



River Voices

Mines lay waste to the nation's rivers

IMPACTS OF MINING ON RIVERS

By [Paul Koberstein](#), Editor, Cascadia Times

Other than food, almost everything we consume or manufacture in this country contains minerals dug from the ground. Many of these products improve our lives, providing for transportation, energy and household products. Yet extracting resources from mines poses serious, long-term threats to neighboring communities and waterways.

Mines release dangerous substances such as arsenic, cadmium, copper, cyanide, zinc or mercury that are harmful to fish, wildlife and humans. Many also leak acid into waterways, killing almost every living thing downstream.

The United States has yet to address the impacts of mining in any comprehensive way. Most mining operations are governed by the General Mining Law, which has not been amended or updated since 1872. The mining industry must comply with the Clean Water and Clean Air Acts, National Environmental Policy Act, state reclamation standards where they exist, and federal and state statutes relating to the handling and disposal of certain toxic wastes, as well as other laws. Critics, however, argue that these general environmental requirements are not adequate to assure reclamation of mined areas.

Coal Mining

Since the early 1900s, coal mining in the Appalachian region has contaminated streams with acidic waters and metallic sediments. According to the U.S. EPA, runoff and drainage from both active and inactive coal mine sites are contaminating mid-Atlantic streams with acidic and metallic waters and

sediments. More than 66,500 documented sources of coal mine drainage in Appalachia have polluted an estimate 17,000 km of streams. In addition to these chemical disturbances, road building, mine site construction and strip mining have impaired the physical habitat of streams adjacent to mining sites through channelization or sedimentation.

“Hardrock minerals” refer to “locatable” materials in rock, such as metals, uranium and uncommon varieties of sand, stone and gravel claimed and developed under the General Mining Law of 1872. But not all mining is hardrock. Coal, oil, gas phosphate, potash, sodium, sulphur and other nonmetalliferous minerals are considered “leasable” minerals. Common varieties of sand, stone, gravel and other rocks are considered “salable” minerals. Leasable and salable minerals have their own sets of laws, regulations and impacts.

Source: USDA, *Wickland Waters* – Issue 4 / Winter 2005

The combined effect of chemical and physical stressors on stream ecosystems is a decline in ecosystem health—loss of biodiversity (fish, macroinvertebrates, algae). Acid Mining Drainage (AMD) has eliminated fish completely from some rivers and streams, and others support only a few acid tolerant species. The water in the rivers is acidic and in the worst polluted streams can cause skin irritation to people who

inadvertently enter the water. The river stains concrete floodwalls red and the bed of many streams are a solid crust of orange or white. The corrosive acid also attacks culverts and bridge abutments, resulting in a shorter than normal life span for those types of infrastructure.

Hardrock Mines

Thousands of historical hardrock (gold, copper and zinc) mines exist across the Western United States. Mine dumps, tailing piles and unmined mineral



River Network

Connecting People, Saving Rivers

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River Network is a national, nonprofit organization whose mission is to help people understand, protect and restore rivers and their watersheds.

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FROM THE PRESIDENT



ver the past two hundred years, few things have been more harmful to more watersheds than irresponsible mining and drilling practices.

Nineteenth century gold mining in California and Oregon ruined thousands of streams, destroying habitat and leaving a toxic legacy that lingers in many streams to this day. Coal mining in Appalachia turned thousands of streams black for decades and left acid drainage that still makes it impossible for many to support aquatic life. Hardrock mining in most of the Rocky Mountain states and many others produced runoff that rendered streams unfit to be a public drinking water supply. Poorly sited and poorly regulated oil and gas drilling, like many of the activities already mentioned, harmed both surface and ground water in Texas, Oklahoma, Louisiana, New Mexico, Colorado, Pennsylvania and Alaska, to name just a few of the hardest-hit states. Some practices, such as the least responsible surface coal mining and in-stream gravel mining operations, actually destroyed not *just* streams' beneficial uses, but streams *themselves*, by drastically altering their physical characteristics.

Modern regulations and social norms have led to the elimination of some of the worst mining and drilling practices and to significant improvement of many of the rest. Still, it will take many decades to finish doing what we can to deal with the legacy of two centuries of irresponsible mining and drilling practices. It will also take time to improve the operation of ongoing operations to the point that they have negligible impact. In the meantime, we must also address new practices, such as coalbed methane drilling and "mountaintop removal" coal mining, that dwarf most previous drilling and mining activities in scale, scope and potential impact.

When I first began my watershed conservation work, I often felt that we were working against overwhelming odds. Over time, however, I learned that with science, law and public opinion on our side, there was virtually nothing we could *not* accomplish. With this issue of *River Voices* we hope to make it easier for the watershed protection community to solve some of the most daunting problems affecting our waters today.

Don Elder



credit: © River Network Collection

Impacts of Mining on Rivers, cont.

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deposits can contaminate the surrounding watershed when weathering of exposed minerals causes acid drainage and metals-enriched waters. According to the U.S. EPA, mine waste has contaminated more than 40 percent of the headwaters of western watersheds.

Acid drainage is a major challenge to be addressed...It has been estimated to cost between...\$2-35 billion to remediate in North America.

Source: *Mining Engineering*, December 1998

than spilled into lands, rivers and streams. Unfortunately in the Powder River Basin, the industry convinced the Corps of Engineers that this was not necessary.

What Can Be Done?

As citizens, we have tools provided by the Clean Water Act and other state and federal laws that are helping to address these problems. In West Virginia, citizens forced their state to limit selenium discharges in scores of mining National Pollution Discharge Elimination System (NPDES) permits. Citizens also won a landmark lawsuit in 2003 when a federal judge prohibited West Virginia from exempting mining activities from complying with antidegradation rules.

In Wyoming, citizens won another major victory in January 2005 when a federal judge ruled that the Corps' permit for the Wyoming coalbed methane operators was illegal. As the judge ruled, "[m]ineral resources should be developed responsibly, keeping in mind those other values that are so important to the people of Wyoming such as preservation of Wyoming's unique natural heritage and lifestyle." An estimated 12,000 to 15,000 producing gas wells in Wyoming won't be affected by the ruling, but an additional 35,000 planned wells could be.

As this issue of *River Voices* reveals, massive loopholes in the law or outright violations still frustrate citizen efforts to protect their own watersheds all across the country. Yet, as we'll see, the Clean Water Act and other laws empower them to take needed action.

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www.times.org



Credit: V.Shockman/www.dhrc.org

Mountaintop coal mining in southern West Virginia

Other hardrock mines produce gypsum, uranium, molybdenum, gravel and phosphate, and can pose significant hazards as well. A molybdenum mine in central

Idaho, located within critical habitat for endangered wild Chinook salmon, has been producing acid drainage at least since 1987.

Coalbed Methane Mining

The extraction of methane from Wyoming's coal beds has caused significant damage in the Powder River Basin. Coalbed methane operators pump water from aquifers to get at the methane. The Army Corps of Engineers issued a dredge and fill permit under Section 404 of the Clean Water Act allowing the discharge of 1.4 trillion gallons of water containing high levels of sodium, arsenic, iron, barium and manganese into the Powder River and its tributaries over the projects' life. Unique fish and aquatic plant communities in Wyoming's streams are threatened by the polluted water. Ranchers have seen their lands flooded, their water rights eliminated and their fields poisoned.

