

**Dragoon Conservation Alliance | Amerind Foundation | Earthworks |  
Patagonia Area Resource Alliance | Arizona Mining Reform Coalition**

July 27, 2017

**To:**

Arizona Department of Environmental Quality, Groundwater Section  
Attention: Vimal Chauhan  
1101 West Washington Street, MC5500E-3  
Phoenix, AZ, 85007  
And by email: VC2@azdeq.gov

**Copied:**

David Haag  
DH1@azdeq.gov

Luke Peterson  
LP4@azdeq.gov

**RE: Comments regarding Gunnison Copper Project Draft Aquifer Protection Permit  
#511633**

Dear Mr. Chauhan,

The above organizations collectively appreciate the opportunity to comment on the Draft Aquifer Protection Permit for Excelsior Mining's Gunnison Copper Project located in Cochise County, Arizona.

**Introduction:**

We have been studying this project closely for the last several years because it would utilize a largely untested technology for copper production, and carries the potential to contaminate groundwater on which multiple communities and businesses rely.

We are aware of no operating commercial copper in situ leaching (ISL) projects at greenfields sites anywhere in the United States that would provide references for their environmental performance. The Florence Copper Project in Arizona is perhaps the only comparable project, yet it has never been in commercial production and has been plagued by civic appeals to deny issuance of revised state and federal permits. At this point, it appears that the Gunnison Copper Project is on a faster path towards potential development, and therefore, is of great interest to environmental advocacy organizations both locally and nationally.

While copper ISL has been utilized on an experimental basis at existing hard rock mines, site conditions and engineering designs at those projects are so vastly different that forming useful environmental comparisons to a greenfield project is not realistic. Additionally, the Gunnison Project is much larger than prior brownfields experiments; acid injection would be over 7 million gallons per day during full production, injected directly into an aquifer of drinking water quality and relied upon by the town of Dragoon and surrounding outlying residential and commercial properties that have water wells. Conceptual flow models of the project area and downgradient of it indicate that existing water wells could be permanently compromised in a contamination scenario.

This includes the town of Dragoon's municipal supply well and the Amerind Foundation's wells. Amerind, located in Texas Canyon, is totally dependent on two wells near Dragoon's municipal supply well and pumped to the Foundation's facilities. Contaminated groundwater would threaten most of Dragoon's residents and businesses, as well as Amerind's existence and impact its ability to perform its role in protecting Arizona's cultural heritage. The Amerind Foundation is an active research and educational center for thousands of Arizonans, preserving thousands of irreplaceable archeological artifacts in its museum. Additionally, Native Americans across the US value Amerind's significant collection of contemporary Native American cultural objects and artworks and their ongoing preservation at Amerind's facility.

In prior conversations, Excelsior's leadership has suggested that the type of ISL design they intend to use is "off the shelf" technology. Presumably they were referring to ISL as it relates to numerous existing uranium ISL operations, such as those in Wyoming or Texas. They suggested that while the injection/recovery well configuration is different from what they intend to deploy at Gunnison, the technology is essentially the same. Earthworks and other groups have studied these operations as well and have been unable to find a single case in which uranium ISL operations have *not* resulted in groundwater contamination. A study published by the U.S. Geological Survey in 2009 found that *"To date, no remediation of an ISR operation in the United States has successfully returned the aquifer to baseline conditions."*<sup>1</sup>

For years, Excelsior has been explaining to the public that their operation is different in terms of environmental risk, yet at the same time suggesting that their technological approach is the same as the uranium industry's. This is the same technology that has caused groundwater degradation in every commercial application to which it has been applied in the United States, and likely in the world.<sup>2</sup> In fact, some studies have suggested that groundwater quality continues to decline even after post-mining groundwater rinsing has been completed.

### **Monitoring:**

We understand that the Gunnison project is upgradient of a limestone formation that may help neutralize contaminants that follow the flow pathway, but this is akin to suggesting that a driver cannot possibly crash because all the passengers are wearing seatbelts. This puts the

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<sup>1</sup> [http://www-pub.iaea.org/mtcd/meetings/PDFplus/2009/cn175/URAM2009/Session%204/08\\_56\\_Otton\\_USA.pdf](http://www-pub.iaea.org/mtcd/meetings/PDFplus/2009/cn175/URAM2009/Session%204/08_56_Otton_USA.pdf)

<sup>2</sup> <http://www.wise-uranium.org/uisl.html>

environmental burden on the effectiveness of Excelsior's hydraulic control methods, but more importantly, on the point of compliance (POC) wells beyond the area of hydraulic control.

ADEQ's draft Aquifer Protection Permit (APP) is inadequate to effectively detect potential contaminant migration for many reasons articulated in these comments, but primarily because there are simply not enough POC wells, and there is not sufficient modelling to best determine their placement. We ask that ADEQ vastly increase the number of POC wells from five to at least 25 (not including the liquids impoundment POC wells), and that these wells be drilled not simply on the boundary of the project area (Pollutant Management Area boundary) but over a much broader area extending further from the project site, predominantly within the conceptual flow model pathway, but also in opposite directions. The locations of these additional wells should be according to the additional work these comments address; their placement is best determined through proper modelling that uses a higher resolution, better calibration, and results in a unique model. Some of these POC wells may be a significant distance from the site and may be owned by a different property owner. In such a case, ADEQ and Excelsior should do everything possible to ensure leasing arrangements or memorandums of understanding between the company and the landowner where these wells may be cited.

