The Water Report

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FACING THE STORMWATER & TIRES PROBLEM

HOW TO TACKLE DEADLY 6PPD-QUINONE IN STORMWATER RUNOFF

by Karen Dinicola, Washington State Department of Ecology (Retired)

Introduction

For twenty years scientists knew that something in urban runoff kills coho salmon in streams before they can spawn. It took new technology and persistence for a research team to finally identify the responsible chemical as 6PPD-quinone (6PPD-Q). 6PPD-Q is a reaction byproduct of the anti-ozonant 6PPD that is added to virtually all motor vehicle tires as a preservative to prevent the rubber matrix from cracking. 6PPD-Q is among the most lethal chemicals known to impact aquatic species; at very low concentrations 6PPD-Q kills coho in fry, juvenile, and adult life stages as well as adult steelhead, rainbow trout, and brook trout.

Well over half of built impervious surfaces are dedicated to motorized vehicle use. These roads and parking areas produce a virtually endless supply of tire debris containing 6PPD and 6PPD-Q. Most roads and parking areas, being older infrastructure, lack stormwater treatment facilities. Consequently, every time it rains tire wear particles are carried directly into surface waters and one can expect this untreated road runoff to contain toxic levels of 6PPD-Q.

Fortunately, many current stormwater treatment methods can remove 6PPD and 6PPD-Q from runoff from roads and parking areas. However, these practices will protect sensitive species only if they can be implemented at scale, in sufficient number, and in the right locations.

Brief History of the Science

Scattered reports of coho salmon in stream-fed hatcheries and urban streams in the 1980s and 1990s described disoriented fish swimming on the water surface and dying within a few hours. Accounts of coho showing these characteristic distress symptoms continued to increase during the 2000s and 2010s with reports of up to nine of ten returning adults dying before they had a chance to spawn. The cause remained unknown.

In 2002, a multi-agency research team shared the first evidence that these events are caused by urban stormwater runoff. They then tried to recreate the toxic effect by using piles of street sweepings and mixtures of metals and hydrocarbons to mimic polluted stormwater and identify what specific chemical was causing the problem. Their research confirmed that road runoff kills coho (Scholz et al. 2011; Spromberg and Scholz 2011) and a strong correlation exists between vehicles, road runoff, and coho pre-spawn mortality across a gradient of urbanization (Feist et al. 2017). But they could not identify the chemical culprit.

New analytical technology led to the discovery of thousands of chemicals in roadway runoff, many of which were also detected in the tissue of dead coho (Du et al. 2017). The chemicals from tire treads best matched the toxic road runoff and caused the same unique behavior and death of coho (McIntyre et al. 2021). Researchers pinpointed the chemical by sorting out individual chemicals in the tire tread (Peter et al. 2018) and further narrowing

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PAHs & PCBs

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the search to ultimately identify the previously unknown chemical 6PPD-Q as the cause (Tian et al. 2020). They found 6PPD-Q kills half of the coho exposed at an extremely low concentration: 95 parts per trillion (Tian et al. 2022).

In studies conducted before 6PPD-Q was identified, researchers learned that contaminated runoff that is filtered through a compost and sand mixture is no longer toxic to coho (McIntyre 2016). Researchers theorized that the lethal toxicant — now known to be 6PPD-Q — was bound to the organic matter in the soil mix during filtration (Spromberg et al. 2016). Identifying 6PPD-Q kicked off a global research effort that has:

- Identified more sensitive — and some apparently insensitive — fish and other aquatic species;
- Developed laboratory analytical methods for water, sediment, and tissues;
- Improved understanding of the fate and transport of this novel chemical; and
- Assessed effectiveness of various stormwater management approaches for addressing the toxic runoff problem.

Washington State Department of Ecology (2022a) summarized the science to date. Sub-lethal effects of 6PPD-Q on biota are presumed but not understood. Human health studies may be forthcoming.

What is Known About 6PPD and 6PPD-Q

6PPD is the highly reactive chemical N-(1,3-dimethylbutyl)-N′-phenyl-p-phenylenediamine. 6PPD has been in use since the 1950s and it comprises about 0.5% to 2% of the composition of nearly every motor vehicle tire on the road today. When 6PPD in the rubber matrix encounters ozone or oxygen, it quickly transforms into many chemicals including the lethal quinone 6PPD-Q. The brownish substance that visibly develops on the sidewall surface of a typical tire is a protective film of 6PPD-Q.

Because 6PPD in tire particles continues to break down and produce 6PPD-Q under exposure to oxygen and ozone in air and in water, both the parent chemical and the lethal byproduct are of concern. 6PPD is present in all sizes of tire debris found on and along roadways, from entire tires and treads down to very fine dust particles. 6PPD is in: discarded tires; repurposed as crumb-rubber turf fields; playground equipment; and landscaping materials. 6PPD is likely used in other rubber products both related and unrelated to motor vehicles, from windshield wipers to anti-fatigue floor mats.

6PPD and 6PPD-Q both are expected to bind to soils and sediments, plastics, plants, and other materials and generally will travel with particles in the runoff rather than being dissolved in the water. They behave somewhat like other well-known pollutants in stormwater, such as **p**olycyclic **a**romatic **h**ydrocarbons (PAHs) and **p**oly**c**hlorinated **b**iphenyls (PCBs) — once such chemicals are trapped in stormwater treatment systems they are unlikely to leach out. On the other hand, in untreated runoff such pollutants will bind to materials that accumulate in receiving water bodies.

Awareness of these chemical properties and the sources and pathways of runoff helps engineers select and design effective runoff management approaches for their projects. Municipal stormwater managers can apply this knowledge at the sub-basin scale to protect water quality and fish habitat.

The Evolving Field of Stormwater Management

As professional fields go, particularly in public works, stormwater management is still relatively new. The first municipal stormwater permits, issued in the 1990s, forced the largest local jurisdictions to start managing runoff (i.e., National Pollutant Discharge Elimination System (NPDES) Phase I permits, issued nation-wide pursuant to federal Clean Water Act authority). However, widespread demand for this specialty only took off after complexity of the stormwater problem began to be more fully understood and Phase II permits were issued in the 2000s to thousands of smaller jurisdictions across the country. Too many jurisdictions still lack adequately funded stormwater utilities.

Best practices for municipal stormwater management have evolved with increased understanding of environmental impacts and new technologies. Early focus was on bacteria, nutrients, metals, and a few organic pollutants. Subsequently, the list of chemicals in runoff and knowledge of the problems they cause have expanded exponentially, outstripping regulatory agencies' capacity to develop rules and leading many stormwater managers to feel like this is a game of whack-a-mole! To be successful, we need to address categories of pollutants according to their sources and chemical behaviors.

Stormwater management is a multi-disciplinary field. Engineers, planners, asset managers, road crews, inspectors, educators, and ecologists work together to successfully prevent and reduce impacts from stormwater pollution. Modern stormwater management encompasses a variety of approaches including: public education; operation and maintenance; system mapping; code requirements for treatment and structural source controls; design review; enforcement; and spill response. Any or all of these approaches

Stormwater & Tires

Treatment Challenges

Proprietary Information

Toxic Runoff

Gray & Green Mitigation

Particle Settling

Sorption Media

can be targeted to a particular problem or spread out across the landscape to address as many issues as possible with the resources available — or some combination of these two implementations.

Current stormwater regulations focus on: managing public infrastructure systems; preventing impacts from development; and controlling specific polluting activities. They have done little to increase the pace at which more runoff is treated from old roads and highways and vast areas of public and private commercial and industrial parking areas. If not otherwise required, decision makers prefer to implement cost effective actions where they can see a change. But it is impossible to quantify a change in the receiving water from a single project, and very difficult to measure the cumulative impact. This cycle — which stymies meaningful action — is untenable.

6PPD-Q is only the most recent, if most alarming, discovery confirming that road runoff is extremely toxic. The Tian et al. (2020) article set off a global investigation into tire wear chemicals and their impact on aquatic species. Manufacturers' tire formulations and other products associated with motor vehicles are considered proprietary information, posing challenges to scientists and regulators trying to understand and prevent biological effects — not only of the ingredients but of the many breakdown products. It is likely that only more bad news will come from future assessments of road runoff toxicity. Stormwater and natural resource managers seek enough information to be confident that the strategies they select and implement will successfully address 6PPD-Q and other stormwater impacts on local fish.

To date, lack of certainty, low confidence, and understandable concern that no amount of treatment will adequately control runoff from an urban watershed have prevented large public investments in stormwater treatment that are needed to address the toxic road runoff problem. While more information will continue to guide future actions, we must act with best professional judgment and experimentation to widely implement effective approaches for reducing 6PPD and 6PPD-Q

Which Stormwater Management Practices Work?

A many-pronged approach, implementing a wide range of stormwater management strategies across our complex urban and urbanizing landscape is needed to prevent road runoff toxicity. Stormwater source controls to reduce the vast amount of 6PPD and 6PPD-Q carried by road runoff and stormwater treatment to remove these chemicals from contaminated runoff are both needed and are inclusive of many different traditional "gray" and newer and evolving "green" approaches. These combined measures will also remove other known and unknown chemicals from road runoff at the site or sub-basin scale.

Ongoing efforts to synthesize current knowledge of flow control, treatment, and source control effectiveness will provide guidance for stormwater managers and project engineers. The Washington State Department of Ecology (2022b) assessed current practices to prevent and reduce 6PPD-Q toxicity from stormwater. The report identifies which approaches for mitigating 6PPD and 6PPD-Q will most effectively prevent these chemicals being carried into receiving waters.

Treatment Methods

Modern stormwater treatment facilities are designed to address the range of small to large rainstorms with different types of treatment devices that employ both physical and chemical processes to remove specific categories of pollutants to varying degrees. Exclusion and settling will help reduce 6PPD-Q concentrations but it will take filtration, sorption (absorption and adsorption), and infiltration, and infiltration to remove toxicity.

- **Exclusion:** Inlet or catch basin grates, screens or bars left tire debris on the street, shoulder, or parking surface for crews or sweepers to pick up.
- **Settling:** Stormwater ponds, tanks, and vaults capture suspended solids except for the smallest microplastics. Ditches and catch basins also allow settling. Mulch slows flow across soil or grassy areas. Deeper facilities with water storage will retain all but the smallest tire particles, while particles that settle in stormwater pipes and shallow facilities are re-suspended during rainstorms. Design projects to capture more runoff volume and slow water down: visible tire particles will settle out, given the chance.
- **Sorption:** 6PPD-Q will sorb or adhere directly to treatment media with carbon content, organic matter, and lots of surface area. A wide variety of natural and synthetic sorption media is available including engineered soil mixes, granular activated carbon, iron-coated sand, chitosan, biochar, and other products that can be incorporated into a treatment device. Naturally occurring topsoil and amended soils are also likely to capture and retain 6PPD-Q. [Note that compost mixes used in used in stormwater treatment do not contain manure or biosolids and have a strictly limited amount of food waste; much less nitrogen and phosphorus are needed to support a few native or decorative plants.]

Stormwater & Tires

Figure 1: Catch basin grates in Tacoma, Washington.

Figure 2: Permeable Pavement

Stormwater & Tires

Bioretention

Sheet Flow

Wattles

Mitigation Practices

6PPD Alternatives

- **Infiltration:** Devices including drywells and injection wells that allow water to percolate into the ground promote consistent stream flows, lower water temperatures, can remove pollutants, and probably do not deliver 6PPD-Q to nearby streams. A unique stormwater facility called bioretention (or bioinfiltration, depending on which state's stormwater design manual is in use) provides both treatment and infiltration. A bioretention facility is in essence a carefully designed and sized rain garden constructed to treat a specific amount of runoff using specified soil mixes. Home-built rain gardens have no design requirements but will remove 6PPD-Q from the runoff they handle.
- **Filtration:** Commercial or natural-based media will remove common pollutants from road runoff especially during early "first flush" or low flow runoff events. Stormwater filters capture tire particles and other particulate matter with adhered contaminants including 6PPD-Q. Commonly used commercial catch basin inserts effectively trap tire particles and 6PPD-Q adhered to solids. Permeable pavements also capture tire particles and 6PPD-Q.
- **Dispersion:** Road runoff allowed to sheet flow across vegetated areas will contain less 6PPD-Q, as the chemical will sorb to the plant material and some of the water will infiltrate. It is not known what area-to-flow ratio is needed to completely capture 6PPD-Q, but for small storms and "first flush" this approach will be effective.
- **Retrofits:** Projects can add or improve stormwater treatment for existing infrastructure with structural treatment facilities and devices. Some cheaper and easier fixes are also available. A field experiment placed sausage-like stormwater wattles containing a sorptive mix into an existing stormwater detention pond and appeared to remove 6PPD-Q as well as, or better than, a bioretention facility. Wattles can also be used to protect catch basin inlets. Another approach is installation of sorptive catch basin inserts throughout a sub-basin, although additional field crews would be needed to deploy this approach at scale.

Any runoff that bypasses treatment will contribute to toxicity in the receiving water. Routine maintenance is required to maintain performance.

Source Control Measures

Stormwater source controls are implemented at the site, or on a basin or jurisdictional scale to directly remove tire particles and prevent them from coming into contact with rain and runoff.

Common practices that address 6PPD and 6PPD-Q include:

- Regularly cleaning out catch basins and pipelines where road debris accumulates
- Routinely sweeping streets and parking lots, and not hosing them down
- Ensuring that wastewater from vehicle washing does not enter storm drains
- Covering piles of tires, crumb rubber, and street waste, to keep rain off the materials
- Garbage pick-up programs that remove and properly dispose of roadside tire debris

Successful programs will minimize tire chunks on and along roadways to prevent vehicles running over them and creating smaller particles that require treatment removal from runoff. Other types of source control include reducing tire wear (by reducing vehicle traffic and turns, or making lighter vehicles) and ultimately finding a suitable, safer alternative replacement chemical for 6PPD in tires and other rubber products.

Elusive Replacement for 6PPD

Most motor vehicle tires contain 6PPD or some combination of 6PPD and other anti-ozonant chemicals. Global, national, and state-level efforts are underway to identify a suitable replacement chemical alternative to 6PPD as a rubber preservative — but a candidate that will meet public demand for tire performance, safety, and longevity is elusive. The types of tires that do not contain 6PPD are generally for indoor or other non-road uses where expectations and standards are lower.

