny NWP 21 altogether, or they could use conditions to require individual certification if the Corps waives the size limitation, to further reduce the allowable project size, or to require numerous other safeguards.

Residential Waivers

NWP 29 (Residential Development): This NWP was in the top ten most-often denied NWPs in the 2007 round. NWP 29 allows the Corps' district engineer to waive the size of impact limitations (1/2 acre or 300 linear feet) on intermittent and ephemeral streams. States could condition NWP 29 to require individual certification of any project receiving such a waiver. This NWP is also a good candidate for conditions protecting both impaired and special category waters through a requirement for individual certification (if these aren't established as a general condition).

Commercial & Institutional

NWP 39 (Commercial and Institutional Developments): This NWP was in the top ten most-often denied NWPs in the 2007 round. NWP 39 allows the Corps' district engineer to waive the size of impact limitations (1/2 acre or 300 linear feet) on intermittent and ephemeral streams. Again, a State could condition NWP 39 to require individual certification of any project receiving a waiver. In addition, NWP 39 can used to permit an incredibly broad range of projects and activities. A State could limit the types of activities allowable without individual certification.

Corps NWPs

AG Activities

Recreational Facilities

Stormwater

Mining

Floodplain

Above-Grade Fills

Unwise Development

NWPs Inconsistent

NWP 40 (Agricultural Activities): NWP 40 was tied for 4th place in the most denied category for 2007. Ohio placed a condition on NWP 40 which limits the use of the NWP to once per farm. NWP 40 allows the Corps' district engineer to waive the size of impact limitations (1/2 acre or 300 linear feet) on intermittent and ephemeral streams. A State could condition NWP 40 to require individual certification of any project receiving a waiver.

NWP 42 (Recreational Facilities): The extent of damage caused by a recreational facility could run from the miniscule to the enormous — for example, compare the possible impacts of a dirt foot trail to a white water park or an angler's access point to a ski development. As mentioned earlier, at least two States (Michigan and Ohio) denied 401 certification on NWP 42 for golf courses and ski areas. Conversely, South Carolina certified NWP 42 only for projects related to nature or horse trails, bike paths, small bridges or walkways. A State could use these types of conditions to ensure large projects receive their individual review.

NWP 43 (Stormwater Management Facilities): NWP 43 was tied (with NWP 44) for the second most-often denied NWP in 2007. When States applied conditions to this NWP, they tended to limit the types (or specific waters) where the certification was applicable or established project impact size limitations to allow individual certification of any project which had the size limits "waived" by the Corps' district engineer. NWP 40 allows the Corps' district engineer to waive the size of impact limitations (1/2 acre or 300 linear feet) on intermittent and ephemeral streams. States can condition NWP 43 to require individual certification of any project receiving a waiver. Several States also explicitly exempted new stormwater facilities from the certification, triggering the need for an individual certification.

NWP 44 (Mining Activities): This was the second most-often denied NWP in the 2007 round. States may again decide to deny certification for NWP 44, and hence require individual certification. NWP 44 allows the Corps district engineer to waive the size of impact limitations (1/2 acre or 300 linear feet) on intermittent and ephemeral streams. States can condition NWP 44 to require individual certification of any project receiving a waiver. Many other BMP-related conditions may be wise, depending on the mining activities in a particular region or State.

NWPs 29, 39, 40, 42, 43 and 44 and the 100-year floodplain: The Corps' 2012 NWPs package includes General Condition 10, which addresses fills within 100-year floodplain. This condition allows activity within the 100 year floodplain as long as the activity complies with FEMA-approved State or local floodplain management requirements. The 2000 and 2002 NWPs prohibited the use of certain NWPs within the 100-year floodplain.

The following excerpts from comments submitted on the 2007 NWPs by the Natural Resource Defense Council, National Wildlife Federation, American Rivers and others summarizes the history this way:

> "The 2000 and 2002 NWPs prohibited the use of NWPs 39 (residential, commercial, and institutional developments), 40 (agricultural activities), 42 (recreational facilities), 43 (stormwater management facilities), and 44 (mining activities) to authorize permanent above grade fills within mapped 100-year floodplains located below the headwaters. See, e.g.,67 Fed. Reg. at 2,093. They also prohibited the use of NWPs 39, 40, 42, and 44 within mapped floodways above the headwaters. Id. at 2,093-94….
>
> …. The Corps was clear in 2002 why prohibiting the use of these development NWPs in the floodplain was appropriate: "We are very concerned with the loss of life and property resulting from unwise development in the floodplain." 67 Fed. Reg. at 2,073; see also 65 Fed. Reg. at 12,880. In fact, it was the Federal Emergency Management Agency (FEMA) that actively pressured the Corps to add these NWP floodplain prohibitions (and more) to the 2000 NWPs.
>
> We have serious concerns related to the impact of the proposed NWP on floodplains in general and on the costs borne by the National Flood Insurance Program and disaster assistance specifically. The proposed NWP appears to be inconsistent with the objectives and requirements of Executive Order 11988 Floodplain Management that requires agencies to evaluate all actions in or affecting floodplains.
>
> Letter dated September 10, 1998 from FEMA Director James L. Witt to Mr. David Olson, HQUSACE…"
>
> [For the full comment document which includes a larger discussion of this topic, visit www.rivernetwork.org/401andnwp.]

States may want to consider conditions that limit or bar the use of some (e.g. NWPs 29, 39, 40, 42, 43 and 44) of NWPs in the 100-year-flood plan without individual review and certification by the State.

Corps NWPs

Local Input Opportunity

CONCLUSION

CURRENT STATUS, STATE'S TIMELINE, PUBLIC COMMENT, ETC.

The NWPs issued by the Corps in February will become effective on March 19, 2012. However, the States still receive their full 60 days for review. The February 21 Federal Register notice began the 60-day Clean Water Act Section 401 water quality certification processes by the States. This gives the States and tribal governments until April 23, 2012 to apply their 401 certification power to review the NWPs and certify, condition, or deny the NWPs for use in their jurisdiction. If the State or tribal government does not take action by April 23, the 401 certification is considered waived and the NWPs will be applied as written — representing a missed opportunity for local input to better tailor the NWP for particular States and tribes..

States are working now to finalize their 401 certification. Many States have already drafted their 401 certification, and some have issued those drafts for public comment and input (a few States apparently didn't even wait for the final NWPs to be issued — e.g., Illinois has already finalized their 401 certification). Now is the time for State agency staff to think creatively about conditions to protect their State's resources. In addition, local governments, watershed groups, and others who are interested in wetland and stream protection should engage with their State agencies now if they have ideas about 401 certification of the NWPs.

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Websites: For more information about the Nationwide Permit 401 certification ideas presented in this article and how to connect with what's going on in your State, visit www.rivernetwork.org/401andnwp. For more information about 401 water quality certification generally, see http://water.epa.gov/lawsregs/guidance/cwa/waterquality_index.cfm.