In other river basins, the polluted water must be reinjected into the ground rather

By the year 2000 CBM accounted for approximately 7.5% of natural gas production in the U.S.

Source: USGS (2000)



Coal Mining

BRINGING THE MOUNTAINS DOWN

Maria Gunnoe has lived all her life in the southern mountains of central Appalachia near the town of Bob White in Boone County, West Virginia. Both her Cherokee and Appalachian heritage taught her to value and care for the bountiful natural world around her. As children, she and her brother earned money catching bait to sell to local fisherman. They spent their summers along the river and in the forested mountains near their home, hunting for “molly moochers” (mushrooms), picking berries and fishing.

Growing up, she knew in the back of her mind that surface mining was taking a toll on the streams and forests near her home. Then several years ago the destruction of mountaintop removal came right to Maria’s front door. Torrential flood waters, exacerbated by mining and timber operations, tore through her front yard, killed her dog, destroyed her barn, and converted her driveway into a raging river. Maria resolved to fight back and discovered she was one of many coalfield residents no longer willing to pay the price of our nation’s thirst for “cheap energy.” She learned that mountaintop removal coal mining was destroying central Appalachia, taking a devastating toll.

The Devastation

Mountaintop removal coal mining (MTR) destroys the environment on a scale that is unprecedented in this country’s history. Coal companies actually blast hundreds of feet off the tops of mountains—literally removing entire mountain ranges—and then dump millions of tons of resultant “waste” into adjacent valleys, burying streams and anything else in the way. Vast, flattened moonscapes now replace what had previously been vibrant and ecologically productive regions.

Large-scale coal mining operations in central Appalachia have permanently buried over

1,200 miles of streams (more than half the length of the Mississippi River) with mining waste and have leveled over 1,500 square miles of forested mountainous terrain (approximately the area of the entire state of Rhode Island). The federal government estimates that this damage is likely to double over the next ten years.

MTR and associated valley fills in central Appalachia constitute the greatest earth moving activity in the United States. Nearly 20% of the landmass of some southern West Virginia counties has already been flattened by surface mines, converted to useless scrubland, and will remain unable to support the growth of trees for hundreds of years.

Coal Mining and the Clean Water Act

Water pollution from these huge mines is supposed to be regulated through two major Clean Water Act (CWA) permits: a water pollution discharge permit (NPDES permit) and a permit allowing mining waste to be dumped into streams (404 permit). Some of the worst water pollution caused by coal mining operations could be moderated if such permits complied with existing laws.

However, every permit issued in West Virginia and Kentucky that we have analyzed over the past several years fails to comply with state and federal CWA laws. According to a former West Virginia permitting chief, not a single permit complies with all CWA requirements.

Water Pollution Discharge Permits and Antidegradation

The backbone of the CWA is the NPDES permit, but control of coal mining pollution through NPDES permits became problematic in the early 1980s when the federal government established minimum water pollution control technologies for coal mines. These “technologies” amounted

by Margaret Janes

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Appalachian Center
for the Economy &
the Environment

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Coal Mining, cont.

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to little more than digging holes in the ground to catch contaminated run off and letting nature take its course. Incredibly, federal guidelines for limits on specific pollutants do not apply when it rains, so runoff from mining operations is nearly unregulated at the very time when mines are most likely to pollute—during rainfall.

This weak federal leadership leaves a lot of room for mischief when states actually issue NPDES permits for coal mining. Only through submitting numerous comments, appealing permits and publishing a report critiquing West Virginia's Clean Water Act compliance record, have we convinced West Virginia to issue more protective NPDES permits for hundreds of mining discharges.

For example, our first legal victory against MTR (in partnership with Trial Lawyers for Public Justice and many coalfield residents and groups) led to a broad federal study of its impacts, which among other things revealed toxic levels of selenium coming from MTR mines with valley fills. Eleven coalfield streams were eventually listed on West Virginia's impaired stream list because of selenium pollution. Through numerous comments, letters and a high profile mining permit appeal, we forced West Virginia to limit selenium discharges in scores of mining NPDES permits. The next challenge is to compel the state to actually monitor and enforce those permits.

States are required to weigh and balance the public welfare against private gain when issuing CWA permits. West Virginia's failure to comply with the

Clean Water Act's antidegradation provisions was an issue in our initial legal challenge of MTR. In 2001, after years of pressure from the Center and other environmental groups, West Virginia finally instituted an antidegradation plan. Not surprisingly, this plan exempted numerous activities from CWA antidegradation review, including some related to MTR. That long list of exemptions became the basis of our national precedent-setting antidegradation lawsuit victory in 2003, when a federal judge prohibited West Virginia from exempting most of the activities cited in the complaint. Antidegradation regulations have finally been implemented in the state, leading to dramatic changes in NPDES permits for new coal mines and other activities.

The Coal Industry and Water Quality Standards

The coal industry has not been silent as environmental advocates have become increasingly successful in tightening water discharge permits. "King Coal" still rules in West Virginia and, with a chokehold on the state's legislature, is proceeding to unravel water quality standards—the foundation of protective NPDES permits. One by one, standards for iron, manganese, aluminum and selenium—all important to coal—have become targets for the industry's "creative science" and political maneuvers on both the state and federal levels. For example, the U.S. EPA in a politically tainted move has recently initiated changes to the federal selenium standard. Leading scientists say the proposed change is "fatally flawed" and will allow up to 40 percent of fish to die.

404 Permits

The other major CWA permit required for coal mines is meant to control the filling of streams with mining waste. The federal government has generally required stream

Mountaintop removal/valley fill coal mining in southern West Virginia in May 2003



Credit: V. Stockman/www.ohwvcc.org

fills to have a constructive purpose, such as a housing development or shopping center — and specifically not be used for waste disposal.

In our Kentucky MTR legal victory, the judge applied that principle to ban most valley fills—federal agencies had been ignoring the law for years. Clearly, coal companies were using streams strictly for waste disposal and not for any constructive purpose. The notoriously conservative 4th Circuit Court of Appeals eventually overturned that ruling, but the Bush Administration had already reacted quickly and dramatically to our initial victory by changing the definition of “fill” to include waste material. This gave the green light to continued approval for coal companies to bury large sections of streams with coal waste. In response, Christopher Shays (R-CT) and Frank Pallone (D-NJ) introduced the Clean Water Act Protection Act of 2003, which would prohibit the dumping of mine waste into streams by reasserting that waste material cannot be used to fill streams. Congress has not taken action on the bill.

Nearly all of the MTR valley fills authorized in West Virginia and Kentucky prior to July of 2004 were illegally rubber-stamped by the Army Corps of Engineers through a streamlined permitting process called Nationwide Permit #21. The Nationwide program was intended to allow quick permitting for minor stream disturbances that would have only a minimal impact, both individually and cumulatively, in a watershed. The Corps’ abuse of Nationwide 21 was based on the conclusion that burying 1200 miles of streams has only a minimal and inconsequential impact on Central Appalachia’s rivers and streams.

