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# Poker Game Mine Project

## General Recovery Overview, Pilot Plant to Production Facility

The goal for the Poker Game Mine Project is to process ore from the mine in a stepwise phased approach first with a 25-50 ton-per-day pilot plant and ramp up slowly to an eventual a 200-400 ton-per-day production facility. The stepwise phased approach will build on successful small-scale processing that can be applied to a larger system. The permitting timeline for the pilot plant is 6-10 months, whereas the permitting timeline for the production plant is 14-20 months. In addition, it is possible to process 5-10 tons-per-day while the pilot plant is being constructed and permitted. The following overview provides a general mine plan for the project.

### Introduction to Gold Recovery

Gold can be recovered through a number of methods, including gravity separation (processing with water), chemical leaching (dissolving and reprecipitating) and roasting (heating). All three are effective and there are a number of things that govern their economical effectiveness. We envision the Poker Game Mine Project will use a combination of gravity separation and chemical leaching to produce precious metals. Roasting is not an economical option at this time.

### Gravity Processing

Gravity concentration process relies on the principal that gold has a high specific gravity that makes it much heavier than common rocks. Elemental gold has a specific gravity of 19.3, and typical rock has a specific gravity of about 2.6, which makes gold seven times heavier. All gravity concentration devices use water to separate gold from the lighter rock material. The prospector's gold pan is the most familiar gravity concentration device. To function properly, the ore must be broken down to particles small enough to provide a significant specific gravity difference among the particles. Gravity processing is commonly used in placer deposits (gold in gravels), where the gold has already been broken away from the rock and is in flakes and nugget form. The gravel is sorted through various screens as a slurry and the gold is recovered in various concentrating devices such as sluiceboxes, jigs, spirals, shaking tables, centrifugal concentrators, and dry washers.

Gravity processing can be used at the Poker Gamer Mine if the rock is crushed small enough to release the free gold particles. Laboratory tests show that the ideal grain size is minus 100 mesh or 0.149 millimeters or smaller. This is essentially fine sand. Gravity processing will recover between 40 – 55% of the available gold in the rock. Therefore, is not the most ideal method of gold recovery.

**Chemical Leaching**

Gold dissolves in a number of chemicals, most notable are mercury and cyanide. Like salt dissolves in water, gold will do the same in the presence of these chemicals. Mercury was extensively used in the past by the small-scale miner, but the health risks were enormous. Dilute cyanide is the most common gold solvent used by the major mining companies. It can be used in either a contained vat-leach system or a massive heap-leach process. Once gold is dissolved from the rock, it can be recovered either through active resins or electro-twining, or both. Cyanide is the preferred leachate because it predominately selects only the gold and silver and leaves other elements behind. Permitting for cyanide is challenging and while not impossible, it just takes time.

Alternative, biodegradable gold and silver leachates offer a simple, short-term permitting pathway to leaching and the recovery process. These products (lixiviants) include thiosulfate, chlorides, thiourrea, and bromides. However, they leach other elements as well, and other elements will inhibit their effectiveness by scavenging the gold before the recovery can be made. Temperature, pressure and residency leach time also play roles in the effectiveness, and every ore has its own particular chemical make-up. Therefore, a “recipe”, is needed to maximize the recovery rate at the most economical cost. There are a number of firms that can provide services to ascertain the leaching recipe. While it is often an ongoing process, the main formula usually can be provided in a few months.

**Phase 1 – Pilot Plant Construction and Interim Gold Recovery**

Once the project is funded and the corporate structure is established, several things willimmediately fall into place. The private land is purchased, site preparation commences and construction of the pilot plant processing building is preformed. The production crew infrastructures are established, supplies are purchased and ore is stockpiled. Meanwhile, a permit is prepared and filed with the BLM to perform small-scale (5-10 tons-per-day) onsite testing using gravity separation methods. This entails crushing the ore to a specified size (-100 mesh), mixing it into a slurry, and processing it over a shaker table to produce concentrates. A finishing unit will separate the gold from the concentrates where it can be smelted into bars or coins. Product consultants will be retained to facilitate the recovery.

