FACT SHEET

(Pursuant to Nevada Administrative Code (NAC) 445A.401)

Permittee Name: **Albemarle U.S., Inc.**

Project Name: **Silver Peak Lithium Project**

Permit Number: **NEV0070005**
Review Type/Year/Revision: **Renewal 2023, Fact Sheet Revision 00**

A. Description of Facility

Location: The Silver Peak Lithium Project (SPLP), formerly Silver Peak Lithium Project, is located in Esmeralda County, within portions of Sections 26 through 28, Township 1 South (T1S), Range 40 East (R40E); Sections 1, 12, 13, and 21 through 25, T2S, R39E; and Sections 1 through 11, 15 through 20, and 29 through 32, T2S, R40E, Mount Diablo Baseline and Meridian, approximately 40 miles southwest of Tonopah, near the town of Silver Peak.

Albemarle U.S., Inc. (formerly Rockwood Lithium, Inc.) is the current Permittee of Record for the SPLP and is authorized to process up to 7,500 tons of lithium carbonate annually using solution mining and chemical processing.

The SPLP is located within the Clayton Valley Playa, a closed hydrological basin. The project occupies approximately 7,386 acres, of which 6,068 acres is private land owned or leased to the Permittee and 1,318 acres on public land administered by the BLM-Battle Mountain District, Tonopah Field Office.

Site Access: From Hawthorne, proceed east then south on US Route (US)-95, 63 miles to Coaldale Junction/US-6; proceed east on US-95/US-6 six miles to the junction of State Route (SR)-265/Nivlock Road; proceed south on SR-265, 21 miles through the town of Silver Peak to the Silver Peak Lithium Project – Administrative Offices, located on the south side of the road. The process facility is on the north side of the road and the brine operations are located approximately 3 miles east of Silver Peak on Silver Peak Road and occupy both the north and south sides of the road.

From Tonopah, proceed west on US-95/US-6 for a distance of 34 miles to the junction of SR-265/Nivlock Road; proceed west, then south on SR-265 through the town of Silver Peak to the SPLP. In addition, access to the site is also possible via gravel/dirt roads from Tonopah and Goldfield.

Characteristics: The SPLP consists of numerous deep wells, solar evaporation ponds, lime sludge pond, process plant, stockpiled salt dumps, and lime slakers. The groundwaters or subsurface brines of the Clayton Valley Playa are essentially the "ore" for the SPLP, and typically average more than 139,000 mg/L total dissolved solids

(TDS). Annual brine well production (extraction) is typically in the billions of gallons range. Annual lithium hydroxide and lithium carbonate plant feed is typically in the tens of millions of gallons range and all processing, reagent storage, and fuel dispensing and storage is on concrete containment of at least 110 percent of the largest tank or vessel.

Production Limitation and Fee Category Designation: Mining facilities regulated by the Division, utilize a regulatory fee structure based on the annual ore production. Although the fee structure differentiates facilities that use chemicals in their beneficiation process and those that do not (e.g., physical separation facility), there is no distinction between hardrock and solution mining.

For fee assessment purposes, the Division and Permittee have agreed upon a fee structure based on the annual ore processed, not the annual volume of lithium brine extracted. With an ore processing rate of 7,500 tons annually, the SPLP has been placed in the lowest fee category for chemical process facilities. Refer to the Division's 1 May 1997 letter to Cyprus Foote Mineral Company for additional details.

B. Synopsis

Background/History: Albemarle U.S., Inc. formerly Rockwood Lithium, Inc. and its predecessor companies (Chemetall Foote Corporation, Cyprus Foote Minerals, and Foote Minerals) have operated at the SPLP site since 1964. Division records indicate that National Pollutant Discharge Elimination System (NPDES) Permit NEV0070005 was first issued to the Foote Mineral Company in 1978 by the Division of Environmental Protection (Division) Bureau of Water Pollution Control (BWPC). The Permit expired in 1982 and although a renewal application was submitted, the NPDES Permit renewal was delayed for a variety of reasons, including 1) BWPC permitting workload and priorities at the time; 2) Pending changes in the administration of the NPDES program and regulation implementation; and 3) the uncertain future applicability of the SPLP to the NPDES regulations. In the interim, the facility was authorized to continue operation under the existing NPDES Permit.