In July 2004, we won a legal challenge of the Corps’ abuse of nationwide permits in MTR operations in West Virginia. This victory forced mining companies to seek individual

404 permits that require site-specific environmental scrutiny and seek public input on each activity. Predictably, the Bush administration appealed this decision. The appeal will be heard in the 4th Circuit sometime in 2005. Meanwhile, we filed an identical legal challenge of the Corps’ illegal use of the nationwide permit in its three Kentucky districts.

Endnote

As powerful industries continue to attack key environmental laws and use “creative science” to promote self-serving environmental policies, it becomes increasingly important for citizens to advocate for environmental protection. State and federal environmental agencies are not up to the task because they lack funding, staff, expertise and political support. Polluters frequently take advantage of these agency gaps by providing the data or expertise needed to establish policy favorable to industry. As advocates, we need to join Maria Gunnoe and arm ourselves with the facts and the law to counterbalance the self-serving influence of the coal barons and other corporate polluters who intend to rob us of a sustainable future.

The Appalachian Center is a regional law and policy center providing legal and policy assistance free of charge to low-income individuals, grass-roots organizations and local communities in precedent-setting litigation designed to protect the environment and the health of central Appalachia. www.appalachian-center.org



Credit: Appalachian Center

Large mountaintop removal mines, like the one pictured above, loom over small communities predisposing them to devastating floods. Maria Gunnoe’s home is located in a small valley like this one.



CASE STUDY

CLEANING UP ABANDONED COAL MINES IN THE DECKERS CREEK WATERSHED

by Evan Hanson
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Deckers Creek drains about 64 square miles of scenic West Virginia hills and small towns before joining the Monongahela River in Morgantown, home of West Virginia University. Since 1995, Friends of Deckers Creek has been working to clean up the creek, which still suffers from acid mine drainage from old abandoned coal mines. Many parts of the creek are nearly devoid of life due to the iron, aluminum and manganese discharged from the acid-producing Upper Freeport coal seam.

The organization has several ongoing programs designed to characterize the problem and to find solutions. Through our Clean Creek Program, we monitor thirteen sites across the watershed each quarter for water chemistry, each fall for fish and each spring for benthic macroinvertebrates. We then publish annual State of the Creek reports to track changes over time and to help target remediation funds toward the most important priorities.

We also chair Deckers Creek Restoration Team meetings that include Friends of Deckers Creek, state and federal agency staff, university researchers and local officials. At these meetings, we coordinate our cleanup efforts and agree on priorities and appropriate technologies for each site. These meetings allow us to avoid duplication of effort and find new ways to leverage scarce funding.

We've been fortunate that the West Virginia Department of Environmental Protection

(DEP) and federal Natural Resources Conservation Service (NRCS) each pledged to contribute \$5 million toward acid mine drainage remediation in the watershed. DEP is allocating money from the Abandoned Mine Land Trust Fund, which originates from a per-ton tax on mined coal. In the first such project of its kind in West Virginia, NRCS is applying Public Law 566 funds toward acid mine drainage remediation. In the past, PL 566 funds have been used to build dams.

Abandoned coal mines are considered to be nonpoint sources of pollution; therefore, DEP has started allocating Clean Water Act Section 319 funds (for nonpoint source pollution control) to help clean up these sites in the Deckers Creek watershed and in other parts of the state.



Credit: Earthworks

A dead bird in an acidic wastewater pond at the Yerington Mine in Nevada.

One more funding source has proven essential: the federal Office of Surface Mining offers grants of up to \$100,000 to watershed groups to help pay to clean up water pollution from

abandoned mines. In 2004, Friends of Deckers Creek secured its first of these Watershed Cooperative Agreements, and this year we plan to apply for several more.

Even in a watershed as small as Deckers Creek, it has taken years to collect enough information to identify the impaired segments and to find all of the abandoned coal mine discharges that cause these impairments. It takes just as long to develop the partnerships needed to build momentum for a cleanup, and it takes patience to work with agencies to make the funding flow.



Hard Rock Mining

THE GOLDEN AGE OF RIVER CONSERVATION

Even though mining often conjures images of a crusty old miner with a pickaxe, modern mining is no longer a pick and shovel affair. Instead, large corporations use toxic chemicals, blasting agents and earth moving equipment capable of altering entire landscapes. Consequently, today's mines generate enormous volumes of waste—more than any other resource extraction industry. For example, only 0.00004 % of all the raw materials used in the gold mining process become a final product (refined gold)—the rest (99.99996%) is waste.

Much of this waste, which is stored in vast piles or behind large impoundments, contains minerals, such as arsenic, cadmium, copper, zinc or mercury that are harmful to fish, wildlife and humans. According to the EPA's Toxic Release Inventory, hardrock mining is the nation's top toxic polluter, with 1.3 billion pounds of toxics released in 2002 alone. So, it's not surprising that mining often results in significant impacts to water quality. Here's how it happens:

Acid Mine Drainage

Acid mine drainage is the proverbial Pandora's box. It occurs when sulfide minerals, unearthed during mining, are exposed to oxygen and water to form sulfuric acid. The acid then leaches other metals out of the surrounding rock. It is a deadly combination. If it isn't captured and treated, it may drain into nearby streams and rivers or seep into groundwater. For example, acid mine drainage from the Summitville mine in Colorado destroyed all aquatic life in 18 miles of the Alamosa river.

Not all mines generate acid. When it does occur, acid mine drainage is generally a severe, long-term problem, continuing for hundreds or even thousands of years.

Metals Leaching

Even if a mine isn't acid-generating,

snowmelt or rainfall can leach metals, like arsenic, copper, cadmium, lead and zinc, out of the excavated rock. If left unmanaged, contaminated water can seep into groundwater or be carried downstream. These metals may play havoc with fish, causing anything from chronic reproductive failure to outright fish-kills. Metals are generally harmful to humans, wildlife and sometimes livestock as well.

Release of Processing Chemicals

Another frequent water quality impact results from the release of processing chemicals (e.g., cyanide, sulfuric acid, etc.). For example, cyanide is often used in gold mining to dissolve the tiny particles of gold from the surrounding rock. These chemicals can enter streams from spills, leaks, processing pond overflows, impoundment failures and pipeline breaks. Spilled cyanide from a mine has appeared in the water supplies of adjacent homes.

Clean Water Act

The Clean Water Act is a critical tool for any concerned citizen. Here are a few different ways to use the CWA to better protect water in your region from the impacts of mining.

Discharge Permits (NPDES)

Just about every part of a mine (e.g., open pit, waste rock pile, tailings impoundment, pipes, processing ponds, etc.) is considered

by Bonnie Gerstring
Earthworks
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Credit: Earthworks

Acid mine drainage from an abandoned mine at Fisher Creek, Montana

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Credit: U.S. EPA

Acid mine drainage collection pond at the Summitville Superfund site in Colorado.

EARTHWORKS
is a national organization dedicated to protecting communities and the environment against the adverse impacts of mining.

For assistance with mining issues, contact the Washington D.C. office at 202/887-1872, the Missoula, Montana office at 406/549-7361, or the Reno, Nevada office at 775/324-6115.

a point source and requires an NPDES discharge permit, if it discharges to surface water (streams, rivers, lakes etc.). A mine is also

required to obtain a permit, if it discharges to groundwater that feeds directly to surface water (i.e., if it is hydrologically connected). This is more difficult to prove, but most courts have upheld this requirement. The public has at least 30-days to comment on a draft permit before the final discharge permit is issued. This is an important opportunity to weigh in with site specific information.

