Fishery Conservation and Management Act Reauthorization: “A” for Effort, “C” for Substance

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“Aggressive” Regulators: Potential Tort Liability of Government Officials

Patrick J. Paul and Richard Siever

The United States Supreme Court recently agreed to hear an appeal by six officials of the Interior Department’s Bureau of Land Management (BLM) challenging a Tenth Circuit Court of Appeals decision that they claim may expose federal officials to damages simply for performing their regulatory duties on behalf of the government. Wilkie, et al. v. Robbins, stems from more than a decade of intense feuding between government land management officers and a Wyoming rancher named Harvey Frank Robbins. Case No. 06-219. Robbins contends that the individual BLM officials attempted to extort an easement from him in retaliation for his refusal to grant a right-of-way, and in the process, they put his dude ranch out of business.

Although a seemingly low stakes case, the appeal poses a series of questions that may have profound effects on the manner in which our regulatory agencies negotiate and the intensity of future enforcement actions. Wilkie specifically involves the issue of whether government officials acting in their regulatory capacity can be guilty of extortion under the Racketeer Influenced and Corrupt Organizations Act (RICO) for obtaining property for the benefit of the government. The appeal also considers whether the Fifth Amendment, in light of Bivens v. Six Unknown Named Agents of Federal Bureau of Narcotics, 403 U.S. 388 (1971), contains a right for private property owners to exclude government officials from their property and whether such a right embraces the claim that officials retaliated against the land owner for exercising that right.

Robbins purchased the High Island Ranch in Hot Springs County, Wyoming, back in 1994. The previous owner had granted to BLM a nonexclusive access easement along a private road on the ranch. BLM, however, previously failed to record the easement, and Robbins had no notice of it when he recorded his interest in the property. Under Wyoming’s recording statute, Robbins took ownership unencumbered by the easement. Robbins also benefited from various unrelated BLM preference rights, livestock grazing permits, and a special recreation permit allowing him to use federal lands adjacent to his property. Under Wyoming’s recording statute, Robbins took ownership unencumbered by the easement. Robbins also benefited from various unrelated BLM preference rights, livestock grazing permits, and a special recreation permit allowing him to use federal lands adjacent to his property. When BLM learned that its easement had extinguished, it took efforts to discuss the right-of-way with Robbins. The federal BLM routine exchanges portions of its federal property for easements over private land and attempted to...
do the same with Robbins. But Robbins refused to grant any right-of-way across his ranch.

Robbins contends that the BLM agents in turn retaliated. He now asserts claims under RICO and the Fifth Amendment, alleging that each of the officials refused to maintain the road providing access to his property; threatened to cancel, and then did cancel, his right-of-way across federal lands; threatened that it would “bury Frank Robbins”; cancelled his special recreational use permit and grazing privileges; brought groundless criminal charges against him; interfered with his dude ranch cattle drives; and otherwise trespassed on Robbins’ property.

Following a series of unsuccessful motions to dismiss, the BLM defendants filed a motion for summary judgment on qualified immunity grounds. The defendants argued that they could not be held liable under RICO for actions authorized by BLM regulations because those actions are not “wrongful” and that the Fifth Amendment contains no clearly established right to exclude others from one’s property. The district court denied summary judgment on both grounds, concluding that the BLM agents’ conduct pursuant to land management regulations could be wrongful if done with the intent of extortion. Further, the district court determined that Robbins indeed held a clearly established right under the Fifth Amendment to be free from retaliation for exercising his right to exclude others from his property.

To BLM’s dismay, the Tenth Circuit affirmed, denying qualified immunity on the RICO claim and permitting Robbins’ Fifth Amendment claim. Although the court did not question that the BLM officials maintained regulatory authority to take each of the allegedly retaliatory acts, it concluded that “if Defendants engaged in lawful actions with an intent to extort a right-of-way from Robbins rather than with an intent to merely carry out their regulatory duties, their conduct is actionable under RICO.” 433 F.3d 755, 768 (10th Cir. 2006).

With regards to the Fifth Amendment claim, the Court of Appeals held that not only does the Constitution protect a “right to exclude” the government from one’s property by requiring just compensation, but it protects property owners from takings outside the eminent domain process. The court indicated that “[i]f the right to exclude means anything, it must include the right to prevent the government from gaining an ownership interest in one’s property outside the procedures of the Takings Clause.” 433 F.3d at 766. Moreover, the court held that the “right to exclude” undoubtedly includes an antiretaliation prohibition. Recognizing a lack of precedent supporting the right against retaliation under the Fifth Amendment, the court noted that “[b]ecause retaliation tends to chill citizens’ exercise of their Fifth Amendment right to exclude the government from private property, the Fifth Amendment prohibits such retaliation as a means of ensuring that the right is meaningful.” Id.

Ultimately, the Tenth Circuit’s decision signifies that government officials may be subject to damages actions under RICO and Bivens for engaging in certain regulatory activity, even if that activity remains squarely within the range of employee duties and has no purpose of personal gain. Accordingly, a decision by the Supreme Court is of great importance to the government’s land management responsibilities and the manner in which BLM operates.

Solicitor General Paul D. Clement recently joined the BLM defendants’ efforts. As noted by the solicitor general, the basic regulatory activity by the BLM officials at issue is quite routine. The government frequently seeks to obtain reciprocal rights-of-way over private property entwined in public lands. Moreover, the ruling may essentially convert what BLM considers lawful regulatory activity into racketeering whenever an individual alleges that the government officer exercised its authority with an intent to extort.

But the Tenth Circuit’s determination implicates the “give and take” of an agency’s standard negotiations with citizens or other regulated entities and potentially sets it up for a constitutional tort. The BLM employees claim that this type of “give and take” in managing federal lands is authorized by regulation, and rulings to the contrary effectively create a constitutional impediment to responsible land management. According to the BLM employees, the court’s ruling essentially confirmed that a RICO predicate act of extortion under color of official act may be shown by merely alleging that the official had extortionate intent to obtain property for the benefit of the government (with no allegation of personal interest in the property or that the official acted outside of the scope of lawful regulatory duties). This, the defendants say, conflicts with the well-established rationale that “regulators do not become racketeers by acting like aggressive regulators.” (Citing Sinclair v. Hawke, 314 F.3d 934, 943 (8th Cir. 2003)). As the defendants submitted in their Petition for Writ of Certiorari, “[t]here is nothing sinister about the government seeking an easement from an adjoining property owner ‘outside the eminent domain process,’ and conditioning an easement over public land on a reciprocal easement over interlocking parcels of private land is not unconstitutional retaliation.”

