

# Superfund and Natural Resource Damages Litigation Committee Newsletter

Vol. 9, No. 1

February 2014

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## EDITORS' NOTE

Ashley A. Peck, Carolyn L. McIntosh, and  
Whitford Remer

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We are pleased to bring you another issue of the ABA SEER Superfund and Natural Resource Damages Litigation Committee Newsletter. In this issue, we feature five timely articles that provide practical insight to Superfund and NRD practitioners.

Three of our articles were originally presented as part of a panel discussion at the ABA SEER 21st Fall Conference in Baltimore, and will allow those who could not attend the conference to enjoy some of the content. These articles provide an in-depth look at significant Superfund sites where unique and innovative approaches have recently been employed to address challenges. We also feature an article on early natural resource damages restoration for the Deepwater Horizon spill that will provide an informative update on efforts at this critical site. Our final article provides practical insight on the challenges of dealing with technical evidence at CERCLA sites.

As always, we would like to extend thanks to this issue's contributors on behalf of the entire committee membership and ourselves as newsletter vice chairs. Contributions help increase thoughtful dialogue among the Superfund and NRD bar and our committee members. We welcome submissions from members and practitioners of all stripes, and would

be pleased to discuss proposed topics with anyone who is interested. Please spread the word, and feel free to contact us using the e-mail addresses below.

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Vol. 9, No. 1, February 2014  
*Ashley A. Peck, Carolyn L. McIntosh, and Whitford Remer, Editors*

*In this issue:*

**Editors' Note**

Ashley A. Peck, Carolyn L. McIntosh, and Whitford Remer ..... 1

**The Gowanus Canal Superfund Site, Brooklyn, N.Y.: Effective CERCLA Tools for a Sediment Mega-Site**

Brian E. Carr ..... 3

**Lessons Learned from Technical Approaches Applied at the Lower Fox River CERCLA Site**

Nancy K. Peterson ..... 7

**The Rio Tinto Mine Site, Elko County, Nevada: A CERCLA Case Study**

Adam S. Cohen and Elizabeth H. Temkin ..... 12

**Overview of Early NRD Restoration in the Deepwater Horizon Oil Spill**

Whitford Remer and Sara Gonzalez-Rothi Kronenthal ..... 17

**Understanding the Limitations of Technical Evidence**

Kirk T. O'Reilly ..... 21

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SECTION OF ENVIRONMENT,  
ENERGY, AND RESOURCES**

**CALENDAR OF SECTION EVENTS**

March 6-7, 2014

**ISBA's 13th Annual Conference**

IIT Chicago Kent College of Law

Chicago, IL

Primary Sponsor: Illinois State Bar Association

March 20-22, 2014

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April 10-11, 2014

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The Ritz-Carlton Hotel

Washington, DC

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Nashville, TN

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The Red Rock Resort, Casino and Spa

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**ABA Annual Meeting**

Sheraton Boston Hotel

Boston, MA

October 8-11, 2014

**22nd Fall Conference**

Trump National Doral Miami

Miami, FL

**For full details, please visit  
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## THE GOWANUS CANAL SUPERFUND SITE, BROOKLYN, N.Y.: EFFECTIVE CERCLA TOOLS FOR A SEDIMENT MEGA-SITE

Brian E. Carr

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### Introduction

The Gowanus Canal is a 1.8-mile-long, man-made canal located in a mixed residential-commercial-industrial area of Brooklyn, New York. Constructed in the mid-1800s, it became one of the nation's busiest industrial waterways, serving three manufactured gas plants (MGPs), coal yards, tanneries, paint factories, and chemical plants. By the late 1870s, the stagnant canal was already an infamous public nuisance. A century of studies and ineffectual measures have failed to adequately address the problems. Contamination is measured in percent levels; pathogen counts regularly exceed testing limits.

In April 2009, the canal was proposed for inclusion on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL). New York City (NYC) and certain developers argued that CERCLA's slow-paced process would impede cleanup and redevelopment. In March 2010, EPA placed the site on the NPL and committed to meeting NYC's cleanup schedule.

EPA's record of decision (ROD) for a \$500 million cleanup was issued in September 2013. This article summarizes various methods used to address the challenges presented.

### Background

Prior to canal construction, the area consisted of Gowanus Creek and surrounding marshes. During the Dutch colonial era, the creek was dammed to power mills. By the mid-1840s, the marshes were considered detrimental to Brooklyn's rapid growth. In 1849, New York State authorized canal construction to promote commerce and development.

The legislation and plans recognized that the canal would be stagnant but proposed flushing measures were skipped. Once built, the canal served as an open sewer for sanitary waste and industrial effluent, including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, metals, and volatile organic compounds (VOCs). Paint and dye factory discharges led to the canal's notorious "Lavender Lake" nickname.

Various unsuccessful measures were taken to address pollution, including directing more sewage to the canal to improve flow. In 1911, a mechanism called the Flushing Tunnel was completed. Designed to improve circulation and flush out pollutants, it consisted of a mile-long, 12-foot diameter tunnel from the harbor to the canal head pumping via a large ship propeller. It operated with mixed results until failing in the mid-1960s.

Passage of the Clean Water Act (CWA), sewage treatment plant construction, and declining industry reduced discharge severity. The Flushing Tunnel was reactivated in 1999, operating until 2010 when NYC determined that proper modernization was needed.

Bordering residential neighborhoods include Park Slope, Cobble Hill, Carroll Gardens, and Red Hook. Properties abutting the canal are primarily commercial/industrial, but high density residential rezoning began in 2009. Though low-lying canal neighborhoods flood frequently from both minor and major storms (e.g., Hurricane Sandy), the Brooklyn real estate boom makes more rezoning likely. Several businesses utilize the canal for barging; canoers and boaters are regularly present. Fishing, including subsistence fishing by surrounding environmental justice communities, occurs despite state fish advisories.

### Tools for Expediting Cleanup

NYC asserted that Superfund would delay cleanup and impede development:

And under the [City] Plan, the entire lifecycle of the project through remedial construction completion would take just over nine years, significantly shorter than the average New York State Superfund listing. The . . . critical advantage of the shorter cleanup . . . will be sooner elimination of potential human health and environmental exposures. For this and other reasons, the City opposes an NPL listing . . .

In response, EPA publicly committed to the City's time frame. To accomplish this, EPA has employed a range of approaches, detailed below.

### **Using Existing Data**

Since the 1870s, dozens of public, private, and academic studies have been conducted. NYC has compiled four separate major reports on CWA compliance since 1983. The U.S. Army Corps of Engineers (USACE), National Grid (the utility successor responsible for remediating the three former MGPs), and private developers have issued innumerable reports regarding the canal and uplands. EPA leveraged these efforts to produce a comprehensive compilation of studies.

Redevelopment studies continued to generate data. To fill data gaps, EPA determined that an EPA-led remedial investigation/feasibility study (RI/FS) would produce faster, better controlled work product, while increasing public credibility as compared to prior potentially responsible parties (PRP) studies.

### **Focused Technical Approach**

EPA focused its technical approach on producing the information necessary for the next remedial step. EPA also prioritized the problems posed by a given source. For example, PRPs argued that further pre-ROD study of 200-odd canal outfalls was needed. EPA's RI determined, consistent with prior NYC data, that all but a few were inactive and had negligible discharges, particularly compared to the 377-million-gallon annual combined sewage overflow (CSO) discharges. Instead, EPA will enforce against unpermitted pipe owners or simply seal the outfalls. Similarly, EPA considered modeling developed by NYC, the USACE, and

National Grid, but disagreed that lengthy pre-ROD refinement was needed. Variability in CSO discharges, infrastructure, and other inputs creates complex conditions with no true model baseline. Overall conditions in the canal, tiny compared to most sediment sites, are readily understood. To delay cleanup for limited benefits would only leave principal threats in place. EPA will consider modeling for refining the design.