Citizens should be particularly wary of mines that claim to be “no-discharge” facilities. Mines often develop problems over time, resulting in water quality impacts that were not predicted at the time of permitting. Thus, it’s important to ensure that extensive monitoring is included in any mine’s discharge permit so that impacts can be caught as early as possible.

Even for mines with discharge permits, it’s important to regularly “watchdog” the mine’s monitoring reports (usually submitted monthly) to determine whether the amount of pollution reported exceeds the amount allowed in the permit. If so, citizens can initiate a complaint, and the permitting authority is required to investigate and provide a written response.

Citizen’s Suit

Too often it takes citizen action to get government agencies to take enforcement

action. If the agency does not take action against a polluter, citizens can invoke the “citizen-suit” provision of the CWA. This allows individuals or organizations to file suit against the company after providing a 60-day notice to the company and agency to give them an opportunity to take action. The two primary types of citizen suits are: 1) for mines that are discharging pollution in violation of the amounts allowed in the permit; or 2) for mines that are discharging without required permits.

Impaired Waters List

The Clean Water Act requires each state to compile a list, called the 303(d) list, of all water bodies that are already too polluted to meet various basic beneficial uses (e.g., swimming, drinking, fisheries, etc.). The list includes a description of each water body, the problem pollutant(s) and the type of activity that caused the pollution. The state is then required to develop a cleanup plan for these impaired streams. In the meantime, the permitting agency should not issue a new permit to any operation that would contribute more of the same pollutant. For example, a mine should not be issued a discharge permit, if it would discharge arsenic into a stream that has been listed as an impaired stream on the 303(d) list due to arsenic pollution. This decision was issued in U.S. District Court in Montana (*Friends of the Wild Swan v. U.S. EPA, et al.*, CV 97-35-M-DWM, District of Montana, Missoula Division).

To learn more about metal mining or to do something to combat mining’s impacts to clean water, go to www.bettermines.org and join Westerners for Responsible Mining—a campaign to better protect the environment from the adverse impacts of mining.



CASE STUDY

PROTECTING THE RED RIVER FROM ACID MINE DRAINAGE



Since its inception in 1988, Amigos Bravos has been active on mining issues. This activity has focused on the pollution of the Red River from numerous tailings spills and other consequences of operations at the Molycorp molybdenum mine in Questa, New Mexico—the largest hardrock mine on the Río Grande watershed.

Amigos Bravos' successful campaign to resuscitate the Red River—once a blue-ribbon trout fishery—has required a two-pronged effort focused on the federal Clean Water Act and New Mexico state ground water regulations.

Short-term Goal

Amigos Bravos believed that the first step in restoring the Red River was to stop acid mine drainage originating at the Molycorp molybdenum mine from entering the river. Since 1988 Amigos Bravos has participated in numerous regulatory hearings and filed two lawsuits to make that case.



In 1995, Amigos Bravos sued Molycorp (a subsidiary of UNOCAL) for acid mine drainage under the citizens' provision of the Clean Water Act. With a team of experts, Amigos Bravos fought Molycorp in and out of hearings in which the mine persistently denied their responsibilities and covered up their role in the degradation of the Red River. In 1998, Amigos Bravos sued the EPA for not fulfilling its mandatory duty, and those actions bore fruit.

In response to the efforts of Amigos Bravos, the U.S. EPA re-issued an NPDES discharge permit to Molycorp in 2000 for discharges to the Red River. This permit required the company to collect and treat over 7,000 tons of pollutants annually discharged into the river.

The permit addressed Amigos Bravo's position that acid mine drainage (AMD), originating from the 328 million tons of waste rock sitting next to the Red River, must cease. The acid mine drainage, which consists of aluminum, cadmium, cobalt, chromium, copper, fluoride, iron, molybdenum, manganese, nickel, lead, zinc, sulfates and total dissolved solids, migrates through groundwater to seeps that discharge directly into the Red River. The Red River below the Molycorp mine is New Mexico's most heavily metal-polluted river.

According to EPA's calculations, the new NPDES permit would eliminate 15,220,205 pounds per year of metals, sulfide and total dissolved solids from discharges into the Red River. This is a total of 7,601 tons of pollutants that will no longer be accumulating

annually in the Red River. This pollution does not stop at the Red River, but migrates into *acequias*—which provide water for crops, kitchen gardens and livestock—and eventually to the Río Grande, a proposed future source of drinking water for Albuquerque and Santa Fe.

Long-Term Goal

The second step in restoring the Red River is to stop acid mine drainage from being created. This can only be done by

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www.amigosbravos.org

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Protecting the Red River, cont.

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reclaiming the 328 million tons of waste rock piles in such a way that rain and snow do not reach the highly mineralized crushed rock. Unfortunately, the NPDES permitting process deals only with the interception and treatment of polluted water, not with stopping pollution from happening in the first place.

At the same time that EPA issued the NPDES permit to Molycorp, Amigos Bravos was working with two New Mexico State agencies with statutory authority to require the eventual restoration of the mine to protect water quality after the mine closes—which could be 40 years from now.

On January 15, 2002 Amigos Bravos, Molycorp, the New Mexico Mining and Minerals Division, and the New Mexico Environment Department reached agreement regarding Molycorp's closeout plan under three separate permits—a mining permit and two groundwater discharge permits. The three permits required the issuance of financial assurance bonds totaling \$157 million to cover the costs of clean-up.

The permits also established some precedent-setting concessions not required by state law—including:

- the withdrawal of 2,247 acres from future mining;
- the immediate start of reclamation instead of waiting until the mine closes—Molycorp has committed to spend a minimum of \$3 million a year on reclamation activities;
- a large and comprehensive revegetation test plot program that creates 100 acres of test plots;



Credit: AIRPHOTO, Pueblo, Colorado

Aerial view of the Molycorp mine

- the establishment of a Technical Review Committee to offer the public and State and Federal agencies the opportunity of reviewing ongoing plans and studies at the mine;
- a revision of the permit if wildlife is being negatively impacted; and
- partial reclamation of the open pit.

Given these successes, Amigos Bravos is now focused on ensuring that the permits are enforced and that outstanding issues affecting the Red River are addressed. One of those issues includes the possibility of improving water quality on the Red River by finding ways to augment flows through recycling mine water.



Mining is an complex issue affecting river and watershed conservation organizations throughout the country. Mining, from hardrock to coal and from gravel to peat, is threatening the quality of our waters. Below are a few examples of how organizations are addressing various types of mining occurring in their watersheds.



The **Kentucky Waterways Alliance** (KWA) has been involved recently in several mine-related water issues. We regularly comment on new mine discharge permits—working to try to strengthen permit limits and biological monitoring requirements. We have identified several permits in which the state did not properly identify the receiving streams' uses and or impairments.

KWA has also commented on several US Army Corps of Engineers 404 permits for valley fill or instream impoundments. The majority of 404 valley fill permits in Kentucky are general or nationwide permits (NWP 21) and do not involve public notice, opportunity for comments, a public hearing or an Environmental Impact Statement. In January 2005, KWA joined Kentucky Riverkeeper and Kentuckians for the Commonwealth in a suit to stop the Corps from issuing NWP 21 permits in Kentucky.