The court of appeals’ decision regarding a right against retaliation embedded in the Fifth Amendment is the first of its kind, as is the denial of qualified immunity in this civil RICO context. The Wilkie case, therefore, could have considerable impact not only on the government’s land management activities but, more importantly, on the liability of government officials in their individual capacities. The pending Robbins appeal reminds us of the extent to which public officers remain susceptible to individual liability for “aggressive” enforcement on behalf of the government.

In another recent example (also in the West) of such developments, the Arizona State Court of Appeals denied a request by State Attorney General Terry Goddard to dismiss a libel counterclaim filed against him in connection with his prosecution of a land developer on behalf of the
state Department of Environmental Quality. Goddard had released a public statement accusing the developer of illegally using state and private land, destroying Hohokam sites dating back to A.D. 750, and killing more than 40,000 protected native plants, including saguaro and ironwood. Goddard's press release contended that the developer committed "wanton destruction of Arizona's heritage resources." The developer now seeks close to $40 million in damages against Goddard for his public statements. The Arizona appellate court denied Goddard's absolute immunity defense, finding that absolute immunity only protects officials where the action is "essential to conducting public business." Goddard v. Fields and Johnson (1 CA-SA 06-0114). "Issuing press releases and holding press conferences about litigation his office is pursuing are highly discretionary functions as is the information he chooses to disseminate . . . ." Id.

As with the BLM case and its likely effect on land management, the court ruling declining an immunity defense for Goddard likely will impact future public announcements in connection with officials' duties.

Surely for property owners like Harvey Frank Robbins, the protection of private property rights is at stake, as well as the ability of those owners to deny federal access to their property. The Wilkie appeal identifies potential issues with federal employees' respect of Fifth Amendment rights and the use of overly aggressive conduct by officials in performing their governmental duties.

Weakened immunity for public officials, however, may impact the nature and bravado of regulatory activity and enforcement. Depending on the upcoming decision by the Supreme Court, future public employees may hesitate to engage in negotiation regarding private land rights-of-way or in hard line regulatory conduct for fear of exposure to personal tort liability. Oral argument before the Supreme Court is set for March 2007.

European Community: Pursuit of Uniform Environmental Crime Penalties

Michael Renouf and Andrew Waite

Two steps forward, one step back. So might be characterized the attempts within the European Community to establish criminal sanctions for serious breaches of environmental law. The issue has been caught up in political infighting between the main institutions of the European Community and the European Union (EU) and has been considered by Europe's highest court of law. The most recent development—a proposal from the European Commission on February 9, 2007, (COM(2007) 51 final) that has the potential to bring about some uniformity across the twenty-seven member states of the EU—has been simultaneously both lauded and vilified.

The fact that the European Community has, with regard to environmental law, moved so far in such a short time is itself worthy of comment. The original text of the 1957 Treaty (Treaty) establishing the European Economic Community (EEC) contained no reference to the environment. Early steps to establish environmental protection laws had to be based on a catch-all provision in the Treaty that allowed the EEC (as it then was) to adopt measures in fields otherwise not provided for that were deemed necessary for the development of the Community. The first legally binding instruments on environmental law were adopted in 1975. The Treaty was amended in 1987 to include a section on the environment, and subsequent amendments in the 1990s resulted in the current framework for environmental protection, which establishes that one of the central Community objectives is to ensure a high level of protection of the environment. In the intervening years, many measures imposing obligations on businesses, public authorities, and individuals have been adopted in areas such as hazardous substances, waste, recycling, energy efficiency, ozone depleting substances, and climate change.

Various factors have led to the move towards uniform sanctions. These include the transboundary impact of many environmental breaches; large variations in national laws and some countries doing little to enforce environmental legislation; opportunities for businesses to exploit differences between national approaches to enforcement; and concerns about some businesses having an unfair competitive advantage. Breaches of environmental rules that are treated in some countries as criminal offences are in others subjected only to administrative penalties. Moreover, even where an environmental offence may be treated as criminal in two or more countries, the type and level of sanction may vary greatly, from low levels of fines to, much more rarely, imprisonment. For example, fines for illegal trade in endangered species vary across the European Community by a factor of 1 to 348. Only some member states provide for further sanctions, including property confiscation or an order for remediation. In addition, various studies have shown that existing national sanctions do not always result in effective implementation of the Community's environmental protection policy and that the differences in approach can lead to distortions within the Community.

One example of the type of situation that could currently influence where and how companies choose to operate is the dumping of toxic waste. Last year a Dutch ship offloaded 500 metric tonnes of toxic waste in the
Ivory Coast, resulting in several deaths and hundreds of complaints of respiratory and other medical problems. The Dutch authorities are investigating the matter as a potential criminal offence, but had the ship been from Spain or Greece the same action could not have been categorized as a criminal offence.

The Commission first made a proposal for a Directive on protection of the environment through criminal law in 2001. However, member states ignored the proposal, which would have followed the Community’s legislative procedures, and instead adopted a Framework Decision that laid down criminal sanctions for breaches of environmental law. A Framework Decision is used under the European Union Treaty to approximate national laws of member states in the field of police and judicial cooperation, and the legislative procedure bypasses the European Parliament. The Commission challenged the Framework Decision, asking the European Court of Justice to annul it on the grounds that it had been adopted on the wrong legal basis. The Court agreed, annulling the Framework Decision in September 2005 and confirming that the Community should adopt criminal law measures concerning environmental protection where necessary to ensure the implementation of European Community environmental policy. Criminal law has traditionally been seen as the exclusive domain of the member states, and although there have been many incursions into sovereignty in this area, the Court’s judgment was seen by some as a watershed. This case may prove significant in opening possibilities for the Community to introduce criminal sanctions to ensure the implementation of other Community policies.

The proposal must now be approved by both the European Parliament (which is in favour of such a measure) and the Council of Ministers. In drafting the new proposal, the Commission has cleverly stuck as closely as possible to the wording of the Framework Decision that was struck down by the Court, reducing the room for manoeuvre of the member states acting in the Council of Ministers to object to the new proposal.

It is also significant that the proposed measure takes the form of a Directive. A Directive obliges member states to bring into force legally binding national laws giving effect to the requirements in the Directive, while leaving each national administration some discretion as to exactly how this is achieved, taking into account their own local situations. In addition, the Commission must ensure that Directives are effectively implemented by all member states and can take appropriate court action where necessary to this end, which itself provides an additional layer of environmental protection that would have been absent under the Framework Decision.

