Environmental Mitigation in Mining: Unique Challenges and Opportunities

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Big mining projects offer big opportunities. Rather than being viewed as a threat to the environment, mining projects (which must occur where the ore is found) offer many options for environmental enhancements. Existing mitigation approaches can miss that chance, even though there is sufficient discretion and flexibility in the applicable law to get good results for the ecosystem, both in terms of watershed and habitat.

A large surface or open pit mine shares little in common with the development of an office park, roadway, or golf course. But wetland and stream impacts from surface mining are subject to the same federal permitting and approval processes as typical development projects (in addition to other unique requirements, such as regulation under the Surface Mining Control and Reclamation Act for coal mining operations). Various federal and state permitting and approval programs involve environmental review and mitigation requirements in some form. In particular, permit applicants are obligated under federal programs to mitigate impacts to wetlands and streams under the Clean Water Act (CWA) and federally listed species and habitat under the Endangered Species Act (ESA). Mitigation for wetlands and streams impacts includes a stepwise sequence: avoid, minimize, and then compensate for unavoidable impacts. As well, a similar policy that emphasizes avoidance is used for the protection of endangered and threatened species. However, this mitigation sequence does not fit particularly well with mining because there is tension between the regulatory preference for avoidance and minimization and the fact that mining must occur where the minerals are found.

Traditional Mitigation Sequence

Mining operations frequently involve the discharge of dredged or fill materials into wetlands or streams within the CWA's jurisdiction and therefore require a permit from the Army Corps of Engineers (Corps) under CWA § 404. 33 U.S.C. § 1344. For surface mining permit applicants, the task is to formulate a plan to maximize the recovery of minable resources while minimizing adverse impacts to environmental resources to a level that is acceptable to regulators and, ideally, to local and environmental groups. Striking the correct balance between these competing interests is possible, but it is complicated by a regulatory program that is difficult to apply in the mining context.

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Recent developments in CWA mitigation requirements and preferences push in somewhat contradictory directions. First, increased emphasis on mitigation in the seventies and early eighties was driven, in part, by the recognition that the CWA § 404 program was not effectively slowing the rate of loss of wetlands. The present policy approach to mitigating impacts to wetlands can be traced in large measure to President George H.W. Bush's decision in 1988 to adopt the "no net loss" policy recommended by the National Wetlands Policy Forum. To implement this policy, the Corps and EPA entered into a Memorandum of Agreement in 1990 (MOA), which set joint policy for applying the mitigation requirements of the Section 404(b)(1) Guidelines. MOA, Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines (Feb. 6, 1990).

Most significantly, the MOA firmly established the now standard hierarchy for acceptable mitigation practices, or "mitigation sequence," in the wetlands program: avoid, minimize, and compensate—in that order. The "avoidance" element of the sequence was embodied in the preexisting Section 404(b)(1) Guidelines, 40 C.F.R. Part 230, which require an applicant to avoid any adverse impact to waters if there is a "practicable alternative" to doing so. There is a rebuttable presumption that practicable alternatives exist for "non-water dependent activities"—a categorization that generally includes mining. 40 C.F.R. § 230.10(a)(3). ("Water dependent activities" are activities for which the use of surface water would be essential to fulfill a basic purpose of the proposed project, such as port construction or channel dredging. Just because an activity cannot occur without impacts to waters, such as mining ore beneath wetlands or streams, does not make it a "water-dependent activity.") Second, steps must be taken to minimize impacts. In the mining context this often includes implementing best management practices such as buffers or other systems to avoid silt runoff into wetlands and reduce impacts to stream banks used for temporary mining equipment crossings. Lastly, for any adverse impacts that cannot be avoided, the permittee must provide compensation. Even though the no net loss policy does not require no net loss in every permit, in practice unavoidable impacts to wetland functions must be replaced on at least a one to one ratio (and often times at a much higher ratio).

The agencies with primary jurisdiction over the ESA, Fish and Wildlife Service (FWS) and National Marine Fisheries Service, are authorized by CWA § 404(q) to comment on any § 404 permit application and, under an agreement with the Corps, these agencies can elevate individual permit decisions for further review if the proposed action may impact an aquatic resource of national importance. Memorandum of Agreement Between the Department of the Interior and the Department

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of the Army (Dec. 18, 1992). Furthermore, the Corps is required to consult with the relevant Service if the proposed action may affect a federally listed threatened or endangered species or its designated critical habitat. Where the consultation obligation is triggered, an applicant's protection from being in violation of the ESA generally will be conditioned on following habitat – or species-specific minimization and conservation measures recommended by the Service and incorporated into the § 404 permit.