Changes to NPDES regulatory criteria resulted in the elimination of NPDES Permit requirement for the SPLP in 1989. In its place, a new Water Pollution Control Permit (WPCP NEV0070005) was issued. In addition, the Division's newly-formed Bureau of Mining Regulation and Reclamation (BMRR), was assigned permitting, monitoring, and compliance responsibility for the SPLP that year.

WPCP NEV0070005 was issued to the Permittee in 1992. In 1994, the Permit was modified for the construction of a lithium hydroxide monohydrate ($LiOH•H_2O$) production facility which was completed in 1996. In 1998, the Permit was modified for the expansion of the lower tank farm in the lithium hydroxide monohydrate plant. In addition, there have been several Engineering Design Changes (EDCs), the most recent being the April 2023 Phase I Evaporation Pond Reactivation.

Current Operations: Lithium bearing brines are pumped from beneath the playa surface by a series of production wells placed and operated to recover the resource most efficiently from the aquifer. The range of designed operation conditions for each well is dependent upon the aquifer and individual hydrology of the unit, with a total wellfield production of no more than 17.86 million gallons of lithium brine per day.

Exploration, well drilling, and aquifer development are continuous throughout the operation. The brines produced from the wells enter the solar evaporating pond system, comprised of 30 evaporating ponds of which 25 are currently active. All are unlined except for the R-2 and R-3 ponds. The R-2 pond holds the hydroxide plant tailings material and the R-3 pond holds the most concentrated solution. Solar evaporation of the brines results in the precipitation of salts, primarily in the form of magnesium chloride ($MgCl_2$) and sodium chloride (NaCl) when the salt solution saturation levels are reached. The ponds are designed to operate with a brine depth of one to two feet, with one foot of freeboard, which equates to more than four times the 100-year, 24-hour storm event.

Evapoconcentration Pond Operations
Weak brine is delivered to the pond system for processing into plant feed material. As weak brine concentration varies between wells and fluctuates throughout the year, adjustments are required in the downstream pond operations to continue to provide the process plant with high quality brine.

The weak brine enters the pond system, where the concentration of lithium is increased via solar evapoconcentration. Wherever possible, gravity flow is utilized throughout the system and by pumps where necessary. When brine concentration reaches approximately a ten-fold increase in lithium it is necessary to remove magnesium from the brines. This is achieved by adding slaked lime ($Ca(OH)_2$) with water and adding the resultant slurry to the brine in a two-stage reactor system. The lime slaking operation is controlled by measuring the specific gravity of the slurry to ensure that the proper ratio of water to lime is used for maximum efficiency. The lime addition rate is controlled by measuring the pH of the brine as it is discharged from the reactors.

The addition of slaked lime results in the production of a semi-solid mud, consisting mainly of magnesium hydroxide ($Mg(OH)_2$) and calcium sulfate ($CaSO_4$), which is deposited in the Lime Solids Pond. Decant and further evaporation of the treated brine results in the continued deposition of salts on the pond floors. When economically feasible, the salts are removed from the ponds and stockpiled in one of three piles located adjacent to the pond area. The discharged brine enters a series of nine small ponds known as the Strong Brine Complex (SBC) for evapoconcentration.

Lithium Carbonate Production
When the lithium concentration reaches levels suitable for Lithium Carbonate Plant feed, the brine is pumped from the SBC to the Lithium Carbonate Plant. Within the plant, the brine is discharged into one of two mixing tanks, where slaked lime and soda ash (Na_2CO_3) are added to remove any remaining magnesium and calcium, which would interfere with the precipitation of lithium carbonate (Li_2CO_3). This treatment results in

the production of a semi-solid sludge composed primarily of magnesium hydroxide and calcium carbonate ($CaCO_3$). This mud is removed periodically from the treatment tanks and discharged into the Plant Waste Ditch (PWD), where it is combined with other plant waste waters and discharged onto the playa surface near the western edge of the pond system.

The quantity of lime added is determined by the final solution pH. The quantity of soda ash solution added to each batch is determined by the treated brine calcium ion concentration. The treated batches of brine are pumped into one of three settling tanks, where the precipitated calcium and magnesium muds are allowed to settle out. The settled brine is decanted through one of two plate and frame filter presses into the Clear Brine Surge Tank (CBST). The filter presses are pre-coated with a diatomite filter media.

The brine feed is pumped from the CBST on a continuous basis through the heat exchangers into the reactor system. The rate of brine feed (in gallons per minute) is based on lithium concentration and production requirements. The heat exchangers heat the brine.