If adopted as currently worded in the Commission’s proposal, the Directive would require member states to ensure that certain types of conduct “when committed intentionally or with at least serious negligence” constitute a criminal offence. In summary, the conduct to be criminalized would include discharges of materials or ionising radiation into air, soil, or water (even lawful discharges if they cause death or serious injury); unlawful treatment of waste, unlawful operation of a plant, or unlawful operations involving radioactive substances that cause or are likely to cause death or serious injury to any person or substantial damage to the quality of air, soil, water, animals or plants; illegal shipment of waste for profit; unlawful treatment or handling of protected wild fauna and flora; unlawful significant deterioration of a protected habitat; and unlawful trade in or use of ozone-depleting substances. Participating in or instigating the conduct both constitute an offence.

The proposed sanctions for individuals vary, depending on the offence, from one to ten years’ imprisonment and may be accompanied by other measures, including disqualification from activities such as that of company director and the obligation to reinstate the environment. In addition, companies can be held liable where either leading representatives have individually or as part of a unit of the business committed a relevant offence for the benefit of the company or where the company has exercised inadequate control. Criminal or noncriminal maximum fines of up to EUR 1.5 million must be imposed, and other penalties such as a fine proportionate to the company’s revenue may also be applied. On top of these sanctions, the company may be required to reinstate the environment and may even be wound up. The Directive establishes minimum requirements, and the sanctions prescribed may be increased at the discretion of each member state.

As is often the case, the Commission’s proposal has been misunderstood or misrepresented by some commentators.

The Commission proposal does not attempt to create new environmental offences but rather to create a level playing field in terms of criminalization of existing offences. The Sun newspaper in the United Kingdom (UK), under the headline “Flower pickers to be criminals?” ran an article covering the Commission’s announcement of the proposal and stated that the “‘taking or damaging’ of wild flowers” would become a criminal offence. In fact, the proposal does not cover all wild flowers but only of those that are already protected by specific legislation.

It has also been argued by some that the proposal will result in a significant transfer of power to the Commission with a correlative erosion of national sovereignty. Given that the proposal had already in large part been agreed upon unanimously by the member states when they adopted the Framework Decision and that the proposal will have to be adopted by the Council of Ministers and the European Parliament before it is enacted, any transfer of power will have taken place through a democratic process. Moreover, it should be emphasised that the imposition of any criminal sanctions would take place at the national level and, contrary to some newspaper headlines, the Commission would not gain the power to imprison or fine anyone.
Fishery Conservation and Management Act
Reauthorization: “A” for Effort, “C” for Substance

Madeline June Kass


Initially enacted in 1976, the Fishery Conservation and Management Act (later renamed the Magnuson-Stevens Act) established a fishery conservation zone (now the U.S. Exclusive Economic Zone) in waters extending off the U.S. coastline and beyond state jurisdictional waters to deter exploitation of fish stocks by foreign fishing enterprises. See 16 U.S.C. §§ 180–1883 (2000). The Fishery Conservation and Management Act (FCMA) also established regional management councils (Councils) and tasked them with developing domestic fishery management plans (FMPs). 16 U.S.C. § 1852(a).

In 1996, in response to the collapse of several important fisheries, Congress amended FCMA by adopting the Sustainable Fisheries Act (SFA). Pub. L. No. 104-297 (1996). The SFA shifted the focus of FCMA from ‘Americanization’ of all U.S. fisheries to the conservation and rebuilding of overfished fish stocks.” JOSEPH J. KALO ET. AL., COASTAL AND OCEAN LAW 436 (2002). Towards these new ends, the SFA, among other things, added these requirements: (1) to conserve fish stocks, restore overfished populations, and minimize bycatch (i.e., fish such as regulatory and economic discards that are harvested but not kept); (2) to assure fair and balanced regional management council membership; (3) to impose a moratorium on new individual fishing quota programs; (4) to improve social benefits for traditional small-scale fishers; and (5) to provide greater attention to restoring and protecting fish habitat. See EUGENE H. BUCK & DANIEL A. WALDECK, THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT: REAUTHORIZATION ISSUES, CRS REPORT FOR CONGRESS 7 (2005)(Report for Congress).

Unfortunately, the SFA did little to stem what might now be described as a national addiction to unsustainable fishing. Seven years after the SFA’s passage, the Pew Oceans Commission found that nearly one-third of the ninety-three assessed fish populations were overfished or being fished at unsustainable rates. PEW OCEANS COMMISSION, AMERICA’S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE 35 (2003), available at http://www.pewtrusts.org/pdf/env_pew_oceans_final_report.pdf (Oceans Report). And sadly the Commission expected new studies to show even more populations in need of rebuilding. Oceans Report at 35–36. Worse yet, the Commission’s report identified eighty-two marine fish populations in North America at risk of extinction along with a number of other marine species, including the northern right whale, the Hawaiian monk seal, the Pacific leatherback turtle, and several species of California abalone. Id. at 36. In economic terms, the Commission concluded that "thousands of jobs and billions of dollars of investment have either been lost or are jeopardized by collapsing fisheries." Id. at v.

In the face of this national fish crisis, Congress’ latest revamping moves in the right direction. First, the FCMRA
clarifies and strengthens existing stock rebuilding provisions by requiring Councils to actually implement required plans and regulations to end overfishing of stocks declared overfished. Moreover, such plans and regulations must now provide for ending overfishing immediately. Pub. L. No. 109-479, § 104. Congress, however, diluted the immediacy element of these changes by setting the time for Council action to end overfishing at two years after notice (doubling the existing one-year timeframe for plan preparation) and by delaying the effective date of the provision to thirty months following enactment. Consequently, the immediate end to overfishing of currently diminished stocks may be delayed until half way into 2011. Id.


These changes are responses to identified information failures. The Oceans Report highlighted significant data gaps, finding the status of 655 populations, including 120 major stocks (those with landings of at least 200,000 pounds of fish a year), to be "unknown." Oceans Report at 35. The Marine Fish Conservation Network and others went further, arguing that not only were there serious data gaps but that some Councils may have used the lack of data to distort the true extent of the overfishing and to postpone much-needed conservation efforts. See SARAH CLARK STUART, MARINE FISH CONSERVATION NETWORK, SHELL GAME: HOW THE FEDERAL GOVERNMENT IS HIDING THE MISMANAGEMENT OF OUR NATIONS FISHERIES (2006) available at http://www.conservefish.org/site/pubs/network_reports/shellgame_lowres.pdf.

