

The Public & Regulator's Image of Mining: An Ecologist's Perspective^{*†}

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Of all the natural resource industries, mining seems to be the least understood by too many regulators and most of the public. This ignorance results in almost certain opposition to any proposed new mining project or the expansion of an existing one, distrust of permit compliance at active projects, and literally irrational demands during closure and reclamation. I do not use this language carelessly with the intent of demonizing project opponents or putting them down. During this talk, I will demonstrate why I take such a strong view.

There are a number of reasons for this lack of understanding. These reasons include the inadequate science education programs in our nation's schools over many decades, mining's invisibility in daily life, and our industry losing badly to our major competitor. I will explain the meaning and importance of the last two factors when I present some potential solutions later in this talk. What I want to focus on today is the unfortunate mis-conception held by regulators and the public on the science governing what we see in the natural world. As an ecologist, I see the effects this has on the industry and society in general.

The three most important factors that I believe are responsible for anti-mining sentiments are:

1. Believing natural systems are static rather than dynamic.
2. Believing that natural systems can be restored, because man-made objects can be restored.
3. Believing that there is such a thing as a free lunch.

The Real World is Always Changing

Listening to project objectors, you would think that nothing changes in nature. According to them, mining causes irreparable change that is, by definition,

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harmful to the local ecosystems. They express their static view of the natural world by demanding that surface mines be filled in to original contours, that vegetation on the reclaimed area be that of pre-European settlement, or requesting pre- and post-dredging cross-sectional surveys of large rivers to ensure that the huge "hole" does not cause the banks to collapse. This is all based on a static view of nature, and I have no idea from where this comes, unless it is the inadequate emphasis on the natural sciences in our educational system.

Why people think the natural world is unchanging when it comes to mining boggles the mind. Most people are aware of the May 18, 1980 eruption of Mt. St. Helens in southwestern Washington, the massive fires in Yellowstone National Park in 1988, earthquakes, mud slides, and other natural phenomena that alter the shape and structure of the landscape. Similarly, many people think that closed-canopy, "old-growth" forests are the epitome of natural processes rather than a single stage in a continually-changing cycle of vegetation, and one which is a biological desert underneath the closed canopy. Yet, when human activities alter the landscape—as we do while we are mining—the alteration is considered harmful, and not just a change that would naturally repair itself even without explicit reclamation activities.

I better put in a disclaimer here: I am referring to natural resource extraction activities of the present and recent past (about the last 50 years), not the hydraulic mining in northern California or the logging practices of clogging rivers and streams with logs, then blasting them free during the winter rains so they would flush down river to the mills, scouring the stream channels as they went. These activities took place under completely different conditions of knowledge about natural world processes, the limits of resources, and increasing population size. They are no more representative of the modern mining industry than are blood-letting and enemas representative of modern Western medicine.

When Mt. St. Helens erupted it wiped out many square miles of vegetation on the north side, filled in river valleys, and put millions of cubic yards of volcanic ash in the Columbia River system and out into the Pacific Ocean. Salmon that had left their natal streams like the Tootle River three- to five-years earlier returned to find that "home" was no more. However, the eruption did not wipe out all the salmon populations in the region for these fish went into other tributaries to spawn and die. Anadromous salmon have the potential to reproduce only once per generation, so they must have a great amount of genetic adaptability or the various species would not have survived tens-of-thousands of years.

Grass and forest fires are part of the dynamics of natural ecosystems, and the plants and animals are highly adapted to them. Without periodic grass fires ignited by lightning, woods and forests would have grown over the open grasslands. Lodgepole pine tree cones do not open to release their seeds until the cones are heated in a forest fire. The so-called "climax" vegetation stage of closed-canopy forests have all the nutrients bound in living biomass so none is available for new growth. And, with the closed canopy preventing sunlight from reaching the forest floor, there is neither food nor shelter for small mam-

mals or big game. Wind throw and forest fires open these forests and release the bound nutrients. This re-setting of the successional pattern provides increased habitats for animals and greater variety in the plant species present. Doesn't this remind you of clear-cut logging's results?