The ROD also focuses on the technical approach. The dredging remedy includes complete removal of accumulated soft sediments, capping only native, coal tar-contaminated sediment at depths where removal is infeasible. The 600,000-cubic-yard dredge volume is small and well defined compared to other sites. The PRPs favored capping most soft sediment, limiting dredging, and disposal. Though potentially feasible, it would be less reliable. Capped soft sediments would be more prone to failure due to structural instability, organic decomposition, and vessel-related damage from a shallower cap.

NYC also asserted that deepening the canal would reduce the dissolved oxygen (DO) benefits of the refurbished Flushing Tunnel, impairing CWA compliance. Absent supporting data and given prior NYC reports suggesting that removal would improve DO by reducing sediment oxygen demand and biochemical oxygen demand, EPA prioritized removal. If DO proves to be an issue, added sand can reduce canal depths cheaply.

### **Iterative Report Release**

EPA determined that proactive information dissemination would reduce delays by promoting an informed discussion and increased project confidence. EPA has actively distributed information, electronically whenever possible via EPA's Gowanus webpage and Facebook. Major reports were released in draft as produced. The RI was issued in January 2011 and the FS in December 2011. For each, EPA held numerous formal and informal public meetings. This iterative approach and ongoing dialogue ensured public familiarity with technical issues when the proposed plan was

released in December 2012. EPA will continue these efforts during design and construction.

### **Stakeholder Coordination—Uplands**

EPA has been proactive in coordinating with the many canal stakeholders. EPA and New York State Department of Environmental Conservation (NYSDEC) have agreed to a coordinated schedule tying the roughly \$500 million MGP cleanups to the dredging remedy, which will start at the head of the canal. To align the remedial schedules, in January 2012 NYSDEC directed National Grid to expedite design of a cutoff wall for the former Fulton MGP facility, near the head of the canal, to prevent subsurface tars, or non-aqueous phase liquid (NAPL) migration.

### **NYSDEC/NYC CWA Coordination**

As a delegated state, NYSDEC has the CWA enforcement lead. NPL designation of two NYC sediment sites, Gowanus and Newtown Creek, has also elevated public attention to the impacts from CSOs on these water bodies. EPA's Superfund program has collaborated with NYSDEC and EPA's own water programs to ensure an effective, comprehensive remedy.

In 2010, NYC began upgrades to the Flushing Tunnel, an adjoining pump station, and a failed sewer main. For such work to proceed, EPA promptly made CERCLA remedy consistency determinations and provided technical comments. The Flushing Tunnel was restarted in December 2013 with its modern pumping system, functional even at low tide, increasing flows by 40 percent.

EPA supports CWA coordination for cost-saving purposes. Under its CWA order, NYC must dredge CSO sediment mounds at the canal head by 2018. Since this shallow CSO dredging and capping would need to be redone for EPA's remedy, EPA is seeking to incorporate this dredging, saving some \$15–\$20 million.

NYC's current \$150 million CWA infrastructure upgrades will greatly reduce CSO impacts to the mid- and lower canal. EPA determined that

CERCLA controls are needed for contaminated CSO solids in the upper canal. Rather than allow NYC to determine whether to build additional CSO controls under its CWA Long Term Control Plan (LTCP) process, due in June 2015, the ROD selected CSO retention tanks as the control technology, the cost for which was estimated at \$78 million based on the assumption that two tanks, one 8-million and one 4-million gallons in size, would be needed. NYC had previously screened out such tanks under the CWA using a \$400 million estimate.

In concurring on the ROD, NYSDEC stated that the LTCP will, at a minimum, meet EPA's remedial performance goals for CSO solids control. EPA has committed to align the two programs to the extent practical, while prioritizing the CERCLA remedy and timeline. Accordingly, the Superfund design will be informed by NYC's LTCP development. EPA believes that major cost savings can be realized through synergies and economies of scale. For example, using the CERCLA permit exemption and locating CSO tanks at City-owned property where the Fulton MGP source removal work will be conducted will save major permit, acquisition, and construction costs.

### **PRP Coordination**

To maximize the available technical and enforcement resources, EPA collaborated with the PRPs where possible. Although EPA chose to do a fund-led RI/FS, in April 2010 EPA entered into administrative consent orders (ACOs) to have NYC and National Grid install groundwater wells at properties that they currently or formerly owned. Each ACO also contained provisions allowing the parties to propose additional work. Under these provisions, both NYC and National Grid have conducted supplemental investigation work, modeling, and other studies.

EPA has also collaborated on the PRP search process with NYC, National Grid, and other parties. PRPs submit background information on current and historic owner/operators for EPA review. EPA routinely shares the responses obtained from



information requests to encourage additional research and analysis.

### **Community Advisory Groups**

Community advisory groups (CAGs) are standard outreach tools for Superfund sites. The Brooklyn community surrounding the canal is both well informed and highly involved. As a result, the Gowanus CAG is believed to be the largest Superfund CAG in the country, often meeting weekly. Although CAGs often have divisions internally or with EPA, the Gowanus CAG strongly endorsed EPA's proposed plan. The CAG includes many creative advocacy groups, promoting a cleaner canal through free canoe rides, canal regattas, a fictional Gowanus Swim team, green streets, the arts, and many other methods.

### **Development Stakeholders**

The Gowanus area, whose sewer shed extends as far as the Barclay Center Arena, is undergoing intense redevelopment pressure. As noted, developers opposed NPL nomination in 2009. In 2013, no developers opposed the cleanup plan. This is likely due to EPA's responsive, multi-level engagement with the development community. EPA takes no position on land use, but seeks to minimize project impacts and promote synergies.

For example, EPA participates in the local Brownfield Opportunity Area (BOA) program with various state and local agencies, the public, and land owners. After a 2011 "Low Line" design contest on increasing canal access attracted entries from around the world, EPA provided informational support for the 2012–2013 sequel called "Waterworks." Waterworks produced local and international submissions for designs to replace the NYC park atop a contaminated MGP parcel with a new park atop CSO retention tanks.

Most importantly, EPA engages directly with developers and buyers. EPA makes data and project-related information readily available. EPA also routinely provides appropriate comfort letters upon request. In December 2013, Whole Foods opened a market directly on the canal, following a

state brownfields cleanup that EPA reviewed during the RI and determined to be consistent with the anticipated cleanup. Like the Barclay Center Arena, Whole Foods will greatly alter the investment market. EPA is preparing to enter into a bona fide prospective purchaser removal order with the Lightstone Group, which has begun construction of 700 residential units along the upper canal. In exchange for liability protection deemed necessary for project financing, this AOC will result in further site characterization and remedial work, including a NAPL hot spot bulkhead containment wall.

### **Streamlining Bulkheads Repairs**

The canal shoreline consists entirely of bulkheads, many 150 years old and in poor condition. Accumulated sediments help support these failing walls, impeding dredging. Almost four miles of bulkhead will require upgrades or shoring at significant expense. As a further complication, in 2006 the Gowanus Canal Historic District, including the bulkheads, was found eligible for the National and State Registers of Historic Places by the New York State Historic Preservation Office (SHPO) following a USACE study.