The new research and funding provisions directly respond to these identified concerns and are laudable. In fact, the Pew Commission proposed creation of a funding mechanism along the lines of the Conservation Fund. Oceans Report at 115. Fishery scientists support ecosystem-based management approaches. Report For Congress at 25. Unfortunately, by virtue of their discretionary nature, these new measures may not be firm enough to overcome lingering Council resistance to conservation, to assure that the most-needed data gets collected in the timeliest fashion, or to implement ecosystem-based management.

In another constructive effort to better align decision making with science, the FCMRA requires that Councils develop annual catch limits for each managed fishery and that the limits established not exceed levels recommended by their Scientific and Statistical Committees (SSCs). Pub. L. No. 109-479, § 103. The SSCs assist the Councils by development, collection, evaluation, and now peer review of scientific information relevant to Council conservation planning. Id. at § 103(b). The amendments go still further by clarifying that SSC appointees must be federal employees, state employees, academicians, or independent experts with "strong scientific or technical credentials and experience." Id. Unfortunately, the act retains provisions allowing the Councils to select and appoint their own SSC members and authorizing the Councils to establish their own peer review process that may be used in place of SSC catch limit recommendations. Id. Of additional concern is the absence of any provisions to hold Council members accountable if annual catch limits are exceeded. Notably, the FCMRA does amend the existing conflict-of-interest provisions to, among other things, make Council member financial interest disclosures available on the Internet for public inspection. Id. at § 103(i).

A third favorable development relates to new measures for fish habitat. The FCMRA allows for the inclusion of deep sea coral protections in FMPs and establishes a new deep sea coral research program (subject to the availability of appropriations). Pub. L. No. 109-479, §§ 105 and 408. Again, although laudable for focusing attention on an area of critical concern, the mere providing of additional discretionary authority to protect corals and a research program with uncertain funding may do little to secure actual habitat protections, particularly given the historic reluctance of the Councils to act to reduce adverse effects of fishing activities on habitat (or impose even mandated restrictions on fishing interests). See Report for Congress at 15 ("Environmental groups commend the regional councils for their success in identifying and describing" essential fish habitat but suggest that "most regional councils have yet to establish measures to reduce the harmful effect of fishing activities on habitat.").

In a fifth step forward, the FCMRA authorizes Councils to undertake limited access privilege programs (LAPPs). Pub. L. No. 109-479, § 106. The LAPPs allow for issuance of federal permits with individual fishing quotas in fisheries managed under existing limited access systems. The program constitutes a "shift to a more market-based approach" and may help to "avoid the 'fishing derby' style of fishing." Linda Larson, Lame Duck Congress Reauthorizes and Revamps Magnuson-Stevens Fishery Conservation and Management Act, MARTEN LAW GROUP ENVIRONMENTAL NEWS, Jan. 10, 2007, available at http://www.martenlaw.com/news/20070110-fishery-act-reauthorized. Derby-style fishing refers to the problem of too many vessels competing to be the first to catch a limited resource and the resulting twin dangers of overfishing and "significant safety risks as boats stay out regardless of conditions." Id.

Overall, given the high stakes and lost opportunity costs, Congress deserves an "A" for effort, but a "C" for substance. Despite the identified improvements and others not mentioned, the new measures fall short of the substantially gutsier recommendations put forward by the...
Pew Oceans Commission and others concerned about fish declines. Notably, where the Commission called for conservation decisions by agency technical experts based on ecological considerations (with allocation decisions left to more politically motivated entities), Congress provided only for input on catch limits by Council-appointed experts; where the Commission recommended implementation of ecosystem-based planning, Congress merely provided for an ecosystem study; and where the Commission called for new compliance mechanisms (including citizen-enforcement provisions), Congress responded instead by giving Councils more discretionary authority.

So yes, FCMRA moves in the right direction and the measures adopted are basically good ones, but they seem unlikely to go far enough or fast enough to save the fish. As succinctly put by the Pew Ocean Commission, we simply continue to “catch too many fish . . . far too quickly, for nature to replace.” Oceans Report at 35. If the crux of the problem is catching too many fish too quickly, let’s start with concrete, compulsory provisions that stop over-harvesting now and go from there.

Public Shorelines and Private Vegetation: Defining the Limits of Ownership

Arnold L. Lum

Among the tenets of American property law is the principle that under the common law, states own title to land that is subject to the ebb and flow of the tide. Moreover, each state has the right to determine the upper limits of its coastline. Shively v. Boulby, 152 U.S. 1, 26 (1894).

Many coastal states have located their coastal boundary along the high water mark. For example, California’s statute states that “[t]he owner of the upland, when it borders on tidewater, takes to the ordinary high-water mark.” Cal. Civil Code § 830 (2006). While the limitation of the public shoreline to land lying below the high tide line may at first appear to be a relatively simple exercise, the issue of what constitutes “ordinary” can be confounding, particularly where the high tide fluctuates significantly on a seasonal basis. In the case of California, its appellate courts have resolved the “ordinary” tide line problem by ruling that the shoreline boundary separating public from private coastline is where the average neap tide is located: “Neap tides are those occurring when the moon is in its first and third quarters, and the high neap tides are somewhat lower than the high spring tides occurring at times of the new moon and full moon. (Citation omitted.)” People v. William Kent Estate Co., 242 Cal. App. 2d 156, 161 (1966). Therefore, beach-combers strolling along California’s beaches during spring high tides can potentially be trespassing on private property.

Hawaii is a state where tides are influenced not only by the moon but by intense, passing North Pacific winter storms that track from the Gulf of Japan eastward towards the American continent, creating large surf that annually attracts big-wave surfers from around the globe. The tides near the north shores of the main Hawaiian Islands are particularly affected by the North Pacific winter storms. Because Hawaii’s high tides are wave-driven during the winter season, the state’s definition of the “shoreline” for purposes of separating public from private property is defined as “[t]he upper reaches of the wash of the waves . . . at high tide during the season of the year in which the highest wash of the waves occurs . . . .” HRS § 205A-1 (2006). However, the statute goes on to explain that this boundary is “usually evidenced by the edge of vegetation growth, or the upper limit of debris left by the wash of the waves.” Id.

The legislature’s “either/or” test for determining the public shoreline boundary articulated in HRS § 205A-1, adopted over two decades ago, 1986 Haw. Sess. L. Act 258, § 2 at 469, unintentionally created an opportunity for owners of shorefront property to extend their boundaries seaward. Landowners began to plant vegetation along the seaward boundary of their lots and install irrigation lines to water the newly planted vegetation. Over time, as the vegetation stabilized, new plantings and extended irrigation lines were installed, leading to a de facto encroachment of private property onto public land. Because Hawaii’s counties have by ordinance adopted shoreline setback requirements for locating structural improvements on beachfront property, the advantage of being able to artificially extend the vegetation line seaward is that it enables a landowner to obtain a county permit to locate structural improvements closer to the shoreline, if the state agency that certifies the shoreline boundary certifies the shoreline at the edge of the newly planted vegetation.