Geothermal Power Plant Permitting

CLOSED LOOP GEOTHERMAL POWER PLANTS

NEW MEXICO CLARIFIES PERMIT PROCESS

by Michelle Henrie, Michelle Henrie LLC (Albuquerque, NM)

Baseload Power

Introduction

High-temperature geothermal resources can be used to generate electricity on a utility scale. Geothermal heat is constant. Therefore, it provides baseload power (24/7) — unlike wind and solar. For electric utility companies that have renewable energy quotas, geothermal electricity is a nice choice because it meets the renewable component without the problems associated with intermittency.

Geothermal resources in New Mexico are governed by the State's Geothermal Resources Conservation Act (GRCA). The GRCA governs the development of high-temperature geothermal resources which are hotter than 250° F. The New Mexico Legislature recently passed an amendment to the GRCA that will impact geothermal regulation in New Mexico going forward.

New Technology

Generating Electricity from Geothermal Heat

Today's technology does not require steam (water vapor) to turn a turbine. Instead, geothermal heat warms a working fluid, which vaporizes at a lower temperature than water, and the working fluid turns the turbine to generate electricity. The technology, called Organic Rankine Cycle or ORC, involves two closed loops.

Closed Loops

The first closed loop pumps geothermal fluid to the surface. The hot geothermal fluid — contained in a pipeline — passes through a heat exchanger. Cooled slightly, it is then reinjected into the same geothermal source so that it can reheat and be used again and again. From the point where the geothermal fluid leaves the geothermal reservoir to the point where it returns, it remains in a pipe, under pressure and in the fluid phase. It does not commingle with the working fluid, shallow freshwater aquifers, or air. It never sees the light of day.

Geothermal Power Plant Permitting

The second closed loop also involves the working fluid. This working fluid, too, never leaves its pipe. This fluid gathers heat from the heat exchanger, vaporizes, turns the turbine, becomes cooled and then is circulated back into the heat exchanger.

Jurisdiction Over Development

Geothermal Regulation in New Mexico

When New Mexico passed the GRCA in 1975, ORC closed loop technology was not commercially viable. At that time, a legislator would have legitimately presumed that the only way to generate geothermal electricity was to extract and deplete the geothermal resource as steam — similar to other extractive natural resources like oil and gas. Also, geothermal wells are similar to oil and gas wells in that they are generally several thousand feet deep. Thus, it makes sense that the New Mexico Legislature gave express jurisdiction over geothermal resource development to the New Mexico Oil Conservation Division (OCD). The OCD issued nearly 100 pages of regulations for geothermal resource development. The regulations cover concerns such as: well spacing; "waste;" "correlative rights;" and "unitization" — all standard concerns in the world of oil and gas. These concerns are also reflected in the federal geothermal act and regulations, which govern the federal Bureau of Land Management's leasing of federally-owned mineral interests in geothermal heat.

"Water" Definition

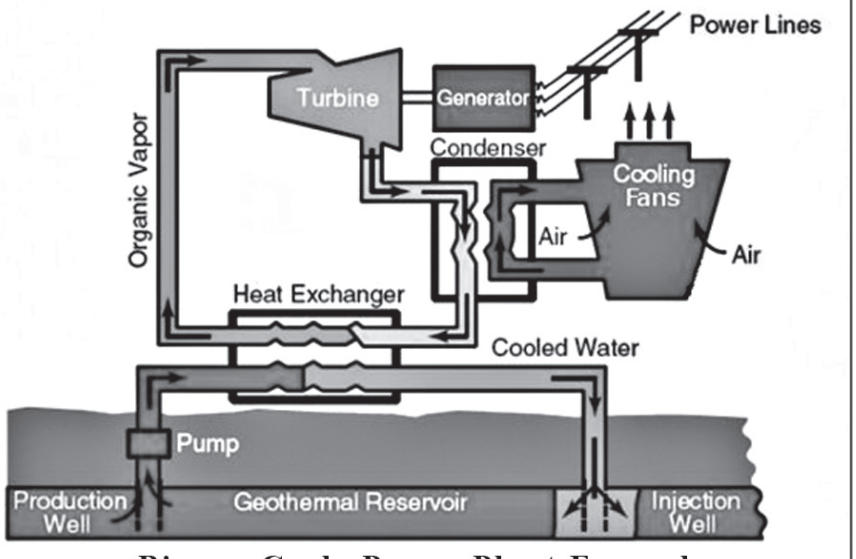
But what about water rights? On the one hand, geothermal fluids could be considered among those "other" fluids that serve an industrial purpose and are, therefore — for policy reasons — not included within the definition of "water." New Mexico has plenty of fluids that are not "water" — such as: the produced water byproduct of oil and gas; fluids resulting from mine dewatering; deep brackish water; and "artificial waters" such as effluent that depend on man, not nature, for continued existence.

State Engineer's Role

On the other hand, a prior New Mexico State Engineer, Steve Reynolds (now deceased), took the position that development of geothermal resources triggered the jurisdiction of the New Mexico State Engineer. This position was held in spite of the fact that the GRCA did not mention the State Engineer when it was passed in 1975. In 2003, the GRCA was amended to say that *low*-temperature geothermal waters are governed solely by the New Mexico Water Code, not the GRCA. However, the GRCA remained silent about the State Engineer's role in regulating *high*-temperature geothermal resources. In addition, the State Engineer's Office never issued regulations for geothermal waters. Without statutes or regulations addressing the issue, there was no way for the public to reasonably ascertain whether or not the State Engineer would also assert jurisdiction over high-temperature geothermal resources.

Geothermal Fluids

On a practical level, dual jurisdiction is fundamentally flawed. For example, OCD treats geothermal fluids like produced water, which are not allowed to touch the ground unless the fluid meets certain water quality thresholds. Thus, any well field testing that involves traditional pump tests is limited in duration by the volume of fluid that can be placed into lined ponds, e.g., 2-3 days. By contract, a typical State Engineer pump test would allow 10 days of testing during which time the water is flowed on the ground — so a 2-3 day test feels inadequate. As a second example, during a State Engineer permit hearing, State Engineer Staff must build a model. However, State Engineer Staff does not have experience modeling horizontal wells (such wells are common in the world of oil and gas development, but not water development). Because OCD and BLM permit well pad sites are within a 10-acre area, and because there is an infinite range of theoretical horizontal well shaft directions and depths, it is challenging if not impossible to determine reasonable but realistic assumptions for the model. In other words, only after the well field is actually drilled — at a cost of millions of dollars — can the well field be accurately modeled from a traditional "water" perspective. Only then could it be permitted without any "what ifs" — which is unrealistic from an investor's perspective.



Binary Cycle Power Plant Example

2012 Amendment to the GRCA

New Mexico has utility-scale geothermal resources, but no geothermal power plants. The first company to receive an OCD permit allowing it to move forward with a power plant is Los Lobos Renewable Power, a subsidiary of Cyrq Energy, with the Lightning Dock Geothermal project. OCD issued a permit in 2009 after a multi-day public hearing conducted before the agency's hearing

Geothermal Power Plant Permitting

Permit Exemption

Water Rights Injury

Water Table Decline

Mitigation Plan

examiner. When the 2012 Legislative session started, Cyrq Energy still did not have a State Engineer permit and could not move its project forward — despite having obtained project financing from Ormat Technologies, which signed a $65 million engineering, procurement and construction contract and a credit agreement in November 2011.