To date, owners wishing to repair bulkheads needed multi-agency approvals. Timber crib and boulder construction leave steel sheet piling driven on the water side as the only practical upgrade. Resulting canal encroachment raises property ownership concerns for NYC, habitat encroachment concerns for NYSDEC, preservation concerns for SHPO, and needs USACE sign-off.

EPA has a variety of approaches to expedite bulkhead replacement and reduce costs. Central to this is EPA's lead agency self-designation for in-canal work and CERCLA section 121 permit exemption use. With these efforts and anticipated MGP remedy containment walls, EPA hopes to have 60 percent of bulkheads replaced outside of direct project costs.

This effort commenced in August 2013 when EPA issued a removal AOC to Benson Metals Corp., which operates a scrap metal recycling facility, 12

days after the facility's bulkhead collapsed into the canal. EPA and NYSDEC directed Benson to install a turbidity curtain, submit debris removal plans, and stabilize the bank. EPA had previously approved Benson's bulkhead design as part of planned future work. Post-collapse, EPA asserted the permit exemption and acted as the conduit to obtain approvals from other agencies. EPA has also created a wetlands mitigation bank. Using this model, EPA is already negotiating another six bulkhead AOCs.

### Timely Enforcement

Timely enforcement has reinforced EPA's credibility. During installation of 90 monitoring wells for the RI, for example, the sole party refusing access was issued an order within 24 hours. EPA plans to continue prompt, flexible enforcement. EPA commenced remedial design (RD) negotiations on the day the ROD was announced and reached agreement in December 2013 for NYC and National Grid to start RD work under their existing AOCs, pending final RD orders in early 2014. Thereafter, EPA will begin negotiating a global remedial action settlement to continue the timely, comprehensive Gowanus Canal cleanup.

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## LESSONS LEARNED FROM TECHNICAL APPROACHES APPLIED AT THE LOWER FOX RIVER CERCLA SITE

Nancy K. Peterson

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### Introduction

The Lower Fox River and Green Bay site encompasses 39 miles of highly industrialized river in northeastern Wisconsin and Green Bay, the largest bay of Lake Michigan. Polychlorinated biphenyls (PCBs) are the primary contaminant of concern, and are found in the river channel and bay sediments. Consumption of PCB-contaminated fish is the primary risk to human and ecological receptors. Federal, state, and tribal entities have been engaged in natural resource damage assessment and restoration activities since 1995, and the U.S. Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR) are jointly overseeing response activities.

The site is a case study in contrasts. Legal disputes have been challenging to resolve. The United States and the State of Wisconsin (State) filed enforcement litigation in 2010, and the eight parties that the governments consider responsible for the PCBs have been litigating allocation issues since 2008. Eleven published opinions later—with the district court having decided a remedy challenge, divisibility defenses, the interface between Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sections 107 and 113, the scope of “arranger liability,” and allocation based on culpability—the parties are now briefing (on nearly all issues) at the U.S. Court of Appeals for the Seventh Circuit.

Yet the site is also characterized by notable cooperative successes on the technical side. The remedy in the six-mile-long upstream reach of the river, known as “Operable Unit 1” (OU1) or Little Lake Butte des Morts, was completed in 2010. Post-remedy sampling in OU1 has shown a marked decline of PCB concentrations in water, sediment

(94 percent decline in the surface-weighted average concentrations) and fish (74 percent decline in walleye). Cooperation on technical evaluations across the site—involving representatives of the governments, oversight teams, and many of the potentially responsible parties (PRPs)—has resulted in a more cost-effective and protective remedy.

## Site History

In the late 1800s, paper mills were built along the banks of the Lower Fox River from Lake Winnebago to Green Bay, Wisconsin. The river supplied the abundant water needed to make paper, and traversed an area blanketed with forestland. By 1950, the “Fox Valley” boasted the largest concentration of paper mills in the country. In contemporary news accounts, the river was described as “the most polluted river in all Wisconsin.” The aroma then associated with paper mills was commonly referred to as “the smell of money,” as the area enjoyed one of the highest per capita income levels anywhere in the United States.

In 1955, one of the local mills began manufacturing NCR®-brand carbonless copy paper and subsequently was purchased by NCR Corporation. Between 1955 and 1971, the invisible microcapsule coating applied by that mill to the copy paper contained PCBs. That mill, in turn, sold its wastepaper to a handful of the other local mills that used wastepaper as stock material in lieu of virgin pulp. The coating process and the recycling processes all resulted in discharges of wastewater containing PCBs.

### Regulatory Approaches to the PCB Problem

After nearly two decades of study and cooperative efforts between state regulators, academics, and local industry, the U.S. Fish and Wildlife Service (FWS) stepped in with notice of a natural resource damage assessment in 1995. EPA, WDNR, the federal trustees (FWS and the National Oceanic and Atmospheric Administration), and two tribal trustees (the Menominee Indian Tribe of Wisconsin and the Oneida Tribe of Indians of Wisconsin)

subsequently entered into an official cooperative arrangement in 2001, which sometimes masks underlying philosophical, policy, and technical disagreements.

The remedial phase began in earnest with EPA’s issuance of notice letters in 1997 requesting performance of a remedial investigation/feasibility study (RI/FS). Negotiations ensued. For reasons not completely understood, the agencies refused the PRPs’ offer to perform the RI/FS. That early choice was the first of a few major decisions (by the agencies and PRPs alike) that illuminate the protracted dispute side of this story.

The site has been divided into five geographic operable units (OUs), with OUs 1-4 being reaches of the river defined by dams and OU5 being the Bay of Green Bay (see figure 1 below).



In late 2002/early 2003, EPA issued two separate records of decision (RODs) for OU1 and OUs 2-5. In both RODs, the selected remedy was dredging, except that natural recovery was selected for OU2



(where the river contains relatively little soft sediment) and OU5 (the Bay of Green Bay). The RODs estimated that approximately eight-million cubic yards of sediment would be removed, and projected the remedy cost for all OUs at approximately \$350 million. However, the RODs woefully underestimated many cost components of the dredging remedy.

### **Joint Post-ROD Technical Evaluations**

One OU1 party believed that engaging the agencies in joint technical and cost evaluations would improve outcomes, and negotiated an administrative order on consent to perform the OU1 remedial design in 2003. The design work led to a consent decree to perform the remedy, in which another OU1 party joined. The OU1 consent decree contained unique features (highlighted below) that incentivized all parties to refine the remedy in an iterative fashion, and to implement it cost-effectively.

In 2004, two parties located in OUs 2-5 agreed to perform the design of that remedy. Performing the design provided a means to gather additional data, more thoroughly evaluate remedial technologies, and engage the agencies and oversight team in more cooperative decision making. The resulting collaborative technical process across all OUs provided a forum for representatives of parties disputing cost allocation to cooperate nonetheless on improving the remedy implementation. Based on the collaborative design work, EPA issued amended RODs for OU1 and OUs 2-5 in 2008. The amended RODs adopt an “optimized remedy,” consisting of dredging, capping of specified areas, and sand covering of low concentration sediments.

### **Mediation of Cost Allocation Issues**

Another cooperative process at the site—mediation of the cost allocation issues—met with more limited success. After the RODs were issued, one of the parties brought in a consultant, Marsh USA, to structure a mediation process designed to reach a global settlement, including insurers of all the PRPs. While a global settlement was not achieved, certain aspects of that process (highlighted below) led to improved understandings of site issues and then to

settlements between several individual PRPs and their carriers.