Needless to say, the landscaping practice described above attracted the attention of beachgoers, eventually resulting in an administrative appeal of the state’s certification of an artificially extended shoreline on Kaua’i by several members of the public who frequented the north shore beaches on the island. After unsuccessfully exhausting their administrative remedies, plaintiffs filed an administrative appeal in circuit court and appealed the lower court’s adverse decision to the Hawaii Supreme Court. Diamond v. State, No. 26997, 2006 Haw. LEXIS 559 (Haw. Oct. 24, 2006). In defense, the state’s land board, which determines by survey the location of the shoreline boundary, had asserted that as long as a landowner’s vegetation edge was stable, it would certify the shoreline at that point, even if the debris line was located landward, on the proffered grounds that a vegetation line is less prone to fluctuation and easier to locate. Id. at 5.

However, in its opinion, the Hawaii Supreme Court disagreed with the defendants, finding that the state’s adoption of the vegetation edge as “the more stable evidence” of the shoreline, id., conflicted with the legislative history of the...
shoreline statute, which included statements in a legislative report that the 1986 amendments to the definition of “shoreline” were intended “to further clarify the manner in which the shoreline is determined to protect the public interest[,]” Hse. Stand. Com. Rep. No. 550-86 (emphasis added).

Previously, in County of Hawai‘i v. Sotomura, 55 Haw. 677, 517 P.2d 57 (1973), the court explicitly stated in a shoreline boundary case that “[p]ublic policy ... favors extending to public use and ownership as much of Hawaii’s shoreline as is reasonably possible.” 55 Haw. At 182, 517 P.2d at 61-62 (emphasis added). Although the court in Sotomura further explained that where there is both a vegetation and debris line on the beach, the presumption is that the shoreline is located along the edge of vegetation growth. Id. at 182, 517 p.2d at 62. The Diamond court determined that the lack of a preference in the post-Sotomura 1986 amendments to the definition of “shoreline,” combined with the above quoted statement made by the Sotomura court and the legislative history of the 1986 amendments to the effect that public use and ownership of Hawai‘i’s shoreline should be protected, warranted “reconfirm[ing]” the public policy set forth in Sotomura and the legislative history of HRS § 205A-1. Diamond, supra, at 14. In essence, the functional effect of its holding, as explained by the court, is to “reject attempts by landowners to evade this policy by artificial extensions of the vegetation lines on their properties.” Id.

Unfortunately, because the appeals process took more than four years to wend its way to a final decision by the Hawai‘i Supreme Court, the owner of the property that was the subject of the litigation was able to obtain a county permit to build a house in reliance on the erroneous state agency shoreline certification, and construction is now ongoing. Supreme Court Slaps Down DLNR, Land Board on Shoreline Certifications, 17 Environ. Haw., Dec. 2006, at 4. Nonetheless, the court’s rejection of private shoreline boundary extension through the artificial planting of vegetation should halt the loss of significant amounts of valuable public beaches in Hawai‘i.

U.S. Perchlorate Policy in Disarray

John Thorne

After more than a decade of debate, perchlorate policy remains in disarray, with states like California and Massachusetts developing enforceable standards while federal agencies and scientists are still working to determine if perchlorate (salts derived from perchloric acid, HClO₄) poses a public health risk at the dietary exposure levels experienced by society. Pressure is growing for immediate national standards even before studies are completed to determine the relative dietary exposures and potential risks from perchlorate in water, fruit, vegetables, cereals, dairy products, wine, beer, and processed foods across the United States and from other parts of the world. The new majority in Congress has promised hearings and has already introduced perchlorate legislation, while government officials remind us that only a few of the foods that make up “typical” diets have been analyzed for perchlorate content, and variations by region can be significant.

Most of the legal and political focus continues to be centered on the major human contributions of perchlorate—such as releases of rocket fuel—to soil, water, and food, although the likely role of naturally occurring perchlorate deposits is gaining attention. Originally thought to only occur in the Atacama Desert of Chile, ancient perchlorate deposits have been tracked by geologists to many locations around the world, including western United States. The U.S. Geological Survey, for example, found natural perchlorate deposits that exceeded 1,000 parts per million (ppm) in several samples of minerals, including potash ore from New Mexico and Saskatchewan, Canada, playa crusts from Bolivia, and hanksite mineral from California. Other studies confirm that natural production of perchlorate has likely occurred for millennia in the atmosphere around the globe, falling with rain or snow, where it accumulated in the kelp of the oceans and many desert soils of the world. Today, natural perchlorate can be measured in wilderness rain, alpine snowfall, and in ancient groundwater aquifers, such as the Ogallala Aquifer. The perchlorate levels in temperate soils from natural sources are often low because it is leached into the subsoils or washed to rivers and oceans by periodic rainfall. But in arid regions of the world with suitable atmospheric and climatic conditions, the literature suggests that naturally produced perchlorate has accumulated in soils and plants for millennia.