For as long as our modern mobile society relies on private cars — or until a suitable replacement chemical is identified and less-toxic but equally safe tires replace the hundreds of millions of tires currently in use — 6PPD in tires will continue to produce 6PPD-Q and toxic road runoff. So, we are faced with a very long horizon for product source control and left with a pressing need for stormwater source control and especially treatment.

Stormwater & Tires

Acting Now

Runoff

Retrofits

Model Complexity

Costs

What Else Do We Need to Know to be Successful?

In addition to understanding how much treatment is needed to adequately address the road runoff from a given watershed, stormwater managers need to know how much maintenance is required and how often they will need to replace sorptive media. These are things that we can learn while acting. Lab studies will evaluate the sorptive capacities of various media, pilot projects will test innovative solutions, and field studies will confirm the effectiveness of deploying the most promising treatment devices at scale. Biologists will learn more about the 6PPD-Q toxicity mechanism and sub-lethal impacts on additional species in more life stages. Reliable laboratory measurement of 6PPD-Q will quantify concentrations in runoff from different land use settings and levels in receiving waters to help measure our success.

Where Should We Act?

All surfaces used for motor vehicle traffic and parking have the potential to be sources of 6PPD-Q in toxic amounts. Multiple-lane, high-traffic roads, and vehicles stopping and turning will produce more tire wear debris particles containing 6PPD and 6PPD-Q. Untreated road runoff impacts receiving waters across the western United States; 6PPD-Q toxicity occurs in small fish-bearing streams crossed by roads and with additional outfalls carrying road and parking area runoff.

Less is known about impacts of 6PPD-Q on biota in large rivers, lakes, or marine waters. Roads frequently run along larger rivers, crossing tributary streams along the way. Treating the runoff at these crossings is needed to address the cumulative impact.

Some problems will be easier to fix. Think of an undeveloped watershed with a single road crossing or only a small impacted area that needs to be addressed. At the other extreme, highly urbanized watersheds are less likely to see success without a tremendous amount of investment, and such an achievement has yet to be demonstrated. To address the middle spectrum, one should focus treatments where vehicles — especially large, heavy ones — are turning at low speeds and at higher counts and at commercial parking lots, vehicle dealerships, park and rides, and ferry terminals.

Do more sweeping, catch basin and pipeline cleaning, and retrofits throughout watersheds that drain to vulnerable streams. Low traffic road runoff should be allowed to sheet flow through a vegetated area before reaching a stream.

Plan for success. Relying solely on opportunistic retrofits concurrent with other public works projects will not be of adequate scope to protect the resources we care about. Prioritization led by tribes and salmon and trout recovery managers will determine where each local jurisdiction should start to address toxic road runoff with new targeted efforts. To select strategic locations for adding treatment, follow the flow paths of road and parking area runoff leading through a basin to each outfall and assess the stormwater infrastructure and opportunities along the way.

Modeling can provide confidence that sufficient retrofits are planned for a complex watershed. The US Environmental Protection Agency (EPA) is working in partnership with Oregon State University on an urban version of the Visualizing Ecosystem Land Management Assessments (VELMA) water quality management simulation model to support local efforts to determine where, how much, and what kinds of stormwater controls are needed to effectively address road runoff and describe the level of effort that will be required for a given watershed.

The sheer magnitude of the road runoff problem in highly urbanized streams makes it challenging to address in the near term. Depending on the amount of old infrastructure present, structural retrofitting costs can range from $20M to $300M per acre with the most impacted basins being the most expensive and difficult to address. This is where cheap retrofits like wattles and catch basin inserts can come into play. For many sensitive receiving waters, action will be needed on both public and private lands.

Recommendations

6PPD-Q joins a long list of toxic chemicals and other challenges for salmon and trout recovery. We have long known that road runoff treatment is needed where fish species are listed as threatened or endangered and recovery efforts are underway. This includes habitat restoration projects and culvert replacements to provide access to upper watershed habitat areas. It is time to act based on what we know while we continue to invest in better technologies, especially those best suited for treating old infrastructure.

Stormwater managers and project designers should incorporate current understanding of 6PPD and 6PPD-Q sources, transport, and treatability into their stormwater management programs as regulators work to provide a more complete set of information and guidance for practitioners. Best professional judgment on effective approaches is available for those trying to tackle this problem (Washington Dept of Ecology 2022b).

Stormwater & Tires

Implementation

Old Infrastructure: Rural v. Urban Retrofit

It is relatively easy to manage road runoff in rural settings. But the safety requirements for roads and highways and restricted amount of space available for structural treatment facilities limit urban retrofit project options.

Some effective and achievable approaches are:

- Plan for strategic, high-impact treatment retrofits
- Provide incentives for private property owners to retrofit parking areas, including relaxing the number of required spaces to provide enough land area to accommodate the treatment facilities
- Ensure that commercial and residential redevelopment projects fully treat road and parking area run-on and runoff without exception
- Continue to encourage rain gardens
- Apply source control measures throughout urban watersheds

Resources

Benefits to receiving waters can be reaped by large investments in developing new cartridge filters, catch basin inserts, and other creative approaches that can be deployed in space-limited areas and across broader swaths of urban landscape. It is essential to fund additional people to do ongoing deployment and maintenance work in the field and ensure their safety, as this responsibility and workload cannot be placed on current road crews. A new tire or vehicle tax dedicated to funding road runoff treatment should be considered and regulatory authority must be used to accelerate change in response to what we know.

Design

Development Projects & Green Infrastructure

Any development project inevitably supports additional motor vehicle traffic and should address road and parking area run-on and runoff with treatment trains that address all categories of pollutants. Future transportation projects should treat all the runoff they convey to receiving waters (not just the new or rebuilt lanes) to protect fish from 6PPD-Q and other toxic pollutants.

Too many project designers treat stormwater requirements as an afterthought or as something to avoid if possible. From the project outset, designers should: preserve the best spaces of healthy soil and mature vegetation on the site; identify suitable locations for stormwater infiltration or dispersion; and design road and parking surfaces to minimize opportunities for runoff to pick up and carry additional pollutants.

Green Practices

More jurisdictions are adopting green stormwater infrastructure approaches as standard practices. Intact soil and plants are amazingly effective filters to remove and break down toxic pollutants. Low impact development practices should replace excessive clearing and grading in the suburbs and corner-to-corner developments in the urban core. Developers should reduce negative impacts of development by protecting and using natural features and/or engineered, small-scale methods to manage stormwater as near as possible to where it falls instead of directing untreated runoff to stormwater systems and receiving waters.

Requirements

Regulatory Agency Roles

Future reissuance of municipal stormwater permits, updates to other relevant stormwater permits, and engineering design manuals, can provide updated information and a practicable implementation framework. The "maximum extent practicable" standard for municipal stormwater established in the federal Clean Water Act is defined by each jurisdiction's permit, and the bar can be set higher. This can be achieved by requiring local jurisdictions to allocate more resources to planning, retrofit projects, and field crews to address everyday public road and parking runoff. Tracking the portion of basins served by the storm sewer system that generates untreated runoff and treating substantially more area each five-year permit cycle is a worthwhile goal; allow wattles, catch basin inserts, and other innovative solutions to meet this requirement. Make credible plans to fully address runoff from areas that drain to streams with threatened or endangered fish species. State and local governments can work together to inventory private entities with outfalls to streams and encourage or require them to treat their road and parking runoff.

Pilot Studies

Regulatory agencies must encourage and fund pilot studies and innovative solutions and allow adaptive management during implementation, shielding well-intentioned experimenters from liability. The agencies should help shoulder the burden of deploying these approaches, particularly the utilization of sorptive devices in space-limited storm sewer inlets and pipes and across broader geographic areas. Funding for well-designed effectiveness studies for the collection of baseline data prior to initiating projects is also a priority.

Stormwater & Tires

Public Investment

Tools for Protection

Conclusion

Our Moonshot Opportunity

We are well positioned to learn our way forward. The scientific, resource management, and regulatory communities have learned a great deal since the discovery of 6PPD-Q. We now need substantial public investment in academic and private sector efforts to develop sorptive materials that can be deployed at scale as small, easily installed and maintained devices such as catch basin inserts, pipeline cartridges, and other technologies.

6PPD-Q from tires, carried to streams in stormwater runoff from roads and parking areas, is the dominant source of the coho mortality problem and is possibly responsible for declines in steelhead and trout species. But 6PPD-Q is not the lone or even the dominant stormwater problem in many of the streams where fish are dying; it is only the most recently discovered compelling reason to mitigate road runoff everywhere possible with all available means. Approaches that use infiltration, sorption, filtration, and/or effectively capture tire debris will effectively remove 6PPD-Q and a host of other toxic pollutants. Soil, compost, and other natural and synthetic sorptive media have the highest treatment potential. Clean Water Act regulations and Endangered Species Act determinations can support broad, strategic implementation of best practices. To successfully address road and parking area runoff at scale, local jurisdictions and highway departments will need additional resources, prioritization, and funding.

For Additional Information:

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Salmon, Rights & ESA

SALMON, WESTERN WATER RIGHTS, & THE FEDERAL ENDANGERED SPECIES ACT

by Glen Spain, Executive Director and General Legal Counsel
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& Institute for Fisheries Resources

Introduction

Mark Twain once quipped, when referring to the arid western US west, that this is where: "Whisky is for drinking; water is for fighting over." Unfortunately, this is even more true today. That point was also made clear at The Seminar Group's recent 27th Annual Endangered Species Act Conference (January 26th-27th in Seattle). Many of the West's water fights are now decades-long running legal battles.

This article provides a short summary of some of the main battles currently ongoing in the courts over conflicts between state-authorized water rights to take water out of rivers versus minimum water supplies required under the federal Endangered Species Act (ESA) to be left in rivers, primarily for the protection of ESA-listed salmon. (Since steelhead are also in the same genus *Oncorhynchus* and the same biological classification of "salmonids," for discussion purposes we will also include ESA-listed steelhead below. All the same factors leading to the decline of salmon are also impacting steelhead populations, many of which are also now ESA-listed).

ESA v. State Rights

For generations, salmon harvests in west coast oceans and estuaries have been the backbone of a several billion dollar/year fishing industry, supporting tens of thousands of jobs in coastal communities, and putting high quality seafood on America's tables. Recent salmon run declines, however, have devastated those coastal communities and destroyed many of those jobs.

PCFFA & IFR

As a west coast wide fishing industry trade association representing many salmon-dependent fishing communities, the Pacific Coast Federation of Fishermen's Associations (PCFFA), along with its sister organization the Institute for Fisheries Resources (IFR), are generally in the thick of these water battles. We are plaintiffs in many water cases aimed at restoring badly damaged salmon runs and the watersheds that harbor these runs — and by that means to help restore the coastal communities, industries, and jobs that depend upon salmon for their existence.

Human Origins of Salmon Declines

One of the most dramatic natural resource tragedies of our times, and one which directly affects our fishing industry by destroying thousands of fishing jobs coastwide, has been the thoughtless and sometimes deliberate destruction of the west coast's once abundant salmon runs. Everywhere on the west coast (both US and Canada) these once abundant wild salmon runs are in steep decline, with many of them already extinct.

Salmonid Stock Risks

Yet the steady decline of west coast salmon runs was largely unacknowledged until the prestigious American Fisheries Society (AFS) published a peer-reviewed, comprehensive scientific survey of the problem in *"Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington"* (Nehlsen, et al., Fisheries, Vol 16, No. 2, pp. 4-21 (March-April, 1991)). That first-ever rigorous survey of all west coast salmonid stocks found that of the 214 separate stocks still existing, 101 were at high risk of extinction, 58 at moderate risk of extinction, 54 of special concern, and one (California Central Valley winter-run Chinook) was already classed as threatened with extinction under the federal Endangered Species Act (ESA) and as endangered under California's separate ESA statute. It also found from historical records that at least 106 to more than 200 other distinct stocks of salmonids had already by that time been extirpated from their native habitat.

Decline Causes

Human actions driving salmon declines are many:

- Over-engineered rivers with too many dams that block migratory salmon and destroy downstream water quality
- Massive dewatering of key salmon-producing rivers, some of which — like the once great San Joaquin River in California — were totally dewatered for decades
- Poor logging and agricultural practices that drive sediment loads up to fatal levels for fish, and fill our rivers with toxic, fish-killing pesticides
- Widespread land-use, urbanization, and water diversion policies that ignore natural river processes and fish needs, and which destroy key salmon spawning and rearing habitat from estuaries to far inland

Salmon, Rights & ESA

Increasing Temps

Dam Impacts

Weak Laws

Minimum Flows

Accelerating world-wide climate change (also driven by human-generated greenhouse gases) just exacerbates all these problems.

Salmon evolved strictly as cold-water fish. At river temperatures averaging above about 68 degrees Fahrenheit (F) the adults die before they can spawn. The even more temperature-sensitive eggs and juvenile salmon die at temperatures well below that threshold. But decades of increased water diversions (which leads to increased water temperatures during daytime high sunlight "spikes") coupled with human developments (like industrial-scale logging and agriculture) that deprive rivers of their natural shade have created consistently higher average water temperatures in nearly every river on the west coast. This has now led to many salmon run collapses, from the Columbia River southward. This is particularly true in California, which lies within the southernmost range of wild salmon, and where rivers are also heating up more rapidly than in the Pacific Northwest due to climate change.

Unfortunately, humans are not very good at responding to slow crises that creep up on us over decades or lifetimes. Many slow but steady environmental crises like this one get ignored until their impacts become too obvious to be denied — often too late to reverse them. The long-term abundance trend of wild salmon throughout the west coast has been deteriorating since European settlement, starting with massive sluice mining operations during the 1850's Gold Rush era in which whole hillsides were washed away for their gold.

The west coast's era of large dam building added to these injuries afterwards, followed by the construction of massive irrigation water delivery systems like those in the Columbia Basin and in California's Central Valley Project that sucked more and more water out of salmon-bearing rivers. The National Environmental Policy Act (NEPA) and most other environmental laws did not exist then, so most of the environmental impacts of these projects were never analyzed beforehand.

Only recently, since the passage in the 1970's of various long-overdue federal and state environmental laws — such as the federal Clean Water Act, NEPA and the Endangered Species Act (ESA) and their state law equivalents — has there been any meaningful brake on the process of river "development" being recklessly conducted regardless of the environmental impact. Before these environmental laws existed, our commercial salmon fishing industry — *which is literally downstream of all these massive river development projects* — had been required to simply accept those impacts, to our severe economic detriment.