### **Litigation Commences**

The United States and the state filed an enforcement action in 2010 to obtain declaratory and injunctive relief requiring the eight recipients of a 2007 EPA unilateral order to jointly and severally perform response work in OUs 2-5. The governments also sought recovery of their own oversight and response costs and natural resource damages. The litigation has been phased. In 2013, the district court granted the requested declaratory and injunctive relief on the response work. Meanwhile, in the allocation litigation, the district court entered a judgment in 2013 against NCR, holding it 100 percent liable for response costs and natural resource damages in OUs 2-5 based on fact-finding on the parties’ relative culpability.

### **Current Status**

Remedial work is complete in OUs 1-3 and portions of OU4. The remaining remedial work in OU4 is expected to be completed in 2017. Long-term monitoring and cap maintenance activities will continue for decades. The estimated cost of all response work implementing the “optimized remedy” is now \$800–\$900 million, about \$500 million more than the original ROD estimates for an all-dredging remedy and as much as \$500 million less than the all-dredging estimates of some technical consultants at the time the original ROD was issued.

### **The Big Challenges**

Two aspects of this site pose big challenges. On the technical side, the remedial challenges derive from the basic site conditions: the PCBs are spread throughout 39 miles of river sediment at varying concentrations beneath a flowing river. The amended RODs require that nearly 20,000 kilograms of PCBs be addressed at concentrations as low as 1.0 ppm. But those PCBs are distributed throughout approximately 8,000,000 cubic yards of sediment. That is equivalent to addressing a small roomful of PCBs dispersed, in constantly varying

concentrations, throughout a building five times the size of the Empire State Building! On the legal side, the challenges derive from the simple fact that only eight PRPs are confronting a \$1 billion problem. This means each 1 percent share of the site allocation translates into a \$10 million price tag.

While the legal issues at this site are worthy of commentary, the remainder of this synopsis will focus on technical approaches implemented at the site. Three strategies are outlined below that led to the PRPs' success in reducing the "size of the overall pie," even while the "slice of pie" issues continue to be litigated. The lessons learned may help resolve disagreements at other sites.

### **Developing and Sharing Key Information to Facilitate Cooperation**

At a complex, multiparty site, it can be challenging to identify and flesh out the information that will drive decision making by the key stakeholders. The Marsh-led mediation process at the site adopted a comprehensive approach to the initial sharing of information, which could hold promise at other sites.

All parties previously had disclosed significant historical information, including their insurance coverage information, in answers to CERCLA section 104(e) information requests. Marsh analyzed that information and invited representatives from all PRPs and all carrier groups with significant exposure, along with representatives from the United States and the state, to an informational meeting. The governmental authorities presented their views of the matter, explained the remedy and described what should transpire for a global resolution to occur. PRPs presented their viewpoints. A mediator previously agreed upon by the parties initiated negotiations. Although a global settlement was not reached, several individual PRPs subsequently used that mediator and the groundwork developed in the global process to negotiate settlements with their own insurers.

The greatest benefit of the global mediation was the early, in-person sharing of facts and perspectives by

each of the key stakeholders. Everyone saw and heard the same presentations, and came to appreciate the complexities of the site. These early meetings of key stakeholders helped facilitate the cooperation that has occurred subsequently at this site.

### **Incentivizing Regulators to Reevaluate Remedial Approaches**

The individual mills that signed up to perform the remedial design in OU1, and then in OUs 2-5, did so to gain some control over technical evaluations that had been lost when the agencies took over the RI/FS. To incentivize the agencies to revisit and reconsider their technical analyses underlying remedy selection, the OU1 parties negotiated several special provisions in the OU1 administrative order on consent for the remedial design and in the OU1 consent decree for the remedial action.

The "Work to be Performed" provisions in the design order included a specific section, "Supplemental Investigations." In that provision, the response agencies acknowledged that voluntary, supplemental investigation of conditions in and upstream of OU1 would be performed. The response agencies affirmatively agreed to review and comment promptly on work generated during the supplemental investigation activities. This cooperative comment process led to formation of technical work groups and two parallel ROD amendments, one that applies to OU1 and the other to OUs 2-5. The ROD amendments modified the original "all-dredging remedy" to an "optimized remedy." Rather than focusing solely on dredging to achieve remedial objectives, the optimized remedy employs a mix of remedial technologies—including dredging, armored capping, and sand covering of areas with low PCB concentrations—to meet performance standards.

In addition, the OU1 consent decree contained special provisions that were intended to focus the agencies' attention on costs as incurred, to improve the agencies' estimates of future costs, and to prompt reconsideration of the overall cost-

effectiveness of the all-dredging remedy. The OU1 parties, rather than agreeing to perform all response work required by the original OU1 ROD, instead deposited into a specially created OU1 escrow account the amount of money approximating the ROD cost estimate for the all-dredging remedy; they also agreed to perform remedial work until the money in the escrow account ran out. The agencies received a copy of each invoice before payment from the escrow account and had the option to object (but never did). The consent decree also provided for notices to be sent when the escrow account balance decreased to \$6 million. The notices then would lead either to the OU1 parties adding monies to the escrow account or to the termination of most consent decree rights and obligations.

The OU1 consent decree was never terminated. Instead the technical evaluations described below resulted in the two ROD amendments. After issuance of the OU1 ROD amendment, two OU1 parties entered into an amended OU1 consent decree, and completed the remedial actions specified in the amended OU1 ROD.

**Establishing Joint Technical Work Groups to Improve Remedial Results and Cost-Effectiveness**  
As work on the remedial design and the remedial action intensified, the governmental agencies and the PRPs agreed to form a series of joint technical work groups. The work groups provided frequent opportunities for in-person discussion. They enabled incremental progress in a variety of areas such as data collection, model evaluation, capping options, the calculation of the sediment surface-weighted average concentration, and planning for long-term monitoring. The work groups also allowed PRP technical representatives to explore alternative approaches with the governmental agencies and oversight contractors before submitting formal work plans. The plan approval process was streamlined because agency representatives informally had considered many concepts during the work group discussions.

Ultimately, EPA issued the ROD amendments to change the original “all-dredging remedy” to the “optimized remedy,” providing for armored capping or sand covering in lieu of dredging in specified subareas of the site. The optimized remedy resulted in cost savings of \$50 million in OU1 alone, and at the same time significantly improved the effectiveness of the remedy. Notably, after remedy completion in OU1, the surface-weighted average concentration of PCBs in the sediment was 94 percent lower than the pre-dredge concentration, and 50 percent lower than would have been expected from dredging alone. This reduction in sediment surface concentrations had a near immediate and positive impact on fish. Within a year of OU1 remedy completion, PCB concentrations in fish tissue in OU1 began to approach background concentrations. PCB concentrations in walleye declined 74 percent, and fish consumption advisories were revised to allow more frequent eating of OU1 fish. Future improvements are expected as sedimentation from upstream and the surrounding watershed continue the natural recovery process.

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## THE RIO TINTO MINE SITE, ELKO COUNTY, NEVADA: A CERCLA CASE STUDY

Adam S. Cohen and Elizabeth H. Temkin

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### Introduction

Sites remediated under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601–9675 (CERCLA) present multiple challenges for government agencies and responsible parties. Parties grapple with complicated technical issues, lengthy cleanups, disputes over liability and allocation, competing regulatory agendas, and excessive and uncertain costs. Successful projects often are ones that address these issues using an innovative approach. The Rio Tinto Mine site in Elko County, Nevada, is one such project. The parties recently entered into a consent decree providing for state-lead oversight and a well-defined schedule for remedy implementation and achievement of performance standards. The potentially reliable parties (PRPs) agreed among themselves on the allocation of future work and cost obligations in a way that facilitated global settlement with the governments. To create the certainty needed to support these settlements, the companies contracted for the implementation of the remedy at an insured, fixed price. This article reports on some of the challenges faced by the involved parties and how those challenges were resolved.