At high enough concentrations, perchlorate competively interferes with iodine uptake by the thyroid and disrupts that gland’s ability to regulate the body’s metabolism. As such, perchlorate is termed a “goitrogen,” named after the chronically swollen thyroid glands (goiters) that were a common affliction in parts of the United States in the late 1920s before iodized salt was available. Although the exposure levels that would cause actual adverse effects in young children, pregnant women, or the developing fetus are unknown, the very high dosages of potassium perchlorate (e.g., 900 mg/day for extended periods) used in medicine since the late 1950s to treat hyperthyroidism due to Graves’ Disease provide some understanding of the large range of perchlorate exposures that are well tolerated by adults. Keith W. Wenzel et al., Similar Effects of Thionamide Drugs and Perchlorate on Thyroid-Stimulating Immunoglobulins in Graves’ Disease: Evidence Against an Immunosuppressive Action of Thionamide Drugs, J. Clin. Endocrinol. Metab., 58:62–69 (1984). Today’s perchlo-
include a cross-section of typical American cuisine: fruit-
with the highest iodine content, 54 to 450
containing multivitamins and dietary supplements. Foods
commercial baked goods, iodized salt, and many iodine-
many processed foods, most dairy products, flavored cereals,
suggests that to be iodine-deficient today, a person must
States is likely to be a very rare occurrence. The literature
development and decreased learning capability.
roid function during sensitive life stages—either due to diet
and newborn development and metabolism. Adequate
the iodide-containing hormones that influence normal fetal
when the maternal thyroid plays a critical role in producing
exposure thresholds for pregnant women and nursing
Environmental Sodium/Iodine Symporter Inhibitors: Potential
adequate.
associations between perchlorate exposures and human
health suggest that perchlorate has been well tolerated by
societies and subpopulations where iodine nutrition is ade-
De Groef et al., Perchlorate Versus Other
Environmental Sodium/Iodine Symporter Inhibitors: Potential
Thyroid Health Effects. EURO. J. ENDOCRINOLOGY. 155:
17–25 (2006). Much less is known, however, about no-
effect exposure thresholds for pregnant women and nursing
infants under iodine-deficiency conditions, a small but poten-
tially vulnerable segment of society. These are life stages
when the maternal thyroid plays a critical role in producing
the iodide-containing hormones that influence normal fetal
and newborn development and metabolism. Adequate
iodine nutrition obviates the effects of goitrogens, but sig-
ificant iodine deficiency or prolonged impairment of thy-
roid function during sensitive life stages—either due to diet
or high levels of competing ions like perchlorate—could
result in adverse effects to the offspring that include delayed
development and decreased learning capability.

Fortunately, significant iodine deficiency in the United States is likely to be a very rare occurrence. The literature
suggests that to be iodine-deficient today, a person must deliberar-ly avoid not just meat, fish and poultry, but also
many processed foods, most dairy products, flavored cereals,
commercial baked goods, iodized salt, and many iodine-
containing multivitamins and dietary supplements. Foods
with the highest iodine content, 54 to 450 μg per serving,
include a cross-section of typical American cuisine: fruit-
flavored cereals, chocolate milk and milk shakes, cheese
pizza, cod/haddock, chicken pot pie, low-fat plain yogurt,
macaroni and cheese, corn grits, homemade lasagna, white
rice, pancakes, chicken noodle casserole, canned spaghetti
in tomato sauce, low-fat milk, apple pie, fish sticks, chocol-
ate pudding, and mashed potatoes. Jean A.T. Pennington
et al., Composition of Core Foods in the U.S. Food Supply,
Cheryl Fields et al., Iodine-Deficient Vegetarians: A
Hypothetical Perchlorate-Susceptible Population, Reg. TOX. &

However, at least one environmental group claims that
perhaps one-third of women in the United States are defi-
cent in iodine, and medical intervention would be needed to
protect newborn babies from the effects of typical dietary
perchlorate exposures (http://ewg.org/reports/thyroidthreat/). Its arguments are based on an interpretation of
recently published data from an epidemiological study by
the Center for Disease Control (CDC), in which urinary
perchlorate and thyroid hormone levels in blood were char-
acterized from more than 2,000 adolescent and adult men
and women living in the United States. Benjamin C. Blount
et al., Urinary Perchlorate and Thyroid Hormone Levels in
Adolescent and Adult Men and Women Living in the United
States, ENVIRON. HEALTH PERSPECTIVES, 114:1865–1871
(2006). The publication reported that thyroid function in
women (but not men) who had levels of iodine in their
urine below recommended sufficiency levels appeared to be
affected by very low levels of perchlorate—although even in
these women thyroid function was still within the normal
range. The environmental group held this publication up as
support for much more stringent standards and quickly peti-
tioned the state of California to further reduce its proposed
6.0 ppb drinking water standard for perchlorate, a standard
that would already be about 75 percent below the 2005 rec-
ommendations of the National Academy of Science and
U.S. Environmental Protection Agency.

Others have been more cautious in their interpretation of
the CDC data. The American Thyroid Association (ATA)
said the findings were intriguing, but cautioned that several
features of the study may limit their application to guidelines
for perchlorate standards, adding their concern that “[t]he
reason that perchlorate, but not other measured goitrogens studied [thiocyanate and nitrate], influenced thyroid function
at low urinary levels of iodine is not explained.” The
ATA concluded that “[t]he issues raised are important
and additional study to resolve them should be pursued.”
(http://www.thyroid.org/professionals/publications/statements/
06_12_13_perchlorate.html). Until key questions are
resolved, it would be premature to base regulatory determina-
tions on this one epidemiological study.

By definition, all goitrogens at some concentrations will
affect normal thyroid function. The literature suggests that
these levels of inhibition may change remarkably among
individuals, depending on many factors including, among
other things, what foods one eats, what the combined
goitrogen level in the meal portions is, and how that level
relates to the iodine levels of the foods eaten plus that stored by the individual. Effects of perchlorate at any give time result only from the incremental effect of iodine uptake inhibition above and beyond the normal inhibition already caused by the intake of these other inhibitors in the diet. Douglas Crawford-Brown et al., Intersubject Variability of Risk from Perchlorate in Community Water Supplies, ENVIRON. HEALTH PERSPECT., 114(7): 975–979 (2006). The CDC study probably examined the levels and effects of perchlorate, nitrate, and thiocyanate on thyroid function because they are the most common goitrogens in our diets. Although the relative potencies of nitrate and thiocyanate as dietary goitrogens are many times less than that of perchlorate (e.g., a 1.0 ppb perchlorate exposure is equivalent to about 150 to 200 ppb nitrate), they are naturally present at such high levels that their net effect is to eclipse that of perchlorate. The literature suggests that, of the total level of iodine-uptake inhibition that occurs from ingestion of food and water, less than 1 percent is due to the perchlorate present, with the balance due to the normal background of other inhibitors that occur in our typical diets. Bert De Groef et al., supra.

Public health officials and environmental regulators, therefore, face a dilemma: If these various iodine-uptake inhibitors have always been present in wholesome, balanced diets of nutritious foods, and the addition of perchlorate adds only a small, perhaps insignificant increment of additional goitrogen, what should the public health response of lawmakers be? If a typical luncheon salad contains more than 2,000 ppm (2,000,000 ppb) of nitrate (and perhaps a similar level of thiocyanate), representing exposure to a level of iodine-inhibition potency equivalent to at least 10 ppm (10,000 ppb) of perchlorate, how can exposures to a few ppb perchlorate in the drinking water or other beverage that accompanies the salad be considered a risk to the population or the most sensitive subgroups of it?