California Water Over-Appropriations

California is not unique in allowing its natural water supply to be grossly over-appropriated. In Oregon, for instance, and in much of eastern Washington, nearly every basin and sub-basin is over-appropriated for much of each year. What makes California unique is that the magnitude of its water over-appropriation is so astonishingly great — largely because its water laws (particularly for controlling groundwater) are so very weak.

Peer-reviewed science studies of water over-appropriation problems in California have concluded that California as a whole has already over-appropriated its river systems more than five times over. In other words, if you stack all the legal California "water rights" together, they amount to diversions for more than five times the water that exists in all of California's rivers combined!

California still has not designated minimum instream flows to protect fish in any of its rivers, despite legislative mandates to do so. Thus, in California there is currently no effective upper limit in state law on how much water can be withdrawn from its rivers, even beyond complete dewatering.

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Groundwater

State v. Local Management

Until recently, California agribusiness has gotten away with using groundwater to substitute for missing stream flows. Note that, alone of all the 50 states, California is the only state that still cannot legally regulate its own groundwater at the state level, instead leaving that task up to each individual county. This gives each county a great incentive to "race to the bottom" to suck out as much groundwater as possible before neighboring counties sharing the same aquifers can do the same.

Some effort to control groundwater overdrafts has begun under a new law *(the Sustainable Groundwater Management Act (SGMA)*, a three-bill package that passed in 2014). *See* Moon, *TWR* #128; Babbit et al. *TWR* #170. However, that law now only requires local counties to develop state-approved "groundwater sustainability plans," which must bring their county groundwater uses into compliance within 20 years. That still leaves in place the very legal fragmentation county-by-county that

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led to massive overdrafts. Plus, there is no assurance that any county will enforce its plan, especially in the face of politically powerful irrigation group resistance.

Subsidence

Sucking up too much California groundwater has already resulted in massive ground subsidence (sinking has been up to 40 feet in some areas) as well as dewatering nearby salmon-bearing rivers that would otherwise be fed by once-filled underground aquifers. It is highly unlikely that a law such as SGMA, which relies solely on weak local enforcement measures, will resolve this problem.

How CVP Operations Have Failed to Protect ESA-listed Salmon

Of the three key California Central Valley Project (CVP) native salmon runs that once supported fisheries, the winter-run and spring-run Chinook runs have been so damaged by decades of habitat and dewatering losses that both are now ESA-listed and thus off-limits to any directed harvest. Only Central Valley fall-run Chinook, which is largely supported by hatchery production, is still open to commercial ocean harvest.

Weak Stock Management

Ocean commercial salmon fisheries are managed by the Pacific Fishery Management Council (PFMC). However, the west coast ocean commercial salmon fishery is also managed by the PFMC (as required by law) in accordance with "weak stock management" principles. Thus, any actions that increase water diversions from, and so increase water temperatures within, the Sacramento/San Joaquin River systems are very likely to exacerbate an already dire situation for these severely depressed ESA-listed winter-run and spring-run Chinook salmon stocks. This will, in turn, further limit fishing opportunities on the intermingling fall-run Chinook that coastal fishing communities depend upon for their livelihoods. Avoiding additional constraints on PFMC-managed ocean salmon fisheries by avoiding, minimizing, or otherwise offsetting adverse effects to California Central Valley "weak stock" salmon runs is thus of paramount importance to the PFMC fishery management system and to the fishing industry.

Increased Mortality

High water temperatures in the Sacramento River below the Shasta/Keswick Dam have resulted in widespread salmon mortalities, particularly for the most damaged and yet most unique salmon stock, the winter-run Chinook. A combination of dams blocking historic habitat, plus higher water temperatures from heated reservoir waters, has confined this unique salmon stock (the only winter-run Chinook salmon in the world) to about six stream-miles of remaining spawning and rearing habitat. This is why the winter-run Chinook are classified as "endangered" under the ESA (the ESA's law's most stringent protection level).

Temp Thresholds

The laws of physics tell us that smaller volumes of water heat up in sunlight faster, and stay warmer longer, than large bodies of water. In the upper Sacramento River especially, the combined impacts of water over-appropriation (especially via the federal CVP irrigation system, which is the largest irrigation system in the world), plus major water quality impacts such as excess sediments, have combined in many west coast watersheds to create higher average water temperatures. These temperatures are fatal to cold-water loving salmon, which start to die as adults *en mass* when daily average water temperature are routinely over about 68.0 degrees F (20.0 degrees Centigrade (C)). Salmon eggs are even more temperature sensitive, with egg mortalities escalating rapidly upwards at daily average water temperatures above 53.6 degrees F (12.0 degrees C).

Conflicting Obligations

But it is primarily the Bureau of Reclamation's (Reclamation's) discretionary CVP irrigation delivery actions which determine how much water remains in the river at any given time, and thus what the temperature of that water will be. Since Reclamation is required by the ESA to avoid any avoidable "take" of ESA-listed fish, this set up an interesting and thorny confluence of legal obligations under both the ESA and the Clean Water Act to protect salmon within the federal CVP.

In PFMC letters in 2015 and 2016, the PFMC raised serious concerns with Reclamation regarding its loss of temperature control at Lake Shasta and the Sacramento River downstream of CVP facilities there. These control losses resulted in extremely high temperatures in those years, triggering very high levels of both winter-run and spring-run Chinook salmon egg mortality. Major losses of fall-run Chinook salmon eggs for those fish in the wild also occurred, all three impacts seriously depressing those fisheries in later years. The PFMC requested a number of water temperature management reforms from Reclamation in those letters to better protect Central Valley salmon runs.

However, in 2019, former Westlands Water District lobbyist and Attorney David Bernhardt was appointed Secretary of Interior (the agency which controls Reclamation) in spite of clear conflicts of interest. The PFMC's many high water temperature concerns were ignored in the creation of a new 2019 CVP Biological Opinion (BiOp) to govern ESA-listed salmon management within the CVP.

Reclamation Goal

Secretary Bernhardt's instructions to Reclamation in creating the 2019 BiOp were to "maximize irrigation deliveries." In greatly over-appropriated water systems like California's, maximizing irrigation could only be accomplished by taking even more water away from the salmon, resulting in even higher

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average temperatures and egg mortality rates. This is exactly what happened after the adoption of the 2019 CVP BiOp. This result was foreseen by objecting National Marine Fisheries Service (NMFS) biologists, but the science was over-ridden and ignored by political appointees.

As a result, under the daily average water temperature targets of the 2019 BiOp, winter-run Chinook salmon experienced very low freshwater survival rates in 2020, and catastrophically low survival rates in 2021. Survival from the egg life stage to the fry life stage (egg-to-fry survival) was estimated to be only 11.46 percent in 2020, the third lowest level in the previous sixteen years, and approximately one-half of the average survival rate over that same sixteen-year period. Conditions were even worse in 2021, when winter-run Chinook salmon again experienced extraordinarily poor spawning and incubation conditions, with a major factor being the high average river temperatures that were under Reclamation's control and that resulted in an egg-to-fry survival rate of only 2.6 percent in 2021. While winter-run Chinook survival numbers for 2022 are not yet finalized as of the date of this writing (2/20/23), a Technical Memo from the Winter-Run Juvenile Production Estimate (JPE) Workgroup dated December 30, 2022, concluded that there was only a 2022 1.94% egg-to-fry survival rate. Since these fish have only a three-year lifecycle, these were potential extinction level impacts.

1.94% Survival Rate

PCFFA and its sister organization IFR have challenged the legality of that 2019 CVP BiOp in *Pacific Coast Federation of Fishermen's Associations (PCFFA), et al. vs. Raimondo,* US Dist. Court of CA, Eastern District, Case No. 1:20-cv-00431, and the State of California joined that challenge in *California Natural Resources Agency (CNRA) vs. Raimondo,* US Dist. Court of CA, Eastern District, Case No. 1:20-cv-00426, as a related case. Unfortunately, the seriously flawed 2019 BiOp will remain in place until these Court challenges are resolved.

Re-consultation

In the meantime, the CVP is being run based on annual Interim Operations Plans (IOPs) while the old, flawed 2019 BiOp undergoes re-consultation by the Biden Administration.

Salmon Egg Mortality Temperature Thresholds Too High

Previously (in studies now more than 12 years out of date), salmon egg mortality analysis work done only in laboratories under highly controlled (non-natural) conditions, found that the seven-day average of daily maximum water temperatures necessary to prevent Chinook salmon egg mortality could be as high as 56.0 degrees F. This is also the water temperature threshold currently included as a water quality standard in the Central Valley Basin Plan and currently also included as a term and condition in Reclamation's water rights by the California State Water Resources Control Board (SWRCB) as Water Rights Order 90-5, which was adopted in 1990 — a decision now over 32 years old.

However, since the SWRCB Order 90-5 standards were established, scientists with NMFS have concluded that 56.0 degrees F. is not protective enough of winter-run Chinook eggs in the field. Peer-reviewed scientific studies have instead concluded that 53.6 degrees F is the point at which temperature-dependent mortalities begin, and from which mortalities rapidly escalate upwards as temperatures increase. The key point is that these new studies assumed conditions that typically occur in-river (i.e., in the wild). This included using additional factors such as oxygen saturation (which also varies by temperature) and stream velocity, to ascertain how salmon eggs would actually respond within the river.

In other words, the best available science now confirms that ESA-listed winter-run Chinook salmon egg temperature-dependent mortalities increase very rapidly at daily average water temperatures above 53.6 degrees F (12 degrees C). The current practice of allowing average water temperatures in the Sacramento River to get as high as 56.0 degrees F (with daily high temperature "spikes" potentially much higher) is essentially cooking salmon eggs to death.

Temp Mortalities

But here is the rub! The only way to avoid high water temperatures that kill salmon eggs in the Sacramento River is to leave more cold water in-river when eggs are present — which means reserving more of that water through the year in the cold-water pool at Shasta Reservoir by reducing irrigation deliveries.

Unfortunately, "maximizing irrigation deliveries" as mandated in Secretary Bernhardt's illegal 2019 CVP BiOp would eventually mean the extinction of salmon throughout most of the California Central Valley, and potentially the end of all ocean salmon fisheries over much of the west coast. Foolish and politically biased water allocation decisions in the past have brought us all too close to such an extinction event already, with climate change-driven drought moving us even closer.

With all that in mind, the PFMC sent a strong letter dated September 12, 2022, to Reclamation, NMFS and the State Water Board noting all the above and stating:

"This is why (as noted below) in future IOPs, and in the eventually adopted salmonid BiOp now under reconsultation, it is our strong recommendation that water temperature standards that are necessary to protect these key Central Valley salmon runs from extinction should be both required, and based on the

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Recommendations

Contradicting Laws

Standard Challenge

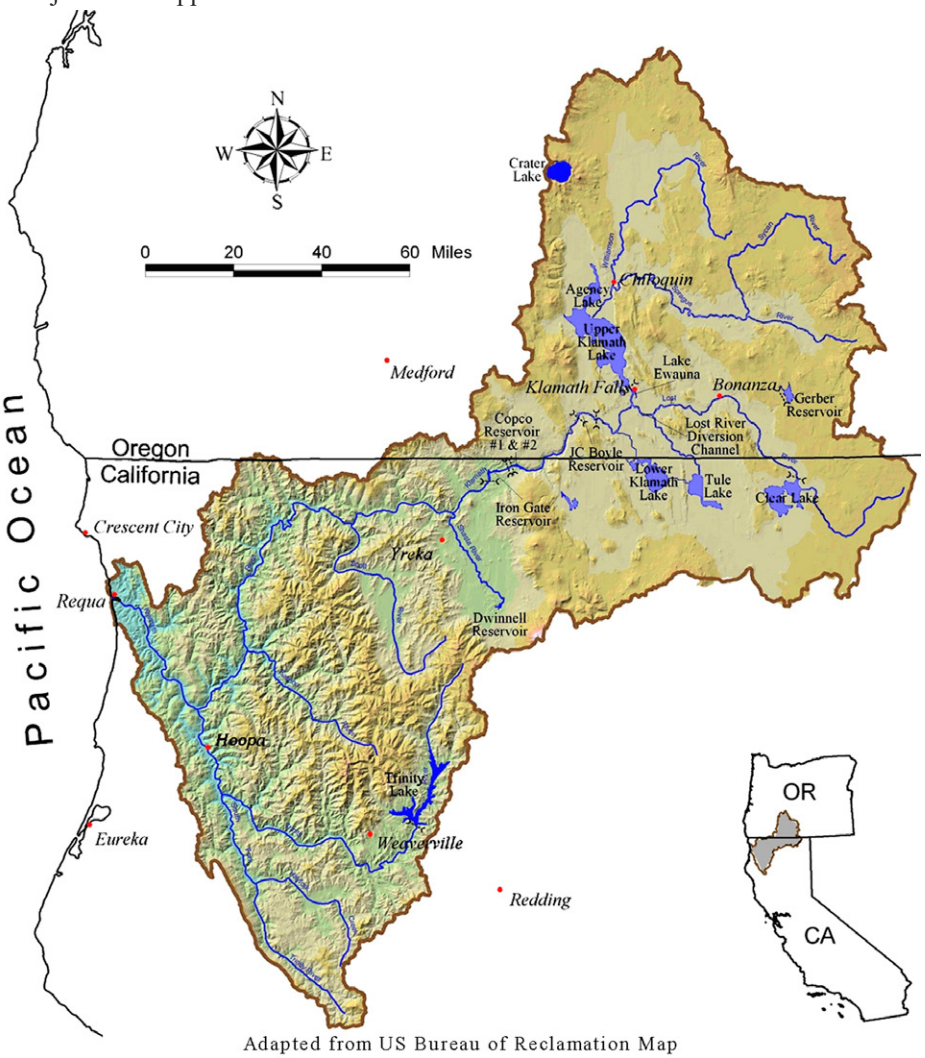
best available science — which at the present time clearly supports the use of 53.5 F. [recommended as a precautionary buffer to account for measurement errors] as an appropriate daily average temperature standard for protecting winter-run Chinook salmon egg incubation at the CCR temperature control point in the California Central Valley."

That PFMC letter, which also contains numerous other recommended actions to bring Sacramento River water temperature standards back into alignment with best available science, can be found on the PFMC's Habitat Committee website at: www.pcouncil.org/navigating-the-council/membership-groups-and-staff/advisory-groups/habitat-committee/.