Shift in Focus to Watershed and Eco-Region Enhancement

More recently, ecological science has advised that compensatory mitigation should serve the needs of ecological units. In 2001, the National Research Council (NRC) published a detailed critical analysis of how the Corps and EPA were incorporating compensatory mitigation into projects with unavoidable impacts to wetlands. Nat'l Research Council, *Compensating for Wetland Losses under the Clean Water Act* (2001). The NRC concluded that the goal of the no net loss policy was not being achieved. They found multiple problems, including an inconsistent application of policies, lack of oversight and enforcement, and a poor record of permittees following through on their permit obligations. The NRC also concluded that compensatory mitigation options that were carried out by third parties, such as a permittee paying in-lieu fees or purchasing credits in mitigation banks, had advantages over compensatory mitigation measures that were implemented solely by the permittee, such as onsite restoration undertaken by the permittee. Among the NRC's recommendations was the implementation of a "watershed approach" to mitigation. This approach demands that compensatory mitigation requirements be designed to best serve the functional needs of the watershed in which the impacts will occur, rather than just ensure accumulation of sufficient acreage to satisfy compensatory mitigation ratios and mathematically offset impacts.

In 2003, Congress directed the Corps to promulgate regulations setting "performance standards and criteria" for compensatory mitigation. Nat'l Def. Auth. Act for Fiscal Year 2004, § 314, Pub. L. 108-136. The Corps' final Compensatory Mitigation Rule was issued five years later, jointly with EPA, and it closely tracks the NRC's recommendations. 74 Fed. Reg. 19594 (Apr. 10, 2008) (codified in various sections of 33 C.F.R. Parts 325, 332 and 40 C.F.R. Part 230). The rule reemphasizes that the mitigation sequence—avoid, minimize, compensate—is controlling, but most importantly it sets a preferential hierarchy for various forms of compensatory mitigation. Under the Compensatory Mitigation Rule, mitigation bank credits, if available, are to be preferred, followed by credits offered by in-lieu fee programs. The least favored approach is permittee responsible mitigation (onsite or offsite). However, the Corps has discretion to deviate from this hierarchy when appropriate. Lastly, the rule codified the regional watershed approach supported by scientists and many local, state, and federal agencies, stating that the "ultimate goal . . . is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites." *Id.* at 19674 (codified at 33 C.F.R. § 332.2(c)).

Mitigation before and after the 2008 regulations emphasizes onsite avoidance and minimization of environmental impacts, often without regard to the condition of onsite wetlands or their landscape position in relation to planned activities. The reality is that onsite avoidance may not contribute much to the overall functioning of a watershed or eco-region. At the same time, the regulations recognize that emerging science and policy indicate that a watershed or regional approach to mitigation is the best approach—indeed, the Corps is required to apply a watershed approach whenever practicable. When it comes to surface mining, however, these two approaches to mitigation can be in conflict.

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Unique Mitigation Concerns in the Mining Context

The tension between avoiding wetlands and restructuring operations with the result of more impacts to non-wetlands is not new. For many minable resources such as uranium, phosphate, and rare earth elements, there are only a limited number of known reserves that can be commercially exploited. For some vital materials, such as phosphate used in fertilizer, there are no substitutes for mined resources. Depending on their depth and other factors, surface mining in the form of strip mining, open-pit mining, dredging, or mountaintop removal may be the only economically viable method of extraction for many resources. If the demand for these resources is to be met, mines must be constructed at the largely inflexible locations where the resources can be accessed.

Because it is generally not possible to avoid or minimize impacts to resources above ore bodies, there is extreme pressure to avoid and minimize impacts when siting support facilities. This can come at a very high cost and pose environmental risks of its own. For example, the material excavated from above the ore (known as overburden) is stored in an overburden storage area (OSA). It stands to reason that the more contiguous area an OSA covers, the greater its capacity. However, breaking up an OSA to avoid a small amount of wetlands or stream results in the need for many more OSAs covering more surface area, oftentimes at a substantially greater distance from the active mining area. This may preserve isolated resource areas (some of which may have been previously disturbed), but it is often at the expense of expanding the footprint of the mining operations and greatly

increasing operational costs in exchange for this limited avoidance of small, isolated areas.

In addition, the hierarchy of mitigation banks and in-lieu fee programs in the Compensatory Mitigation Rule may not make best use of the opportunity presented by mining projects. Although mining typically involves disturbing large land tracts, it is a temporary activity and disturbed areas must be reclaimed. As areas are reclaimed, compensatory mitigation efforts on site can commence. Sometimes there are opportunities to reclaim and restore areas while mining migrates through the site from one pit or location to another. The temporary and sequential nature of these impacts allows for greater flexibility in addressing environmental impacts than may be available for permanent projects like housing developments or infrastructure. Importantly, it also facilitates close oversight of mitigation efforts by the Corps and state regulators while the site is still active, which can help ensure that mitigation requirements are being fulfilled in accordance with the operator's permits. Thus, mining presents opportunities for onsite (as well as offsite) mitigation that may differ from other activities.