With so many natural goitrogens in what society has found to be a healthy, balanced diet of water, fruit, vegetables, cereals, dairy products, meats, and other protein sources, the fact that many of these same foods also supply essential iodine may help explain the rarity of adverse effects of goitrogens. Where iodine levels are adequate, perchlorate and other goitrogens are without effect. This is demonstrated, for example, in the reduction of goiter and other effects of iodine deficiency in parts of the United States after the introduction of iodized salt in the late 1920s. Today’s processed foods and dietary supplements provide many additional sources of iodine. Despite this, health officials believe that the United States should do more to ensure adequate iodine nutrition for pregnant women and nursing infants. Many countries mandate iodine supplementation, especially during pregnancy, while others have doctors who prescribe supplementation for any person showing deficiency, irrespective of whether there is significant exposure to environmental iodine-uptake inhibitors such as perchlorate, nitrate, or thiocyanate.

It is unfortunate that we do not have a better understanding of the combined effects of perchlorate, thiocyanate, nitrate, and other iodine-uptake inhibitors in our lives. Common sense dictates that such overall consideration, rather than a narrow focus on perchlorate in isolation, would provide a more realistic assessment of potential health effects of perchlorate. Gail Charnley, Politics, Perchlorate, and Public Health, ELI ENVIRON. FORUM, Nov/Dec: 23–27 (2006).

Absent evidence that such inhibitors in our diets are having adverse effects on society, policymakers should approach regulatory solutions cautiously.

### Transitioning to Revised NAAQS for Particulate Matter: Up in the Air?

**Gale Lea Rubrecht**

National Ambient Air Quality Standards (NAAQS or standards) are promulgated pursuant to the federal Clean Air Act (CAA). They regulate the release of air pollutants considered harmful to human health and the environment. Fine particulate matter (PM) that can lodge in the lungs is one of the pollutants regulated. The CAA further requires the U.S. Environmental Protection Agency (EPA) to review air quality criteria on which the standards are based and the standards themselves and make appropriate revisions at five-year intervals. Under that mandate as well as a consent decree, EPA promulgated revised PM standards for particles 2.5 microns or smaller (PM2.5) on September 21, 2006.

The final 2006 PM NAAQS are highly controversial and are the subject of legal challenges pending in the United States Court of Appeals for the District of Columbia Circuit. Because the 2006 PM2.5 standard is more stringent than the 1997 standard, more counties will be designated nonattainment under the 2006 PM NAAQS than under the 1997 standard. Local communities do not want to be part of a nonattainment area because a nonattainment designation makes it difficult to attract new business and to expand existing businesses. States have limited resources and have either not begun or are just beginning to design emission control strategies to attain the existing standards and now must figure out how to attain a more stringent standard before they submit attainment plans for the existing 1997 standards. Industry is burdened with compliance costs for control measures needed to attain the existing standards and will likely be subject to additional compliance costs for control measures to attain the 2006 revised NAAQS. Industry argues that the standards are unnecessary, pointing to recent EPA reports stating that air quality is improving and scientific studies stating that the existing 1997 PM NAAQS are protective of public health.

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According to industry, the revised standards will drive up the cost of energy, leading to higher prices for consumers and job losses in the manufacturing sector. Environmental groups can be expected to argue that EPA should lower the PM2.5 standard further than it did and that the agency should not have removed the PM10 annual standard.

With the high controversy over PM standards, EPA has been moving very slowly to implement and revise the standards. EPA published an advanced notice of proposed rulemaking on February 9, 2006, concerning the transition from the 1997 NAAQS for PM to the 2006 revised PM standards (71 Fed. Reg. 6718). Due to legal challenges to the 2006 standards, EPA's designations under the 1997 PM standards did not take effect until nearly eight years later on April 5, 2005. EPA's designations under the 1997 PM standards were also challenged in court, but the litigation is being held in abeyance pending reconsideration of the designations in light of an EPA-admitted error concerning the carbon emissions estimates used in making the designations. Meanwhile, the "clock" for states to submit their PM2.5 state implementation plans continues to run. States have three years or until April 2008 to submit their state implementation plans to achieve or attain the 1997 NAAQS for PM2.5 in those areas that have been designated nonattainment. Following EPA approval of the state implementation plans, nonattainment areas have until April 2015, or April 2020 if granted a full five-year extension, to achieve or attain the 1997 PM standards.

In its February 2006 advanced notice of proposed rulemaking, EPA proposes options for the transition from the current 1997 PM NAAQS to the revised standards that it promulgated on September 21, 2006.

The September 21, 2006, final rule strengthens the 24-hour PM2.5 standards from the 1997 level of 65 micrograms per cubic meter (\(\mu g/m^3\)) to 35 \(\mu g/m^3\) and retains the current annual PM2.5 standards at 15 \(\mu g/m^3\). EPA did not replace the 24-hour PM10 standard with a new standard for particles between 2.5 and 10 microns in size (PM10-2.5) as the agency had proposed but instead retained the existing 24-hour PM10 standards of 150 \(\mu g/m^3\). The agency revoked the annual PM10 standards.

With respect to the revised 24-hour PM2.5 standards, states may make recommendations in November 2007 for areas within their borders to be designated attainment, nonattainment, or unclassifiable based upon air quality monitoring data. Two years later, in November 2009, EPA is expected to promulgate new PM2.5 designations with an effective date of April 2010. A monitoring network for PM2.5 exists, and three years of air quality monitoring data as required by the CAA will be available when the states make their recommendations in 2007 and EPA promulgates designations under the 2006 revised PM NAAQS in 2009. States will then have three years, or until April 2013, under the CAA to submit new PM2.5 state implementation plans, and nonattainment areas will have until between April 2015 and April 2020, depending on circumstances, to attain the revised PM2.5 standards.

EPA proposes two options in the February 2006 advanced notice of proposed rulemaking for the transition from the 1997 PM2.5 NAAQS to the new 2006 PM2.5 NAAQS. Under Option 1, EPA would not revoke the 1997 annual PM standard but would revoke the 1997 daily PM2.5 standard one year after designations are finalized under the new PM2.5 standard. Under Option 2, EPA would revoke both the 1997 annual and daily PM2.5 standards one year after designations under the new PM2.5 standard. Because the new PM2.5 designations are expected to take effect in April 2010, the revocation of the 1997 standards under either Option 1 or Option 2 would not occur until April 2011.