This growing California high water temperature conflict is a perfect example of how the ESA, the Clean Water Act, and state water laws (both water quality and water allocations) interact and can contradict each other. This whole conflict between irrigation deliveries and salmon water needs underscores also that California's current water allocation system is simply unsustainable. The fundamental cause is that fish and wildlife needs were never considered when state water allocation laws were initially developed, and instead it was assumed that there was plenty of water for every need — with no need to say "no" to the next water right application down the road. The federal ESA, as well as the Clean Water Act, thus impose some ecological "sustainability" limits on water allocations under state laws, often for the first time.

The Klamath: Water Rights vs. ESA-Required Flows

One of our other landmark water law cases, *Yurok Tribe, PCFFA and IFR v. U.S. Bureau of Reclamation, et al.,* (US Dist. Ct., California (N. Dist.), No. 3:19-cv-04405-WHO) has proceeded in two distinct stages. The first stage was a standard challenge brought in 2019 to Reclamation's 2019 Biological Opinion (BiOP) intended to protect ESA-listed Coho salmon in the lower Klamath River from the over-appropriation of the Klamath River's limited water supply by Reclamation's federal Klamath Irrigation Project in the upper river.



Adapted from US Bureau of Reclamation Map

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Minimum Flows

Reclamation's Klamath Irrigation Project both stores and draws water from Upper Klamath Lake (the natural lake headwaters of the Klamath River) for the Klamath Project irrigation system. This water thus never gets to downstream salmon.

The first stage of litigation was more or less resolved with Reclamation's withdrawal of the 2019 BiOp as flawed pending a formal re-consulation under ESA Section 7, and an Injunction requiring Reclamation to keep certain amounts of water in the river for ESA-listed Coho salmon in the meantime. At that point, the federal government acknowledged its obligations under the ESA to maintain certain minimum flows in the river below the Klamath Project in order to meet its federal ESA obligations. The case was then "stayed" (suspended with no action) for several months to allow time for all this to be worked out; in the meantime the Project was run under an Interim Operations Plan (IOP).

Second Stage of Litigation: Oregon Court and Oregon Water Rights

The second stage of this litigation began in 2020 when the largest irrigation district using the federal Klamath Irrigation Project, the Klamath Irrigation District (KID), went to the Oregon State courts and obtained an Injunction requiring the Oregon Water Resources Department (OWRD) to *forbid* Reclamation from releasing Upper Klamath Lake water (which KID characterized as "stored water") to meet its obligations under the ESA — including meeting its obligations under a federal Court Injunction requiring it to do so. The Oregon Injunction was based solely on Oregon State water rights statutes, without any consideration of federal law. Under court order, OWRD then issued such a "cease-and-desist" order to Reclamation, threatening it with penalties for non-compliance. *See Order on Motions for Summary Judgment*, ECF Doc. 1102 (Feb. 6, 2023) at 33-34 (Order); available at: www.govinfo.gov/content/pkg/USCOURTS-cand-3_19-cv-04405/pdf/USCOURTS-cand-3_19-cv-04405-20.pdf

No Win Situation

Thanks to KID's ancillary lawsuit in Oregon State court, it then became legally impossible for Reclamation to comply with the prior federal Court injunction without violating the OWRD Order, and vice versa. Reclamation found itself in a "no win" dilemma.

State v. Federal

The Oregon State court's ruling was based on KID's theory that *Reclamation did not have an explicit Oregon water right* to allow water to flow down the river into California for salmon. Reclamation's position, however, was that Reclamation never needed such an Oregon water right to begin with, because the federal ESA-mandated obligations to protect these listed fish basically pre-empted state water rights laws. A direct confrontation was thus set up under the Supremacy Clause of the US Constitution over which body of law (state water rights or federal ESA) controlled and which preempted the other.

This conundrum led to much tension and confusion in the Klamath Basin in 2022. To resolve the situation, the Plaintiffs Yurok Tribe, PCFFA and IFR, as well as Reclamation's US Department of Justice (DOJ) attorneys, all agreed to submit this ancillary Klamath ESA-related dispute (arising out of the original litigation), to a determination by the federal district court (Court). The Court assumed jurisdiction after a number of Intervenor protests — including from KID — were all dismissed.

Discretionary Management Control - Reclamation

Discretionary Control

We (Plaintiffs Yurok Tribe, PCFFA and IFR) and the DOJ both argued that the Ninth Circuit Court of Appeals had already held more than 22 years ago that Reclamation has discretionary management control over operations of Link River Dam, requiring it therefore to comply with ESA Section 7 and the resulting salmon Biological Opinion (BiOp). *Klamath Water Users Protective Ass'n v. Patterson,* 204 F.3d 1206 (9th Cir. 1999) at 1213 (*Patterson*). The OWRD Orders likewise conceded that Reclamation has discretion to release flows to the Klamath River to comply with the ESA, but it viewed that authority as limited to what it characterizes as the natural river flow. This concession confirms that Reclamation has "some discretion" to operate the Project to benefit listed Klamath River salmon, and ESA Section 7 therefore applies to the Project. *Order* at 24-25.

Exempt Delivery Contracts

KID also tried to raise a defense against ESA enforcement via claims that Reclamation's obligation to use "stored water" solely for irrigation purposes was "non-discretionary," and thus fell into a recently created exemption from ESA obligations for non-discretionary federal actions under *National Association of Home Builders v. Defenders of Wildlife,* 551 U.S. 644, 661, 669 (2007) (*National Home Builders*). This has become a fashionable legal theory favored by many irrigation water users to try to exempt their water delivery contracts from the ESA. However, unlike in *National Home Builders*, no federal statute strips Reclamation of all discretion to operate the Klamath Project to benefit salmon.

To examine this new exception in more detail, in *National Home Builders* the Supreme Court addressed what it called a "clash" between the legislative commands of the Clean Water Act and the ESA. The Clean Water Act requires that the federal Environmental Protection Agency (EPA) "shall approve" the transfer of permitting authority to a state if nine specified and exclusive criteria are satisfied.

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Conflicting Action

Logical Requirements

Extreme Position

Court Decisions

Because EPA then was Congressionally mandated to approve the transfer when these conditions are met, the Supreme Court ruled that EPA actually lacked the power to ensure the transfer would not jeopardize endangered species' survival. *Id*. at 665-67.

However, *National Home Builders* makes ESA Section 7 inapplicable only where a *statute requires* the agency to undertake specific, nondiscretionary acts. *See Karuk Tribe*, 681 F.3d at 1024; *see also Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv*., 524 F.3d 917, 928 (9th Cir. 2008) (quoting *Home Builders*, 551 U.S. at 666) (Section 7 is inapplicable only when an agency is "unable to 'simultaneously obey' both Section 7 and a separate statute which expressly requires an agency to take a conflicting action."); *see also Jewell*, 749 F.3d at 785 (Section 7 is inapplicable only where the agency has been stripped of all discretion or made it impossible to benefit the listed species).

No federal statute strips Reclamation of all discretion to operate the Klamath Project in a manner beneficial to salmon in the Klamath River. The Ninth Circuit has repeatedly held that Reclamation has substantial discretion in carrying out actions for large federal reclamation projects. The Reclamation Act in fact gives Reclamation broad authority "to perform any and all acts" necessary and proper for the operation of the Klamath Project to meet its various purposes. 43 U.S.C. § 373; *see supra* at 21.

National Home Builders involved a direct clash between two legislative commands, one in the ESA and the other in the Clean Water Act. *Id.* 551 U.S. at 661. Applying the presumption against implied repeals, the Supreme Court avoided reading Section 7 to overrule the Clean Water Act's express statutory mandates. "The regulation's focus on 'discretionary' actions accords with the commonsense conclusion that, when an agency is *required* to do something by statute, it simply lacks the power to 'insure' that such action will not jeopardize endangered species." *Id*. at 666 (emphasis in original). No statute elevates the Klamath irrigation contracts to the status of nondiscretionary statutory mandates that tie Reclamation's hands and preclude Section 7 compliance. We argued that *National Home Builders,* therefore, is simply not applicable.

The State of California also has some sharp criticisms of KID's "extreme position" that Reclamation had the power, indeed the duty, to dry up the Klamath River at the state border between Oregon and California rather than leave flows in the river for California-based ESA-listed salmon. *See Amicus Brief* the State of California filed in this case (ECF Doc. 1058 (filed 9/15/22)). California also noted that the 9th Circuit has already confirmed that Reclamation must comply with the ESA unless it literally is prohibited from doing so, citing *Nat. Res. Def. Council v. Jewell,* 749 F.3d 776 (9th Cir. 2014) and multiple other authorities.

This line of cases interpreting *National Home Builders* is a good defense against instances of Reclamation or its contractors claiming that their irrigation contracts are somehow "non-discretionary" and therefore the ESA does not apply as a restriction against future water deliveries. This was a claim frequently made by the prior federal Administration under Secretary of Interior Bernhardt. It is now being systematically demolished by various courts' decisions and several internal Interior Memos to support that interpretation have since been withdrawn or countermanded under current Interior Secretary Haaland.

ESA Preempts State Agency Order

The end result of the Klamath dispute was Judge Orrick's Ruling in Case No. 3:19-cv-04405-WHO on February 6, 2023 (ECF Doc. 1102) by way of an *Order on Motions for Summary Judgment (Order)* ruling in favor of the Plaintiffs Yurok Tribe, PCFFA and IFR and Cross-complainant the United States.

In that *Order* Judge Orrick ruled at pp. 1-2:

"The OWRD Order is preempted by the ESA because it stands as an obstacle to the accomplishment of Congress's purpose and objective in enacting in ESA: protecting and restoring endangered species."

(*Order on Motions for Summary Judgment* available at: www.govinfo.gov/content/pkg/USCOURTS-cand-3_19-cv-04405/pdf/USCOURTS-cand-3_19-cv-04405-20.pdf).

The Court also clearly and unequivocally stated that the Ninth Circuit *Patterson* case remains the controlling law of the river when it says ESA requirements "override the water rights of the irrigators." *Id*. at 24-25. The Court also specifically rejected the *National Home Builders* defense raised by the Klamath Water Users Association (KWUA) and KID that the BOR's "stored water" allocation system was "non-discretionary" noting that there is no statutory basis for this claim, the difference between "stored water" and "natural flows," if any, is not relevant as the ESA Section 7 applies to both, and much case law supports ESA water obligations pre-empting state water rights when they are in conflict. *Id.* at 25-29.

Whether the case will be appealed is not yet known. But such an appeal is unlikely to prevail in the face of the prior *Patterson* case by the Ninth Circuit involving many of the same parties and issues.

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Third Stage of Litigation: Reduction of ESA Flows by Reclamation

A third stage of litigation in this landmark water case is about to begin. Its seems that Reclamation has unilaterally recently decided to reduce the flows for ESA-listed salmon in the lower river by 11 percent below the "minimum instream flows" specified in the NMFS 2019 BiOp as "necessary to prevent extinction." This action directly violates the Incidental Take Permit (ITP) of that BiOp and illegally places lower river salmon in jeopardy.

Emergency Injunction

The Plaintiffs expect to go back to Judge Orrick on a *Supplemental Complaint* on this specific issue on or shortly after March 23rd, 2023, asking for injunctive relief on an emergency basis. We will argue once again that in our prior litigation *Pacific Coast Federation of Fishermen's Associations (PCFFA), et al. vs. U.S. Bureau of Reclamation,* 426 F.3d 1082 (9th Cir. 2005) the Ninth Circuit made it quite clear that Reclamation must maintain at least BiOp "minimum flows" at all times, throughout the entire term of its BiOp and Incidental Take Permit (ITP) requiring those minimum flows.

Facing A Future of More Water Conflicts

Water conflicts are, unfortunately, hard-wired into today's grossly over-appropriated western water allocation systems. Also, under current state water laws, fish and wildlife water needs are usually short-changed in favor of irrigation and development needs. Federal ESA and Clean Water Act water obligations and Tribal water rights generally are often simply ignored under state water laws. Also, very few west coast water rights systems or water delivery contracts are scaled up or down in their promised volumes for delivery based on actual available annual precipitation, which can vary widely — and thus these water right contracts or allocation systems are not based on any concept of water supply sustainability.

Unjust Laws

As recently pointed out in a Petition to the California State Water Resources Control Board (SWRCB) for *Rulemaking to Review and Revise Bay-Delta Water Quality Standards*, filed by a number of Tribal Nations and groups representing people of color in May of 2022, the water allocation system itself, especially in California, was based on blatant racism, including laws prohibiting whole groups of (non-European) people from even owning property, thus depriving them of any appurtenant water rights. *See* Winnemem Wintu Tribe, et al., *Petition for Rulemaking to Review and Revise Bay-Delta Water Quality Standards*, filed with the SWRCB on May 24, 2022, available from Restore the Delta at: www.restorethedelta.org/2022/05/24/petition-filed-tribes-and-environmental-justice-groups-link-bay-delta-collapse-to-water-rights-from-californias-racist-past/.

Flawed Projections

In California particularly, the Central Valley Project water delivery contracts are also based on an obsolete, grossly over-optimistic projection of future water supplies (e.g., a projection based on the plan in the 1950s of seizing most of the water available in northern California and shipping it south, using dams, reservoirs, and canals or tunnels never built and in volumes that never existed to begin with). Thus, many of California's water rights and many water delivery contracts provide mostly "paper water" — the actual water to supply 100% of these contracts simply never existed. For more about the "paper water" problem in California, see the California Water Impact Network (C-WIN) page at: https://www.c-win.org/overallocation

Climate Change

Climate change, which is projected to result in more frequent and longer droughts, will only make the current conflict-ridden system worse. Already, southern California is facing severe water shortages because of the near drying up of the Colorado River — again, largely due to the fatal combination of existing water over-appropriations hitting the hard wall of less actual water supply due to climate change. This is all further complicated by multiple state legal systems that fail to recognize either the water needs of fish and wildlife, the water rights of Tribes, or the need for sustainable water systems based on water that is actually available, not "paper water" and wishful thinking.

Reform

On a more optimistic note, there have been some recent, well thought-out efforts to reform western water laws. The most recent effort is a Report from a number of prominent California water law professors, *Updating California Water Laws to Address Drought and Climate Change,* (Feb. 3, 2022), available from the Water Education Foundation (*see* https://www.watereducation.org/aquafornia-news/new-report-updating-california-water-laws-address-drought-and-climate-change).