The hot brine feed is split between the first two reactors in a ratio based on operating conditions and brine strength. Soda ash is added continuously to Reactor #1 by a weigh feeder at a rate controlled by plant instrumentation. The quantity of excess soda ash added is determined hourly by titration of the mother liquor from Reactor #3 with adjustments made accordingly. The product slurry overflowing Reactor #3 is pumped into a bank of cyclones, with the overflow from the cyclones discharged to the Settler Tank, for sedimentation. The Settler Tank under flow is pumped to another cyclone, and the overflowed mother liquor is pumped to the pond system. The cyclone underflow slurry is spread over the extractor belt where the remaining mother liquor is removed by vacuum and pumped into the mother liquor line and returned to the ponds.

The product cake on the extractor is washed with hot, softened, or purified water to remove any contaminants left by the mother liquor. The water is removed from the cake by another vacuum pan and pumped into Reactor #1. The washed cake is fed to a propane fired dryer, then air conveyed to the product bin and packaging warehouse.

Lithium Carbonate Circuit Unauthorized Improvements and Reconciliation

During the 4th quarter 2013 Mine Compliance Inspection, Division personnel identified unauthorized changes and improvements made to the existing fluid management system at the SPLP. To reconcile the changes, the Permittee submitted an EDC on 29 January 2014 (approved by the Division on 4 February 2014).

In an effort to improve solution flow and eliminate plugging, the underground PWD piping was removed and, in its place, a new concrete-lined ditch was installed. This involved digging up the 12-inch diameter steel piping, forming the new culvert floor and walls, pouring concrete, and installing grating. The changes to the drainage ditch appear to have eliminated the problem of plugging and now permit cleanout of the drainage ditch that traverses the roadway. The open drainage is twice the cross-sectional area of the piping although no changes were made to either the volume or rate of fluids that use the ditch.

The rear of the Lithium Carbonate Plant building has an access point to a dock that is level with the first floor of the plant. The first floor is the main area for loading reagents or removing equipment. The dock is elevated and difficult to access and the road to the dock is a steep, dirt slope with the drainage ditch crossing through it.

The original dock height was roughly 5 feet higher than the dirt ramp, and the ditch was approximately 6 inches subgrade and spalling. Forms were made and concrete was poured in order to raise the ramp slope about 2 feet at the dock. The concrete was poured 6 inches thick overall, except at the ramp, where it is wedge-shaped. The ditch remained in the same location although the ditch walls were elevated to the new ramp height and new grating was installed. The new height of the dock is roughly 30 inches above the concrete driveway.

The improvements made at this location allow for easier access to the first floor of the Lithium Carbonate Plant while removing the dirt ramp which eroded materials into the ditch and under the plant itself in the subfloor. The integrity of the ditch has been improved significantly and the reduced slope will decrease the opportunity for debris to fill the ditch. The location of the ditch did not change nor has the fluid composition or quantity changed.

Lithium Hydroxide Production
In the Lithium Hydroxide Plant, lithium carbonate is reacted with slaked lime to produce a lithium hydroxide solution and calcium carbonate solids. The calcium carbonate solids are separated by centrifuging, washed and moved to the playa for storage in the pond system. The lithium hydroxide solution is evaporated in a triple effect evaporator to precipitate the solid lithium hydroxide monohydrate ($LiOH•H_2O$), which is dried and packaged for sales. A portion of the lithium hydroxide monohydrate is further processed into anhydrous lithium hydroxide (LiOH) for sales.

To further supplement lithium hydroxide production, the SPLP is authorized to receive scrap lithium metal from the Permittee's Kings Mountain, North Carolina facility and from a toll producer for the purpose of producing lithium hydroxide solution. Scrap lithium metal is added to the non-potable brine ponds where it reacts to produce lithium hydroxide solution.

Lime is slaked with dirty condensate in the lime slaker, which feeds slurry to a reactor. Lithium carbonate is fed to the reactor with lime with the resulting slurry pumped to a series of digesters, which provide sufficient residence time for the reaction to go to completion. The concentration of LiOH and CO_2 in the slurry are measured to control the feed rates to the reactors and to adjust the lithium carbonate-lime ratio. CO_2 is a measure of the unreacted lithium carbonate, which if present will cause scaling in the evaporator tubes. The values are maintained by adjustments to the lime, lithium carbonate and make-up water feed rates.