The world is always changing. That is one reason why I need to mow my lawn on a regular basis throughout the year. But, when it comes to a mining project, change in the landscape is presented as a catastrophe that should never be allowed. This makes no sense at all. At the worst, a mine will reset the successional cycle of vegetation or change the landscape from open range to a lake. The only scale used to determine that one landscape is "good" and another is "bad" (or "better" and "worse") is the scale of human values. From the ecological perspective of the structure and function of natural ecosystems, the one landscape is different from the other landscape, but they both work, even if they follow different paths of change.

Why "Restoration" Cannot be Applied to the Natural World

You may think that I am just being overly fussy when I tell you that we cannot restore ecosystems, mine sites, or any other biological or ecological entity. After all, there is the Society for Ecological Restoration, a branch of environmental science called Restoration Ecology, and so on. However, I hope to convince you that being fussy about the exact meaning of words - and how they are applied or mis-applied - is very important in how the public perceives mining.

From Webster's Revised Unabridged Dictionary (1913) :

Restoration \Res'to*ra'tion\ (r?s't?*r?"sh?n), n. [OE. restauracion, F. restauration, fr. L. restauratio. See Restore.] 1. The act of restoring or bringing back to a former place, station, or condition; the fact of being restored; renewal; re[e]stablishment; as, the restoration of friendship between enemies; the restoration of peace after war.

The key part of the definition is "bringing back to a former place, station or condition"¹. We can no more do this with landscapes such as mine sites than we can to ourselves. All of us have changed over the past 20 years, and I believe that most of us would pay dearly for the ability to be "restored" to that condition. Well, come to think of it, there is the plastic surgery industry selling just this idea with cosmetic surgery. But, seriously, we just finished considering that all natural systems are dynamic, not static. They are constantly changing, whether or not humans are the active agents of change. Because of the constant change in natural systems and landscapes, it is impossible to "restore" them in the sense of the dictionary definition.

¹While a person's health can be restored after injury or illness, the definition of ecosystem health is so much more subjective that it cannot be practically defined.

We can, however, reclaim lands and put them to a determined beneficial use after we are done mining. But, there is no greater value in trying to return a mined-out site to the precise condition of the land before mining began than there is in trying to return Mt. St. Helens or Yellowstone National Park to their prior conditions.

This demand for restoration of a site when mining has been completed comes up in public comments and regulatory agency requirements for reclamation bond release.

At a county commissioners' hearing on the highly controversial expansion of a hard-rock quarry just outside Portland, Oregon, an opponent stood up and demanded that the operator agree to restore the quarry site to "pre-European settlement" conditions. After conferring with my client, I stood up at the microphone and told the Commissioners that we agreed to the demand. On one condition: that we had to be given a complete and accurate description of the soil chemistry, vegetation composition, and climate at that time. I explained that other than the climate (over which no one had any control), we could certainly try to restore the site, but we needed highly detailed information so we knew for what we were aiming, and we could measure our progress toward achieving that goal. The demand was dropped.

The most frequent appearance of the demand to restore a mine site is the reclamation bond release process. Many regulatory agencies base their bond release criteria on the comparison of the revegetated site with a reference area. There are, however, several potential problems with this idea.

First, the disturbed lands might have been over-grazed for decades before the mine went in, so the reference areas are either of very low value for wildlife and cattle, or they could not support animal grazing at all. Is this really the desired end condition of the "restored" mine lands? It is often easier to revegetate the lands with a succession of plant species that offer higher wildlife and cattle food values than do the surrounding reference areas.

Second, the reference areas have taken many years to reach the vegetative community growing there. Regardless of whether the reclamation is in a semi-desert or the soggy Northwest, it can take a comparatively long time to match vegetation newly planted on disturbed soils with that on undisturbed areas.

Third, even natural events such as a forest fire can result in a new vegetative community that looks nothing like the area that burned. It might be decades before the species mix returns to pre-burn conditions. Or, if the area has been sufficiently disturbed by the fire and other natural phenomena, the new vegetation mix may go into a different successional direction and produce permanent changes in the species present. Different, yes; better or worse, no.

So the concept of restoration is really the incorrect standard to apply to a mine site. But, because mining companies object to restoration standards (as compared to reclamation standards), less knowledgeable regulators and many in the public think that we are trying to avoid doing "the right thing". As long as the word "restoration" is applied to any mining-related activity, we will have a difficult time getting everyone to think objectively and scientifically about the results.