There is also a growing effort to follow up these recommendations with Legislative implementation. In addition, there are a number of efforts in California to finally create first-ever, enforceable, state-mandated minimum instream flows for its major rivers, to protect its rapidly diminishing fish and wildlife resources.

Dam Removal

There are also a number of dams coming down soon, particularly the four obsolete hydropower dams in the Klamath Basin, in what will be the largest dam removal project in history to date, coupled with the largest salmon habitat restoration effort to date to restore volitional fish access to more than 240 stream-

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Klamath Restoration

miles of once fully used salmon habitat. Deconstruction of those four Klamath dams will formally begin in March, 2023, and be completed by the end of 2024, followed by several years of habitat restoration. For more information about the demolition of the Klamath dams see the website for the Klamath River Renewal Corporation, the legal entity charged with actual Klamath dam removals (www.klamathrenewal.org).

Salmon fishing-dependent communities, however, cannot simply wait to see if real solutions to these largely structural water problems arise. We must use every tool at our disposal to make sure the west coast's seriously damaged salmon runs are recovered as quickly as possible up to abundance levels that once again produce sustainable and harvestable surpluses that can support our jobs and our coast communities — and allow us to continue to deliver high quality salmon to America's tables.

For Additional Information:

Glen Spain, Pacific Coast Federation of Fishermen's Associations and the Institute for Fisheries Resources, 541/ 689-2000 or fish1ifr@aol.com

Glen Spain, J.D., is the current Acting Executive Director of both the Pacific Coast Federation of Fishermen's Associations (PCFFA) [www.pcffa.org], the largest trade association of commercial fishing families on the west coast, as well as its sister marine and watershed protection organization, Institute for Fisheries Resources (IFR) (www.ifrfish.org). He is also the long-time General Legal Counsel for both organizations, a position he has held for more than 40 years. He serves as the appointed Commercial Fishing Industry representative to the Pacific Fishery Management Council's Habitat Advisory Committee. Glen received his law degree from New College School of Law in San Francisco, California, in 1978, and is a member of the State Bars of both California and Oregon and admitted to practice law in several federal jurisdictions. He also sits on the Board of Directors of the Klamath River Renewal Corporation (KRRC), which is the legal entity charged with the removal of the four Klamath River hydropower dams. In 2015 he was also honored with the "Lawyer of the Year" Award by the California Lawyer magazine for his pioneering work in California water law.

PFAS & Superfund

PFAS & SUPERFUND

by Walter Mugdan, US EPA Region 2 (New York, NY)

Introduction

In recent years, a number of chemicals that have been largely unregulated have generated considerable concern, including at existing or prospective Superfund sites. Of intense and growing concern is a group of compounds known as per- and polyfluoroalkyl substances (PFAS). Perhaps most common among these is perfluoroctanoic acid (PFOA), which was used to make non-stick materials like Teflon, and was also used widely in fire-fighting foam; and perfluorooctanesulfonic acid (PFOS), used in stain-resistant fabrics and food packaging, among other uses. In December 2017, the US Environmental Protection Agency (EPA) announced a cross-agency effort to "address" PFAS. Acting on one of the elements of that initiative, on August 26, 2022, EPA issued a proposed rule designating PFOA and PFOS as "Hazardous Substances" under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA commonly referred to as Superfund).

PFOA & PFOS

Basis of the Proposal:

> [The proposed designation] is based on significant evidence that PFOA and PFOS may present a substantial danger to human health or welfare or the environment. PFOA and PFOS can accumulate and persist in the human body for long periods of time and evidence from laboratory animal and human epidemiology studies indicates that exposure to PFOA and/or PFOS may lead to cancer, reproductive, developmental, cardiovascular, liver, and immunological effects.

Health Risk

Some PFAS compounds have adverse health effects at extremely low concentrations. On June 15, 2022, EPA issued an Interim Updated Drinking Water Health Advisory for several PFAS compounds including PFOA and PFOS. (Such an advisory is non-regulatory, but it represents EPA's assessment of the level at which vulnerable

PFAS & Superfund

Advisory Levels

Measurement Challenges

CERCLA Action

Groundwater Contamination

POETs

Toxic Tort Suits

Punitive Damages

people are protected from adverse health effects resulting from exposure throughout their lives to these individual PFAS in drinking water.)

For PFOA, the interim drinking water advisory level is four parts per quadrillion. To put this in context, that is equivalent to about four seconds of time over 30 million years! This is remarkable for many reasons, not least of which is that it is about five hundred times lower than the usual laboratory detection level of two parts per trillion. In other words, as a practical matter, it is virtually impossible to measure. The drinking water advisory level for PFOS is 20 parts per quadrillion, also functionally unmeasurable.

Indeed, EPA recognizes that the extremely low advisory level concentrations are functionally unable to be measured. The Minimum Reporting Level (MRL) for these PFAS, as established in EPA's fifth Unregulated Contaminant Monitoring Rule applicable to certain drinking water systems, is 4 parts per trillion. The MRL is defined as "the minimum quantitation level that, with 95 percent confidence, can be achieved by capable analysts at 75 percent or more of the laboratories using a specified analytical method (recognizing that individual laboratories may be able to measure at lower levels)."

Why is it Important for PFAS to be CERCLA "Hazardous Substances"?

PFAS are not currently regulated under federal environmental laws (though a number of regulatory actions are planned or underway). In particular, there are as yet no federal "maximum contaminant levels" for drinking water; they are not "hazardous wastes" under the Resource Conservation and Recovery Act (RCRA); and they are not yet "hazardous substances" under CERCLA. However, if disposed of they are "solid wastes" under RCRA; and if released into the environment they are "pollutants or contaminants" under CERCLA. But they do not trigger corrective action obligations under RCRA, and the government's enforcement authorities under CERCLA are significantly circumscribed, though some action can be taken under each statute. Under Section 104(a) of CERCLA, EPA can take a Superfund response action whenever:

(A) any hazardous substance is released or there is a substantial threat of a release into the environment; or

(B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health.

Thus, there is a significantly higher burden for EPA to take a response action with respect to a "pollutant or contaminant" than for a "hazardous substance." Moreover, under Sections 106 and 107 of CERCLA, EPA can take enforcement actions for cost recovery and/or injunctive relief (i.e., cleanup work) *only* for a release or threatened release of a hazardous substance.

PFOA and other PFAS are being found in groundwater across the US, including at some current Superfund sites. If the proposed rule is finalized, it is possible — indeed, likely — that sites where PFAS contamination is found will be added to the Superfund National Priorities List (NPL) so that the full range of CERCLA authorities can be brought to bear.

Cleanup of PFAS Contamination

Fortunately, PFOA and some other PFAS can be removed from water relatively easily, with common treatment technologies such as air stripping or activated carbon. Unfortunately, some PFAS (including compounds intended as a replacement for PFOA and given the trade name "GenX" by manufacturer DuPont,) are somewhat less easily removed from water. (During 2017 the discovery of GenX in the Cape Fear River and associated drinking water supplies in North Carolina brought…well, considerable fear to local communities.)

In 2017, EPA added to the NPL the St. Gobain Performance Plastics McCaffrey St. facility in the Village of Hoosick Falls, New York because of PFOA discharges that contaminated the municipality's public drinking water supplies. This was only the second time EPA proposed to add a site to the NPL based on discharges of a "pollutant or contaminant" (rather than a "hazardous substance"), and the first time involving PFOA or any PFAS. Air deposition of PFAS in the Hoosick Falls community is also a concern; and similar concerns arise near other sources of air emissions. For example, New Jersey is investigating the impact of air deposition from the Chemours/DuPont and Solvay facilities in the southern part of the state; several hundred homes were found to have private well water contaminated with PFAS above state standards (see below), and have been provided with Point of Extraction Treatment Systems (POETs) or connected to municipal drinking water supplies.

PFAS Litigation

DuPont, the maker of Teflon, faced some 3,500 toxic tort suits in Ohio, alleging injuries from PFOA-contaminated drinking water. In December 2016, a jury in the first of these to go to trial awarded $2 million to the plaintiff in compensatory damages, and in January 2017 it awarded an additional $10.5 million in punitive damages. A few weeks later, in February 2017, DuPont and Chemours (its former subsidiary, which it spun off in 2015) settled these cases for a cash payment of $671 million. (The 2019 film Dark Waters is based on the lawyer who first brought these suits, and the clients he represented.) And anyone who has watched television during the past several months will have seen frequent advertisements by lawyers encouraging service members who were stationed at Marine Base Camp Lejeune to join toxic tort suits over alleged exposure to PFAS while serving there.

PFAS & Superfund

State Regulation of PFAS

State Standards

At least 31 state legislatures are currently considering bills relating to toxic chemicals, with most of those addressing PFAS; and a significant number of states have already established their own standards or guidelines for PFAS. At least eight states (MA, MI, NH, NJ, NY, RI, VT, and WA) have proposed or issued Maximum Contaminant Levels (MCLs) for two or more PFAS compounds, most commonly PFOA and PFOS. New Jersey was the first state to adopt a drinking water Maximum Contaminant Level (MCL) for any PFAS; it has adopted MCLs of 14 parts per trillion (ppt) for PFOA and 13 ppt for PFNA, and added PFNA to its List of Hazardous Substances under the New Jersey Spill Act (the NJ analog to CERCLA). [Editor's Note: Perfluorononanoic acid, or PFNA, is a synthetic perfluorinated carboxylic acid and fluorosurfactant that is also an environmental contaminant found in people and wildlife along with PFOS and PFOA.] New Jersey has also set Interim Specific Groundwater Quality Criteria for PFOA and PFOS.

New York has set MCLs of 10 ppt for PFOA and PFOS, and has also promulgated Soil Cleanup Objectives for these compounds. New York also established PFOA, PFOS, and their salts as "hazardous substances" under its cleanup law. The state of Washington concluded that PFAS, as a class, fall under its Toxics Control Act "and will need to be cleaned up."

Vermont has established an MCL of 20 ppt for PFOA; New Hampshire set MCLs for four PFAS including PFOA (12 ppt) and PFOS (15 ppt); and Pennsylvania recently finalized MCLs for PFOA (14 ppt) and PFOS (18 ppt). North Carolina set a "health goal" of 140 ppt for GenX, Dupont's Teflon replacement compound (actually, a group of compounds). Some states have issued PFAS health advisories for drinking water, rather than regulatory standards; and some states have issued groundwater, soil, and air standards.

Soil Advisory Levels

As of early 2022, at least nine states (AK, CA, CO, CT, DE, ME, MN, NM, OH) that have not issued MCLs have issued drinking water health advisories for two or more PFAS compounds, including PFOA and PFOS; of these, seven (not CA and MN) use EPA's previous 70 ppt health advisory for combined PFOA and PFOS. At least twelve states (AK, CO, FL, MA, MI, MN, NC, NH, NJ, TX, VT, WI) issued groundwater advisory levels for two or more PFAS compounds, most commonly PFOA and PFOS; these criteria vary significantly, e.g., PFOA levels ranging from 12 ppt to 2000 ppt. At least nine states (AK, FL, IN, MA, MI, MN, TX, VT, WI) have also issued soil advisory levels; like the groundwater levels, these vary significantly from state to state. At least three states (MI, NH, TX) have issued air advisory levels. And in 2019 New York enacted legislation phasing out the use of PFAS-containing firefighting foam. Several states require monitoring for PFAS in public drinking water systems, including California, New Jersey, and New York. (The author thanks his colleagues Kevin Kubik and John Bourbon for assistance in compiling this information.)

As can be seen from the above, no state has set a regulatory standard below the low parts-per-trillion level. Thus, these state standards are several orders of magnitude higher (less restrictive) than the EPA interim health advisory for PFOA and PFOS. At this writing, EPA itself is preparing to propose a federal MCL for at least those two compounds; it is unlikely the standard will be below the usual detection limit of 2-4 ppt.

Conclusion

Minimum Concentrations

On December 5, 2022, EPA proposed a rule to improve Toxic Release Inventory (TRI) reporting on PFAS (*see* sidebar, next page). The rule would eliminate an existing exemption that allows facilities to avoid reporting when PFAS are used in *de minimis* concentrations. Because PFAS are used at low concentrations in many products, removing the *de minimis* exemption ensures that covered facilities that make or use listed PFAS will no longer be able to avoid disclosing releases and waste management quantities for these chemicals.

In 2020 Congress added certain PFAS to the list of chemicals for which TRI reporting is required, and provided a framework to automatically add other PFAS in future years. Currently, some 180 PFAS compounds are on the list. Congress established TRI reporting thresholds of 100 pounds for each of the listed PFAS.

Increased Reporting

During the previous Administration the provisions were codified in a manner that allows facilities to disregard certain *de minimis* concentrations of chemicals in mixtures or trade name products (below 1% concentration for each of the TRI-listed PFAS, except for PFOA for which the concentration is set at 0.1%). The 2022 proposed rule would eliminate the availability of that exemption and require facilities to report on PFAS regardless of their concentration in products. This reporting might reveal manufacturing sites where PFAS are being used, that might be sources of contamination. NOTE: Any opinions expressed herein are those of the author, and do not necessarily reflect the position of the US Environmental Protection Agency.

For Additional Information:

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PFAS & Superfund

Walter Mugdan, serves as Deputy Regional Administrator of the Region 2 office of the U.S. Environmental Protection Agency (EPA), located in New York City. During the 2021 presidential transition period he served as Acting Regional Administrator. From 2008-2017 he was Director of the Emergency and Remedial Response Division, heading up a staff of over 200 employees responsible for the Region's "Superfund" toxic waste cleanup, emergency preparedness and response, and brownfields programs. From 2002-2008 he headed the Region's Division of Environmental Planning & Protection, where his staff of about 180 scientists, engineers and planners managed the Region's air, water, hazardous waste and environmental review programs. Prior to that appointment, he served as Deputy Regional Counsel and then Regional Counsel for Region 2, where he headed a staff of 80 attorneys. He joined EPA in 1975 as a staff attorney, and subsequently served in various supervisory positions in the Office of Regional Counsel, including chief of the units responsible for Superfund, RCRA, TSCA, FIFRA and the Clean Air Act. He has authored numerous publications on environmental law topics, particularly on hazardous waste regulation and remediation.