Since December 2002, the Corp had issued at least fifty-four new NWP 21 in Kentucky. These permits alone authorized 191 valley fill operations and would have buried over 35 miles of Kentucky streams.

Kentucky Waterways Alliance, Inc. (KY)
www.KWAlliance.org

The **Cheat River watershed** has been severely impaired by the effects of coal mining. Of key importance at this point in time is the status of the Surface Mining Control and Reclamation Act. This federal program is running on an extension until June 30, 2005 and is the program that taxes each ton of coal produced today to address the pollution of pre-regulated mining of yesterday (before 1977). It is extremely important that this program be renewed.

Friends of the Cheat (WV)
www.cheat.org

AMD&ART has been working with the citizens of a small coal mining town, Vintondale, Pennsylvania to artfully transform 35 acres of mine-scarred land that includes an acid mine drainage discharge into a community asset, the AMD&ART Park. Using an interdisciplinary collaborative approach, the Park combines community history with innovative science, landscape design and art to create a new town center that includes an AMD treatment system, wetland habitat and public recreational area.

AMD&ART (PA)
www.amdandart.org

The **Taku River** is the largest unprotected and undeveloped watershed on North America's Pacific Coast. The river is threatened by a proposal to re-open the closed Tulsequah Chief mine and to build a 100-mile access road through this virtually roadless wilderness watershed. On January 5, 2005, the Canadian federal government issued a draft approval and we are now trying to beat that back.

The Stikine/Iskut region is seeing explosive growth in mineral exploration, as well as threats from oil and gas exploration and coalbed methane development. Two major mines, Galore Creek and Red Chris, are already in the planning stages. The Galore Creek project is especially worrisome because it calls for a major industrial access road down the Stikine River.

The situations here are very similar in that mining companies want road access into wild areas, and these roads are likely to foster additional development beyond the mine the access roads are being proposed for.

Transboundary Watershed Alliance (AK/YT)
www.riverswithoutborders.org

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Water pollution violations continued to occur at the 3M Quarry due to inadequate stormwater management facilities and limited erosion controls. Members of the **Stony Brook-Millstone Watershed Association** documented these violations, testified at various state and local hearings, and pressured the NJ Dept. of Environmental Protection (NJDEP) for remediation and enforcement. In May 2003, the NJDEP issued an Administrative Consent Order (ACO) citing 11 violations for stormwater runoff, and a fine for \$99,120.

In January 2004, after receiving the necessary approvals from state, county and local offices, 3M began construction of five stormwater retention basins, connecting channels and the regrading, capping and vegetating a 60-acre mineral fines pile. 3M proposed to complete these actions in June 2005.

The Association continues to monitor the streams and work with 3M, NJDEP, Township and County officials, and local residents to ensure that appropriate stormwater control measures are implemented under a NJPDES Stormwater Permit.

Stony Brook Millstone Watershed Association (NJ)
<http://www.thewatershed.org>

Abandoned mine drainage (AMD) is the third leading cause of impairment in the **Schuylkill Watershed** and the leading cause of impairment in its headwaters. Over 158 identified abandoned mine discharges contribute to the impairment of 222 miles of stream according to the Pennsylvania Department of Environmental Protection. The low pH (high acidity), low dissolved oxygen and high concentration of metals from these discharges create an aquatic environment in which the many macroinvertebrates and other bugs associated with healthy aquatic ecosystems simply cannot survive. The large brook trout population native to this area is also severely impacted and limited by this water chemistry resulting from AMD. The impacts of metal loadings from AMD are seen from the headwaters all the way to Philadelphia where the Schuylkill River is a major source of drinking water for over 1.5 million people. Through the Schuylkill Action Network, many organizations, including Schuylkill Headwaters Association and the Philadelphia Water Department, have partnered to address AMD issues. Current activities include acquiring of grant funding for the implementation of AMD treatment projects and monitoring to quantify the impact of AMD on the Schuylkill and evaluate the water quality benefit derived from the implementation of treatment projects.

Philadelphia Water Department - Office of Watersheds (PA)
<http://www.phila.gov/water/protect.html>

The **Idaho Conservation League** works extensively with our members and local communities to protect human health and the environment from the potentially harmful impacts of mining. Current "hot" issues in Idaho are: 1) proposals for new mines, including the Atlanta mine, a large cyanide heap leach mine upriver from Boise and the Treasure Valley; 2) efforts to reform Idaho's mining laws to ensure that mines are appropriately bonded to cover reclamation and closure costs; and 3) protecting human health from toxic pollution—for instance, we are currently working to protect southern Idaho streams from toxic mercury emissions to the air from mines in Nevada. Mercury can settle out from the air and poison our waters.

Idaho Conservation League (ID)
www.wildidaho.org

Peat mining is also an issue of concern. We have had some major issues with peat mining impacting our rivers.

Downeast Salmon Federation (ME)
www.mainesalmonrivers.org



We surveyed the economic impacts of gravel mining at several mines on the lower 27 miles of the **Great Miami River** in southern Ohio. We found that if you live along the river within one mile of a gravel operation, your house is on average worth \$16,725 less than its equivalent farther away. Also, the total reduced value of property near gravel mines is about \$2.8 million, resulting in a tax revenue loss of \$119,000 a year to local governments.

Mine operations have a low assessed land value of \$12,800 an acre versus \$30,800 an acre for residential communities nearby. Gravel trucks chew up county roads at high cost. While necessary, mining should stay away from rivers—it degrades surface and groundwaters, disturbs recreation and quality of life and damages habitat. People don't like the noise, lights, dust, commotion and the moonscape scenic damage to the streams.

Rivers Unlimited (OH)
www.riversunlimited.org

The **Rivers of Colorado Water Watch Network's** monitoring network has provided data to determine the impacts of hard rock mining and some gravel mining in Colorado, set restoration targets and evaluated restoration demonstration technologies. The results of the monitoring efforts include: determining the extent of impact; determining restoration targets or clean up goals; testing the effectiveness of demonstration treatments, such as the effectiveness of different wetland material and size to removed elevated metals. The primary lesson learned in these efforts is that the clearer the monitoring objectives and/or questions are before the monitoring is implemented, the easier it is to produce clear and specific results.

Colorado Division of Wildlife (CO)
<http://wildlife.state.co.us/riverwatch>

In **Crested Butte** source watershed a coalition, including state and federal agencies, is asking EPA to put the site on the National Priorities List. The mine is discharging zinc and cadmium impairing aquatic life. We are also suing the Forest Service/BLM for issuing a patent without a presently marketable deposit. This is the first case a patent is being appealed by anyone other than a competing mining company.

High Country Citizens' Alliance (CO)
www.hccaonline.org

Plumas Corporation is currently involved in a study, funded by CalFed for about \$125,000, with the Desert Research Institute. Dr Jennifer Duan is modeling bedload movement in mountain streams. In her modeling work, she produces a graphic that looks like a piece of graph paper laid over the channel bed. At each intersection of the graph, there are values in the model for things such as particle size, velocity, and other parameters. Then she can add things like restoration structures in the channel, vanes, or gravel vortex samplers, and see how the deposition of material changes. This is very useful for us because we are trying to do restoration of a channelized creek with very high bedload. Gravel mining has not been good for fish habitat in the creek, and the Department of Fish and Game just curtailed the operation, which is causing more deposition in other areas, and further eroding the walls of this entrenched channel.

