Monday, September 26, 2016

Dear Forest Service Comment Reviewers,

I’m writing in response to the current Arizona Minerals Inc (AMI) Hermosa-Taylor Drilling Project proposal for the Patagonia Mountains sector of the Coronado National Forest. I write as a Patagonia resident, citizen, and as an architect with a career focus on sustainable design. I understand that the current proposal is considered “geological exploration” and is prior to any future proposals for opening a mine.

There are many environmentally significant consequences of this proposal, and several issues I feel should be thoroughly addressed in the Federal consideration of Arizona Minerals’ proposal.

1. **Abandoned mines in the area.** The Patagonia Mountains have had had more than a century of on-and-off mining projects, and there are over a hundred abandoned mines in the area, including the Trench Mine and Lead Queen mine. I don’t believe that the full extent and contents of all the past mining in the area are known, so it seems vital to question what might be their interactions of past tunnels, tailings, shafts and water flows with the drilling program? If drilling penetrated an underground tunnel, for example, what interactions of toxic waste with the core samples might occur? What other interactions with past mining might occur -- such as unexpected drainages, or contamination of core samples? Also, what dangers do these past mines create for the movement of equipment and people in the area?
2. **Existing problems with acid mine waste from older mines.** In 2 of the last 3 years, monsoon rain events have caused toxic overflows into surface waterways, and these should be studied in and near the project area. What remediation efforts are underway, and how successful are they?
3. **New waste and wastewater produced by drilling.** All effluent related to drilling should be known and monitored, and if toxic or sediment-laden, prevented from entering waterways. In general, the cumulative effect of all forms of drainage from the site, both on and below ground, needs to be viewed in light of all other activities affecting the watershed.
4. **Fluids used in drilling.** As with fracking, some substances used in drilling might be considered “proprietary,” but that is not an excuse for not disclosing exactly what is being added to the earth at drill-sites. It should be stated exactly what substances will be brought onsite for drilling use -- or otherwise pumped into the ground during drilling -- and why they won’t harm wildlife or get into aquifers. How are these substances stored, and what provisions are proposed to avoid leakage and spills?
5. **Roadway engineering and erosion control.** For the lengths of new and existing roadways used for this project, what measures are taken in their design to prevent sediment-containing runoff from getting into streams, and to prevent runoff in “rain events” from worsening the already difficult road situation for residents, ranchers, Border Patrol, and other longstanding users of the local roads? If road washouts or greater-than-normal flooding occur as a result of the proposed drilling program, how will repairs happen, and who will cover the costs? After the drilling program is completed, who will maintain the newly bullldozed roads, cuts and fills? (I’ll mention remediation below)
6. **Runoff from areas cleared for drilling pads.** Where something like a drill rig, generator, or any significant-sized internal combustion engine operates for a long time, there are likely to be petrochemicals like engine oil, power steering fluid and engine coolant, released onto the ground, and possibly other chemicals used onsite. What are these releases likely to be, and what will be done to prevent their contamination of nearby surface waters or penetration into underground aquifers? What accidents are possible and what measures by the drilling companies would prevent them?
7. **Effects of traffic increases and gates.** What will be the consequences of heavy equipment, drill rigs, drillers and other employees using the county and Forest Service roads to get to and from work at the drill sites? Will extra maintenance be required, and if so, who will provide it? Is Santa Cruz County going to incur extra expenses for road maintenance as a result of this proposal? Does the gating of existing roadways limit any longstanding road uses in the area?
8. **Behavior of company security guards on public roads.** There was a recent incident (10/8/2016) of a mining company security guard inappropriately telling 2 local citizens they could not stop and look around, on Harshaw Road, and this is a clear intrusion on normal, common and permitted citizen use of the area. It’s not specifically an ecological impact of mining, but is a significant illegal power tactic which, if continued, I fear would limit the normal appreciation of nature in the area, and thus harm businesses related to ecotourism.
9. **Forest fire prevention**. In a chronically dry desert area subject to both grassfires and more major forest fires, the project might create risks for forest fires and there needs to be a Fire Risk Management Plan in place, to show how this danger is responded to. For instance, 1) What fuels are in used by equipment and generators, and how much is stored onsite? 2) Are the pads and roads “fire-wise,” in Forest Service terminology? And 3) Do the drill rigs have lightning protection? Also, what is the process for periodic fire district review of fire safety measures in place? This is doubly important because of the remote location of the project. [Note that 2 years ago, in the now-abandoned Hermosa drilling program, sparks from grinding metal onsite ignited a 400-acre fire.]
10. **Wildfire response.** In the event of a major forest fire, is there a plan for AMI’s drillers to coordinate with local fire and other emergency response agencies? For instance, would firefighters have easy and immediate access to onsite water storage tanks or wells at the drilling sites (with suitable fittings in place) in the event of a major fire? Would all roads in the drilling project area be immediately open to any firefighters and their equipment?