EPA PFAS ACTIONS

The EPA webpage "Key EPA Actions to Address PFAS" outlines current and recent PFAS-related actions taken by the agency. ***See*** www.epa.gov/pfas/key-epa-actions-address-pfas#

The most recent announcements include:

$2 Billion in Bipartisan Infrastructure Law Funding for PFAS and Emerging Contaminants in Drinking Water

In February 2023, EPA announced the availability of $2 billion from President Biden's Bipartisan Infrastructure Law to address emerging contaminants, including PFAS, in drinking water across the country. This investment, which is allocated to states and territories, will be made available to communities as grants through EPA's Emerging Contaminants in Small or Disadvantaged Communities grant program. These funds will promote access to safe and clean water in small, rural, and disadvantaged communities while supporting local economies.

See www.epa.gov/dwcapacity/emerging-contaminants-ec-small-or-disadvantaged-communities-grant-sdc

Inactive PFAS Significant New Use Rule

In January 2023, EPA proposed a rule that would prevent anyone from starting or resuming, without a complete EPA review and risk determination, the manufacture, processing or use of an estimated 300 PFAS that have not been made or used for many years, known as "inactive PFAS." In the past, these chemicals may have been used in many industries in a variety of ways, including as binding agents, surfactants, sealants and gaskets, and may also have been released into the environment. Without this proposed rule, companies could resume uses of these PFAS absent notification to and review by EPA.

See www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas

PFAS Analytic Tools

In January 2023, EPA released a new interactive webpage, called the PFAS Analytic Tools, which bring together multiple sources of information on PFAS in one place. These tools will help the public, researchers, and other stakeholders better understand potential PFAS sources in their communities.

See https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas

Memo on Addressing PFAS in Clean Water Act Permitting

In December 2022, EPA issued a companion memo providing guidance to states on how to use the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permitting program to reduce harmful PFAS pollution. This memo expands upon an earlier memo issued to EPA Regions in April 2022 and is a critical step in EPA's efforts to restrict PFAS at their source.

See www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf

WATER BRIEFS

ARTIC GRAYLING MT
ESA LAWSUIT

Conservationists sued the US Fish and Wildlife Service (Service) on Jan. 30 seeking protections for Montana's Arctic grayling population under the Endangered Species Act. The plaintiffs — the Center for Biological Diversity, Western Watersheds Project, and Butte resident Pat Munday — are represented by Earthjustice.

Once found throughout the upper Missouri River drainage above Great Falls, native populations of Montana's Arctic grayling are now mostly limited to a short stretch of the Big Hole River and a few small lakes in Montana. Extensive withdrawals from the Big Hole River reduce river levels to a trickle every summer and threaten the graylings' survival. A conservation agreement implemented by the state has, to date, not restored summer flows sufficiently to sustain grayling.

"Montana will lose this beautiful fish without more water in the Big Hole River," said Kristine Akland, senior Northern Rockies attorney at the Center for Biological Diversity. "It's well past time for the Arctic grayling to be protected under the Endangered Species Act."

The effort to protect the grayling has a long history of bureaucratic malfeasance, according to the plaintiffs. The Service considered the grayling a candidate for listing as an endangered species from 1994 until 2014, when the agency reversed itself and denied protection based on the state conservation agreement and allegedly increased numbers.

Conservation groups challenged that denial, eventually getting a 9th Circuit Court of Appeals ruling that the Service's claims of an increased population were not supported by evidence and that the agency had failed to consider climate change's impacts on stream temperatures and flows. The Service doubled down on these claims in 2020 and again denied protection even though threats persist and the grayling's numbers remain perilously low.

"These fish face a litany of threats including over-withdrawal of water, habitat degradation, competition from non-native fish, and now climate change on top of it all," said Emily Qiu, associate attorney with Earthjustice's Northern Rockies office. "Too much water is already taken out of the Big Hole River and climate change will only make the situation worse."

"Voluntary measures haven't recovered the grayling, and are not enough to bring this unique fish back from the brink of extinction," said Erik Molvar, executive director with Western Watersheds Project. "The compounding threats of irrigation withdrawals, livestock degradation of key spawning streams, and climate change warrant bold federal action to protect the grayling's last remaining strongholds."

Grayling have been reintroduced to the Ruby River and survive in small numbers in Hebgen Lake, a reservoir on the Madison River, but both populations are struggling. They have also been stocked in many lakes outside their native range. These lake dwelling, or adfluvial, fish provide little security for the native population of primarily river dwelling fish as studies have found they can't survive in flowing water.

Protection under the Endangered Species Act would require a federal recovery plan to be created to address chronic low flows in the Big Hole River, among other threats. The suit was filed in U.S. District Court, District of Montana, Butte Division and is available at: https://earthjustice.org/documents/legal-document/arctic-grayling-complaint

FOR INFO Kristine Akland, Center for Biological Diversity, 406/ 544-9863, kakland@biologicaldiversity.org; Pat Munday, Butte resident, 406/ 565-1826; Perry Wheeler, Earthjustice, 202/ 792-6211, pwheeler@earthjustice.org; Erik Molvar, Western Watersheds Project, 307/ 399-7910, emolvar@westernwatersheds.org

MINING LEASES MN
BOUNDARY WATERS AREA

The Biden-Harris administration took action on Jan. 26, 2023 to protect the Boundary Waters Canoe Area Wilderness and surrounding watershed, a spectacular network of rivers, lakes, and forests in northeastern Minnesota that comprise the most heavily visited wilderness area in the United States.

Responding to concerns regarding the potential impacts of mining on the area's watershed, fish and wildlife, Tribal and treaty rights, and robust recreation economy, Secretary of the Interior Deb Haaland signed Public Land Order 7917 withdrawing approximately 225,504 acres in the Superior National Forest in northeastern Minnesota from disposition under the United States mineral and geothermal leasing laws for a 20-year period, subject to valid existing rights. This action will help protect the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness and the 1854 Ceded Territory of the Chippewa Bands, from the potential adverse impacts of new mineral and geothermal exploration and development.

"The Department of the Interior takes seriously our obligations to steward public lands and waters on behalf of all Americans. Protecting a place like Boundary Waters is key to supporting the health of the watershed and its surrounding wildlife, upholding our Tribal trust and treaty responsibilities, and boosting the local recreation economy," said Secretary of the Interior Deb Haaland. "With an eye toward protecting this special place for future generations, I have made this decision using the best-available science and extensive public input."

The decision is the culmination of more than a year of evaluation by federal partners and robust public involvement regarding the potential impacts of mining on the important natural and cultural resources of the Rainy River Watershed.

In October 2021, the US Department of Agriculture's Forest Service submitted a withdrawal application to the Bureau of Land Management, which manages the subsurface mineral estate under the national forest. Extensive public input was sought on the requested withdrawal, and the Forest Service conducted a science-based environmental assessment to evaluate the potential impacts of prohibiting new mineral and geothermal exploration and development within the Rainy River watershed for the next 20 years. The analysis and decision were informed by approximately 225,000 comments gathered from two public comment periods, three virtual public meetings, and two Tribal consultations.

More than 150,000 visitors from around the world every year are drawn to the 1.1-million-acre Boundary Waters, the only lake-land wilderness in the National Wilderness Preservation System. It boasts more than 1,200 miles of canoe routes, 12 hiking trails, and 2,000 designated campsites, and contributes up to $17.4 million annually to the more than $540 million recreation and tourism economies in Cook, Lake, and St. Louis counties.

Located adjacent to Voyageurs National Park, Grand Portage National Monument, and Quetico Provincial Park in Ontario, the area contains over 1,100 lakes, interspersed with islands and surrounded by forests that extend nearly 150 miles along the border with Canada. Congress expanded protections for the wilderness area in 1978, when it directed the Forest Service to maintain high water quality and to minimize "to the maximum extent possible" the environmental impacts associated with mineral development.

The public land order withdrawing portions of the Superior National Forest from operation of the mineral and geothermal leasing laws, subject to valid existing rights, is authorized by the Federal Land Policy and Management Act. The Secretary of the Interior has the authority to withdraw this area for a maximum of 20 years, subject to renewal. Only Congress can legislate a permanent withdrawal. A map of the area is available on the BLM's website.

FOR INFO https://www.fs.usda.gov/project/?project=60916

FINANCIAL GUIDANCE US
CLEAN WATER ACT

On Feb. 1, 2023, EPA announced its updated Clean Water Act Financial Capability Assessment (FCA) Guidance to help communities ensure public health protections and financial feasibility as they make plans to comply with the Clean Water Act (CWA). The Guidance outlines strategies for communities to follow to support affordable rates while planning investments in water infrastructure essential to protecting our Nation's waters.

"EPA is committed to ensuring all communities have access to clean water and critical water services. We also recognize that a growing number of people struggle to afford their water bills," said EPA Assistant Administrator for Water Radhika Fox. "The updated FCA Guidance provides a better

process to assess communities' ability to afford water quality improvements, and also highlights a variety of tools, including assistance programs, grants, and subsidized loans, to help communities plan and pay for necessary water infrastructure improvements."

When discharges from municipal wastewater treatment facilities violate the CWA, EPA sets a schedule for the municipality to implement control measures to address the discharges as soon as possible. When negotiating CWA compliance schedules, EPA considers public health, environmental protection, and a community's financial capability. The FCA Guidance outlines the financial information and formulas used to assess a community's financial ability to make the needed water infrastructure investments essential for CWA implementation. The FCA Guidance is also used to evaluate the economic impacts on public entities of certain **w**ater **q**uality **s**tandards (WQS) decisions.

For communities seeking extended CWA compliance schedules or certain changes to water quality standards, the updated FCA Guidance provides a clear process to demonstrate financial capability and ensure that a financial strategy is in place to support needed infrastructure upgrades without overburdening their most vulnerable ratepayers. The updated FCA Guidance also contains new measures that provide a better description of a community's ability to afford water services, including community-specific poverty factors that are available and easy to find from census data. The FCA Guidance incorporates feedback from nearly 3,000 comments received during the public comment period and provides clear, step-by-step instructions for evaluating financial capability, including options for communities with less capacity.

The FCA Guidance is a starting point for negotiations and is not legally binding. The FCA Guidance recognizes that a variety of factors should be included in CWA schedule negotiations and encourages communities to bring their individual circumstances to those discussions. If a community has additional information that justifies a longer schedule than the general schedule benchmarks, this information can be submitted to EPA. Where appropriate, this information can result in different schedules than those suggested by the baseline analysis in the FCA Guidance.

The updated FCA Guidance provides ideas for working within legal boundaries and broadly consider how to minimize rate impacts to residents. For example, the FCA Guidance provides links to resources for obtaining available federal funding or for establishing programs to help low-income customers. In addition, EPA's Water Finance Center can connect communities to technical assistance providers who can help with rate design and analysis, asset management planning, identifying sources of funding, and/or developing State Revolving Fund applications.
FOR INFO www.epa.gov/waterfinancecenter/clean-water-act-financial-capability-assessment-guidance

SALMON FISHERIES AK

BRISTOL BAY

The Bristol Bay watershed in southwestern Alaska supports the largest sockeye salmon fishery in the world, is home to 25 federally recognized tribal governments, and contains large mineral resources.

On Jan. 30, 2023, EPA issued a Final Determination under its Clean Water Act Section 404(c) authority to help protect the most productive wild salmon ecosystem in the world. With this action, EPA is limiting the disposal of dredged and fill material associated with developing the Pebble deposit in certain waters that are important to sustaining the region's salmon resources.

After reviewing the Recommended Determination provided by Region 10, including the scientific and technical information spanning nearly two decades, EPA has determined that the discharges evaluated in the Final Determination will have unacceptable adverse effects on salmon fishery areas in the South Fork Koktuli River, North Fork Koktuli River, and Upper Talarik Creek watersheds of Bristol Bay.

The Final Determination prohibits the specification of certain "waters of the United States" in the South Fork Koktuli River and North Fork Koktuli River watersheds as disposal sites for the discharge of dredged or fill material for the construction and routine operation of the mine plan described in Pebble Limited Partnership's June 8, 2020, Clean Water Act Section 404 Permit application, as well as future proposals to construct and operate a mine to develop the Pebble deposit that would result in the same or greater levels of loss or change to aquatic resources.

The Final Determination also restricts the use of certain "waters of the United States" in the South Fork Koktuli River, North Fork Koktuli River, and Upper Talarik Creek watersheds as disposal sites for the discharge of dredged or fill material associated with future proposals to develop the Pebble deposit that would result in adverse effects similar or greater in nature and magnitude to those associated with the Pebble Limited Partnership's 2020 Mine Plan.
FOR INFO https://www.epa.gov/bristolbay/final-determination-pebble-deposit-area

DISCHARGE PENALTY CA

GALLO WINERY

Modesto-based E. & J. Gallo Winery (Gallo) has agreed to pay a penalty of $378,668 in connection with an Aug. 9, 2021, discharge into the Merced River of more than 90,000 gallons of wastewater mixed with irrigation well water from the company's Livingston winemaking facility.

The Central Valley Regional Water Quality Control Board (Board) first learned of the discharge through a report by a concerned citizen. During its subsequent investigation, Board staff confirmed that a discharge had occurred containing elevated levels of potassium, organic matter and salinity, all of which can threaten the health of fish and other aquatic life.

The Board determined the penalty in this matter using a formula that calculates a number of factors, including an estimate of the size of the discharge, its impact on water quality, a determination of the winery's culpability and how willing the company was to cooperate with the investigation.

"Protecting the water quality of our creeks and rivers is a core duty of the regional board," said Clay Rodgers, an assistant executive officer of the Board. "Discharges like these put the health of our waterways at risk, and the penalty reflects the seriousness of this violation. Gallo has also agreed to steps to prevent this from happening again in the future."

Modesto-based Gallo has installed additional check valves in strategic pipeline locations that should prevent wastewater from backing up and flowing in the irrigation system toward the river outlet.

Half of the penalty amount will be dedicated to what is known as a supplemental environmental project, which will pay for a portion of Merced County's Hagaman Park restroom septic tank and leach field relocation project in Livingston. Gallo will pay the remaining $189,334 to the State Water Pollution Cleanup and Abatement Account.
FOR INFO Soledad Calvino, 415/ 972-3512, calvino.maria@epa.gov

FUNDING OPPORTUNITY AZ

WIFA LOANS

The Long-Term Water Augmentation Fund (LTWAF) is a funding mechanism created to increase water supplies for the state of Arizona. Financial assistance includes loans provided by the Water Infrastructure Finance Authority of Arizona (WIFA) to eligible entities but not grants. The WIFA will obtain full repayment for monies or financial assistance provided from the fund by the recipients of the funding or financial assistance or the recipients of any water supply development project made available from monies from the fund through water subcontracts, loan repayments, rates, fees, charges or otherwise, as appropriate.

