



# Gunnison Copper Project Permitting

Copper mining projects are required to obtain a series of permits from several regulatory agencies prior to start up and operation of any mining project. The two most significant permits for the Gunnison Copper Project are the Aquifer Protection Permit (APP) issued and enforced by the Arizona Department of Environmental Quality and the Underground Injection Control (UIC) Permit issued by the United States Environmental Protection Agency (USEPA).

Both the APP and UIC are comprehensive permits supported by exhaustive environmental studies that require a major investment of both time and money. These studies are developed and conducted by third party, independent professionals licensed with the appropriate authorities. The permits are designed to ensure that the operation, monitoring and compliance, and eventual closure of the discharging facilities do not violate regulations designed to protect public health and the environment. As such, they regulate, monitor, and verify every operational and closure aspect of the project.

APP and UIC permit applications submitted for Gunnison must be prepared by independent consultants working closely with the ADEQ and USEPA. All studies completed for the APP and UIC applications have to be reviewed and approved by the agencies, which often employ other independent experts to verify the assumptions, methodologies, and conclusions of any technical work submitted on Gunnison. Excelsior fully supports this permitting process, designed to ensure the best possible operation for both Gunnison and the community.

It is the responsibility of Excelsior Mining and the independent licensed professionals to ensure the materials provided to the agencies are comprehensive, representative, accurate, and conform to regulatory requirements. It is the responsibility of the ADEQ and the USEPA to fully review and investigate the materials and issue the relevant permits, but only after they are satisfied the project can be operated safely and meet regulatory requirements.

## **So what do the permits focus on?**

In a word: everything! The permits are complex because the facilities and operations proposed by mining companies involve complex engineering, geochemical, and hydrologic systems. The applications have to be especially detailed in how the project will operate and eventually close.

The APP is designed to protect groundwater and considers characterization of and controls for all potential discharges. It involves the review of the engineering designs related to leak detection, flows, process solution characterization, monitoring, and closure. The UIC relates to actual well field, well design and construction, pumping and extraction rates and well abandonment.

## **How will Gunnison operate?**

Only after Gunnison receives its approved APP and UIC permit can Excelsior begin to build the facilities to support the operations. The facilities needed for operations include delivery and recovery wells, monitoring and point of compliance (POC) wells, pipelines and control systems, copper processing and

recovery equipment (solvent extraction/electrowinning [SX/EW]), water and solution storage ponds, and various support facilities.

During operations, a dilute acidic solution will be delivered into a series of wells drilled into the copper deposit. The construction of the wells along with the pressure and rate of delivery are all regulated by the UIC permit. Recovery wells surround the delivery wells to capture the solutions by pumping and establishing hydraulic control. In simple terms, hydraulic control is established by pumping out slightly more fluids than what is delivered to the deposit. This net recovery of fluids creates a hydraulic gradient towards the recovery wells and prevents solutions from escaping the mining area.

Copper-bearing solutions are then pumped to the SX/EW facility that removes the copper and the solutions are reconditioned and cycled back to the mining area for re-delivery. All the facilities that deliver, recover, convey, or process solutions are constructed, operated, maintained, and monitored, in accordance with the APP and UIC permits.

When all the extractable copper is recovered, the acidic solutions are withdrawn and water is rinsed through the formation to restore the aquifer to permit standards. Once rinsing is completed, the wells are then abandoned in accordance with permit conditions and Arizona Department of Water Resources regulations.

### **How will Gunnison maintain hydraulic control?**

Hydraulic control is established when total fluid recovery is greater than total fluid delivery. This establishes a cone of depression in the well field and creates an inward hydraulic gradient towards the well field. This inward gradient in turn prevents solutions from escaping beyond the cone of depression within the mining area and impacting the surrounding aquifer. Once the cone of depression is established, all solutions within the mining area are effectively contained. This hydraulic containment is monitored and managed throughout the mining and subsequent rinsing of the mine area.

### **What are the control systems?**

Operations are measured and monitored by several independent means. First, electronic flow meters will be utilized to monitor the delivery and recovery of solutions from individual wells within the well fields. The flow meters are used in the site water balance to demonstrate that more fluids are being recovered than are being delivered. In addition to flow meter data, observation wells located in close proximity to the mining areas are physically monitored to show the development and maintenance of the inward gradient towards the well field. Lastly, monitoring or POC wells are positioned outside the mining area and are monitored and sampled to demonstrate that no process fluids are leaving the mining area.

### **What is Gunnison required to monitor during operations?**

Both the APP and the UIC permits will establish strenuous testing and monitoring requirements for the construction, operation, and closure of permitted facilities at the project. The monitoring and reporting requirements and deadlines will be determined by the ADEQ and the USEPA and will be fully described in the permits issued. Gunnison will be required to collect and report information as described in the permits, and that information is regularly audited by the permitting agencies and available to the public.

### **How will Gunnison ensure compliance?**

The monitoring, sampling, and reporting requirements and associated deadlines mentioned above will be included in compliance sections of the permits issued by both the ADEQ and USEPA. Failure to report required information or falsification of records is subject to permit revocation as well as civil and criminal penalties. The agencies aggressively pursue non-compliance with permit conditions.

### **How will Gunnison monitor site conditions?**

Typically, operational monitoring is done by the facility as a normal course of operations. Compliance monitoring activities (especially those that are reported to the agencies) are usually done using a combination of independent outside consultants and internal environmental staff. Monitoring forms and the results of compliance monitoring and sampling is validated and quality assurance/quality control checked prior to submission to the agencies as part of the compliance requirements. This documentation is available to the public.

### **What will Gunnison do if they discover unexpected conditions?**

Both the APP and the UIC permits contain requirements and protocols for addressing unexpected conditions. Depending on the nature of the occurrence, the permittee would be required to make adjustments to operational parameters or, in the most extreme circumstances, actually cease operations until the conditions are mitigated or eliminated. The permittee likely would be required to notify the agencies of those unexpected conditions and work with them to identify, approve, and implement appropriate solutions. Additional or enhanced monitoring is often required by the permits to more closely observe site conditions and monitor corrective actions. This information is available to the public.

### **Disclaimers**

*Special Note Regarding Forward-Looking Information:* This presentation contains "forward-looking information" concerning anticipated developments and events that may occur in the future. Forward looking information contained in this presentation includes, but is not limited to, statements with respect to: (i) that the Gunnison Project is ideal for an in-situ copper recovery operation; and (ii) how hydraulic controls will work at the Gunnison Project. Please refer to <http://www.gunnisoncopper.com/index.php/about/disclaimer> for additional information regarding "forward-looking information."

*Additional Information:* Further information about the Gunnison Project can be found in the technical report filed on SEDAR at [www.sedar.com](http://www.sedar.com) entitled: "Gunnison Copper Project, NI 43-101 Technical Report, Prefeasibility Study" dated February 14, 2014.

*Qualified Person:* Excelsior's exploration work on the Gunnison Project is supervised by Stephen Twyerould, Fellow of AUSIMM, President and CEO of Excelsior and a Qualified Person as defined by National Instrument 43-101. Mr. Twyerould has reviewed and approved the technical information contained in this presentation.