### Site Background and History

The Rio Tinto Mine site is a former underground copper mine. The disturbed portion of the site covers about 400 acres. Mill Creek runs from west to east through the site and joins with the Owyhee River approximately one mile downstream. Heavy metals and acid drainage from mine tailings impounded in the Mill Creek valley affect downstream surface water quality.

The first significant administrative action taken to address post-mine closure environmental conditions occurred in 1986 when the former operators entered into an administrative order on consent with the

Nevada Department of Natural Resources, Division of Environmental Protection (NDEP) to prevent Mill Creek from flowing into the tailings impoundments. The companies formed the Rio Tinto Working Group (RTWG) sometime later to facilitate future cleanup actions. The RTWG companies and the NDEP entered into a series of consent orders providing for the stabilization of the tailings piles and other measures to improve downstream water quality.

The site is not on the National Priorities List. However, it is being addressed under CERCLA in a manner consistent with the National Contingency Plan (NCP) pursuant to EPA's Superfund alternative approach. Starting in the mid-2000s, the RTWG companies worked with NDEP, EPA, the Duck Valley Indian Reservation of the Shoshone-Paiute Tribes, and other interested stakeholders toward a global settlement to provide for implementation of a final remedial action by the RTWG in exchange for covenants not to sue from the agencies under CERCLA and state law. Remedial alternatives were presented in the proposed plan published in October 2010. NDEP and EPA executed the record of decision (ROD) on February 14, 2012. The consent decree was entered on May 20, 2013, providing for reimbursement of NDEP and EPA response costs, settlement of natural resource damages, performance of the selected remedial action, and covenants not to sue. Remedy construction began in June 2013 and is expected to continue for three to five years. Surface water monitoring will continue for at least another 20 years.

### Remedy Description

Tailings materials will be excavated from the Mill Creek valley and placed in an on-site repository. The excavation will be partially backfilled with clean fill, and Mill Creek will be realigned to its approximate native orientation. A liner will be placed in the realigned creek channel and covered with protective soil and rock. Features intended to facilitate fish passage through the reconstructed channel will also be installed, and riparian areas will be revegetated.



Downstream surface water quality will be monitored during and following remedy construction in accordance with protocols included in the ROD. The Water Quality Compliance Protocol establishes the performance standards for the remedy, describes the methods to be used for conducting water quality compliance monitoring, and identifies additional actions that may be required if compliance milestones are not achieved at the times specified. The Ambient Monitoring Protocol will generate data that can be used to confirm that releases from the underground mine workings are not degrading surface water quality. If such influences are detected, additional response actions may be required.

### **Challenge #1: Competing State and Federal Oversight**

Overlapping interests of state and federal agencies greatly affected the consent decree strategy. History demonstrated that the RTWG companies and NDEP could work together cost-effectively. At the same time, the companies needed a global settlement resolving all government claims under both state law and CERCLA. While EPA may have deferred to NDEP if remedial action proceeded without direct EPA involvement, there would be no guarantee that EPA would not assert its authority under CERCLA to require additional investigations or further response actions. But in pursuing the goal of maximum binding effect of the settlement, the companies had to grapple with the potential inefficiencies of dual oversight, or worse—inconsistent direction from NDEP and EPA. From the start, the strategy was to involve EPA in the global settlement process, but also to continually make sure that NDEP would have the lead role. NDEP itself strongly advocated for this role; and, ultimately, the RTWG companies, NDEP, and EPA were able to develop a consent decree and management consultation process that achieved a balance of authority satisfactory to all parties. This required certain deviations from EPA's model consent decree provisions, and at times dogged negotiations among the various interests involved.

The ROD states that NDEP was the lead agency in the selection of the remedy, with concurrence from EPA. NDEP is also the lead agency for implementation and oversight of the remedy. State-lead sites are not unprecedented under CERCLA, but they are not particularly common either. Of 30 recent CERCLA consent decrees we found involving both the EPA and states as parties, we identified only two where the state was clearly assigned a lead remedial action oversight role. Subpart F of the NCP sets forth the requirements for state involvement in CERCLA response actions. These regulations stem from section 121(f) of CERCLA, 42 U.S.C. 9621(f), which requires the promulgation of regulations providing for “substantial and meaningful involvement by each state in initiation, development, and selection of remedial actions to be undertaken in that State.” Section 300.515(e) of the NCP provides more specific guidance on the state role in remedy selection and preparation of the ROD. For sites like Rio Tinto, where Superfund monies are not being used, a state may proceed under its own enforcement authority, select the remedy, and prepare a ROD, either with or without EPA concurrence.

The RTWG companies pursued a global settlement approach memorialized in a consent decree entered into with the State of Nevada and the United States (and also the tribes), which established the lead role for NDEP, provided for EPA's concurrence at certain key points in the remedial action process, and offered both state and federal covenants not to sue. NDEP developed the proposed plan and the ROD. EPA was identified as the support agency and concurred with the selected remedy. The consent decree assigns approval authority for the remedial design and other work plans and submittals to NDEP, subject to EPA's right to provide comments. NDEP will perform periodic site inspections and will be primarily responsible for direct agency oversight during remedy construction. Other responsibilities allocated by the consent decree include the following: certification of completion of remedy construction and certification of achievement of performance standards require concurrence of NDEP and EPA; NDEP may require

further response actions if it determines the remedy is not sufficiently protective; EPA may also require further response actions, but only if it first engages in management consultation with NDEP; and either agency may issue a work takeover notice, but EPA cannot implement a work takeover without first allowing NDEP to take over the work.

At times, the dual involvement of state and federal agencies slowed the global settlement process, as NDEP and EPA struggled with formulating the balance between lead agency and support agency authorities in the absence of precedent and on-point model consent decree language. To address this, the RTWG companies assumed a more proactive role than what might be typical for other sites. The companies were instrumental in crafting the remedial framework and drafting key CERCLA documents, including the proposed plan, ROD, and consent decree. This activism helped to bring the global settlement process to a timely conclusion. The end result—a clearly articulated remedial approach, schedule, and balance of agency authorities—should facilitate a more efficient and cost-effective remedial action.

## **Challenge #2: Multiple PRPs**

Before the RTWG companies could settle with the government, they first had to resolve their respective liabilities for past and future response costs. Because the companies performed different types of mining-related operations during sequential periods of time, there were questions about the extent to which each company contributed to the ongoing water quality impacts. These questions involved complex technical issues and legal issues common to many CERCLA sites, including successor liability, parent-subsidiary defenses, orphan shares, and equitable allocation.

While intercompany liability issues were significant, the RTWG companies recognized the benefits of approaching NDEP and EPA together. As a cooperating group, the RTWG would have a greater influence on the nature and design of the final remedy. Without that unity, there was concern that EPA would assume the lead oversight role,

triggering a lengthy remedial investigation/feasibility study (RI/FS) process and increased costs.

To resolve these issues, the RTWG companies utilized a mediator highly experienced in CERCLA allocation issues. The companies presented information on the source, fate, and transport of the water quality impairment and developed their legal defenses. Ultimately, the companies reached agreement on an allocation that would facilitate further global settlement negotiations with the governments. The agreement established a formula for allocating costs and assigned lead responsibility to one party for remedy implementation.