Interested parties may submit preliminary information about their projects as the WIFA adopts policies, procedures, and rules regarding the application process for the LTWAF.
FOR INFO LTWAF@azwifa.gov, www.azwifa.gov/programs/funding-type/long-term-water-augmentation-fund

PFAS FUNDING US

EMERGING CONTAMINANTS

The US Environmental Protection Agency (EPA) Administrator Michael S. Regan announced the availability of $2 billion from President Biden's Bipartisan Infrastructure Law to address emerging contaminants, like Per- and Polyfluoroalkyl Substances (PFAS) in drinking water across the country. This investment, which is allocated to states and territories, will be made available to communities as grants through EPA's Emerging Contaminants in Small or Disadvantaged

Communities (EC-SDC) Grant Program and will promote access to safe and clean water in small, rural, and disadvantaged communities while supporting local economies. Administrator Regan announced the water infrastructure investments in Maysville, North Carolina while holding a community roundtable with North Carolina Department of Environmental Quality Secretary Elizabeth S. Biser and other state and local leaders.

The Bipartisan Infrastructure Law invests $5 billion over five years to help communities that are on the frontlines of PFAS contamination reduce PFAS in drinking water. This initial allotment of $2 billion to states and territories can be used to prioritize infrastructure and source water treatment for pollutants, like PFAS and other emerging contaminants, and to conduct water quality testing.

EPA is also releasing the Emerging Contaminants in Small or Disadvantaged Communities Grant Implementation document. The implementation document provides states and communities with the information necessary to use this funding to address local water quality and public health challenges. These grants will enable communities to improve local water infrastructure and reduce emerging contaminants in drinking water by implementing solutions such as installing necessary treatment solutions.

The actions represent a significant milestone within the Biden-Harris Administration's commitments to combat PFAS pollution and safeguard drinking water, and specifically EPA's October 2021 PFAS Strategic Roadmap. Under the Roadmap, EPA is working across EPA to protect the public from the health impacts of PFAS. EPA has taken a number of actions to deliver progress on PFAS including:

- Proposing to designate two PFAS as CERCLA hazardous substances. If finalized, this will be a critical step toward increasing transparency around releases of PFAS and holding polluters accountable for cleaning up their contamination.
- Releasing drinking water health advisories. Acting in accordance with EPA's mission to protect public health and keep communities and public health authorities informed when new science becomes available, EPA issued drinking water health advisories for four PFAS.
- Laying the foundation to enhance data on PFAS. This included an order under EPA's National PFAS Testing Strategy requiring companies to conduct PFAS testing, and nationwide sampling through the Unregulated Contaminant Monitoring Rule for 29 PFAS in public drinking water systems.
- Expanding the scientific understanding of PFAS. EPA issued more than 30 scientific publications by EPA researchers and released EPA's PFAS Thermal Treatment Database.
- Translating the latest science into EPA's cross-agency PFAS efforts. This included updating EPA's contaminated site cleanup tables, developing new PFAS methods and conducting toxicity assessments, and issuing draft national recommended water quality criteria to protect aquatic life.
- Continuing engagement with the public. EPA's PFAS work was informed by public webinars, stakeholder meetings, Congressional testimony, and engagement with EPA's federal advisory committees.

In addition to this new grant, EPA is also working to propose a PFAS National Primary Drinking Water Regulations (NPDWR) in the coming weeks. The draft proposed rule is currently undergoing interagency review and EPA will issue the proposed rule for public comment when it clears the Office of Management and Budget. EPA anticipates finalizing the rule by the end of 2023.

These actions highlight EPA's commitments outlined in the PFAS Strategic Roadmap to protect public health and the environment from the impacts of PFAS. They also illustrate the benefits of investing in water — protecting public health and the environment, addressing key challenges facing communities, and creating jobs.

FOR INFO www.epa.gov/dwcapacity/emerging-contaminants-ec-small-or-disadvantaged-communities-grant-sdc

WATER QUALITY CA

POLICY AMENDMENTS

The California State Water Resources Control Board (Board) is proposing to amend its Water Quality Enforcement Policy (Enforcement Policy). Several of the proposed amendments are intended to enhance the protection of water quality in environmental justice and disadvantaged communities.

The Board adopted the Enforcement Policy to further its mission to protect and enhance the quality of the waters of the State by defining an enforcement process that addresses water quality problems in the most firm, fair, efficient, effective, and consistent manner. The Enforcement Policy provides guidance that enables the Boards' staff to openly address the greatest needs, deter harmful conduct, protect the public, and achieve maximum water quality benefits. The Enforcement Policy was last amended in 2017.

The proposed amendments would clarify certain principles that are central to the Enforcement Policy, helping to ensure more transparent and consistent application of the statutory factors outlined in California Water Code sections 13327 and 13385, subdivision (e) that the Boards must consider when assessing a civil liability. The amendments would also establish a template for procedures for evidentiary hearings to consider imposition of administrative civil liability, re-organize several sections to improve efficiency and flow, and add clarifications to a variety of provisions to enhance transparency to the Boards' enforcement process and penalty methodology application. Non-substantive technical amendments would increase comprehensibility.

Specific amendments relate to environmental justice and disadvantaged communities. The current Enforcement Policy discusses (section I.E.) the Boards' commitment to conducting enforcement in a manner that ensures the fair treatment of people of all races, cultures and income levels, giving consideration to those most vulnerable in communities disproportionately impacted by environmental pollution. The proposed amendments would incorporate statutory definitions for Disadvantaged Communities (DACs) and reference CalEnviroScreen, among other resources, for designating DACs. The proposed amendments also include statutory definitions for environmental justice. In addition, in section II.B., the current Enforcement Policy requires the Boards to prioritize enforcement cases using a specific list of factors. The proposed revisions add considerations of whether violations impact environmental justice or disadvantaged communities to the list of factors used to determine enforcement case priorities.

The public comment period for these amendments began on Feb. 10, 2023. Comments are accepted until noon on April 28, 2023. A public hearing will be held to receive comments on the proposed amendments on April 18, 2023 at 9:30 A.M. at the CalEPA Headquarters Building, Coastal Hearing Room, 1001 I Street, Sacramento. Members of the public may attend the meeting virtually or in person. Further information is available at: https://www.waterboards.ca.gov/water_issues/programs/enforcement/water_quality_enforcement.html

Comments may be submitted in writing to: Clerk to the Board, State Water Resources Control Board, Box 100, Sacramento, CA 95812-2000 (Mail) or 1001 I Street, 24th Floor, Sacramento, CA 95814 (hand delivery). Comments may also be submitted by e-mail to commentletters@waterboards.ca.gov or via fax to 916/ 341-5260. On August 15, 2023, the State Water Board staff will summarize the comments received on the Enforcement Policy and propose any revisions in response to the comments.

FOR INFO Catherine Hawe, 916/ 322-3538 or Catherine.Hawe@waterboards.ca.gov

WATER GOVERNANCE OR

ADVISORY REPORT

"Water is life. And the findings in this advisory report are shocking," said Secretary of State Shemia Fagan. "Not only are many families in Oregon dealing with water insecurity today, many more are at high-risk of becoming water insecure in the very near future. What's shocking about this report is it shows that we don't have a plan to address the problem. So today, I am offering the Oregon Legislature and Governor Kotek a road map to create a statewide plan to address water security in Oregon. We must take urgent action to address this crisis."

Communities across Oregon are grappling with water insecurity, unable to reliably and routinely access adequate, safe, and clean water to meet their needs. Many factors can increase the risk of water insecurity, such as climate change, drought, overallocation of surface and groundwater, and the presence of contaminants which degrade water quality and endanger public health. Oregon is not

well-prepared to systematically address these risks under its current governance model. Oregon's institutional framework around water is fragmented and there are persistent and concerning governance gaps that undermine the state's efforts to address water insecurity.

Oregon has made efforts to address some of these gaps in the past, to limited effect. There are notable ongoing efforts on the part of some state agencies and stakeholders, particularly around water planning and data. Yet agencies with key water responsibilities lack the appropriate resources and guidance needed to make real, sustained headway. Existing policies and political pressure may also act as a barrier to addressing these gaps and protecting water security for communities across the state.

The following aspects of water governance also need attention:

- The state lacks broad, diverse, and appropriately representative community engagement in water decisions
- Oregon does not have an actionable statewide water plan, or a regional framework that could tie a statewide plan to regional planning and implementation
- Key water agencies and state leadership lack shared water security priorities, making coordination more difficult when agencies have distinct areas of focus
- Water data is disaggregated and not set up to support regional planning needs
- The state lacks a water funding strategy that ties planning to investments, sustained funding for meeting community planning and implementation needs, and state agencies lack funding and capacity to fully carry out their duties
- External pressures, such as litigation from stakeholders, can sometimes prevent agencies from using their regulatory discretion to public benefit
- Federally recognized Tribes are unable to ensure water security in their homelands due in part to certain ongoing agricultural and industrial practices

The state must develop a water governance model centered on meeting public needs and protecting water security. This model should build on past efforts and the ongoing work of state agencies, Tribes, communities, and stakeholder groups. There is no single existing template that will easily fit Oregon's unique needs; however, good water governance principles such as effectiveness, efficiency, and trust and engagement, as well as certain practices used in other states, can inform how Oregon develops a more robust water governance model.

In addition to developing a regional water planning framework, state leadership should pursue the following actions to better protect Oregonians from water insecurity:

- Develop statewide priorities centered on water security shared by state leadership and agencies to guide holistic and inclusive water decisions
- Connect an actionable and comprehensive state water plan to a regional planning framework to guide water decisions and policy development
- Convene a formal planning and coordination body with diverse and balanced representation to guide the statewide plan and support regional planning
- Define the state's overall role and specific agency roles within a regional framework to support effective planning and implementation and avoid overlap and gaps in service
- Increase public engagement and incorporate more diverse and balanced community feedback and needs into statewide and regional water decisions
- Enhance public awareness and understanding of the state's water challenges
- Prioritize the human right to water and explore policy options to better protect community and ecosystem health
- Improve water data to support strategic decision making
- Adopt a strategic approach to water funding and establish a consistent funding base to support desired outcomes
- Clearly support state agencies tasked with carrying out regulatory responsibilities
- Integrate Oregon's federally recognized Tribes as full and equal partners into state and regional water decision-making

While today's report is not an audit under government auditing standards, it has undergone the same quality assurance process. Issuing an advisory report allowed the Audits Division to consider a fuller scope of water governance responsibilities beyond those of a single state agency.

FOR INFO: audits.sos@sos.oregon.gov, 503/ 986-2255, https://sos.oregon.gov/audits/Documents/2023-04.pdf

CLIMATE RESILIENCE WEST

DROUGHT FUNDING

On Feb. 13, the Department of the Interior announced a $728 million investment to deliver clean, reliable drinking water to rural and Tribal communities, support water conservation in the Upper Colorado River Basin, and complete projects to improve water supply reliability. This historic funding from President Biden's Bipartisan Infrastructure Law, the Inflation Reduction Act, and the Consolidated Appropriations Act of 2023 supplements unprecedented investments to protect the stability and sustainability of the Colorado River System now and into the future.

Funded by the Bipartisan Infrastructure Law, seven authorized rural water projects under construction in Iowa, Minnesota, Montana, New Mexico, North Dakota and South Dakota will receive $278 million. These investments build on the allocation of $420 million for rural water construction activities in fiscal year 2022. The funding is helping projects complete construction of water treatment plants and intakes, supporting work related to pipeline connections, pump systems, and reservoir construction, and advancing other efforts to provide potable water to rural and Tribal communities.

The Bureau of Reclamation (Reclamation) is also making available up to $125 million to support the relaunch of a System Conservation Pilot Program in the Upper Colorado River Basin. The renewed program — funded with an initial allocation through the Inflation Reduction Act — will help support water management and conservation efforts to improve water efficiency and ultimately protect the short-term sustainability of the Colorado River System. This is in addition to the over $325 million in fiscal year 2023 funding that Reclamation has allocated for ongoing work on drought resilience projects across the country.

Overall, the Bipartisan Infrastructure Law provides Reclamation with $8.3 billion over five years for water infrastructure projects to advance drought resilience and expand access to clean water for families, farmers, and wildlife. The Inflation Reduction Act is investing an additional $4.6 billion to address the worsening drought crisis. Combined, these laws represent the largest investments in climate resilience in the nation's history.

Funding in fiscal year 2023 from the Bipartisan Infrastructure Law will enable significant advances of rural water systems:

- $77.56 million for the Rocky Boys / North Central Montana Rural Water System in Montana for core pipeline construction, continued construction progress of a water treatment plant, as well as construction for segments associated with Havre, Chester, and Shelby Hub service areas
- $62.11 million for the Eastern New Mexico Rural Water System in New Mexico for the construction of approximately 26 miles of raw water transmission pipeline
- $60 million for the Lewis & Clark Rural Water System in Iowa, Minnesota, and South Dakota to support a water treatment plant, construction associated with the Sibley service area, and to reimburse states for related costs
- $26.33 million for the Garrison-Diversion Unit of the Pick-Sloan Missouri Basin Program in North Dakota for efforts associated with construction of water treatment plants, as well as efforts to support service on the Spirit Lake, Standing Rock, and Fort Berthold Reservations
- $25 million for the recently authorized Musselshell-Judith Rural Water System in Montana for substantial completion of rural water construction activities
- $15 million for the Fort Peck Reservation – Dry Prairie Rural Water System in Montana to support substantial completion of the project
- $12 million for the Jicarilla Apache Rural Water System in New Mexico to support progress toward water treatment plant upgrades

Detailed information on the fiscal year 2023 spend plan is available on Reclamation's website.

Up to $125 million in funding from the Inflation Reduction Act will enable Reclamation, in partnership with the Upper Colorado River Commission, to immediately implement the System Conservation Pilot Program. From 2015 to 2018, the Upper Basin System Conservation Pilot Program

successfully tested new approaches to conserve water on the Colorado River and proved these measures are effective to temporarily increase water efficiency and mitigate the impacts of drought.