The gravity separation unit can be set up and fine-tuned within a couple of months. An excavator will be used to excavate the ore and a loader will be used to transport the ore to the processing site. We envision a three-stage crushing system, a jaw crusher followed by an impact mill that is followed by a ball mill. Oversized material will be recirculated through the system. The ground ore powder will be conveyed to a series of shaker tables to collect the concentrates. The shaker tables will be set up on the existing concrete pad at the mine building. A water tanker will supply the facility with water from a nearby private well. Meanwhile, a new well will be permitted and drilled in the alluvial wash downslope from the mine at our mill site claim. Water will be recycled through the processing system. It is anticipated that a 3-5-person crew will be required to operate the gravity separation process.

Meanwhile, the private land is being purchased and the permit to do the 25-50 tons-per-day pilot plant permit is being prepared and submitted to BLM and the State of Nevada. An independent geochemical engineering firm will be retained to develop the alternative chemical leach recipe for the interim pilot plant. Manufactures of the pilot plant processing equipment will be contacted and the equipment purchasing will commence once the purchase of the private land is completed.

Additionally, exploration and rock sampling will assess other nearby veins and claim staking will secure adjacent lands. A new block of 65 claims are planned, which will buffer the mine site and secure additional mineralized ground. Detailed geological mapping and rock sampling will also be conducted on these newly acquired lands. Geological assessment of the Main Vein will continue, assessment of the low-grade ore for heap leach potential will begin, and the planning of a diamond-core drill program to assess the deep ore potential will be initiated.

**Phase 2 – Pilot Plant Construction and Production**

Once the private land is procured and the site graded the building can be built and stocked with processing equipment. Once the permits are approved by the BLM and the State of Nevada, the 25-50 tons-per-day pilot plant can begin processing. The pilot plant will initially use an alternative, biodegradable chemical leachate to dissolve the gold from the rock and put it in solution. A combination of activated resins and electro-twining will recover the gold and silver from the solution.

The process begins with excavating fresh ore from the Main Vein, transporting it to the pilot plant building where it is crushed and processed. Excavation will be performed with an excavator and hauling the ore will be performed with two articulated trucks. A haul road will be constructed on federal ground to avoid use of the county road. A backhoe or a skiploader will load the ore into a hopper that'll dump into a jaw crusher that will feed an impact mill then a ball mill. Powdered ore will be mixed into a slurry and fed to the processing vats.

Ideally, but upon the advise of the geochemical engineering firm, the leach process will be conducted through a series of 6-12, 500-1,000 gallon cylindrical vats or tanks. Slurry pumps will deliver the ore to each vat at a prescribed amount, stirring fins to keep the ore suspended, temperature, pH and Eh diodes will control the solution release values. Once the ore solution reaches a prescribed finished state, the cylinder is evacuated to a filter press whereby the liquids are separated from the solids. The solids are discarded and used in reclamation. The liquids, referred to as the pregnant solutions, are sent to the activated resin columns and then to the electro twining systems. The remnant solutions are piped back and remixed with fresh ore. Raw gold product is collected and refined to 99.999 fine in an onsite furnace. This process can be repeated 4-6 times per day per vat, depending upon the recipe developed by the geochemical engineer. An onsite analytical laboratory overseen by a qualified geochemical engineer will continually monitor the ore to maintain optimum recoverability throughout the process. Security will be emplaced for a high degree of confidence that everything is processed smoothly.

Meanwhile, permitting for the 200-400 tons-per-day plant is being prepared by an outside geotechnical firm. The ore processing will switch to a cyanide-based recovery system. Laboratory test will be conducted to devise the best system for the specific ore. Ideally, the vat system will be retained, however, there are other systems than may be preferable. Additional buildings will be constructed to facilitate the expansion.

Regional exploration will continue to locate additional ore targets. Lands will be acquired or claimed to provide for a heap-leach operation to process the low-grade ore. A secondary processing facility may be constructed to facilitate the low-grade ore.

**Phase 3 – Full-Scale Production**

The permit to process 200-400 tons-per-day is approved and construction activities begin to make this happen. The vat systems are modular, so the additional processing units will be phased into production as the expansion takes place.

**Offsite Processing**

If there is a delay in the permit for the 200-400 tons-per-day processing plant, offsite ore processing could take place to increase yields. The vat processing systems are simple to operate and maintain and can be set up virtually anywhere, even in a downtown warehouse. Therefore, other processing facilities could be operated to increase yield and revenue.