The Opportunity That Mining Presents

Fortunately, the Corps and EPA have built sufficient flexibility into the § 404 program to allow for creative mitigation plans that deviate from the preferences outlined in the mitigation sequence and Compensatory Mitigation Rule. When considering mitigation for mining, it is important to keep in mind that the policy and scientific underpinning of CWA mitigation is to improve water quality through a regional watershed approach. Mining projects, by virtue of size alone, can provide good opportunities for implementation of watershed and eco-regional planning concepts, both with onsite restoration (as part of reclamation) and with offsite compensatory mitigation.

One of the most commonly cited negative aspects of surface mining—large areas of ground disturbance—provides both a challenge and a unique opportunity by offering mitigation of a magnitude that, when carefully planned, can benefit watersheds and eco-regions in a remarkable way. Surface mining generally involves modification of the landscape within the mine's footprint, subject to applicable reclamation requirements after mining, on a scale that is comparable to very few other forms of human activity. Most surface mines cover hundreds or even thousands of acres that not only can be reclaimed at a highly functional level due to contemporary knowledge and technology but that lead to creation, restoration, enhancement, and preservation of offsite resources of an even greater magnitude (due to the compensatory mitigation ratios required). An inescapable fact of surface mining is that the larger the mine, the more mitigation will be required. This affords an opportunity to provide real benefits to a regional watershed.

While proposed mining projects often meet with opposition, better results generally are reached through cooperation between permit applicants, agencies, and local environmental groups. State and local regional planning efforts have long identified primary regional environmental stressors as well as priorities for efforts to address the stressors. This includes identification of priority lands for conservation, degraded wetlands in need of rehabilitation, invasive species slated for eradication, beneficial habitat corridors and greenways, as well as other measures. Large mining projects provide a chance to advance these regional or watershed goals by forming partnerships among permitting authorities, permit applicants, interested third parties (e.g., local landowners and NGOs), and other relevant federal and state agencies.

Mitigation efforts for sensitive species should follow the same regional approach. With sensitive species, mining companies can become valuable partners in developing and advancing conservation goals. It is beneficial for mine applicants to engage the FWS and state species regulators early in the process with the goal of formulating comprehensive plans that may provide benefits as both wetlands and species mitigation. For example, conserved and reclaimed land protected under conservation easements can be ideal refuges for sustainable populations of sensitive species relocated from mine sites or other locations lacking adequate protection. Conservation and land-trust organizations often have region-wide plans with "wish lists" of sensitive habitat areas to preserve if the funding were to become available. Partnerships between mining companies and these organizations can be mutually beneficial because they can facilitate the identification and protection of offsite mitigation areas that provide both species and wetlands conservation benefits. Similarly, when developing plans for onsite avoidance of high-value wetlands and streams, it is prudent to prioritize those with the highest value as habitat for sensitive species such as wildlife corridors. Well-planned integration of water resource and species/habitat mitigation provides watershed and eco-region benefits that are greater than the sum of their parts.

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Demanding onsite avoidance and minimization of wetland resources and habitat but leaving mineral resources stranded and unrecovered would have many adverse consequences. There are great long-term costs to society from poor stewardship of mining resources that may be overlooked. Valuable minerals should be efficiently extracted, not left in the ground. This is why federal coal leases contain the MRE clause, requiring maximum economic recovery of the coal by the lessee. In addition, compared with well-planned

watershed and eco-region based mitigation, onsite avoidance and minimization may offer fewer ecological benefits to the relevant ecological units, especially where mining operations are planned for lands that have been previously disturbed by agriculture, silviculture, or even past mining activities. Wetlands, streams, and upland habitats on such lands often have significantly reduced functions to begin with. Advances in mitigation technology and practice, such as GPS-guided earthmoving equipment and improved stream designs, simplify and encourage creation of higher functioning habits than were possible only a decade ago, even where mine operators may not receive full credit for such value-added reclamation.

Mitigation in mining does not have to be a zero sum game of trading avoidance for ore. Using the CWA mitigation regulations with an eye on the goal—improved watersheds and regional habitat—regulators and applicants can focus on what is most important: providing maximum environmental benefits on a broader scale. In short, the apparent conflict between the mitigation sequence and the watershed approach to mitigation can be resolved for the benefit of the environment *and* mining of natural resources.