11. **Air pollution.** Any significant movement of earth creates air pollution, and the grading plans for pads and roads should show how this will be addressed. In addition, the exhaust emissions of vehicles, generators and drill rigs should be analyzed for their effects on biological communities in the vicinity of -- and especially downwind of -- the project area. Both these sources of air pollution can be a significant disruptor of habitat, whether the species involved are considered endangered or otherwise.
12. **Desired 24/7 operation pattern.** This is traditional in the mining industry, and is already in use on AMI’s ongoing drilling program on private lands. It is not, however, strictly required to conduct drilling. Nighttime light and noise pollution, as well as the coming and going of employees, is a threat to the habitats of many species, whether or not they are primarily nocturnal. The practice of 24/7 operation threatens the habitat of most species in the area of the drilling -- and has impacts miles away because of the light and noise – so the scientific community should be consulted about the scope of these biologically very significant effects. In addition, the 24/7 pattern is already annoying to the rural households and ranches in the area, so the round-the-clock operation has social consequences as well as ecological ones. Requiring daytime-only drilling would help the light pollution aspect of 24/7 operation, but would not stop the noise which also disrupts both wildlife and people.
13. **Light pollution.** Southern Arizona is a world-class astronomical research area, with many millions dollars invested in major astronomical research facilities in the area, by the University of Arizona, Smithsonian Institution (at Mt. Hopkins), and dozens of private observatories both large and small. In the last decade or two, the astronomical sciences have recognized the great value of “dark skies” to their research into the vastness beyond our planet. As a result I feel the schedule and fixtures of night-lights of drilling operations need to be shown to meet the requirements of of the Santa Cruz County’s Light Pollution Ordinance, which requires very specific shielding of light fixtures to put light only on the ground in the area it’s needed, rather than broadcasting it into an atmosphere that can spread it around. Light fixtures of all drilling operations also should prevent horizontal spread of light off the immediate drilling area, since the current AMI drilling site lighting can be seen on the ground over four miles away. For these reasons, light pollution is a significant impact that needs to be studied in the current proposal, and there should be no exemption to the ordinance for the mining industry.
14. **Archaeological possibilities.** Since the watersheds of Sonoita Creek and Harshaw Creek have been occupied for at least 10,000 years and numerous pottery shards and other prehistoric artifacts have been found near Harshaw Creek, the project area should be investigated for possible archaeological sites, whether residential, ceremonial, or ceremonial. Also, the descendants of early indigenous peoples, the modern-day Tohono O’odham, should be consulted for possible sites of spiritual and historical significance to their tribe. It would be a cultural loss to accidentally eliminate sites or materials of clear archaeological value.
15. **Loss of grazing area for current cattle operations.** Are there water sources or trails now used by range cattle in the area of the proposed drilling, and how would these affect ongoing cattle operations? Would ranchers need to be compensated for loss of grazing rights? Are the many free-range cattle in the area -- often seen on Harshaw Road for example -- at increased risk because of traffic increases due to the project? Have local ranchers, as major traditional users of the National Forest in this area, been consulted about the project’s effects on their stock and other aspects of their operations?
16. **Wildlife habitat and endangered species**. The effects of the drilling program do not end at the project’s property lines, so the effects on wildlife habitat need to be studied at a larger, more regional scale, since there are large numbers of Endangered Species in the area. (I’ll get to questions about biodiversity below.)
17. **Wildlife corridor.** The most prominent among migratory mammals that use the Patagonia Mountains as part of a wildlife corridor are the “big cats,” including jaguars, ocelots, mountain lions and bobcats. Their migratory pathways stretch northward from northern central Mexico through the Patagonia Mountains to “sky island” destinations in southeastern Arizona. The big cats are known to use mountainous routes and avoid open areas like the San Rafael Valley. From a look at the map of the proposed drilling area, the project appears as an east-west blockage to the major north-south wildlife corridor through the Patagonia Mountains to the Santa Rita Mountains, and this very significant effect should be included in the study of the proposal. From this point of view, the effective project area should include the use of Harshaw Rd. as an access from SR 82, since the increased traffic on that road makes crossings by big cats and other mammals more dangerous and less likely.
18. **Project water use and municipal watershed protection.** For the needs of drilling, how much water is needed, over what period of time, and where will it come from? Will new wells on public property be drilled? Given the difficulties of well drilling in the Patagonia Mountains, will continued water purchases from the town of Patagonia be needed? What will be the effects of the project’s water use on the supplies of the Town of Patagonia’s wells? Is the town’s municipal watershed going to be protected? This is one of the most significant possible effects that needs to be fully addressed. Watershed protection includes runoff and larger aquifer considerations, and I’ll address those next.