Additional POC wells should be placed where contaminants would be most likely to migrate based on this additional modelling work. During the first year of commercial production, monitoring of all POC wells is requested monthly; in the second year, bi-monthly; in the third year, quarterly, and so on until year five. After that, biannual monitoring is acceptable. All POC wells should be drilled at least one year prior to commercial operation, and extensive baseline water quality data should be collected by a third party laboratory for all of them and posted online. Baseline data should include every known constituent of concern that could degrade groundwater quality in any way.

We also ask ADEQ, as a condition of approval of the APP permit, to include mandatory biannual monitoring requirements of existing wells on private property for those who request it. ADEQ should consider at least a five mile radius to determine who is eligible for this program. In addition, ADEQ should require that abandoned wells within a five mile radius be inspected and analyzed by a third party to ensure that vertical mixing of contaminants from one potential pathway to another doesn't exacerbate the spread of pollutants in a contamination scenario. If this is determined to pose any risk, ADEQ should require the complete plugging of these wells.

Given the extraordinary environmental and social impact of a groundwater contamination scenario beyond the area of hydraulic control, and the historical context of the poor environmental performance of ISL technology generally, Excelsior and ADEQ must demonstrate that they are committed to the preservation of baseline water quality. The company seems quite confident that its operations will not compromise water quality. If this is to be taken seriously, then ADEQ should impose strict conditions of approval regarding what happens when things do not go as planned, and Excelsior should have no problem agreeing to such conditions, which are addressed below.

### **Corrective actions as conditions of approval:**

At all POC wells, including the additional ones requested in these comments, a third party laboratory shall collect and analyze data on the frequency requested above. Any detectable change beyond the alert limit at POC wells shall be noted and the findings published online. ADEQ, Excelsior, and all interested civic groups shall meet immediately if and when this occurs to discuss the specific nature of the baseline deviation, and what may be the cause of it. If the exceedance continues for six months, Excelsior must cease all injection operations, or, if the problem appears to be local and specific to POC wells next to liquids storage facilities, those facilities shall be drained and repaired immediately. If specific conductivity or pH exceed alert levels at the intermediate monitoring wells or at the observation wells, similar responses are necessary because these parameters are indicators of problems. Specific conductivity and pH should immediately begin to be monitored at the POC wells downgradient of the intermediate wells with exceedances.

If any analytes exceed state and/or federal maximum contaminant levels for groundwater that were not already exceeded in the baselines, Excelsior must cease all injection operations immediately, or as noted above, drain liquids impoundments and repair the leak(s). During this cessation period, ADEQ, Excelsior, and civic groups shall convene to attempt to reach consensus about the cause of the exceedances and produce a plan for immediate corrective actions. Once the corrective action plan is created and implemented, injection of lixiviant (or utilization of liquids impoundments) shall not continue until the affected POC wells return to baseline. If conditions fail to return to baseline or continue to worsen, rinsing operations shall begin per the APP permit procedures, and Excelsior shall not be permitted to stop rinsing or continue reinjection until conditions have returned to baseline.

### **Bonding:**

Bonding levels have not yet been determined by ADEQ, but it is critical that bonding amounts consider groundwater contamination, not simply planned reclamation bonding for rinsing, well pad reclamation, the removal of outbuildings, and other similar planned activities. State bonds must account for all possible environmental liabilities, including a worst-case scenario calculation and the costs associated with all elements of the resulting cleanup.

As you may know, pending federal bonding regulations under the Comprehensive Environmental, Reclamation, and Liabilities Act (CERCLA), section 108(b), are not guaranteed to address these issues at this time. It remains to be seen what the final regulations will or will not cover. Therefore, the state of Arizona must hold bonds that the EPA regulations may not cover if the project begins operating. The bond would provide specific calculations for the costs associated with a large contamination event which spreads rapidly and must be remediated immediately. It should also include calculations for catastrophic liquids impoundments failures due to overtopping, impoundment breaches, or major liner failures. In the event that EPA regulations do cover many of these items, a memorandum of understanding between ADEQ and EPA should specify which agency will bond for specific potential failures.

Most importantly, ADEQ must not allow corporate guarantees from Excelsior or any subsequent operator to qualify as bonds. Bonds must be actual financial assets, not legal promises or certificates of financial health or credit worthiness.

Finally, the process of bonding the Gunnison Copper Project should use a stakeholder-based approach, publicly noticed, and put out for a 60 day scoping comment period. ADEQ should prepare a draft bonding proposal using input gathered during the public scoping process, and release a draft bonding proposal for another 60 day public review period.

**Technical comments:**

For this review of the Draft Aquifer Protection Permit, we have consulted with an independent hydrologist, Dr. Tom Myers, for a full review of the technical and modelling components of the project. Dr. Myers has been involved with this project for over two years, has written a preliminary conceptual flow model, has reviewed Excelsior's APP application and all appendices, and has reviewed the draft APP from ADEQ to produce the attached analysis. Dr. Myers has also visited the Excelsior site and met with Excelsior leadership to discuss project specifics in person.

The undersigned organizations include by reference Dr. Myers' technical comments included in this transmission as a PDF file. The technical comments should receive the same consideration as this document.

We appreciate the opportunity to submit these comments, and hope they will result in important technical changes as well as conditions of approval to the draft APP.

Please don't hesitate to contact Pete Dronkers of Earthworks at (775) 815-9936 or [pdronkers@earthworksaction.org](mailto:pdronkers@earthworksaction.org) or Dr. Tom Myers at (775) 530-1483 or [tommyers1872@gmail.com](mailto:tommyers1872@gmail.com) with any questions, concerns, or comments. We would like the preparation of the final APP to be a deliberative process among all stakeholders, and we are available for teleconferences and meetings.

Sincerely,

Dragoon Conservation Alliance  
Earthworks  
Amerind Foundation  
Arizona Mining Reform Coalition  
Patagonia Area Resource Alliance