The proposed GRCA amendment was a cooperative inter-agency effort involving both the State Engineer's Office and the State's Department of Energy Minerals and Natural Resources (which houses OCD), as well as industry representatives. The goal of the amendment was to establish narrow circumstances in which, for policy reasons, it made sense to *not* require a State Engineer permit in addition to an OCD permit. These narrow circumstances are met when a project: (1) uses high-temperature geothermal resources; (2) all diverted fluids are reinjected into the same source (e.g., using ORC technology); and (3) there is no net depletion to the source. In addition to the remedies already contained in the GRCA, the amendment allows water rights holders who felt their water rights had been impaired by such projects a specific right of action in court. This right of action mirrors the statute allowing development of deep brackish water.

Due to concerns raised in the State Legislative Committees' hearing process, an additional provision was included in the amendment. This provision addressed concerns by irrigators that if a project caused water table declines beyond normal seasonal fluctuation during the irrigation season, such that the existing pump and well infrastructure was inadequate to provide water for crops, the irrigators could lose crops before any court remedy would be complete. The agencies looked to existing statutes to identify a two-step process to answer this concern. First, the agencies tracked a provision used in connection with permitting County subdivisions. Under that process, the State Engineer delivers to the County an opinion as to whether the proposed water supply for the subdivision is adequate. Similarly, in connection with permitting geothermal power plants, the State Engineer will deliver to OCD an opinion as to whether and which water rights could be impaired by the geothermal project. Second, the agencies looked to plans of replacement, which are used in connection with mine dewatering. If any water rights are identified by the State Engineer opinion as likely to be impaired, the geothermal developer must submit a plan of replacement showing how it will mitigate. Examples of mitigation include trucking in water temporarily, deepening wells, or building pipelines to deliver water. Based on personal experience, geothermal industry representatives felt there was an extremely low risk of the water table dropping appreciably due to a closed-loop ORC project. Their experience showed slight water table fluctuation as a project comes on line (a few feet), but then the water table stabilizes as the production and injection reaches equilibrium. Generally speaking, a slight water table rise would be expected.

Conclusion

The proposed GRCA amendment (HB 201) passed unanimously in the House and 36-6 in Senate — only one of 77 bills to pass in this short session (the lowest number of bills passed since 1976). The amendment was supported by geothermal developers who testified that without this legislation, there was no reason to work on projects in New Mexico when there are easier, lower-risk projects available in other geothermal states who have clear permitting paths involving only one agency. With this legislation, the Cyrq Energy project as well other geothermal utility-scale projects will be able to move forward in New Mexico.

HB 210 was signed into law by Governor Susana Martinez on Mach 6th. *See* www.nmlegis.gov/lcs/legRpt/legactgov.aspx to access this bill.

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WATER BRIEFS

GROUNDWATER REGULATION TX

OWNERSHIP & TAKINGS

In a severe blow to regulation of groundwater by the Edwards Aquifer Authority, the Supreme Court of Texas (Court) decided that "land ownership includes an interest in groundwater in place that cannot be taken for public use without adequate compensation guaranteed by article I, section 17(a) of the Texas Constitution." *Edwards Aquifer Authority, et al. v. Burrell Day, et al.*, Case No. 08-0964 (Feb. 24, 2012). The Court rejected summary judgment on the "takings" claim of R. Burrell Day and Joel McDaniel (collectively Day) and remanded the case to the district court for further proceedings on their claim.

Interestingly, the Court did hold that the Edwards Aquifer Authority (Authority) properly limited Day's permit under the Edwards Aquifer Authority Act (EAAA) based on the historical, beneficial use of groundwater and the fact that water from Day's well had historically flowed into a lake prior to irrigation use — thereby converting it into surface water, which then becomes "state water" under Texas law. "The Water Code defines state water — water owned by the State — as '[t]he water of ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state' ". TEX.WATER CODE § 11.021(a). *Slip Op*. at 9. "Day argues that because groundwater — defined by the Code as 'water percolating below the surface of the earth'— is not included in this list, it can never be state water. But the character of water as groundwater or state water can change." *Id*. Thus, because Day's water flowed from the well into a lake, where it was primarily used for recreation use, the Court found that there "was substantial evidence to support the Authority's finding that the groundwater became state water in the lake." *Id*. at 11.

Despite the findings about Day's historical use of the groundwater and the validity of the Authority's restrictions that limit Day's rights, the key issue for the Court was, "Whether groundwater can be owned in place… ." *Id*. The Court answered its question, holding simply, "But we held long ago that oil and gas are owned in place, and we find no reason to treat groundwater differently." Ownership of the overlying land thus gives every landowner in Texas ownership of the groundwater located under the land, without being restricted by historical use.

The Court's opinion discusses the rule of capture in some detail — especially the seminal case that adopted the rule in 1904 (*Houston & T.C. Railway v. East*, 81 S.W. 279 (Tex. 1904) — and its previous decision that groundwater and surface water should be treated differently. The Court, however, then noted the distinction from the *East* case: "The effect of our decision denying East a cause of action was to give the Railroad ownership of the water pumped from its well at the surface. No issue of ownership of groundwater *in place* was presented in *East*, and our decision implies no view of that issue." *Id*. at 15 (emphasis added). Explaining the rule of capture, the Court quoted *Sipriano v. Great Spring Waters of America, Inc*., 1 S.W.3d 75, 76 (Tex. 1999):

> The rule of capture answers the question of what remedies, if any, a neighbor has against a landowner based on the landowner's use of the water under the landowner's land. Essentially, the rule provides that, absent malice or willful waste, landowners have the right to take all the water they can capture under their land and do with it what they please, and they will not be liable to neighbors even if in so doing they deprive their neighbors of the water's use.

The Court then addressed the dilemma in the present case, again citing *Sipriano* at 79, 81. "The right to capture was not unfettered; it precluded the plaintiffs' suit but not legislative regulation, which we expressly recognized and encouraged. The concern was that with no common law liability for a landowner's unlimited pumping, legislators had inadequately provided for the protection of groundwater supplies…But while the rule of capture does not entail ownership of groundwater in place, neither does it preclude such ownership." *Slip Op*. at 19.

Ultimately, the Court rejected arguments that groundwater should be treated differently than oil and gas, citing *Elliff v. Texon Drilling Co.*, 210 S.W.2d 558, 561 (Tex. 1948)(internal citations omitted):

> In our state the landowner is regarded as having absolute title in severalty to the oil and gas in place beneath his land. The only qualification of that rule of ownership is that it must be considered in connection with the law of capture and is subject to police regulations. The oil and gas beneath the soil are considered a part of the realty. Each owner of land owns separately, distinctly and exclusively all the oil and gas under his land and is accorded the usual remedies against trespassers who appropriate the minerals or destroy their market value.