Plumas Corporation (CA)
<http://www.plumascounty.org>

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For the past ten years **Friends of the Kaw** has fought to end in-river sand and gravel mining or dredging in the Kansas River because of the physical degradation it causes the stream bed and banks and the loss of natural habitat. Because of our vigilance, five applications for new dredging permits in a pristine section of the river have been either denied or withdrawn and the number of dredging operations on the river have been reduced from eighteen in 1996 to twelve in 2005. Although the State of Kansas has taken the first step by beginning a comprehensive study of degradation of the Kansas River to quantify the primary causes, the battle is far from won as the second step to study and make recommendations on the future of in-river dredging is yet to be approved.

Friends of the Kaw (KS)
www.kansasriver.com

Prairie Rivers has been actively involved in the coal mining issue in Illinois, particularly with respect to the impact these activities have on water quality. A few years ago, while fighting an NPDES permit for a coal mine in Vermilion County, we discovered that coal mines in Illinois were—under Illinois regulation—exempted from several key provisions of the Clean Water Act. Working with the Environmental Law and Policy Center we fought these exemptions, securing a ruling from U.S. EPA that stipulated they were in fact a violation of federal law. As a result, all NPDES permits for coal mines in Illinois now go to U.S. EPA for review and approval to ensure they comply with federal law. The outcome, recent NPDES permits for coal mines are some of the strongest we have seen.

Prairie Rivers Network (IL)
www.prairierivers.org

There is a traditional “rule” that any Hawaiian may take up to 25 river rocks for use in constructing an imu or pit oven. I assume the “konohiki” or supervisor of the ahupua’a or of this specific resource of the ahupua’a guided the selection and minimized the disturbance to the stream bed. Today, folks still take some of these rocks for that purpose but there isn’t much enforcement. Certainly the state lacks personnel or expertise in this area.

Hanalei Watershed Hui (HI)
www.hanaleiwatershedhui.org

We are in the midst of challenging a proposed mine by Kennecott near the headwaters of one of Michigan’s most pristine rivers. The **Salmon Trout River** has the last naturally reproducing population of Coaster Brook Trout on the South shore of Lake Superior; in part because the watershed is almost totally undeveloped. There is a lot of opposition locally, but in general, Kennecott’s agenda seems to be moving forward quickly.

Central Lake Superior Watershed Partnership (MI)
www.superiorwatersheds.org

Environment Law Foundation and the Western Mining Action Project represent the Karuk Tribe of California in a suit against the U.S. Forest Service. The suit arises out of the Forest Service’s decision to allow suction dredging, mechanized sluicing and other forms of gold mining in the Klamath and Six Rivers National Forests without environmental review. The operations harm several endangered species including the coho and steelhead. The complaint specifically alleges violations of the Endangered Species Act, the National Forest Management Act, the National Environmental Policy Act, the Clean Water Act, the Forest Service Organic Administration Act of 1879 and the Administrative Procedures Act. The case will be decided on the administrative record.

Environmental Law Foundation (CA)
www.elflaw.org

After watching industrial mica mining companies destroy a sensitive cultural site for nearly four decades, **Picuris Pueblo**, a small Native American community located 25 miles to the south of Taos, filed an aboriginal title claim in state court in order to stop the destruction. The mine’s proposed U.S. Forest Services closeout plan allowed the corporation to walk away from a large open pit because the vertical mine scar would create raptor habitat.

Picuris Pueblo, (NM)

In 2003, the Cannon River Watershed Partnership needed to address aggregate mining in our watershed. A review of that effort and recommended advocacy were printed in our September 2003 *Watershed Watcher*, which can be found at www.crowp.net/Newsletters.htm. Below are "CRWP Guidelines for Aggregate Mining within the Cannon River Watershed."

Cannon River Watershed Partnership (MN)
www.crowp.org

Guidelines for Aggregate Mining within the Cannon River Watershed

The Cannon River Watershed Partnership is comprised of 500 members dedicated to supporting its mission to protect and improve the surface and groundwater resources and the natural systems of the Cannon River Watershed.

Given that the demand for aggregate has increased far beyond projections especially in the Twin Cities metropolitan area and that the Cannon River Watershed has rich deposits of both gravel and limestone within close proximity to this area; and

Given that the Cannon River Watershed is targeted for large-scale mining operations that have the potential to have significant impact on the surface and ground waters and the natural systems which the Cannon River Watershed Partnership is committed to protecting;

The Board of Directors of the Cannon River Watershed Partnership requests that the following issues and standards be addressed in creating and/or updating mining and extraction policies and in issuing permits for mining and extraction operations:

- The quality and quantity of water discharged from mining and extraction operations should be regulated as part of any permit in compliance with the antidegradation policies of the Federal Clean Water Act.
- The standard of "no additional pollution discharge" applied to the lower Cannon River under the designation as an "Outstanding Value Resource Water" should be applied to all natural or manmade tributaries in the Cannon River Watershed.
- The minimum setback of 300 feet required by the Minnesota Legislature for the "Wild and Scenic" designated segment of the lower Cannon River should be applied to all natural or manmade tributaries in the Cannon River Watershed.
- Permitting of mining and extraction operations should be based on knowledge of the potential for degradation to the groundwater and surface water resources that are vital to our communities and economy.
- All permits for mining and extraction operation should be contingent upon continual monitoring for degradation of potentially affected water resources with a baseline of information on these water resources determined before permits are issued.
- Mining and extraction operations should not be allowed to artificially raise or lower the groundwater table beyond the perimeter of the mine site.
- Mining and extraction operations should not significantly increase or decrease base flows into surface waters so as to threaten naturally occurring fish, wildlife, or aquatic life.
- Water discharged from mining and extraction operations into surface waters should be restricted to assure that increased flow will not exacerbate instream erosion nor cause downstream degradation.
- Mining and extraction operations should be conducted in a manner that assures that the site will be reclaimed within a reasonable period of time as productive farmland, lakes, naturally functioning wetlands, woodlands, or building sites.

Coalbed Methane Mining

STRATEGIES FOR FIGHTING CBM

by Steve Jones

Watershed
Protection
Program
Attorney
Wyoming
Outdoor
Council

There are many problems with coalbed methane (CBM) development. While it is a good source for much-needed natural gas, the impacts of developing that gas can be substantial. If not managed properly, significant damage to landscapes, including rivers and streams, can occur.

Wyoming has become the poster child for bad CBM management. For instance, the proposed alternative in the Powder River Basin Environmental Impact Statement for CBM development revealed these astonishing impacts: 1) the disposal of 1.4 trillion gallons of water into the rivers and streams of the basin over the project's life, 2) 17,000 miles of new roads, 3) 20,000 miles of new pipelines, 4) 5,300 miles of new utility lines, 5) over 200,000 acres of soils and vegetation to be stripped bare, 6) 500 to 1,200 surface discharge facilities for the water and 7) 1,800 to 4,000 infiltration waste pits to handle CBM produced water.

