**FACT SHEET**
(pursuant to NAC 445A.401)

Permittee Name: **Liberty Processing, LLC**

Project Name: **Liberty Precious Metal Testing and Processing Facility**

Permit Number: **NEV2010101 (Renewal 2014)**

## A. Location and General Description

Location: The Liberty Precious Metal Testing and Processing Facility (Liberty Process Facility) is located on private land in southern Nye County, approximately 76 miles southeast (by air) of Beatty, Nevada and approximately 36 miles northwest (by air) of Pahrump, Nevada. The process facility is located in the Amargosa Valley, within a portion of Section 1, Township 17 South, Range 48 East, Mount Diablo Baseline and Meridian.

***Site Access*:** *From Beatty:* Proceed on US-95 south for a distance of 29 miles to the junction of SR-373. Proceed south on SR-373 for a distance of approximately 10 miles to the intersection of Mecca Rd. Proceed west on Mecca Rd. approximately 5 miles to the intersection of Cottonwood Rd. Proceed north on Cottonwood Rd. for a distance of approximately 1 mile to the entrance of the Liberty Process Facility, located on the east side of Cottonwood Rd. *From Pahrump:* Proceed on SR-160 north for a distance of 27 miles to the Junction of US-95. Proceed on US-95 north for a distance of 16 miles to the junction of SR-373. Proceed south on SR-373 for a distance of approximately 10 miles to the intersection of Mecca Road (Rd.). Proceed on Mecca Rd. west approximately 5 miles to the intersection of Cottonwood Rd. Proceed on Cottonwood Rd. north for a distance of approximately 1 mile to the entrance of the Liberty Process Facility, located on the east side of Cottonwood Rd.

***General Description:*** The Permittee intends to operate the Liberty Process Facility as a testing and toll milling facility to chemically extract precious metals from off-site ores and other feed material at an authorized rate of no more than 18,500 tons of ore annually. Processing of any material designated as or determined to be hazardous is strictly prohibited.

The Liberty Process Facility is designed to be operated and closed without any discharge or release in excess of those standards established by regulation except for meteorological events which exceed the 24-hour, 25-year design storm event.

***Permitting History:*** Water Pollution Control Permit (Permit) NEV2003104, was first issued to Franklin Lake Resources Inc. (FLRI) for the FLRI Pilot/Test Facility in April 2007. The WPCP became effective on 11 May 2007 with a two-year expiration date. The pilot facility was designed to test and evaluate various precious metal extraction

technologies on ore obtained and transported from FLRI's small mine near Death Valley Junction, California.

Pursuant to Nevada Administrative Code (NAC) 445A.411, a pilot or testing facility permit may not exceed two (2) years from the effective date. Testing beyond two (2) years requires submittal of a permit application in accordance with NAC 445A.394 through 445A.398.

Franklin Lake Resources Inc. was dissolved in 2009 and restructured as Liberty Processing, LLC (Liberty). Since the expired pilot/test facility permit could not be renewed, Liberty submitted a fee and application materials for a Permit to chemically process up to 18,500 tons per year. The Permit was assigned a new identification number (WPCP NEV2010101).

## B. Synopsis

***Ore Characterization:*** The Permittee intends to operate the Liberty Process Facility as a testing and toll milling facility. Ores and other process feed material from in-State sources and processed at the Liberty Process Facility must be obtained from Nevada-permitted facilities; otherwise each source will require incorporation into the Liberty WPCP as a Major Modification. Ores and other process feed material from out-of-State and processed at the Liberty Process Facility must be obtained from facilities licensed or permitted by the state of origin.

Prior to the receipt of any ore or other process feed material by the Permittee, the material must be characterized for constituents present, the potential for acid generation and the potential to degrade waters of the State. The Liberty Process Facility is prohibited from accepting, stockpiling or processing any hazardous material at any time, regardless of the state of origin. The Permittee must have written certification from a certified environmental manager (CEM) or equivalent, currently registered and in good standing with the State of origin and not affiliated with the Permittee. The certification must state that the ore or other process feed material is not hazardous pursuant to the regulations of the state of origin. In addition, the written certification and characterization results must be submitted to and approved by the Division prior to transport of the material into Nevada.

Tailings will be collected in super sacks or barrels and transported to U.S. Ecology in Beatty, Nevada for disposal.