The Court followed the quote from *Elliff* with the conclusion, "We now hold that this correctly states the common law regarding the ownership of groundwater in place." *Slip Op*. at 26.

The opinion also provides insight into the Court's view of a "takings" claim for groundwater in Texas. "Groundwater rights are property rights subject to constitutional protection, whatever difficulties may lie in determining adequate compensation for a taking." *Id*. at 28. The opinion contains a detailed discussion of groundwater management in Texas and "whether EAAA's regulatory scheme has resulted in a "taking" of landowners' "constitutionally compensable interest in groundwater." *Id*. at 36. The Court remanded the "takings" claim back to the lower court, despite the lack of historical use and questions about groundwater regulations, since it also found that "a landowner cannot be deprived of all beneficial use of the groundwater below his property merely because he did not use it during an historical period and supply is limited." *Id*. at 45. It should be noted, however, that the Court did not decide that a "takings" was established: "A full development of the record may demonstrate that EAAA regulation is too restrictive of Day's groundwater rights and without justification in the overall regulatory scheme." *Id*.

The 50-page opinion goes into much more detail on several issues, including the "use it or lose it" principle, and is undoubtedly an important case for Texas water law. *The Water Report* plans to publish a detailed article on the case and its ramifications in an upcoming issue.

For info: Case at: www.supreme.courts.state.tx.us/historical/2012/feb/080964.pdf

WATER BRIEFS

STREAM ADJUDICATION OK

FEDERAL & STATE LITIGATION

The on-going controversy in Oklahoma over water rights in Sardis Lake has resulted in additional litigation with significant implications. A federal lawsuit filed by the Choctaw Nation and Chickasaw Nation led Oklahoma Attorney General (AG) Scott Pruitt, on behalf of the Oklahoma Water Resources Board (OWRB), to ask the Oklahoma Supreme Court (Court) on February 10 to begin the process of a general stream adjudication under the McCarran Amendment to determine water rights in three major stream systems in southeastern Oklahoma (Kiamichi, Clear Boggy, and Muddy Boggy systems). "It's our obligation to protect the rights of the state and all of its citizens. Unfortunately, tribal leaders chose to initiate litigation, calling Oklahomans' water rights into question. So today, we filed an application with the Oklahoma Supreme Court to begin the process of adjudication, which will confirm those water rights," Pruitt said. "Mediation continues to be a viable option in this case, and we remain hopeful an agreement can be reached." The Court assumed original jurisdiction over the case on February 23 and a hearing before a referee of the Court has been set for April 19. *OWRB v. The United States, et al.,* Case No. 110,375 (Feb.23, 2012).

In addition, the AG — on behalf of the Oklahoma Water Resources Board and Governor Mary Fallin, who are defendants in the federal court case filed by the Nations — filed motions to dismiss the federal court case based on an assertion that the federal court lacks jurisdiction since the action is a premature effort to have federal courts usurp Oklahoma's management of waters of the State, among other legal grounds. The City of Oklahoma City and the Oklahoma City Water Utility Trust (OCWUT) were also named as defendants in the federal lawsuit. *Choctaw Nation and Chickasaw Nation v. Mary Fallin, et al.*, Case No. CIV-11-927-W, (Jan. 26, 2012), Second Amended Complaint.

According to the AG, the federal lawsuit alleges the Indian Nations have federally-protected rights to the water within a 22-county territory in southeastern Oklahoma that are "prior and paramount" to any rights granted by the State to Oklahoma's citizens. Among other things, the lawsuit seeks: (1) declaratory judgments against any action by the OWRB on a pending application by Oklahoma City and OCWUT for a permit to use stream water from Sardis Reservoir in southeastern Oklahoma, or any other withdrawal or export of water from the area at issue, unless and until there is initiated a general stream adjudication that satisfies the requirements of the federal law known as the McCarran Amendment; and (2) permanent injunctions against any such action unless and until a general stream adjudication that satisfies the McCarran Amendment is completed.

In a cover letter that accompanied the AG's action to initiate the stream adjudication, the AG stated that his office will continue to attempt to mediate a settlement. The cover letter, however, notes that "the Tribes have launched an unprecedented media campaign to malign the State's efforts to address the challenges the Tribes themselves have brought as to your rights to water in southeastern Oklahoma. More recently the Tribes have greatly increased the airing of their commercials so that they are akin to a public relations blitzkrieg… ." The AG also stated that, "[T]he Tribes' actions over the years indicate their interest is in making money from the sale of water to Texas...the State has no way of knowing whether the Tribes' primary motive is no longer to make hundreds of millions of dollars selling water to Texas and elsewhere… ."

The necessity for a stream adjudication was further addressed in the cover letter: "One thing is clear, the Tribes themselves, not the bringing of a general stream adjudication, have caused the threat to the water resources of our State. The cloud of uncertainty placed upon existing water rights by the Tribes' claims can only be cured effectively in one way: the filing of a general stream adjudication. The adjudication will allow, under state and federal law, (and in state court) the final determination of the water rights of all claimants to water within the identified Basins. The adjudication will allow for the State, and all claimants to Oklahoma's precious water resources, to defend and protect their rights."

The AG offered assurances to water right holders in the affected basins that he would attempt to make the adjudication as easy as possible for those parties. "As it proceeds, we will be asking the Court to approve forms which may be filled out and returned, or completed on the internet, which residents can use to respond to protect their rights-without the necessity of hiring a lawyer. Further, we will take steps to make the process as painless as possible, and will continue-assuming the Nations are still willing to do so--to attempt to mediate a settlement, which can be approved as part of this adjudication, and thus streamline the process."

The AG laid out its basis position in the cover letter: "…while the State realizes that the Federal Government has made many promises to the Tribes in the past, including promises that their land would never be part of the territory or a state, Congress long ago changed its minds and made those lands part of the State of Oklahoma. The State's position is that in opening the lands to settlement, diminishing the Tribes' land, and in creating the State of Oklahoma, which included lands of the Tribes, Congress severely limited the Tribes' rights and powers. It was not the intent of Congress to create a State with the responsibilities of providing for the health and safety of all of its citizens, including the responsibility of seeing all citizens have water, yet not give it regulatory control over the State's waters. If the Tribes have any remaining water rights-which is doubtful-they would relate to the small percentage of land within the area that is Indian Country-not the sweeping power claimed by the Tribes, powers which would put the economic future of the entire state in the Tribes' hand." Earlier in the cover letter, the AG noted more specifically the percentage of tribal land he believes is involved: "The Tribes claim they have the right to regulate and control one hundred percent (100%) of the waters in the 22 counties in southeastern Oklahoma, despite the fact the Tribes' 'Indian Country' composes perhaps 3% or less of the land within those 22 counties."

For info: Details and documents available on OWRB's website: www.owrb.ok.gov/util/legal.php

WATER BRIEFS

WATER LEGISLATION KS
"USE IT OR LOSE IT"

Kansas Governor Sam Brownback signed two bills into law March 5 that are designed to conserve the state's water supply and extend the life of the Ogallala Aquifer. According to the Governor's press release, "House Bill 2451 eliminates the state's 'use it or lose it' water policy and gives landowners incentive to conserve water because they won't feel that they must use their maximum amount of water when they don't need to just so they don't lose water rights. Senate Bill 272 amends multi-year flex accounts to expand irrigators' capabilities and options so they can manage their crop water without increasing long-term water use under their water right."