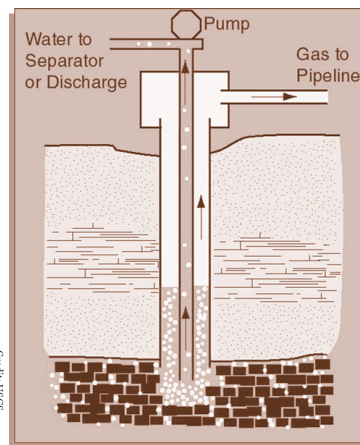
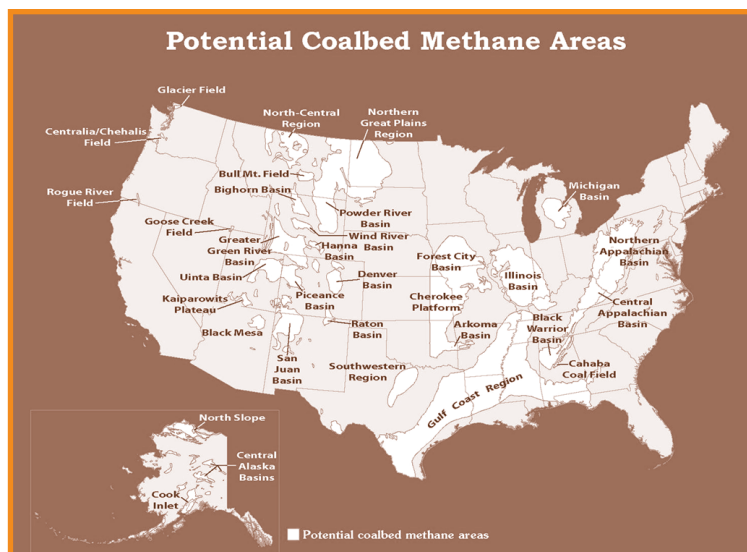


Diagram showing the production scheme of gas and water for a typical coalbed methane well.

The quality of CBM wastewater (also referred to as “produced water” in the industry) varies considerably with the coal seam in which it is found. In some basins, the quality of the water is bad enough that it is quite clear, even to industry, that it must be reinjected rather than foisted upon the surface lands, rivers and streams. But this has not been the case in the Powder River Basin, where industry has been unwilling to concede the point. The primary problems identified with CBM produced water quality in the Powder River Basin are salinity and sodicity.

Salinity is the potential for accumulation of soluble salts in the root zone of soils. High salinity makes water less available to plants and at very high levels the plants may suffer direct salt damage. Waters are not suitable for irrigation with an electrical conductivity (EC) greater than 2,250 micro ohms per centimeter, but in areas with restricted drainage of soils (typical of the Powder River Basin), anything higher than 1,200 is problematic.

The sodium adsorption ratio (SAR) value of water is the ratio of sodium to calcium and magnesium. The SAR value, often referred to as “sodicity,” affects plant production by slowing infiltration and the permeability of soils. The SAR values for water at 6 to 8 are the upper threshold before infiltration and permeability problems will affect existing agricultural uses.



Attempts to use the Clean Water Act (CWA) to stop some of the pollution occurring in the Powder River Basin have met with at least some success. But industry may be learning the terrific advantage of getting the bureaucrats on your side. There can be no question that the existing Administration's energy policy has encouraged the BLM and the U.S. EPA (and other federal agencies) to "get the gas out."

Possible avenues that environmental groups have used (or are considering) for attacking this alliance of government and industry include the following:

Challenge issuance of National Pollutant Discharge Elimination System (NPDES) permits. Under Section 402 of the Clean Water Act, every discharge permit issued by a state (that has been granted primacy for handling the NPDES permit program) must go through a public comment period. A permit can be objected to by any concerned citizen and challenged if the agency issues it. This challenge is often before an administrative hearing body, but sometimes must be filed directly before state court, depending on what the state law may require.

File civil suits for discharging pollution without a discharge permit. This would be an obvious violation of the CWA, as long as it is a discharge to waters of the United States. This option is often not available, since CBM operators are usually savvy enough to get a discharge permit. But see *Northern Plains Resource Council v. Fidelity Exploration and Development Co.*, 325 F.3d 1155 (C.A.9 (Mont.), 2003).

File civil suits to enforce NPDES permits. Once an NPDES permit is issued, if its terms are not complied with by the permittee, an action can be brought against the permittee for failure to comply.

A good way to check for violations is to review the permit file, and pay particular attention to the monitoring reports. This could also be a violation of the Clean Water Act, and as such could be brought as a citizen suit in federal district court.

Challenge issuance of individual federal dredge and fill permits. Under Section 404 of the Clean Water Act, before any person can conduct a dredge and fill operation in a river or stream, they must first obtain a permit from the U.S. Army Corps of Engineers (except in Michigan and New Jersey—where those states have primacy to issue most 404 permits). For CBM operations, often the CBM drillers put a dam across a drainage to hold back the nefarious CBM produced water. Those dams require dredge and fill permits.

Challenge the issuance of general dredge and fill permits. The Army Corps of Engineers is in the habit of issuing "general permits" to ease its work load. General permits (also known as "Nationwide Permits" if they apply nationally) allow permittees to proceed with dredge and fill operations without the necessity of obtaining individual dredge and fill permits from the Corps. This is allowed under the Clean Water Act only where the environmental impacts are similar in nature and are minimal. WOC brought a successful challenge to such a general permit in Wyoming. See *Wyoming Outdoor Council v. U.S. Army Corps of Engineers*, 351 F. Supp. 1232 (D. Wyo., 2005)

Petition the state rule-making agency for tougher water quality standards applicable to CBM discharges. Of particular concern are salinity (measured as electrical conductivity or specific conductance) and sodicity (measured as SAR [sodium adsorption ratio]).

Coalbed Methane Mining, cont.

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Ask EPA to establish new effluent limitations guidelines, that are technology-based, for CBM discharges. It is quite apparent that CBM discharges are sui generis (e.g., unique) and have different problems than conventional oil and gas discharges. There is already an unpublished report from U.S. EPA that identifies treatment prior to discharge (using reverse osmosis techniques), as well as reinjection methods, as technologically feasible for CBM produced water. See the U.S. EPA study, which can be found at www.northernplains.org.

Petition the U.S. EPA to withdraw the permitting program from a state for failure to administer the NPDES permit program properly (due to failures in monitoring, enforcement, compliance with CWA requirements, etc.). This can often force the state agency in question to “shape up” and demonstrate to the U.S. EPA that it is trying to enforce the Clean Water Act in its state.

Get the U.S. EPA to write water quality standards for the state. If the U.S. EPA recommends changes to state water quality standards—a triennial review process must occur every three years—and the State fails to comply with that recommendation, the Clean Water Act authorizes the U.S. EPA to promulgate water quality standards for the State. See 33 U.S.C. § 1313(c).

Object to Use Attainability Analyses (UAA). Use Attainability Analyses have been used to downgrade a particular stream segment to a lower use classification that would afford less protection for the stream, making it easier for CBM drillers to discharge pollution without having to treat the water. Typically in Wyoming, this has resulted in downgrading many streams from Class 3 (protected for aquatic life) to Class 4 (appropriate for industrial use and livestock watering). But these UAAs may be challenged, if appealed in a timely fashion.