***Ore Delivery and Stockpiling:*** Ore (or other process feed material) certified as non-hazardous, is delivered by truck to the Liberty Process Facility in super sacks or barrels which are stored on an outdoor concrete stockpile pad or a dedicated stockpile area inside the process facility. The stockpile pad is 20 feet by 40 feet of reinforced concrete, surrounded by a 6-inch high stem wall and adjacent to the 100-foot by 20-foot reinforced

concrete pad (also surrounded by a 6-inch high stem wall), used for interim storage of tailings prior to removal off-site for permanent disposal.

***Liberty Process Facility and Containment:*** With the exception of the feed hopper and thickener, process components are located inside a 76-foot by 140-foot steel building with a reinforced concrete floor surrounded by a 6-in high stem wall. The facility is comprised of a 76-foot by 122-foot process area with the remaining area dedicated to wet laboratory, fire assay and reagent storage. Secondary containment within the process building is approximately 35,000 gallons, almost three times the required 12,950-gallon minimum containment volume.

The floor is graded to a centrally located floor drain which drains to a 500-gallon covered sump located outside the building. A pump and float switch have been installed within the sump to ensure there is no overflow of solution. Solution collected in the sump is pumped directly to a 5,000-gallon holding tank inside the building for return to the process. The pad, sump and containment areas are all coated with an epoxy-based, acid resistant material.

In an effort to optimize operational capabilities and existing space at the Liberty Process Facility, an Engineering Design Change (EDC) approved 7 August 2013, authorized the construction of two, two-cell reinforced concrete containment pads (referred to as LPF-301 and LPF-302) located outside and adjacent to the existing Process Facility Building.

LPF-301 is comprised of two, equal sized cells, approximately 14 feet by 38 feet by 4 feet deep. Concrete thickness is 12 inches. The surface of the cell floor is 42 inches below ground surface which results in a 6-inch high curb or berm above ground surface. Both cells are equipped with a decline ramp for access. A 6-inch by 24-inch deep overflow weir will be installed within the cell divider. Maximum available volume for each cell is approximately 13,900 gallons.

The floor of each cell is graded to drain to a corner collection sump, approximately two-feet by 2-feet by 2-feet deep. The sumps are concrete-lined and filled with coarse gravel fill material. In addition, each sump utilizes an 8-inch diameter decant riser and dedicated pump to recycle water back to the Process Facility Building. Waterstop material will be utilized at all concrete joints and the concrete will be coated with ultraviolet light-resistant and chemically-resistant epoxy.

LPF-302 is comprised of two, equal sized cells, approximately 70 feet by 34 feet by 4 feet above the ground surface. A 6-inch by 24-inch deep overflow weir will be installed within the cell divider. Maximum available volume for each cell is approximately 62,300 gallons.

Concrete thickness is 12 inches. Both cells are graded to drain to individual concrete-lined collection sumps, approximately 2-feet by 2-feet by 2-feet deep. Waterstop

material will be utilized at all concrete joints and the concrete will be coated with ultraviolet light-resistant and chemically-resistant epoxy.

Process components within the Liberty Process Facility are discussed further under the sections *"Material Sizing and Gravity Separation Circuit"*, *"Froth Flotation Circuit"*, *"Precious Metal Leaching Circuit"*, *"Precious Metal Recovery Circuit"* and *"Water Clarification Circuit"*. As a toll milling facility, utilization of some or all of the process circuits and components is dependent on the physical and chemical characteristics of the material as well as the mineralogy of the material to be processed.

***Material Sizing and Gravity Separation Circuit:*** The Material Sizing and Gravity Separation Circuit is comprised of a hopper/vibrating feeder, wet trommel screen, vibrating deck screen, spirals, centrifugal concentrators, and various conveyance devices.

Process feed material is dumped into the feed hopper located outside the building. The hopper discharges the material onto a vibrating feeder where it is then conveyed to a trommel screen for separation into various size fractions. Clarified make-up water is introduced to the feed end of the trommel to optimize size separation efficiency and to create a slurry for subsequent gravity separation operations. Undersize material from the trommel is discharged onto a vibrating wet screen deck for additional size classification, while the oversize material (including any tramp material) is discharged and conveyed to a designated temporary tailings storage area (a contained area within the process building) where it is allowed to dry under natural conditions. Once dry, the tailings are loaded into super sacks or barrels for shipment off-site for additional processing and/or disposal.