HB 2451 is more limited than implied in the press release. The bill amends a section of law dealing with the abandonment of water rights, eliminating the requirement that groundwater rights — in areas declared closed to further appropriation — be required to have a means of diversion available "to put water to beneficial use within a reasonable time." Groundwater rights in closed areas would be considered to have due and sufficient cause for nonuse and, therefore, not subject to forfeiture because of abandonment. The change would allow area water right holders to conserve water without the fear of losing their water rights. The closed areas are located in the western half of Kansas.

SB 272 amended the Multi-Year Flex Account program. As explained by Chief Engineer David Barfield of the Division of Water Resources, Kansas Dept. of Agriculture, the bill increases the amount of groundwater that can be pumped under a flex account, without increasing overall water use. The statute allows water right holders to exchange annual pumping maximums for a five-year maximum, enabling substantial flexibility in year-to-year pumping. Previously, the statute imposed a water penalty for that flexibility, by requiring a 10 percent reduction in that five-year quantity to promote water conservation. Largely because of that penalty, very few water users placed their water rights into flex accounts, and so the statute had not resulted in much conserved water. The amended statute eliminated the ten percent reduction for conservation. Second, the bill provides three different potential options for water users to compute the amount of water that they can place into a flex account. They can use the average annual historic usage of the water right, based on the years 2000 to 2009, multiplied by five; they can use the normal irrigation requirement for crops in their county, multiplied by their maximum irrigated acres, again multiplied by five; or where available, they can use a Groundwater Management District developed alternative, provided that it does not increase long-term water use.

For info: Bills and details available at: www.ksda.gov/dwr/content/314/cid/1973#1

PRODUCED WATER US
ENERGY-WATER NEXUS STUDY

Water is a significant byproduct associated with oil and gas exploration and production. A 2009 Argonne National Laboratory study estimated that 56 million barrels of water are produced onshore every day, but this study may underestimate the current total volume because it is based on limited, and in some cases, incomplete data generated by the states. This water, known as "produced water," may contain a variety of contaminants. If produced water is not appropriately managed or treated, these contaminants may present a human health and environmental risk.

On January 9, the US Government Accountability Office (GAO) released a study entitled "Information on the Quantity, Quality, and Management of Water Produced during Oil and Gas Production." GAO was asked to describe: (1) what is known about the volume and quality of produced water from oil and gas production; (2) what practices are generally used to manage and treat produced water, and what factors are considered in the selection of each; (3) how produced water management is regulated at the federal level and in selected states; and (4) what federal research and development efforts have been undertaken during the last 10 years related to produced water. To address these objectives, GAO reviewed studies and other documents on produced water and interviewed federal and state regulatory officials, federal scientists, officials from oil and gas companies and water treatment companies, and other experts. GAO focused its review on the nine states that generate nearly 90 percent of the produced water, and conducted site visits in three states.

GAO found that in general, the volume of produced water generated by a given well varies widely according to three key factors: the hydrocarbon being produced, the geographic location of the well, and the method of production used. For example, some gas wells typically generate large volumes of water early in production, whereas oil wells typically generate less. Generally, the quality of produced water from oil and gas production is poor, and it cannot be readily used for another purpose without prior treatment. The specific quality of water produced by a given well, however, can vary widely according to the same three factors that impact volume — hydrocarbon, geography, and production method.

Oil and gas producers can choose from a number of practices to manage and treat produced water, but underground injection is the predominant practice because it requires little or no treatment and is often the least costly option. According to federal estimates, more than 90 percent of produced water is managed by injecting it into wells that are designated to receive produced water. A limited amount of produced water is disposed of or reused by producers in other ways, including discharging it to surface water, storing it in surface impoundments or ponds so that it can evaporate, irrigating crops, and reusing it for hydraulic fracturing. Managing produced water in these ways can require more advanced treatment methods, such as distillation. How produced water is ultimately managed and treated is primarily an economic decision, made within the bounds of federal and state regulations.

The management of produced water through underground injection is subject to the Safe Drinking Water Act's Underground Injection Control program, which is designed to prevent contamination of aquifers that supply public water systems by ensuring the safe operation of injection wells. Under this program, the Environmental Protection Agency (EPA) or the states require producers to obtain permits for their injection wells by, among other

WATER BRIEFS

things, meeting technical standards for constructing, operating, and testing and monitoring the wells. EPA also regulates the management of produced water through surface discharges under the Clean Water Act. Other management practices, such as disposal of the water into surface impoundments, irrigation, and the reuse of the water for hydraulic fracturing, are regulated by state authorities.
For info: Ann Mittal, GAO, 202/ 512-9846 or mittala@gao.gov; Study at: www.gao.gov/products/GAO-12-156

INFRASTRUCTURE COSTS US
INTERIOR FUNDING

The cost of repairing and expanding US drinking water infrastructure will top $1 trillion in the next 25 years, an expense that likely will be met primarily through higher water bills and local fees, a study released by the American Water Works Association (AWWA) shows. "*Buried No Longer: Confronting America's Water Infrastructure Challenge*" analyzes many factors, including timing of water main installation and life expectancy, materials used, replacement costs, and shifting demographics. Nationally, the infrastructure needs are almost evenly divided between replacement and expansion requirements.
For info: Report: www.awwa.org/Government/Content.cfm?ItemNumber=1062&navItemNumber=58521

INFRASTRUCTURE WEST
RECLAMATION FUNDING SUPPORT

On February 8, Secretary of the Interior Ken Salazar announced $50 million in funding for water infrastructure in the West — including $30 million in funding for rural water construction projects. The funding will support a variety of efforts — providing financial assistance and construction support for rural water projects, addressing aging infrastructure to maintain system reliability and safety, restoring aquatic habitat, and meeting the increasing water demands of the West.