The settlement approach included a streamlined process for remedy implementation and protections against open-ended future expenditures. The allocation formula and assignment of responsibility were made contingent on the retention of a contractor that would perform the remedial action for an insured fixed price. The companies believed that a fixed-price approach would be less expensive than a time-and-materials arrangement (an outcome that has largely been borne out); and the associated reduction in overall cost liabilities, coupled with greater certainty, allowed each company greater flexibility to reach agreement. The companies set a dollar limit for remedy construction, insurance coverage, and operations and maintenance. The company with lead responsibility for remedy implementation would retain the fixed-price contractor for an amount less than the spending limit, purchase the insurance, and manage the fixed-price contract. In exchange for certain other consideration, the lead company would release and indemnify the other companies, but the indemnity and other settled obligations would only be effective if the lead company actually entered into an insured, fixed-price cleanup contract that met the cost limitations and other criteria established by the settlement agreement.

Within a short time after execution of the settlement agreement, the lead company selected a qualified contractor to perform the remedy from among several solicited bids. The company and the

contractor coordinated in purchasing insurance coverage against cost overruns, third-party pollution claims, and regulatory reopeners. Although bids were solicited prior to final remedy selection and issuance of the ROD, there was sufficient information available at the time of bidding about the nature and scope of the likely final remedial action to allow the contractor to set a guaranteed price that satisfied the cost limitation set by the companies' settlement and allocation agreement. This was due, in part, to NDEP's preapproval for the remedial design/remedial action work plan before the execution of the consent decree.

### **Challenge #3: Remedy Implementation and Cost Control**

An important requirement for the overall settlement and implementation strategy was cost certainty and control. This was achieved through a combination of fixed-price contracts for remedy construction and post-construction monitoring, cost-cap insurance, and pollution premises liability insurance providing coverage for unknown pollution conditions and third-party claims. The pollution premises liability policy also includes reopener coverage for work that may be required after remedy construction.

The first fixed-price contract assigns responsibility to the contractor for the performance of all work and payment of all expenses required to achieve certification of completion of remedy construction. The risk of cost overruns and schedule delays are assigned to the contractor. The contract also contains warranties and indemnities against post-certification work requirements and expenses arising as a result of any defects in design or construction. Cost-cap insurance protects the contractor if costs exceed the contract price. Reporting costs, agency oversight costs, stipulated penalties, and most other expenses associated with remedial action implementation are the contractor's responsibility. This scheme creates incentives to control costs and accelerate remedy completion.

The second fixed-price contract covers the five-year period after remedy construction, during which time the contractor will perform the monitoring and

maintenance required to confirm achievement of the performance standards in the consent decree. Contractor obligations are similar to those required by the remedy construction contract, although the amount of activity and the value of the contract are significantly less.

Remedy construction costs are paid according to a pre-set schedule as construction milestones are completed and documented in payment requests. All funds necessary to pay the contract prices will be deposited into trust accounts during the first three years of the remedial action. Payment distributions from the trust accounts must be preapproved by the lead company. Approval depends on confirmation that the associated construction milestone has been completed.

The trust accounts were set up to satisfy the requirements for an "environmental remediation trust" under the Internal Revenue Code and the applicable Treasury Regulations (section 671 of the Internal Revenue Code of 1986, as amended, and the implementing Treasury Regulations at 26 C.F.R. § 1.677(a)-1(d) and § 301.7701-4(e)). This ensures beneficial tax treatment for remediation expenses at the time funds are distributed.

The consent decree acknowledges that placement of funds into the trust accounts shall satisfy the financial assurance obligations of the companies for completion of the remedial action. In the event of a work takeover, NDEP or EPA will be able to use the funds to complete the remedial action. In this way, the companies avoid the additional burden and expense of purchasing more traditional forms of performance guarantees.

### **Challenge #4: Establishing and Achieving Performance Standards**

The tailings will be removed from Mill Creek, and the channel will be reconstructed within the first three-to-five construction seasons. However, recovery of surface water quality is projected to take longer, since groundwater movement through the alluvium will be required to return the system to natural conditions. The RTWG companies and the

agencies developed a multi-tiered approach that will simultaneously recognize the short-term completion of remedy construction and also allow for the long-term achievement of surface water quality objectives.

The consent decree establishes two points at which NDEP and EPA will certify completion of remedial action milestones: (1) when all construction activities are completed; and (2) when water quality-based performance standards are achieved. After the first certification, reporting and oversight requirements will be reduced, and remedial efforts will focus on water quality monitoring. The second certification marks the transition from remedial action to long-term operations and maintenance. At that point, water quality monitoring will cease, financial assurances will be released, and on-site activities will be limited to maintaining the repository cover. Cost-cap insurance will cover cost overruns prior to the first certification. Premises pollution liability insurance will cover reopeners and unanticipated expenses after that point.

The parties developed a water quality compliance protocol that establishes a series of water quality milestones to be achieved following completion of remedy construction. The protocol also identifies further response actions that may be required if the milestones are not achieved within the time periods specified. NDEP and EPA approved the protocol during pre-consent decree negotiations, so it could be included in the ROD. The protocol's water quality milestones are defined in the consent decree as the performance standards for the remedial action. Milestones are set at five-year intervals to coincide with five-year reviews performed by NDEP and EPA under CERCLA section 121(c).

If performance standards are not achieved in the Owyhee River within ten years after remedy construction and in Mill Creek within twenty years after remedy construction, reevaluation of the standards or implementation of additional remedial measures may be required. But adherence to the protocol means that additional remedial measures should not be considered until that time and should

not be required until after less extreme options have been evaluated. Once performance standards are achieved, the RWTG companies can request the second certification, enabling the transition to long-term operations and maintenance.

## Conclusion

The approaches discussed here should help to ensure the efficient and cost-effective implementation of the remedy. The Rio Tinto Mine site demonstrates that state lead oversight is a viable option under CERCLA, although a PRP seeking a state lead may need to be more proactive in pushing a global settlement to conclusion. This case study also shows that resolving allocation disputes among PRPs can benefit the global settlement process, and that establishing a framework for fixing remediation costs over time can facilitate allocation. Finally, building a degree of certainty about future remedial design and decision making into a consent decree and ROD, through preapproval of the remedial action work plan and incorporation of compliance protocols, can reduce the open-ended nature of remedial action.

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## OVERVIEW OF EARLY NRD RESTORATION IN THE DEEPWATER HORIZON OIL SPILL

Whitford Remer and

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### Introduction

Prior to 1989, a patchwork of international, federal, and state law governed oil pollution events. Two disasters—the IXTOC I and Exxon Valdez—almost ten years apart, prompted legislative action to define a regime to prevent, respond to, and establish liability for these types of events: the Oil Pollution Act of 1990 (33 U.S.C. §§ 2701 et seq.) and accompanying Natural Resource Damage Assessment regulations (15 C.F.R. 990.10 et seq.). The Deepwater Horizon oil disaster is putting that regime into action. In the shadow of the law, government agencies and the responsible parties have begun a unique first step, known as early restoration, to address the damage in the Gulf of Mexico. This article provides a brief history of the Oil Pollution Act, introduces the Natural Resource Damage Assessment, and takes a deeper look at ongoing early restoration efforts in the Gulf of Mexico. Civil penalties under the Clean Water Act pending before U.S. District Court Judge Carl Barbier are not discussed.

### History

On June 3, 1979, the IXTOC I well blew out in the deep waters of the Bahia de Campeche in the Gulf of Mexico. Two Mexican state-owned oil companies and a Texas-based company were responsible for the rig. Given sovereign immunity practice and U.S. admiralty law, damages from the spill were largely unpaid. In response, Congress created the Oil Spill Liability Trust Fund as part of a 1986 Budget Reconciliation Act; however, the law did not provide funding or authorize expenditures.