The screen undersize material is pumped from a sump under the vibrating screen deck and discharged to the bank of spiral concentrators for gravity concentration. The spiral concentrators generate concentrate, midlings and tailings fractions through the manipulation of splitter gates at the spiral discharge.

The concentrate fraction is the heaviest and contains the highest precious metal content and is conveyed to its own dedicated precious metal leaching circuit. Refer to the section *"Precious Metal Leaching Circuit"* for additional details.

The midlings fraction is the next heaviest and contains lesser amounts of precious metals and other metals of interest. The midlings are conveyed to their own dedicated precious metal leaching circuit. Refer to the section *"Precious Metal Leaching Circuit"* for additional details.

The tailings stream, or waste material, is the largest by volume and is either discharged directly to a secondary particle separation system for dewatering and loading into super sacks or barrels for additional off-site processing and/or disposal or conveyed to a froth flotation circuit for additional precious metal recovery. Refer to the section *"Froth Flotation Circuit"* for additional details.

Finer particles remain in the water stream and are sent to a water clarification system for polishing (i.e. settling out of solids) before the water is returned to the process water storage tank for use as make-up water. Refer to the section *"Water Clarification Circuit"* for additional details.

***Froth Flotation Circuit:*** Depending on the physical, chemical, and mineralogical characteristics of the material processed, a froth flotation circuit is available for added process flexibility. Initially, the Permittee intends utilize the Froth Flotation Circuit to recover additional precious metal values from the spiral tailings fraction. The flotation circuit is comprised of an agitation/conditioning tank, flotation cells, process pumps and sumps, and flotation reagent mixing, storage and handling equipment.

Rougher spiral tailings report to the conditioning tank, where a flotation collector is added to the pulp/slurry to selectively alter the surface chemistry of the fine gold, silver, and pyrite particles present in the spiral tailings (above). The entire Froth Flotation Circuit is located within the existing fluid management system inside the Liberty Process Facility.

The conditioned tailings report to a pumpbox where a frothing agent is added followed by the flotation cells where compressed air is injected to generate the froth. In theory, the gold, silver and pyrite particles will attach to the froth and float to the surface, where they collect and are mechanically removed as a flotation concentrate. Depending on the performance of the flotation circuit, sufficient space is available within the building for the installation and operation of additional flotation cells for further scavenging of the flotation tailings.

The flotation concentrate is conveyed to the Precious Metal Recovery Circuit (below) for precious metal recovery. The flotation tailings are discharged directly to the secondary particle separation system for dewatering and loading into super sacks or barrels for additional off-site processing and/or disposal.

***Precious Metal Leaching Circuit:*** Gravity or flotation concentrates and midlings are conveyed to separate leach circuits for precious metal recovery. Bench scale leach tests will be performed to determine the optimum leach reagents, optimum residence time, and optimum temperature. These are the only circuits using cyanide. Components containing cyanide are segregated from the remainder of the process system by separate containment curbs and have a dedicated spill containment sump. Sodium hydroxide is used for pH control and cyanide solution is filtered and returned to the recovery process where possible. Solutions that can no longer be recycled are destroyed using hydrogen peroxide.

Once leaching has been completed, leach solutions are filtered through a plate and frame filter. The filter cake from this system will be neutralized, characterized, and disposed of

offsite. The pregnant solution (filtrate) from this system is pumped to the Precious Metal Recovery Circuit.

***Precious Metal Recovery Circuit:*** Several different components may be used individually or in conjunction with each other for precious metal recovery. Components include a Merrill-Crowe zinc precipitation, carbon recovery, a carbon column, and an ion exchange column. In all cases spent process fluids are returned to the process where possible or neutralized, characterized and disposed of at an approved off-site facility. Any cleaned process water that is not recycled is evaporated. Any solid residues generated are collected, characterized and then disposed of at an approved off-site facility.

In an effort to demonstrate operational capabilities and increase marketability to potential toll-milling customers, the Permittee investigated the use of electrowinning and zinc precipitation as potential methods to recover gold and silver from pregnant cyanide leach solutions. Although both methods were determined to be suitable for implementation/operation at the Liberty Precious Metal Testing Facility, zinc precipitation was selected based on system cost and availability.

A Minor Modification approved on 25 June 2013 authorized the design, construction, operation, and closure of a 30-gallon per minute (gpm) Merrill-Crowe Zinc Precipitation Circuit at the Liberty Process Facility.