Six rural water projects, selected by the US Bureau of Reclamation (Reclamation) as directed by the Consolidated Appropriations Act of 2012, will help advance infrastructure projects that will deliver clean, reliable drinking water to remote areas. The projects are: $10.9 million for the Garrison Diversion Unit (Pick-Sloan Missouri Basin Program) in North Dakota to allow the Spirit Lake Tribe to replace an existing water storage reservoir to ensure reliable water service to the West Fort Totten area of the reservation. Funding will also be used to replace poor quality private wells in Logan and McIntosh counties. Fort Peck Reservation/Dry Prairie Rural Water System (Montana): $9 million to enable the Assiniboine Sioux Tribe to complete the mainline pipeline from Brockton to the Big Muddy to facilitate the delivery of water to Dry Prairie. The funds will also allow for the completion of the mainline from Big Muddy to Culbertson so that a sufficient amount of water from the new treatment plant will be delivered to Dry Prairie. Lewis and Clark Rural Water System (South Dakota, Iowa, Minnesota): $5 million for the purchase of water treatment plant tools, vehicles, maintenance equipment, security fencing, and installation of approximately three miles of pipeline in Minnesota. Rocky Boy's/North Central Montana Rural Water System (Montana): $3.9 million for the Chippewa Cree Tribe of the Rocky Boy's Indian Reservation to complete a portion of Segment 3 of the Core pipeline installation for the Rocky Boys Rural Water System. It will also help to provide an interim water system to three areas in Montana as part of the North Central Montana Rural Water System. Eastern New Mexico Water Supply Project (New Mexico): $1 million to support the construction of an intake structure at Ute Reservoir to supply water to eight municipalities and three counties in eastern New Mexico. Jicarilla Apache Rural Water System (New Mexico): $200,000 to assist the Jicarilla Apache Nation in continuing its on-going work related to the Jicarilla-Apache Water System will allow construction of new water and wastewater facilities in the town of Dulce, New Mexico. This new funding is in addition to $16.1 million that Reclamation had already identified for construction activity for the Mni Wiconi project in South Dakota that will help build water distribution systems to serve several rural communities, including reservation areas of the Oglala Sioux Tribe and the Rosebud Sioux Tribe.

To allocate fiscal year 2012 funding for rural water projects, Reclamation considered the level of time and financial resources already committed by project beneficiaries, a perspective on regional watersheds, and compelling need — such as water quality, tribal members served, economic impacts, and water use efficiency.

The remaining $20 million in Reclamation funding supports: $5 million for fish passage and fish screens to meet increasing water demands in the West while protecting the environment and restoring aquatic habitat that has been impacted by historic development; $6 million for water conservation and delivery studies to promote water conservation and improved water management; $4 million for environmental restoration and compliance efforts with an emphasis on species recovery and protection; and $5 million for facility operation, maintenance, and rehabilitation to ensure system reliability and safety of infrastructure in support of sustainable water management.
For info: Adam Fetcher, DOI, 202/ 208-6416; Project summaries available at: www.usbr.gov/budget/2012/spd

CAFO PERMIT MANUAL US

EPA has released a technical manual for concentrated animal feeding operations (CAFOs) to provide states, producers, and the general public with general information on Clean Water Act and National Pollutant Discharge Elimination System (NPDES) permit program requirements for CAFOs, information to explain CAFO permitting requirements under the Clean Water Act, and technical information to help states and producers understand options for nutrient management planning. EPA intends the manual to be a living document that will be updated periodically to incorporate new and emerging approaches to CAFO management, including those focused on manure reuse and recycling and use for energy generation. Interested parties are encouraged to bring to EPA's attention questions and suggestions concerning the content of this manual at any time. EPA will update this document periodically to ensure that this manual remains as helpful as possible.
For info: Manual at http://cfpub.epa.gov/npdes/afo/info.cfm#guide_docs

WATER BRIEFS

AG & CONSERVATION US

USDA TO ENHANCE CRP PROGRAM

On March 2nd, US Department of Agriculture (USDA) Secretary Tom Vilsack announced the opportunity for agricultural producers to enroll a total of one million acres of land in a newly enhanced Conservation Reserve Program (CRP) initiative to preserve grasslands and wetlands.

CRP is a voluntary program available to agricultural producers to help them use environmentally sensitive land for conservation benefits. Producers enrolled in CRP plant long-term, resource-conserving covers to improve the quality of water, control soil erosion and develop wildlife habitat. In return, USDA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years.

The goal of the new CRP grasslands and wetlands initiative is to increase enrollment of environmentally sensitive land through targeted signups. USDA's Farm Service Agency (FSA), which administers CRP, will set aside acres within the 32-million acre program for specific enrollments that benefit duck nesting habitat, upland birds, wetlands, pollinators, and wildlife. Rather than wait for a general sign-up (the process under which most CRP acres are enrolled), producers whose land meet eligibility criteria can enroll directly in "continuous" categories at any time.

CRP changes include:

New Continuous Pollinator Practice
(100,000 additional acres)
A new continuous practice to permit producers to develop pollinator habitat for many pollinator species.

Increase Acreage for Wetland Restoration
(200,000 additional acres)
Two practices will expand that are designed to restore wetlands that are both within a 100-year floodplain and outside of a100-year floodplain. Last year's floods were a strong reminder of the value of wetlands in absorbing storm water and slowing run-off.

Critical Grassland Restoration
This initiative targets areas that can restore important habitats to protect threatened and/or endangered species, candidate species, or species of significant social/economic importance. The restoration work would be done through the following existing practices and sub-initiatives:

Increase Acreage for SAFE
(400,000 additional acres)
SAFE practices provide the flexibility to meet the specific needs of high-value wildlife species in a participating state or region through higher-quality habitat. SAFE projects would be developed at the state and local level.

Duck Nesting Habitat
(150,000 additional acres)
Restores wetlands and develops nesting habitat in areas deemed as the most critical waterfowl areas. Currently, there are 175,000 acres enrolled.

Upland Bird Habitat Buffers
(150,000 additional acres)
Provides extremely valuable habitat for upland birds such as quail and pheasants. Currently, there are 244,000 acres enrolled in this initiative.

Greater Incentives for Continuous CRP

To encourage producers to sign up their most environmentally valuable acres FSA will increase the Signing Incentive Payments (SIPs) to $150 per acre from the current level of $100 per acre. The incentive is offered on most continuous practices and will include wetland restorations, pollinators, and upland bird habitat.

Recently, USDA announced two additional CRP sign-ups: a four-week general sign-up beginning on March 12 and ending on April 6; and a continuous sign-up for Highly Erodible Cropland beginning this summer, which seeks to protect the nation's most environmentally sensitive lands. The Highly Erodible Cropland initiative permits landowners to enroll up to 750,000 acres of land with an Erodibility Index (EI) of 20 or greater.

Currently, about 30 million acres are enrolled in CRP. Contracts on an estimated 6.5 million acres will expire on September 30, 2012.

For info: FSA fact sheet "Conservation Reserve Program" — which can be found at www.fsa.usda.gov

CONSTRUCTION RUNOFF US

EPA ISSUES NEW PERMIT

EPA is issuing a new permit for construction operators. Stormwater discharges from construction sites can contain harmful pollutants, such as nutrients, that contaminate waters, increase drinking water treatment costs, and damage aquatic ecosystems. The 2012 construction general permit is required under the Clean Water Act and replaces the existing 2008 CGP, which expired on February 15, 2012.

The 2012 permit updates include steps intended to limit erosion, minimize pollution sources, provide natural buffers or their equivalent around surface waters, and further restrict discharges to areas impaired by previous pollution discharge. Many of the permit requirements implement new effluent limitations guidelines and new source performance standards for the construction and development industry that became effective on February 1, 2010, which include pollution control techniques to decrease erosion and sediment pollution. The permit will be immediately effective in areas where EPA is the permitting authority: Idaho, Massachusetts, New Hampshire, New Mexico, Washington, D.C., and most US territories and in Indian country lands.