19. **Downstream consequences.** Runoff from drilling and related clearing could mix both new drilling and existing unmanaged acid mine wastes. The project area, as part of the Harshaw Creek watershed, is a major contributor to Sonoita Creek, which flows into Lake Patagonia, a favorite local fishing spot, and then into the Santa Cruz River. The Lake’s bottom sediments and its fish are already being examined for possible contaminants from the past. This is a significant enough pollution possibility that biologists knowledgeable about pollution effects on wildlife in the entire downstream watershed should be consulted in evaluating this possible effect of runoff from the drilling area. Fortunately, we have very knowledgeable local scientific researchers in this area, as the next point mentions.
20. **Trans-border aquifer considerations.** After the Transboundary Aquifer Assessment Act signed by Mexico and the US in 2006, the countries have collaborated in assessing watersheds, including several municipalities on both sides of the border, as reported in a recent article (Sept. 13, 2016), at <http://www.hcn.org/articles/for-the-first-time-u-s-and-mexico-take-stock-of-the-underground-water-they-share?platform=hootsuite>. In this article, the Univ. of Arizona has included an insightful watershed map for the San Pedro and Santa Cruz “Binational Basins,” and the project’s Santa Cruz basin study is said to be nearing completion. I’m concerned that the years of trans-border study by eminent scientists -- about nature and functioning of the local aquifer for the Santa Cruz River and contributory watersheds -- be consulted and used in the full review of the AMI proposal.
21. **Site remediation after completion of the drilling project.** It is likely that the drilling will leave significantly damaged land and wildlife habitat in its wake. If this next drilling proposal is approved, one scenario is that after the drilling program is completed, it does not lead to major mining efforts in the near future, say a decade or so. In this case, the disturbed land should be remediated to approximate its pre-drilling landforms, plant communities including trees, shrubs and grasses and soil types and mircrofauna, in order to regenerate damaged or eliminated wildlife habitats. AMI’s track record at remediation after similar exploratory drilling could be examined. (It’s worth noting that the scarring and erosion of a recent nearby non-remediated drilling area is dramatically visible in satellite photography of the now-abandoned Hermosa drilling program area of Wildcat Silver. It is centered at 110.71143 degrees N and 31.455205 degrees W, and resembles the clear-cut logging destruction done in the Northwest.) To be sure remediation could be accomplished, a Remediation Plan would need to be backed by a suitably sized Performance Bond, based on an independent and scientifically informed proposal and cost estimate and held and administered by a fully independent agency or financial entity.
22. **Border Patrol operations.** Will any road closures hinder the free movement of personnel from the US Border Patrol, and will the extra vehicle traffic generated by drilling employees and equipment hinder any Border Patrol operations? Because of the continuing regional extent of borderland surveillance and migration activities, this aspect of project impact needs to be considered.
23. **Climate change.** Following recent NEPA guidelines, it seems to me that all emissions of this project need to be reviewed in light of current knowledge and new responses to the demonstrated nature of human-induced climate change. For instance, what are the total atmospheric emissions of this project; what is the atmospheric heat created by machine operations related to the project; what is the project’s carbon footprint? -- and what are some ways to reduce these effects?
24. **Biodiversity.** The international community of biological scientists, with E.O. Wilson as spokesperson, has concluded that it is vital for human long-term survival to preserve areas of high biological diversity, and the Patagonia Mountains are being shown to have the greatest biodiversity of any region in the U.S. This is a large-scale resource that the proposal puts somewhat at risk, and is perhaps the largest-scale significant environmental impact of the proposal to be considered.
25. **Effect on local business.** Finally, for us local small business owners, it’s clear, and very encouraging, that Patagonia has in recent decades transformed itself into a thriving economy based on ecotourism, with a wide variety of activities drawing people to appreciate and utilize the natural world around the town, ranging from hunters to mountain bikers, horseback riders and artists to wildlife biologists and nature observers of many types. The sustainability of this economy is one of the main reasons I moved here. For the residential design clients that my livelihood as an architect comes from, the powerful attractions of the natural world are always a draw for them, and I’m worried that continuing drilling operations would be part of the degradation from extractive industries that will make potential clients not want to move here, as they start seeing Patagonia’s future to be more like the desolation of Morenci or Ajo. This would be a very significant and negative consequence for my next couple of decades of business in the area, as well as negatively affecting many other small business owners in the area.

Because of the fullness and complexity of these many consequences, I strongly believe the AMI drilling proposal deserves the depth of understanding and consideration which a carefully prepared and fully reviewed Environmental Impact Statement would provide.

Thank you for your consideration and for listening to the public’s concerns in this matter.



Robert Castle Gay

Radius Architects LLC

PO Box 914

Patagonia, AZ 85624