Almost ten years later, on March 24, 1989, the Exxon Valdez oil tanker crashed into Bligh Reef in Prince William Sound, Alaska. Even with a fairly robust settlement, over 20 years of litigation

followed. In 1990, based in large part on lessons learned following IXTOC and Exxon, Congress enacted the Oil Pollution Act (OPA) to fund the Oil Spill Liability Trust Fund, allow for expenditures, and consolidate and strengthen response and liability into a single statute.

As compared to the Clean Water Act (33 U.S.C. §§ 1301 et seq.), OPA created an oil spill response process and established liability for actual damage to natural resources held in the public trust. Specifically, OPA provides for an early response led primarily by the federal on-scene coordinator (for a marine spill, the U.S. Coast Guard). The on-scene coordinator has the authority to use the Oil Spill Liability Trust Fund for response and removal activities as provided in the National Contingency Plan. These costs can be recovered from the potentially responsible party or parties (PRPs). OPA also establishes a scientific and legal process, known as the Natural Resource Damage Assessment (NRDA), whereby natural resources trustees can recover from parties responsible for the spill: costs of restoring natural resources damaged by the spill; lost use of the natural resources; and costs of assessing the damage.

### NRDA

During the Natural Resource Damage Assessment, state, tribal, and federal trustees catalogue the nature and extent of the damage to “natural resources,” defined to include “land, fish, wildlife, biota, air, water, ground water, drinking water . . . and other such resources . . .” (33 U.S.C. § 2706). The NRDA trustees then estimate the “costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources” for the benefit of the public (43 C.F.R. § 11.38(a)).

The NRDA process may require decades. For example, even in the Exxon Valdez circumstance where the oil was relatively geographically confined, scientific assessments of the spill are ongoing 20 years later. For Deepwater Horizon the quantity, distribution, depth, and geographic reach of oil combined with migratory patterns, ocean

currents, and a dynamic ecosystem creates a complex assessment process. Adding to the difficulty is the apparent lack of baseline data in the Gulf of Mexico, which provides a point of reference to pre-oil spill conditions.

Recognizing that such a long assessment process would have resulted in a protracted time lag between acute response and restoration, exactly one year and a day following the Deepwater Horizon blowout, federal and state NRDA trustees and British Petroleum (BP) announced they had reached a historic and unprecedented agreement to begin up front restoration. On April 21, 2011, under the “Framework for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill,” BP agreed to commit up to \$1 billion to fund early NRDA restoration projects in the Gulf Coast region.

### **Early Restoration: A New Tool?**

The framework agreement provided each of the seven trustees overseeing restoration of the Gulf Coast with \$100 million with the remaining \$300 million to fund additional state-sponsored projects selected by the Department of the Interior (DOI) and the National Oceanic and Atmospheric Administration (NOAA). The Trustee Council was initially comprised of representative from the five Gulf Coast states (Florida, Alabama, Mississippi, Louisiana, and Texas), DOI, and NOAA. On September 10, 2012, President Obama added the U.S. Environmental Protection Agency and the U.S. Department of Agriculture as advisors to the Trustee Council (Exec. Order No. 13,626, 76 Fed. Reg. 56,749 (Sept. 10, 2012)).

The framework agreement is significant for a number of reasons. Most notably, the agreement marks the first time a PRP has made such a significant up front investment for restoration. NRDA regulations permit the trustees to conduct emergency restoration actions to mitigate the acute impacts of an incident prior to completing the full damage assessment, provided certain conditions are met (15 C.F.R. 990.26). In the case of the

Deepwater Horizon, the trustees and BP both recognized that the magnitude of the spill and the rich ecosystems of the Gulf Coast required significant and expedited up-front restoration. The framework agreement was negotiated pursuant to the NRDA regulations as an emergency restoration action. While the regulations provide general guidelines on how emergency restoration actions should be identified and implemented, a great deal of discretion is given to the trustees on how to carry out restoration. For that reason, the structure of the framework agreement is unique.

While the framework agreement complements existing NRDA regulations, it reads more like a five-page, one-billion dollar contract between BP and the trustees than a proscriptive, structured restoration plan. The agreement seeks to “commence implementation of early restoration projects that will provide meaningful benefits to accelerate restoration in the Gulf as quickly as practicable” (Early Framework Agreement, p.1). Under the agreement, the trustees, BP, and the public can propose projects. In January of 2014, 942 projects had been submitted for consideration. BP reserves the right to ultimately agree to or veto each proposed project. The condition that BP must approve each project is unique to the framework agreement. In a traditional NRDA case, trustees propose a full restoration plan to PRPs and generally a settlement is reached, rather than the project-by-project approach adopted for Deepwater Horizon early restoration. Under the project-by-project approach, BP has the ability to evaluate and negotiate the offsets and public perception of each project. Perhaps most important to Gulf Coast recovery, the framework agreement embraces and encourages cooperation between BP and trustees at the outset of the incident.

On April 18, 2012, the first phase of projects under the framework agreement was announced. In the first phase, the trustees proposed \$62 million worth of restoration projects focused on marsh creation, oyster restoration, artificial reef placement, and human use projects. A second, much smaller phase of projects totaling \$9 million was announced on

December 21, 2012. These projects focused on bird and turtle habitats in Florida, Alabama, and Mississippi. Finally, in May of 2013 the trustees agreed to fund \$627 million worth of projects, with \$318 million dedicated to barrier island restoration along Louisiana's heavily oiled coastline.

Projects proposed under the framework agreement must be consistent with section 1006 of the Oil Pollution Act and NRDA regulations at 15 C.F.R. §§ 990. The agreement imposes an obligation to make the environment and the public whole in relation to natural resources or services injured as a result of the spill, and to compensate for interim losses resulting from the incident. The projects must have a nexus to damages related to the spill, be consistent with the anticipated long-term restoration plan, and carry a reasonable price tag.

### **Baseline Data**

The Deepwater Horizon NRDA is one of the most widely studied, complex, and well-funded environmental restoration processes undertaken to date. One of the greatest challenges for the trustees is developing the scientific baseline to which injured natural resources must be restored. This scientific question has significant legal and financial implications and is central to achieving full restoration. Adding to the complexity are changes made to the Gulf Coast environment by humans long before the Deepwater Horizon disaster occurred. Coastal Louisiana is at the confluence of subsidence, sea-level rise, a flood risk reduction system that starves coastal and riverine wetlands of nutrients and freshwater, and management of the Mississippi River in a way that shunts sediment off the coastal shelf rather than into the natural delta. The U.S. Geological Survey estimates that Louisiana has lost 1900 square miles of coastal land since 1930. Deepwater Horizon NRDA scientists are faced with distinguishing marsh loss due to oiling from that due to other processes; whether oil compounded the erosion; and if so, by how much. Land is not the only complexity: fish and wildlife move, and predators eat prey. It will be a challenge to determine the multifaceted and interconnected

impacts to migration patterns, breeding, and the food web. The Gulf Coast is a complex, dynamic, and rich ecosystem. Developing a baseline condition for the hundreds of species, and thousands of miles of coastline, wetlands, and blue water is an extraordinary task.

NRDA scientists are not without allies in this enormous task: BP has provided both funding and agreed to cooperative assessments. Aside from the hundreds of millions of dollars pledged by the company to fund long-term research, BP recently announced plans to make all of its scientific data on the disaster public. While the data dump may seem overwhelming at first (there are at least 2.3 million water column samples) cooperative agreements developed up front by BP and the trustees reduced duplicative sampling. By providing up-front funding and sharing data sets for analysis, cooperative assessments and studies can reduce interim natural resource losses, assessment costs, and legal costs.