For info: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

GREEN INFRASTRUCTURE US

EPA UPDATES WEBSITE, OFFERS WQ ASSISTANCE

EPA's updated "Green Infrastructure" website repackages and expands upon EPA's previous website to showcase EPA's research on green infrastructure and to serve as a gateway to the wealth of resources developed by governmental agencies, academia, non-profits, and the private sector. Stakeholders can consult the website for up-to-date information on green infrastructure publications, tools, and opportunities.

The first opportunity announced on the website is the availability of direct assistance from EPA to facilitate the use of green infrastructure to protect water quality. Technical assistance will be provided through EPA contract support, and will be directed to watersheds/sewersheds with significant water quality degradation associated with urban stormwater. The total EPA assistance available is approximately $950,000, and will be distributed among 10-20 projects. Letters of interest must be received by April 6, 2012.

For info: http://water.epa.gov/infrastructure/greeninfrastructure

CALENDAR

March 18-21 OR
2012 Sustainable Water Management Conference & Exposition, Portland. Marriott Waterfront Hotel. Sponsored by American Water Works Ass'n. For info: www.awwa.org/Conferences

March 20 OR
Zidell Remediation Project: It's All in the Process (Brownbag), Portland. Portland Bldg. Auditorium, 1120 SW Fifth Ave., 2nd Floor. Sponsored by the Rivers Office. For info: Rick Bastasch, City of Portland, 503/ 823-0275 or www.portlandonline.com/river

March 20-23 LA
Environmental Awareness Bootcamp, New Orleans. Hilton Garden Inn French Qtr. For info: EPA Alliance Training Group, 713/ 703-7016 or www.epaalliance.com

March 21 AZ
Gardenroots: The Dewey-Humboldt, Arizona Garden Project (Brownbag), Tucson. WRRC, 350 N. Campbell Ave., 12-1:30pm. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526, jcripps@cals.arizona.edu or cals.arizona.edu/azwater

March 21 WEB
Managing Water Above & Below: USGS Webinar, WEB. For info: https://www3.gotomeeting.com/register/507285990

March 22-24 UT
41st Annual Conference on Environmental Law, Salt Lake City. The Grand America. Sponsored by the American Bar Ass'n. For info: www.ambar.org/EnvironACEL

March 24 CO
Dolores River Restoration Day, Gateway. Sponsored by Tamarisk Coalition, Moab BLM, Rim to Rim Restoration & Dolores River Restoration Partnership. For info: www.tamariskcoalition.org

March 25-27 Quebec, Canada
3rd IWA-WEF Wastewater Treatment Modelling Seminar 2012, Mont-Sainte-Anne. Sponsored by International Water Ass'n & Water Environment Federation. For info: Bruce Johnson, bruce.johnson2@ch2m.com

March 25-27 CA
WateReuse California Annual Conference, Sacramento. Sheraton Grand. For info: WateReuse: www.watereuse.org/sections/california/conference

March 26-28 LA
GIS & Water Resources VII: 2012 AWRA Spring Specialty Conference, New Orleans. Sheraton Hotel. For info: American Water Resources Ass'n, www.awra.org/meetings/

March 27 OR
Sediment - CERCLA & Oregon Cleanup Law Conference (Portland Harbor), Portland. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, hduncan@elecenter.com or www.elecenter.com

March 27-28 CA
29th Annual Executive Briefing: Decision Points 2012, Sacramento. Doubletree Hotel. Sponsored by Water Education Foundation. For info: www.watereducation.org/doc.asp?id=850

March 28 NM
Hydraulic Fracturing Conference, Santa Fe. Inn & Spa at Loretto. For info: CLE International, 800/ 873-7130 or website: www.cle.com

March 29 CO
Dying of Thirst: The Right to Water in a Globalized World Symposium - Micro Water Management: Individual Access to Water & Sanitation, Denver. University of Denver. Sponsored by Center on Rights Development. For info: www.centeronrightsdevelopment.org

March 29-30 NM
Law of the Rio Grande Conference, Santa Fe. Inn & Spa at Loretto. For info: CLE International, 800/ 873-7130 or website: www.cle.com

March 30 AZ
Macro-Rainwater Harvesting/ Evaporation Interception (Brownbag), Tucson. WRRC, 350 N. Campbell Ave., 12-1:30pm. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526, jcripps@cals.arizona.edu or cals.arizona.edu/azwater

April 4-5 WA
Clean Water & Stormwater Seminar, Seattle. Renaissance Seattle Hotel. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

April 4-5 OK
Student Water Research Conference, Stillwater. OSU. For info: Dr. Garey Fox, 405/ 744-8423, garey.fox@okstate.edu or http://agwater.okstate.edu/news-events/student-water-research-conference

April 5 CO
Dying of Thirst: Right to Water in a Globalized World Symposium - Water in the West Panel, Denver. University of Denver. Sponsored by Center on Rights Development. For info: www.centeronrightsdevelopment.org

April 9-11 CO
The Colorado River Basin: Agenda for Use, Restoration & Sustainability for the Next Generation (State of the Rockies Conference), Colorado Springs. Colorado College. For info: www2.coloradocollege.edu/stateoftherockies/conference.html

April 10 AZ
Biofuel Production & Water in the Southwest (Brownbag), Tucson. WRRC, 350 N. Campbell Ave., 12-1:30pm. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526, jcripps@cals.arizona.edu or cals.arizona.edu/azwater

April 10-11 WA
Low Impact Development Workshop: Bioretention, Puyallup. WSU LID Research Facility. For info: http://cm.wsu.edu/ehome/index.php?eventid=34097&

April 10-11 MD
Understanding & Managing TMDLs Training Event, Annapolis. Aarcher Institute Training Ctr. For info: Aarcher Institute, 410/ 897-0037 or training@aarcherinstitute.com

April 10-12 MT
Strategies & Solutions for Managing Storm Water - 2012 Montana Stormwater Conference, Kalispell. Hilton Garden Inn. For info: Janet Bender-Keigley, 406/ 994-6671 or Jkeigley@montana.edu

April 11-13 CA
Central Valley Tour (Field Trip), San Joaquin Valley. Sponsored by Water Education Foundation. For info: www.watereducation.org/toursdetail.asp?id=826&parentID=821

April 12 CO
Dying of Thirst: Right to Water in a Globalized World Symposium - Who Owns Water? Panel, Denver. University of Denver. Sponsored by Center on Rights Development. For info: www.centeronrightsdevelopment.org

April 12-13 CA
Water Rights & Trading Regional Summit, Santa Barbara. Bacara Resort. Sponsored by WestWater Research & American Water Intelligence. For info: jmc@globalwaterintel.com

April 16-18 DC
National Hydropower Ass'n Annual Conference, Washington. Capital Hilton. For info: www.nationalhydroconference.com/index.html

April 18 WA
UW Water Symposium, Seattle. NHS Hall, University of Washington. Hosted by Center for Urban Waters. For info: CUW: www.urbanwaters.org/

April 18-20 MT
Riparian Restoration in a Contaminated Environment Symposium, Deer Lodge. Elk's Lodge. Sponsored by Montana Natural Resource Damage Program. For info: www.doj.mt.gov/lands/symposium.asp