The program is cooperatively managed by Reclamation and the Upper Division States of Colorado, New Mexico, Utah and Wyoming acting through the Upper Colorado River Commission.

This program supplements additional investments from the Biden administration to help increase water conservation, improve water efficiency, and prevent the System's reservoirs from falling to critically low elevations that would threaten water deliveries and power production. Reclamation is reviewing applications for a similar program in the Lower Colorado River Basin and expects to make additional announcements to support water conservation and address the ongoing drought.

The Consolidated Appropriations Act of 2023 provides an additional $325 million in funding for work in five categories within the Water and Related Resources account, including:

- Over $229 million for Water Conservation and Delivery
- $50 million for Rural Water
- $31 million for Environmental Restoration or Compliance
- $11 million for Fish Passage and Fish Screens
- $4 million for Facilities Operation, Maintenance, and Rehabilitation

This funding will go to construction and preconstruction activities where environmental compliance has been completed and the project will improve water supply reliability, improve water deliveries, enhance economic development, promote job growth, advance Tribal and non-Tribal water studies and activities or address critical backlog maintenance and rehabilitation activities.
FOR INFO https://www.usbr.gov/budget/

TOXIC SUBSTANCES US

NEW EPA APPROACH

EPA released for public comment and peer review on Feb. 24th a set of principles for evaluating cumulative risks under the Toxic Substances Control Act (TSCA) and an approach for applying those principles to the evaluation of the cumulative risk posed by certain phthalate chemicals undergoing TSCA section 6 risk evaluation. This is an important step in the process of EPA developing the capability under TSCA to examine risk to people from exposure to multiple chemicals with similar effects.

Until now, EPA has generally approached TSCA risk assessments by looking at the risk posed by a single chemical. However, in many cases people are exposed to multiple chemicals with similar effects at the same time. In some of these cases, EPA believes that the best approach to evaluate risk to human health may be to look at the combined risk to health from these chemicals. This cumulative risk assessment approach can help more appropriately evaluate risks people face and may be helpful in more effectively mitigating the identified unreasonable risks. Evaluating cumulative chemical risks may also provide particularly useful information for communities that are overburdened by chemical pollution. Ultimately, cumulative risk assessment will help EPA better understand and address risks from chemicals as required by the law.

Chemicals, such as some of the phthalates, have particularly similar effects on human health and have been found in the human body at the same time. Public comments received by EPA, and other federal and international regulatory agencies, support a cumulative approach to assessing the risks of phthalate chemicals. The principles and approach documents released are the first steps towards EPA conducting a cumulative risk assessment under TSCA.

EPA's "Draft Proposed Principles of Cumulative Risk Assessment Under the Toxic Substances Control Act" discusses what cumulative risk assessment is and how it could be used in the scientific and regulatory context of TSCA. A cumulative risk assessment will not always be the best approach, or possible to complete in the statutory timeframes provided for TSCA risk evaluations. But when chemicals are sufficiently similar toxicologically and are found to present co-exposures — meaning people are exposed to multiple chemicals at the same time — a cumulative risk assessment may be appropriate.

Phthalates are a group of chemicals used in many industrial and consumer products, including polyvinyl chloride (PVC) products, to make plastics more flexible and durable. Because of their widespread use in industrial and consumer products, people can be exposed to many phthalates. Phthalates have been found in food and have also been measured in human blood samples. Numerous laboratory animal studies have demonstrated that prenatal phthalate exposure can impact male development and reproduction, in a phenomenon known as "phthalate syndrome."

EPA is currently conducting risk evaluations for five phthalates designated as high-priority substances under TSCA, including di-ethylhexyl phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), di-isobutyl phthalate (DIBP), and dicyclohexyl phthalate (DCHP), and two phthalates subject to manufacturer-requested risk evaluation, including di-isononyl phthalate (DINP) and di-isodecyl phthalate (DIDP).

In the "Draft Proposed Approach for Cumulative Risk Assessment of High-Priority Phthalates and a Manufacturer Requested Phthalate Under the Toxic Substances Control Act," EPA proposes a methodology for evaluating cumulative risk for the phthalate chemicals currently under review.

EPA proposes in its approach submitted for public comment and peer review that DEHP, BBP, DBP, DIBP, DCHP and DINP (but not DIDP) are toxicologically similar (and pose an additive hazard) and that the US population is co-exposed to these phthalates. Therefore, EPA is proposing to group these phthalates for cumulative risk assessment under TSCA as described in the "Draft Proposed Approach" document.

This proposed approach is not itself a cumulative risk assessment nor does it make a finding of risk, but rather is a methodology that EPA proposes to use and seeks public input about and peer review on. Additionally, since risk estimates have not yet been developed for the individual chemicals, EPA cannot predetermine the results of that work in this cumulative risk assessment approach. The cumulative risk assessment for phthalates and individual risk evaluations are being conducted in parallel, and those risk evaluations will undergo their own public comment and peer review, as appropriate. By releasing this approach for public comment and peer review now, EPA is assuring that the methods used to conduct the cumulative risk assessment will be based on the best available science. The results of the phthalate cumulative risk assessment may help inform EPA's individual phthalate risk evaluations and ultimately the unreasonable risk determinations.

EPA will hold a public virtual meeting of the Science Advisory Committee on Chemicals (SACC) on May 8-11, 2023, to peer review the cumulative risk assessment principles and framework. Information on attending the public virtual meeting will be available in April 2023 on the SACC website (see below).

Upon publication of the Federal Register notice, written comments on the documents undergoing peer review will be accepted for 60 days through www.regulations.gov (Docket No. EPA-HQ-OPPT-2022-0918).
FOR INFO https://www.epa.gov/tsca-peer-review

CALENDAR

March 16-17 UT & WEB

Wallace Stegner Center 28th Annual Symposium: The Future of the Great Salt Lake, Salt Lake City. University of Utah S.J. Quinney College of Law. Hybrid Event: In-Person and Online. For info: https://sjquinney.utah.edu/events/

March 17 WY

Real Estate & Land Use Seminar, Laramie. Hilton Garden Inn Laramie. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net or www.theseminargroup.net

March 21 WEB

Creating the Water Workforce of the Future: Webinar - "It Really Matters: Ensuring Diversity, Equity, and Inclusion in the Water Workforce, Presented by US EPA. For info: https://www.epa.gov/sustainable-water-infrastructure/water-sector-workforce-webinars

March 22-24 NY

UN 2023 Water Conference - Our Watershed Moment: Uniting the World for Water, New York City. UN Headquarters. For info: https://sdgs.un.org/conferences/water2023

March 24 CA

2023 Kern County Water Summit: California's Most Critical Water Issues, Bakersfield. Mechanics Bank Theatre. Presented by the Water Association of Kern County; 6:30am-2:00pm Pacific Time; Registration Deadline March 10th. For info: www.wakc.com

March 28-29 CA

Post-Fire Hydrology and Runoff Management Course, McClellan. Sacramento County Office of Emergency Services. Presented by Floodplain Management Association. For info: www.floodplain.org/ or admin@floodplain.org

March 28-31 CA

The Utility Management Conference, Sacramento. SAFE Credit Union Convention Center. Presented by American Water Works Association & Water Education Foundation. For info: www.awwa.org/Events-Education/Utility-Management

April 3-4 NM

Law of the Rio Grande Conference: Opportunities for Collaboration of a Shared & Valuable Resource, Santa Fe. La Fonda on the Plaza. Perspectives from New Mexico, Texas, and Colorado by Leading Experts. For info: CLE International: 800/ 873-7130 or www.cle.com

April 3-5 CA

19th Annual Western Boot Camp on Enrivonmental Law, San Francisco. Hogan Lovells. Presented by Environmental Law Institute; Deadline for Registration & Payment March 20th. For info: www.eli.org

April 4-5 VA

Interstate Council on Water Policy's Spring Washington D.C. Roundtable, Arlington. Doubletree Hotel Crystal City; Hosted in Conjunction with the National Water Supply Alliance. April 5th Morning - Water Policy Summit with Partners of Water Organizations Across the US. For info: https://icwp.org/news/2023springroundtable/

April 6 UT & WEB

Bears Ears - Landscape of Refuge and Resistance: Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/events/

April 11 OR

Contaminated Sediments Conference: Climate Change Resilience Adaptation & Environmental Justice, Portland. Miller Hall - World Forestry Center. Presented by Environmental Law & Education Center. For info: www.elecenter.com

April 11 UT & WEB

Corresponding With the Young Wallace Stegner - Wallace Stegner Center and Tanner Humanities Center Presentation, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/events/

April 13 WEB

Clean Water, Complicated Laws: What to Do When You Receive a Clean Water Act 60-Day Notice - 2023 Water Quality Webinar Series, Free Webinar on Water Quality Issues, Laws & Regulations; 10:00-10:30am Pacific Time. Presented by Best, Best & Krieger. For info: https://bbklaw.com/news-events/webinars >> Clean Water

April 13-14 DC & WEB

Clean Water Act 2023: Law and Regulation Conference, Washington. In-Person & Webcast Event; Hunton Andrews Kurth LLP, 2200 Pennsylvania Avenue. Presented by Environmental Law Institute and American Law Institute-CLE. For info: www.eli.org or www.ali-cle.org

April 13-14 WEB

Water 2023: Legal, Financial, and Executive Challenges & Opportunities Workshop, Virtual Event. Presented by American Water Works Association. For info: https://www.awwa.org/Events-Education/Legal-Finance-Workshops

April 16-18 CA

CMUA 2023 Annual Conference, San Diego. Rancho Bernardo Inn. Presented by California Municipal Utilities Association. For info: www.cmua.org >> Events

April 16-19 MN

Sustainable Water Management Conference, Minneapolis. Hyatt Regency Minneapolis. Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Sustainable-Water-Management

April 18 CA & WEB

Public Hearing on Amendments to California's Water Quality Enforcement Policy, Sacramento. CalEPA Headquarters Building, 1001 I Street, Second Floor; 9:30 am Pacific Time. For info: https://www.waterboards.ca.gov/water_issues/programs/enforcement/water_quality_enforcement.html

April 18-21 CA

AC23 - 2023 CWEA Annual Conference: "One Community One Purpose", San Diego. Town & Country Resort. Conference of the California Water Environment Association. For info: www.cwea.org

April 19 WEB

Idaho Brownfields Conference - NEBC Virtual Conference, Presented by Northwest Environmental Business Council. For info: www.nebc.org/ >> Conferences

April 20-21 TX

Texas Wetlands Conference: Funding Priorities, the Sackett Decision & the Future of Texas Projects, Galveston. Tremont House. For info: CLE International: 800/ 873-7130 or www.cle.com

April 24-25 UK

Smart Water Systems 12th Annual Conference, London. Copthorne Tara Hotel. Presented by SAE Media Group; New Technologies & Latest Developments. For info: www.smart-water-systems.com

April 26-28 CO

52nd Spring Conference on Environmental Law, Denver. Grand Hyatt Denver. Presented by the American Bar Association. For info: environ@americanbar.org

May 2 CO

2023 WateReuse Colorado Conference, Boulder. SEEC Bldg., University of Colorado - Boulder. Presented by WateReuse. For info: www.watereuse.org

May 5 AZ

32nd Annual Desert Horticulture Conference, Tucson. El Conquisdator Hotel. Plants and Design, Plant Health, and Water/Urban Landscapes. For info: https://cals.arizona.edu/deserthort/

The Water Report
Water Rights, Water Quality & Water Solutions in the West
3615 W. Hills of Gold Dr. Tucson, AZ 85745

CALENDAR

May 7-10 — **AZ**

National Association of Environmental Professionals Annual Conference, Phoenix. Sheraton Phoenix Downtown Hotel. Annual Conference & Training Symposium. For info: www.naep.org/

May 8-10 — **NE**

Water for Food Global Conference, Lincoln. Nebraska Innovation Campus Conference Center. Presented by the Daugherty Water for Food Global Institute; Innovative Ways to Improve Water & Food Security by Increasing Farmers' Resiliency to a Changing Landscape. For info: https://waterforfood.nebraska.edu/

May 9-11 — **CA**

ACWA 2023 Spring Conference & Exhibition, Monterey. Monterey Conference Center. Presented by Association of California Water Agencies. For info: www.acwa.com/events/

May 9-11 — **NC**

20th Annual Climate Prediction Applications Science Workshop: Understanding Socio-Economic Value of Climate Data, Prediction, Information & Services, Ashville. TBA. Presented by the National Weather Service. For info: https://www.weather.gov/climateservices/cpasw

May 9-11 — **AZ**

96th Annual AZ Water Association Conference & Exhibition, Phoenix. Phoenix Convention Center. For info: https://www.azwater.org/ >>Events & Training

May 11 — **WEB**

Clean Water, Complicated Laws: How to Participate in the MCL Development Process - 2023 Water Quality Webinar Series, Free Webinar on Water Quality Issues, Laws & Regulations; 10:00-10:30am Pacific Time. Presented by Best, Best & Krieger. For info: https://bbklaw.com/news-events/webinars >> Clean Water

May 16-17 — **TX**

Environmental Trade Fair & Conference, Austin. Austin Convention Center. Presented by the Texas Commission on Environmental Quality; Agency Staff Leads Over 100 Courses & Discussions. For info: www.tceq.texas.gov/p2/events/etfc/etf.html

May 17-19 — **CA**

Bay Delta Water Tour, Sacramento. Tour Travels into the Sacramento-San Joaquin Delta. Presented by Water Education Foundation. For info: https://www.watereducation.org/tour/bay-delta-tour-2023

May 18-19 — **AZ**

Law of the Colorado River: The Next Century of River Policy - 23rd Annual Conference, Scottsdale. Hilton Hotel. For info: CLE International: 800/ 873-7130 or www.cle.com

May 19 — **AZ & WEB**

Annual Water Utility Leadership Forum - Northern Arizona Municipal Water Users Association (NAMWUA), Flagstaff. High Country Conference Center; Hybrid: In-Person & Virtual Event. Colorado River Projections, Permit Compliance & Reporting Tips. For info: https://namwua.org/water-utilites-leadership-forum

May 22-24 — **NV**

Western States Water Council 2023 Spring (201st) Meetings, Reno. Peppermill Resort Spa Casino. Field Trip 5/22; Meetings 5/23-5/24. For info: https://westernstateswater.org/events/2023-spring-201st-meetings/

June 1 — **WA**

Contaminated Properties in the Northwest Conference, Seattle. TBA. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net or www.theseminargroup.net