The Liberty Merrill-Crowe Circuit will be skid mounted on steel I-Beams with approximate dimensions of 8 feet by 16 feet for installation inside the process building within containment. The circuit will be fabricated, wired, and plumbed at the manufacturer's facility and will be wet tested prior to shipping.

The circuit will include (2) fiberglass mix tanks and (1) fiberglass holding tank all agitated with 2-horsepower (hp) tank mixers with stainless steel shafts and 3-blade impellers. The circuit will also contain a 316-stainless steel pan filter connected to a 5-hp vacuum pump with a 12-inch diameter by 16-foot tall vacuum receiver tower containing ring-shaped packing for de-aeration of the pregnant leach solution (PLS). The circuit will also include a stainless steel bag filter for PLS polish filtering and an approximate 16-inch by 16-inch plate and frame filter press with diatomaceous earth pre-coat feeder for primary filtration. The circuit will be plumbed with Schedule-80 poly-vinyl chloride (PVC) piping. Circuit wiring will be PVC conduit with 12-gauge wire. Monitoring will be provided for all three mix tanks and will include pH and oxygen reduction potential (ORP) sensors.

***Water Clarification:*** The Water Clarification Circuit receives process water from the gravity concentration circuit for the sedimentation of suspended solids and the return of clean (clarified) water to the gravity circuit. The clarification circuit includes hydrocyclones, clarifiers, water holding and decant tanks.

The water holding and decant tanks are large open top tanks with 10,000 to 20,000 gallon holding capacity. Water is pumped to the first tank and as the suspended solids settle, water decants to the next tank. The final tank in series is referred to as "fresh" water make-up and holding tank where make-up water from a well can be added.

Flocculants and coagulants may be used in the Water Clarification Circuit to assist in collection and settling of suspended solids. All process solids and fluids used in the beneficiation process will be kept within the process building until characterized and disposed of at an approved off-site facility.

## C. Receiving Water Characteristics

The Amargosa Valley is located within a typical basin and range geomorphologic province. The valley floor consists of alluvial fill material and the surrounding range front is comprised of Tertiary volcanics.

The depth to groundwater beneath the Liberty Process Facility is 95 feet as determined from groundwater monitoring well MW-1, which is located 150 feet southeast and downgradient of the process building and ore stockpile area. The make-up water well is upgradient of the Liberty Process Facility, approximately 750 feet northeast of the process building.

The water quality from the make-up water supply well and the monitoring well both meet the Profile I reference values.

There are no surface waters or springs identified within a half mile of the Facility.

## D. Procedures for Public Comment

The Notice of the Division's intent to issue a permit authorizing the facility to construct, operate and close, subject to the conditions within the Permit, is being sent to the **Pahrump Valley Times** for publication. The Notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing within a period of 30 days following the date of public notice. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected intrastate agency, or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator

determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.403 through NAC 445A.406.

## E. Proposed Determination

The Division has made the tentative determination to issue the Permit.

## F. Proposed Effluent Limitations, Schedule of Compliance, Special Conditions

See Section I of the Permit.

## G. Rationale for Permit Requirements

The facility is located in an area where annual evaporation is greater than annual precipitation. Therefore, it must operate under a standard of performance which authorizes no discharge(s) except for those accumulations resulting from a storm event beyond that required by design for containment.

The primary method for identification of escaping process solution will be placed on required routine monitoring and inspection and the sampling of monitoring well MW-1. Specific monitoring requirements can be found in the Water Pollution Control Permit.

## H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code (USC) 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50 Code of Federal Regulations [CFR] 10, 15 April 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service is authorized to enforce the prevention of migratory bird mortalities at ponds and tailings impoundments. Compliance with State permits may not be adequate to ensure protection of migratory birds for compliance with provisions of Federal statutes to protect wildlife.

Open waters attract migratory waterfowl and other avian species. High mortality rates of birds have resulted from contact with toxic ponds at operations utilizing toxic substances. The Service is aware of two approaches that are available to prevent migratory bird mortality: 1) physical isolation of toxic water bodies through barriers (covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of the toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective. Contact the U.S. Fish and Wildlife Service at 1340 Financial Boulevard, Suite 234, Reno, Nevada 89502-7147, (775) 861-6300, for additional information.

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