The Mythical Free Lunch

From a scientific viewpoint, this is the most difficult mis-conception of mining to overcome. As an industry, we have done such a good job of cleaning up after ourselves when we have mined out a site that no one notices. And, as I mentioned at the beginning of this talk, mining is invisible to almost everyone in the general population.

People drive past crop land and they know their food is being grown there. Everyone recognizes cattle on the open range or in a feed lot. And you cannot drive past a hog farm without being aware of it. Except for some residents of New York City who did not know that chickens are birds, according to a New York Times article about 35 years ago, people are aware of the source of their food. The New Yorkers? Well, they told the reporter, everyone knows that birds have feathers, but chicken don't have feathers. They are naked on their trays and wrapped in clear plastic.

People drive past a clear cut, or a pulp and paper mill and they know where their furniture, lumber and paper comes from. It is quite easy to recognize a tree farm from a stand of mixed species of various ages. Power plants (nuclear, coal, hydroelectric) are very visible, as are the electricity transmission lines that run across the country. Most people understand that these structures are the reason there is electricity waiting at the outlets in their houses.

But, virtually no one is aware that the minerals he uses every day—demands, in fact—start life as a rock in the ground. Most mines are either located well off the beaten track, or they are mandated to be visually screened from public view. There are no regulations to require visual screening of crop or grazing land, or timber harvest sites, but mines must be kept hidden from public view. Because people do not constantly make the connection between the minerals they use every day and a mine, they take the minerals for granted. They do not understand the concepts of “minerals” or “mining”. Therefore, they are easily lead to believe the message of the FUD (that is Fear, Uncertainty and Doubt) industry that all mining is a terribly nasty activity that must be either totally stopped, or shoved off-shore to some poor, uncaring, third-world country. I guess this is part of their efforts to “Save the Earth”.

Not only are active mines hidden from view by distance or screening berms and vegetation, but they literally disappear from view when they are reclaimed. All of us, inside the industry and outside the industry, regularly drive (or walk) past a reclaimed mine site and we are totally unaware of the site's history. About three miles from where I live is a K-Mart, built on a reclaimed gravel pit. The Sleeper Mine in northern Nevada will eventually be a recreational lake that also provides a wildlife water resource that did not exist there before. A surface coal mine in northern Mexico is going to be reclaimed as a golf course. It is no wonder the public thinks mines are only destructive of the landscape when they literally cannot see a reclaimed, former mine.

About three years ago, the newspapers in Oregon's Willamette Valley (where 90 percent of the state's population resides) were praising the fact that Oregon's economic base had passed from natural resource extraction to high tech – the

computer industry. Now this puzzled me, for I cannot think of a single component of a computer (chips, boards, cases, monitor screen, wire) that is not a mineral. The telephone system, fax capabilities, cell phones and the Internet are all completely dependent on mined minerals. Other than the bills from the providers, no product of the high-tech industry is grown. I think this is the perfect illustration of how invisible mining is, and how we are mis-perceived by the public.

Of course, mining is not the only industry saddled with the perception that we can have the standard of living we do without paying for it. But, even some regulators seem to think that mining must, by definition, cause irreparable harm to species and their habitats. I wonder what they think happens to their jobs as mining regulators (directly or indirectly) if mining went away.

But, because people do not see the connection between their toothpaste, baking soda, automobiles (or bicycles), jobs and the mining of minerals, they are prepared to believe the worst about the industry. There re, of course, both direct and indirect costs we pay for the necessities and the luxuries in our lives.

Possible Solutions to the Problems

The industry as a whole is doing a lot of good toward making these issues go away. What I believe is needed is to extend a lot of these individual efforts nationwide and across all sectors of the industry.

Many states have established excellent educational programs aimed at the K-12 school population. The Mineral Information Institute in Golden, CO, is a wonderful resource for companies and associations wanting to establish an education outreach program. More importantly, the MII web site has reclamation stories available—with photographs—that you can use and use as models for preparing your own stories. (Planning to produce a reclamation success story should start when the mine is being planned. Or, at least during the operational phase.)