Get streams declared off limits. The aim here is, even if you can't keep out CBM discharges altogether, maybe there are some rivers or streams where you can demonstrate that they are too precious, too clean, too outstanding to let the CBM drillers despoil it with their pollution. This worked in Wyoming, at least for a while, with the Tongue River, which is quite pristine and would be significantly degraded if massive amounts of CBM pollution were to be discharged into the river. Your allies in this fight may be downstream water irrigators or a downstream state that does not want to have the upstream state's water pollution foisted upon it.

Get a downstream state to insist that the upstream state to stop polluting. As required by the CWA, a downstream state can object to any NPDES permit issued by a state on the ground that it will affect the quality of the stream in the downstream state. If a downstream state objects to the issuance of a permit, the U.S. EPA Administrator can block the issuance of any state-issued permit that is outside the guidelines and requirements of the Clean Water Act. See 33 U.S.C. §1342(d)(2).

In large measure, environmental organizations often find themselves involved in a rear-guard action, trying to enforce existing laws, in the face of an increasing governmental determination to look the other way. Administrative appeals and litigation are the main tools, but not the only ones. There is a need, moreover, to be strategic and try to cover the field in a sweeping fashion, that will have a large impact on the problem. Ultimately, environmental organizations will face an uphill battle, but one well worth taking on, considering the massive environmental impacts of the development contemplated by CBM drillers.



CASE STUDY

COALBED METHANE DEVELOPMENT THREATENS NATIVE PRAIRIE RIVER

The Powder River is one of the last free flowing prairie rivers in the United States. European immigrants characterized the Powder River as “a mile wide and an inch deep, too thin to plow and too thick to drink.” Dr. Daniel Gustafson, a stream ecologist based in Bozeman, Montana, described the Powder River as, “the best interior big, sandy river on the continent.” The Powder River ecosystem is remarkable in that it still supports an intact native aquatic community. Several species are so rare that they are listed by Wyoming Game and Fish as species of concern, and some have been considered for protection under the Endangered Species Act.

Threatening the Powder River and the land and water around her are the rich reserves of coal that underlie the Powder River Basin—the source of one of the most extensive coalbed methane gas (CBM) developments in the country. Over the next ten years the Bureau of Land Management predicts that 51,000 CBM wells (35,000 new wells) will be producing, and discharging as a “waste product,” several million barrels of water per day. In order to release the methane from the coal, the coal seam must be “dewatered,” as water pressure prevents methane from migrating. During the dewatering phase, enormous volumes of water, averaging nearly 15,000 gallons per day per well, are discharged into dry stream beds or reservoirs. This torrent of produced water causes soil erosion, stream sedimentation, vegetation death and water quality degradation. The primary contaminants are salinity, arsenic, barium, manganese, iron, aluminum and radium 226.

The Powder River Basin Resource Council and the Wyoming Outdoor Council have taken the lead on this issue, working continuously over the past five years to rein in the development and stop the damage from CBM water discharges.

We fought for enforcement of the Clean Water Act—from the simple requirement that industry test for more than four pollutants in the discharge water, to submitting a petition to the Environmental Protection Agency to revoke the Wyoming permitting authority.

For the last three years, we have reviewed CBM discharge permits that are issued each month, protesting those that we feel are most harmful to waterways and aquatic ecosystems.

We hired specialists to analyze the impacts that large volumes of CBM discharge water will have on fisheries and vegetation in the Powder River and her tributaries. One conclusion of a study by Confluence Consulting found that “[e]valuations of conditions in the Powder River provided cause for concern for the persistence of this rare and special ecosystem.” The report provided impetus for the Wyoming Game and Fish Department to conduct their own analysis of the aquatic life in the river, which has led to badly needed limits on CBM discharges.

Finally, we work closely with ranchers and landowners along the Powder River and her tributaries, to document damage to soils and vegetation in order to limit the damaging CBM discharges flowing into the river. As a part of this effort, we organized a watershed monitoring group along Clear Creek (the primary tributary of the Powder) to gather critical baseline data before CBM development occurs in that watershed, in the hopes of keeping the stream pristine.

The state and federal government have turned a blind eye to the problems this booming industry has created. The solutions continue to lie in the hands of the people who are fighting to protect what will ultimately be our Powder River legacy.

by Jill Morrison

Powder River Basin
Resource Council
Community Organizer

www.powderriverbasin.org



RESOURCES & REFERENCES

The **Center for Science and Public Participation** provides objective research, education and technical advice to grassroots groups, non-governmental organizations, regulatory agencies, businesses and indigenous communities on natural resource issues, especially those related to mining.

www.csp2.org/

Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the destructive impacts of mineral development in the United States and worldwide. Numerous publications, reports and articles are available online.

www.earthworksaction.org/

MiningWatch Canada is a pan-Canadian initiative supported by environmental, social justice, Aboriginal and labor organizations from across the country. It addresses the urgent need for a coordinated public interest response to the threats to public health, water and air quality, fish and wildlife habitat and community interests posed by irresponsible mineral policies and practices in Canada and around the world.

www.miningwatch.ca/

The **Office of Surface Mining's** mission is to carry out the requirements of the Surface Mining Control and Reclamation Act in cooperation with States and Tribes. OSM prepares an annual report that describes the oversight of State programs and describes coal mining activities nationally. The report—available online at: www.osmre.gov/rep.htm—includes the states that regulate coal mining activities and other useful information.

www.osm.gov/

The **Powder River Basin Resource Council** is committed to the empowerment of people through community organizing. They have a webpage specific to the addressing the impacts of Coalbed Methane Gas mining.

<http://www.powderriverbasin.org/>

SkyTruth is a nonprofit organization that uses remote sensing and digital mapping to educate the public and policymakers about the environmental consequences of human activities—such as mining, and to hold corporations and governments to higher standards of accountability around the globe.

www.skytruth.org/

The **Surface Mining Control and Reclamation Act** of 1977 can be viewed online at:

www.osmre.gov/smra.htm



The **Toxics Release Inventory** gives citizens information about toxic releases in and around their communities. With this information citizens can encourage mining companies to reduce their toxic releases and/or agree to more vigorous oversight of their mines.

www.epa.gov/tri/

Westerners for Responsible Mining is an alliance of western (and non-western) residents and organizations who cherish our rural communities, landscapes and resources. They are dedicated to protecting communities, water resources and special places from the adverse impacts of irresponsible mining practices and a lack of corporate accountability in the hardrock mining industry.

www.bettermines.org/wrm/

The **Appalachian Center for the Economy & the Environment** is a regional law and policy organization. The Center works together with individual citizens and grassroots citizens' groups to clarify, analyze and act on the environmental and economic issues that affect communities.

www.appalachian-center.org/

The **Wyoming Outdoor Council** is Wyoming's largest statewide conservation organization and the state's leading advocate for natural resources conservation and environmental protection. WOC's work encompasses a broad range of conservation issues that affect Wyoming's environmental integrity: public lands protection, state environmental policy, wildlife and its habitat, oil and gas development, mining and mine reclamation, watersheds and rivers and nuclear and toxic wastes.

www.wyomingoutdoorcouncil.org/

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