### **Additional Considerations**

Several of the early restoration projects announced thus far compensate for the loss of human use of natural resources. This may be in part due to the continued litigation regarding the extent of BP's liability for natural resources damages. The evidence required to justify to the public the selection of ecosystem restoration projects is likely to be integral to the ongoing case.

The variety of projects to restore public use of natural resources may be a result of public or political pressure on trustees from impacted communities. Restoring ecosystem function will often take longer than building a boat ramp, for example, and Gulf Coast residents are anxious to see tangible progress.

It may also simply take longer to complete the assessment of impacts to the resources themselves. For example, the impact of fishery closures directly due to the spill was relatively quickly quantified—but the long-term impact on fish reproduction is necessarily a longer process. As a result, studies to

determine the fate of the oil and the long-term impact to natural resources are ongoing.

While *Exxon* was settled on Clean Water Act claims, the United States and the state of Alaska included a “reopener” clause in the event future environmental damage was discovered. The governments have been unsuccessful in their attempts to use the clause to address lingering oil. (*United States v. Exxon Corp.*, No. 3:91-CV-0082, 41 ELR 20046 (D. Alaska Feb. 15, 2012)). The experience in *Exxon* may influence trustees to try to gather as much information as possible to ensure a settlement contemplates potential future harm. The cooperative assessment process will be an asset in that sense. Agency-PRP cooperation, especially in the form of cooperative assessments, is an emerging trend in the NRDA field. Such arrangements may symbolize a turning point in how future NRDA are handled. The billion-dollar question will be whether future PRPs follow in BP’s footsteps as cooperative participants up front.

## Conclusion

The Gulf Coast is an incredibly rich and diverse ecosystem. Natural resources are the cornerstone of the region’s economy. Wildlife tourism supports 2.6

million jobs and generates over \$19 billion in annual spending. In 2009 the region provided more than 90 percent of the nation’s offshore oil and natural gas production, 33 percent of the nation’s seafood, and 13 of the top 20 ports by tonnage. The Deepwater Horizon oil spill damaged both the Gulf Coast economy and its rich environment. The trustees responsible for restoring this critical and fragile ecosystem have a difficult task ahead. But with commitment and cooperation on the part of BP and the trustees, and with innovative restoration tools such as the early framework agreement, there is hope the Gulf will recover.

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## UNDERSTANDING THE LIMITATIONS OF TECHNICAL EVIDENCE

Kirk T. O'Reilly

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Whether assessing risk, determining damages, apportioning liability, or allocating costs, decisions made under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are often based on the results of technical investigations. Such results include both quantitative measurements, such as the concentration in a particular sample, and more subjective findings concerning past actions or future risks. Due to the interdisciplinary nature of environmental science, understanding the intricacies of the methodologies and assumptions underlying claims and conclusions made in remedial investigations, feasibility studies, or natural resource damages assessments can be a challenge to trained engineers and scientists. The task of evaluating technical evidence is even more difficult for attorneys, decision makers, and local citizens involved in the Superfund process.

While not focused on CERCLA or even environmental science, a recently published commentary (503 NATURE 335 (2013)) presents 20 tips for interpreting scientific claims. As noted by the authors Sutherland, Spiegelhalter, and Burgman, their goal is to help the non-scientist interrogate technical advisors and to grasp the limitations of science-based evidence. Realizing that sufficient training for all parties using technical information is impossible, the commentary provides tips for improving “interpretive scientific skills.”

Although not unique, technical issues associated with Superfund raise challenges because decisions have to be made in the face of significant uncertainty. Whether determining if a release resulted in an impact to sediment with a complex chemical baseline or predicting the risk of small exposures to a compound over many years, the inherent variability can greatly exceed detectable effects. While review of Sutherland et al.'s commentary is recommended for all environmental practitioners, these five points are of particular

relevance to the evaluations of technical evidence at complex CERCLA sites.

- No measurement is exact. Laboratory variability, and more importantly the heterogeneous distribution of chemicals, impacts conclusions about the nature and extent of contamination. This can be a particular problem when trying to reach risk-based treatment goals that are near either background or analytical detection limits.
- Bias is rife. Ignoring the potential bias of parties involved, experimental design can bias study results in unanticipated ways. For example, the selection of sample locations will influence the evaluation of average concentrations or contaminant distribution.
- Correlation does not imply causation. Setting a lower bar than the courtroom, the peer-reviewed literature is full of examples with insufficient evidence to support claims of causation. The problem is often worse at Superfund sites where parties assume sediment contamination is the cause of measured fish tissue concentrations, and then use food web models to find a correlation.
- Extrapolating beyond the data is risky. Whether assessing risks or predicting the long-term efficacy of a remedial alternative, critical decisions are often made based on the results of models that conduct just such extrapolations.
- Dependencies change the risks. Risk assessment is a mix of science and policy. Results depend as much on policy-driven assumptions as on toxicological or chemical data. While often cited as a unit less value, it is important to remember the calculated risk is specific to a receptor exposed under the assumptions used in the assessment. While the influence of some assumptions, such as the fish consumption rate of the local population, is easy to understand, other assumptions such as the role of trophic level transfers in food webs, are more difficult to consider.

When reviewing technical evidence or communicating with experts, it is important to differentiate between what are measurements, findings, hypotheses, or opinions. Many of the findings that serve as the basis for major decisions at CERCLA sites, such as calculated health risks or predicted recovery rates, are only the results of complex models that incorporate many untested assumptions. While useful, these models do not identify facts about a site, and the value of the output ultimately depends on the validity of the assumptions. Uncertainty cannot be eliminated at complex sites, but it should not be ignored. As with any evidence, there is often more to the story than originally meets the eye.

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## 2014 CALL FOR NOMINATIONS

### THE SECTION INVITES NOMINATIONS FOR THE FOLLOWING AWARDS:

#### **Environment, Energy, and Resources Dedication to Diversity and Justice Award**

Recognizes people, entities, or organizations that have made significant accomplishments or demonstrated recognized leadership in the areas of environmental justice and/or a commitment to gender, racial, and ethnic diversity in the environment, energy, and natural resources legal area.

#### **ABA Award for Distinguished Achievement in Environmental Law and Policy**

Recognizes individuals and organizations who have distinguished themselves in environmental law and policy, contributing significant leadership in improving the substance, process or understanding of environmental protection and sustainable development.

#### **Environment, Energy, and Resources Government Attorney of the Year Award**

Recognizes exceptional achievement by federal, state, tribal, or local government attorneys who have worked or are working in the field of environment, energy, or natural resources law and are esteemed by their peers and viewed as having consistently achieved distinction in an exemplary way.

#### **Law Student Environment, Energy, and Resources Program of the Year Award**

Recognition of the best student-organized educational program or public service project of the year addressing on issues in the field of environmental, energy, or natural resources law. The program or project must have occurred during the 2013 calendar year.

#### **State or Local Bar Environment, Energy, and Resources Program of the Year Award**

Recognition of the best CLE program or public service project of the year focused on issues in the field of environmental, energy, or natural resources law. The program or project must have occurred during the 2013 calendar year.

#### ***Nomination deadlines: May 5, 2014.***

These Awards will be presented at the ABA Annual Meeting in Boston in August 2014.

**For more information:**  
[www.ambar.org/EnvironAwards](http://www.ambar.org/EnvironAwards)