April 19 AZ
Valuing the Multi-Benefits of the Murray-Darling Basin Plan (Brownbag), Tucson. WRRC, 350 N. Campbell Ave., 12-1:30pm. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526, jcripps@cals.arizona.edu or cals.arizona.edu/azwater

April 19 WA
Water Right Transfers Seminar, Seattle. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 19 AK
Regulation of Water in Alaska Seminar: The Changing Environment of Permitting & Enforcement, Anchorage. Hotel Captain Cook. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 19 CO
Dying of Thirst: Right to Water in a Globalized World Symposium - Rivers of Conflict Panel, Denver. University of Denver. Sponsored by Center on Rights Development. For info: www.centeronrightsdevelopment.org

April 19 WEB
Private Sector Role in Site Cleanup: The Regulatory Perspective Course, WEB. For info: NGWA: www.ngwa.org

April 19-20 CA
Planning & Environmental Law Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

April 23 OR
Water Quality: Toxics & Water Quality Standards Conference, Portland. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, hduncan@elecenter.com or www.elecenter.com

April 24-25 WA
Low Impact Development Workshop: Permeable Pavement, Puyallup. WSU LID Research Facility. For info: http://cm.wsu.edu/ehome/index.php?eventid=34097&

April 25 WA
GoGreen '12 Seattle Conference, Seattle. For info: http://seattle.gogreenconference.net/event_details/

April 25 WEB
Life Cycle of Groundwater Data - From Field to Lab to Electronic Data Deliverable to Report (Course), WEB. For info: NGWA: www.ngwa.org

April 25-26 OR
Oregon Future Energy Conference, Portland. Presented by Northwest Environmental Business Council & Oregon Solar Energy Industries Ass'n. For info: Sue Moir, NEBC, 503/ 227-6361, sue@nebc.org or www.nebc.org

April 26 CO
Site Characterization: The Groundwater System Course, Denver. Hampton Inn - Downtown. For info: NGWA: www.ngwa.org

April 26-27 CO
Federal Regulation of Culture, Wildlife, & Waters of the U.S. Institute, Denver. Marriott City Center. Sponsored by Rocky Mt. Mineral Law Foundation. For info: Mark Holland, RMMLF, 303/ 321-8100 x106, mholland@rmmlf.org or www.rmmlf.org

April 26-27 OR
Pacific Northwest Timberlands Management Seminar, Portland. World Forestry Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 26-27 CO
Fundamentals of Groundwater Geochemistry Course, Denver. For info: NGWA: www.ngwa.org

The Water Report
Water Rights, Water Quality & Water Solutions in the West
260 N. Polk Street • Eugene, OR 97402

CALENDAR

(continued from previous page)

April 27 — OR
Oregon League of Conservation Voters Annual Celebration for the Environment, Portland. Oregon Convention Ctr. For info: http://olcv.org/node/6120

April 27 — MT
Wetlands Seminar, Helena. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 28-29 — CA
Investing in Our Water Future: Focus on California Seminar, Santa Barbara. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 30-May 4 — OR
National Water Quality Monitoring Council 8th Water Quality Monitoring Conference, Portland. Sponsored by National Water Quality Monitoring Council. For info: http://acwi.gov/monitoring/conference/2012/index.html

May 2-4 — WA
2012 PNWS-AWWA Conference, Yakima. Yakima Convention Ctr. Sponsored by Pacific NW Section - American Waterworks Ass'n. For info: www.pnws-awwa.org/SectionIndex.asp?SectionID=60

May 2-4 — OR
Living Future Sixth Annual Conference: Women Reshaping the World, Portland. Hilton Executive Tower. For info: http://cascadiagbc.org/living-future/12

May 3 — DC
Wetlands Law & Regulation Course, Washington. Hunton & Williams Law Office. Offered by ALI-ABA; WEBCAST Available. For info: www.ali-aba.org/

May 6 — CA
Contaminant Hydrogeology of Karst (#305) Course, Garden Grove. For info: NGWA: www.ngwa.org

May 6-10 — CA
2012 National Ground Water Ass'n Ground Water Summit: Innovate & Integrate, Garden Grove. Hyatt Regency Orange County. For info: NGWA: http://info.ngwa.org/servicecenter/Meetings/Index.cfm?meetingtype=cf

May 8-9 — WA
Low Impact Development Workshop: Green Roofs, Low Impact Foundations & Rain Water Collection, Puyallup. WSU LID Research Facility. For info: http://cm.wsu.edu/ehome/index.php?eventid=34097&

May 8-11 — CA
ACWA 2012 Spring Conference & Exhibition, Monterey. Conference Ctr., Portola & Marriott Hotels. For info: Ass'n of California Water Agencies, www.acwa.com/content/event-registration

May 8-11 — CA
2012 National Mitigation & Ecosystem Banking Conference, Sacramento. Sheraton Grand Sacramento & Convention Ctr. For info: http://mitigationbankingconference.com

May 10-11 — CA
Groundwater Economics Course, Garden Grove. For info: NGWA: www.ngwa.org

May 13-18 — Ireland
World Congress on Water, Climate & Energy, Dublin. Sponsored by International Water Ass'n. For info: http://iwa-wcedublin.org/

May 15-18 — NV
Environmental Awareness Bootcamp, Las Vegas. Residence Inn Las Vegas Hughes Ctr. For info: EPA Alliance Training Group, 713/ 703-7016 or www.epaalliance.com

May 16 — AK
Water in Alaska: Changing Environment of Permitting & Enforcement, Anchorage. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

May 20-24 — OR
2012 Land Grant & Sea Grant National Water Conference, Portland. Mariott Waterfront. For info: www.usawaterquality.org/conferences/2012/default.html

May 22-23 — WA
Low Impact Development Workshop: Site Planning, TESC, Plan Review & Inspection, Puyallup. WSU LID Research Facility. For info: http://cm.wsu.edu/ehome/index.php?eventid=34097&

May 22-24 — NV
2012 Tahoe Science Conference - Environmental Restoration in a Changing Climate, Incline Village. Sierra Nevada College. For info: http://tahoescience.org/events/conferences/

May 24-25 — CA
Flood Management Tour (Field Trip), Stockton. Sponsored by Water Education Foundation. For info: www.watereducation.org/toursdetail.asp?id=1207&parentID=821

May 25 — WA
Fisheries & Hatcheries Legal Frameworks Seminar, Seattle. Crowne Plaza, 1113 Sixth Ave. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

June 3-6 — MO
Collection Systems 2012 Conference & Exhibition: Show Me the Green - Confluence of Planning, Implementation & Regulations, St. Louis. St. Louis Convention Ctr. For info: Water Environment Federation, 800/ 666-0206 or www.wef.org/CollectionSystems

June 3-8 — FL
Joint 9th INTECOL International Wetlands Conference, Orlando. Sponsored by Society of Wetland Scientists and the Greater Everglades Ecosystem Restoration. For info: www.conference.ifas.ufl.edu/intecol/