Option 1 would not require any antibacksliding measures, whereas Option 2, which is similar to the approach adopted by EPA for the transition from the 1-hour ozone standard to the 8-hour standard, would require antibacksliding provisions. For example, under the 8-hour ozone implementation rules, mandatory controls, such as reasonably available control technology, continue to apply, but states may modify or remove discretionary control measures if the modification or removal does not interfere with attainment of, or progress toward, the 8-hour ozone NAAQS. New Source Review major source applicability cut-offs and offset ratios for an area's 1-hour ozone classification would not continue to apply after revocation of the 1-hour standard under the 8-hour implementation rules. These provisions for New Source Review during the transition from the 1-hour standard to the 8-hour standard were challenged by environmental groups in NRDC v. EPA, No. 06-1045 and consolidated cases (D.C. Cir.), and on December 22, 2006, the D.C. Circuit agreed with the environmental petitioners. The D.C. Circuit's decision will likely provide a model for regulating backsliding during the transition from the 1997 PM standards to the 2006 PM standards.

In addition to any antibacksliding measures that EPA adopts in a final rule on the transition to the 2006 PM2.5 NAAQS, EPA will address issues such as designations, conformity, and New Source Review related to the implementation of the 2006 PM2.5 NAAQS in one or more final rules. If EPA's track record on promulgating rules related to implementation of the 1997 PM2.5 and 8-hour ozone NAAQS as well as New Source Review Reform is any indication, it may be years before EPA completes promulgation of final rules implementing the 2006 PM2.5 NAAQS.

A few issues pertaining to the 2006 PM standards for particles 10 microns or smaller (PM10) arise as an immediate consequence of the agency's decision to retain the 24-hour PM10 standards but revoke the annual PM10 standards. EPA addresses these issues in its September 2006 final PM NAAQS rule. Because EPA is retaining the current PM10 standards, new nonattainment designations for PM10 will not be required. States may request redesignation of an area based upon the most recent air quality data available, however. Because EPA is not changing any PM10 designations, transportation and general conformity will continue to apply to all PM10 nonattainment areas. Because EPA is revoking the annual PM10 standard, conformity determinations in PM10 areas will be required for the daily
PM10 standard but not the annual PM10 standard. Transportation conformity means that any highway or transit projects in a nonattainment area must conform to the state implementation plan and not interfere with the state's ability to attain and maintain the NAAQS. General conformity requirements apply to federal entities and prohibit federal entities from undertaking a project in a nonattainment area that would interfere with the state implementation plan or the state's ability to attain and maintain the NAAQS. The requirements under the New Source Review Program for Prevention of Significant Deterioration increments and baseline years are not affected.

Although EPA did not adopt its proposal for a PM10-2.5 standard in the September 21, 2006, final rule, EPA said it will establish requirements for a new multipollutant monitoring network that will include PM10-2.5 monitors. EPA established requirements for a new multipollutant monitoring network that will include PM10-2.5 monitors in its final revisions to its ambient air monitoring regulations published in October 2006. Those monitors will speciate PM according to the composition as well as the size of the particles. These monitors are expected to help fill in the information deficits regarding the public health impacts of PM10-2.5. EPA hopes that it will then have the scientific information it needs to adopt a PM10-2.5 standard during the next five-year review of the PM NAAQS.

EPA's proposed rule for the transition from the 1997 PM2.5 NAAQS to the new 2006 PM2.5 NAAQS is largely uncontroversial. Industry groups have been generally supportive of the proposed rulemaking, and environmental groups did not comment. Environmental groups did challenge EPA's antibacksliding provisions in the ozone transition rule. The D.C. Circuit sided with the environmental groups and vacated and remanded EPA's Phase 1 8-hour ozone implementation rule. Because the proposed rule for the transition from the 1997 PM2.5 NAAQS to the new 2006 PM2.5 NAAQS repeatedly references various approaches taken in the ozone program during the transition from the 1-hour standard to the 8-hour standard, as well as the PM2.5 program, it seems reasonable to conclude that EPA will likely follow similar paths in the transitions from the 1997 PM2.5 standard to the new 2006 PM2.5 standard and from the 1-hour ozone standard to the 8-hour ozone standard. However, because EPA's Phase 1 8-hour ozone implementation rule is on remand, EPA may delay promulgation of rules providing for transition from the 1997 PM2.5 standard to the new 2006 PM2.5 standard until resolution of the administrative proceedings on the Phase 1 rule implementing the 8-hour ozone NAAQS.

There is a great deal of uncertainty surrounding the 2006 PM NAAQS and their implementation. The timelines for implementation and attainment of the 2006 PM NAAQS extend into the future, and based on recent history, the landscape of the air regulatory process can change as issues are debated during that time. Because of this uncertainty, the transition from the 1997 PM NAAQS to the 2006 PM NAAQS can be described as being "up in the air," too.

Green Solutions
(Continued from page 11)

they need to be implemented on a broad scale.

Green infrastructure is an ideal candidate for community outreach and education programs. Downspout disconnection, rain barrels, rain gardens, and green roofs may individually manage a relatively small volume of storm water, but collectively they can have a significant impact on the environment. Portland, Oregon's downspout disconnection program, for example, now diverts 1 billion gallons of storm water away from the combined sewer system each year through the participation of an estimated 45,000 households. City of Portland Bureau of Environmental Services, Downspout Disconnection Program, at http://www.portlandonline.com/bes/index.cfm?c=43081. The city offers to disconnect downspouts at no cost to the homeowners or will pay homeowners $53 for each downspout that they disconnect themselves. City of Portland Bureau of Environmental Services, Downspout Disconnection Program, at http://www.portlandonline.com/bes/index.cfm?c=43081. The program is implemented in conjunction with a system of green roofs, curb extensions, vegetative swales, and rain gardens that collectively help to mitigate urban storm water problems. Green infrastructure can be introduced into a community one lot at a time, so getting community members informed about the benefits of green infrastructure for CSO reduction mobilizes individuals to help to tackle the problem.

Although some communities are already beginning to explore green infrastructure as a solution to combined sewer overflows, its use is still not widespread. CSOs present a serious risk to human and environmental health that we cannot afford to ignore. The CSO Control Policy mandates that local communities develop Long Term CSO Control Plans, and incorporating green infrastructure as a central feature of these plans is an important step toward improving our water quality and achieving the WQS mandated by the CWA. The CSO Control Policy does not specifically mention green infrastructure, but neither does it preclude the use of green infrastructure for complying with the requirements of the policy. Since green infrastructure can be used effectively to reduce the volume of CSOs, it should be a component of all LTCPs. For more information about combined sewer overflows and green infrastructure solutions to them, see the Natural Resources Defense Council's report, Roofops to Rivers: Green Strategies for Controlling Storm Water and Combined Sewer Overflows, which may be found on its Web site www.nrdc.org.