In my experience, it is not that difficult to get people to acknowledge that natural systems are highly dynamic. Point out examples with which everyone is familiar: having to mow the lawn frequently, flooding rivers, sliding hill-sides, grass or forest fires, volcanic eruptions. We tend to take the dynamic aspects of nature for granted and we have no particular reason to think about it (unless, of course, we are ecologists working for the natural resource industries). It is not difficult for those with an anti-mining agenda to promote the idea that mining causes change that are devastating and permanent.

To effectively explain that mine sites can be reclaimed into productive lands, I suggest that every mining company start preparing a reclamation success story. This is the most effective, indeed the most powerful, way to communicate to regulators and the public how modern mining works. These success stories will provide the bases for press releases, television coverage, informational packets for your state and federal legislators, and inducement to potential investors. How better to convince skeptical regulators, investors and local

residents that you are a responsible mining company than by showing them what you have done with previous projects?

Presenting award-winning reclamation stories can be used to remove the idea that a mine site should be “restored” to the pre-mining conditions. Perhaps the most convincing story comes from British Columbia. As one of their tourism-oriented web sites describes Butchart Gardens:

“View fifty acres of floral finery offering spectacular views as you stroll along meandering paths and expansive lawns. In 1904, the Butchart Gardens began as an effort to beautify a worked-out quarry site on the 130-acre estate of Mr. and Mrs. R.P. Butchart, industrial pioneers in Canada. Their endeavor became a family commitment to horticulture and hospitality spanning more than 90 years and delighting visitors from all over the world.”

Perhaps not every mine and quarry can become a major tourist attraction, but each one can contribute to society’s needs in that area. By presenting examples of successful stories, we can effectively promote understanding of the difference between restoration and reclamation.

The last misconception I presented, that we can get something for nothing, is arguably the most difficult to overcome. The major reason, in my opinion, is that this idea is one of the products of the mining industry’s major competitor: the FUD industry.

The FUD industry produces no goods or services. Instead, it generates fear, uncertainty and doubt about the mining industry and our fellow natural resource industries. In April 2001, Tom Knudson of the Sacramento Bee wrote a five-part series on the FUD industry, but the paper calls it “Environment, Inc.”

This industry is our competitor because it has won the hearts and minds of the public and of politicians, and convinced too many that mining is evil and must be shut down if we are to “save our environment”. The free lunch they try to give away is that all of us can maintain our standard of living, continue to have the food, medicines, and other necessities of life without mined minerals. The alternative story is that we should push mining off-shore and let other countries absorb the environmental impacts of mining on their lands and their economies.

The sad fact is that this idea is supported by the same folks who proudly display the bumper sticker that reads, “Think Globally, Act Locally.” They don’t recognize that we do ourselves no good by pushing our perceived problems out of sight. In fact, if the more extreme environmental community really cared about global environmental conditions, they would insist that as much mining as possible occur in this country.

We have here the most comprehensive environmental laws with which the mining industry complies. We have strict enforcement of these laws by federal, state and local authorities. We have a very highly educated and dedicated mining work force that keeps the industry in compliance. The best way to reduce any actual environmental degradation from mining is by having it occur here where it is readily examined by anyone.

The idea that we can have all the minerals we demand without any cost at all is ready to be retired permanently. One way we can do this effectively is to stop demonizing those who oppose our industry, and we must stop calling them names. What we must do is treat them like a business competitor and develop our own strategies, tactics and plans to out-compete them. We have a powerful message to present. A message that mining exists to fulfill the demands of everyone in society, and that we do it with minimal, temporary disturbance to the environment. When we have finished mining a site, we return it to a secondary productive use and, within a few short years, all signs of the mine are gone except to those who know it was once there.

From my perspective as an ecologist, an active mine site is an opportunity to create a type of environment that would not exist in the area if the mine was never permitted and operated. Lands that have been over-grazed for decades, or that would be paved and lighted for residences and commerce are wildlife refuges, even during operations. The disturbances are temporary and are, from an ecological perspective, nothing more than a resetting of the natural successional processes that landscapes and vegetation undergo all the time. There are no objective measurements in science that allow us to determine that one landform is "better" or "worse" than another. It is part of our job to present this message to the public and to the agencies that regulate our activities.

I hope that you all go on from here with a better understanding of some of the problems we face as an industry, and you have confidence that the tools and techniques to overcome these problems are available to all of us.