Slurry overflow from Digester #4 pumped to Bird Centrifuge #1, where the LiOH bearing liquor is separated from the $CaCO_3$ muds. The liquor is sent to unfiltered storage, and the muds re-slurried with water and sent to Bird Centrifuge #2. The concentrate from the washing is sent to the reactor, and the muds re-slurried and returned to the playa. The purpose of the second centrifuge is to wash the mud to minimize the loss of lithium from the process. The liquor from unfiltered storage is pumped through plate and frame filter presses to remove any remaining bits of solids. After leaving the presses, the liquor is sent to filtered storage for feeding to the Tripple Effect Evaporator (TEV).

In the TEV, water is removed from the liquor by evaporation under vacuum. Evaporation under vacuum allows boiling of the liquor at temperatures much lower than atmospheric pressure. Formation of lithium hydroxide crystals at temperatures above about 1500° F can result in the precipitation of the anhydrous form instead of the monohydrate.

A portion of the slurry from the recirculation system from the third effect of the evaporator is diverted to a hydrocyclone, where the thickened slurry is fed through a clarifier into the product centrifuge. The concentrate is removed and returned to the evaporator system. The product cake is washed with hot water and delivered to the dryer. The dryer is of the steam-heated air rotary design, and both product and air temperature are controlled, as well as air humidity. The dried product is then transferred to the screening and packaging operation.

Control of drying conditions is critical to product quality in that under drying will produce a product which will cake in the package, and over drying will result in the formation of anhydrous lithium hydroxide on the surface of the product crystals which will produce dust when handling. Product from the dryer is passed through a Rotex screen to segregate by size fraction depending on customer needs and specifications. Over and undersize material is re-dissolved and returned to the evaporator system. Product is packaged after screening into appropriate containers and sampled for final shipping analysis.

Product Packaging and Shipment
Product intended for packaging and shipment to customers is transferred by pneumatic conveyors or feed screws to various packaging bins, depending on the product line. From the packaging bins the product is transferred into the packaging facility by mechanical conveyors. In the packaging facility the product may be packaged in a number of different containers, depending on sales and inventory needs.

Future Plans: With the demand for lithium and lithium compounds increasing, future plans include improvements to the pond system and wells and the full-time operation of the lithium carbonate plant.

Fluid Management: In the solar pond system, the brines flow from one pond to another, typically through flow points cut in the dikes separating the ponds, or pumped where elevation differential requires, as evaporation increases the total dissolved solids (TDS) content. Management of the flow through the system consists of regular monitoring of pond levels and laboratory analysis of the contained brines.

The rate of brine transfer from one pond to another is dictated by the rate of solids increase, which is dependent upon the evaporation rate, which is seasonally variable. Sampling of the pond brines for laboratory analysis is done on a regular schedule, which provides for sampling of each pond a minimum of once per month and a maximum of once daily, depending upon the need.

Pond levels are surveyed monthly, for calculation of contained gallons, and monitored daily by visual inspection. The storage capacity for meteoric waters is typically in excess of one foot of freeboard, which equates to more than four times the 100-year, 24-hour storm event. The flow through the system is adjusted and closely monitored during and after any severe storm event and action must be taken by plant personnel in the event the quantity of precipitation exceeds one tenth of an inch, pursuant to the emergency response plan.

The process fluids at the lithium carbonate plant site are contained in lined steel tanks, which are either open-topped (if located inside the plant) or covered (if located outside the facility). Process fluids at the lithium hydroxide plant are contained in steel and fiber reinforced plastic tanks, which are either open-topped (if located inside the plant) or covered (if located outside the facility). In addition, collection sumps have been installed to provide for the recovery of any fluids which may collect on the processing floor. These fluids are returned to the process for recovery of the contained lithium product values. The secondary containment required pursuant to NAC 445A.436 is provided for the post-regulation lithium hydroxide plant and lower tank farm (including acid tanks), but not the pre-regulation lithium carbonate plant.

New Pond Construction

To increase pond evaporation area during the winter months, an EDC approved by the Division on August 16, 2013, authorized the construction of two new ponds 18-North and 18-South) south of the existing pond system. The ponds are located on public and private land and were constructed in two phases (Phase 1 and Phase 2). Soil materials for the project originated from stockpiles and sources on private land, and clay and rock for coring and rip rap was sourced from a borrow pit located on BLM land. These two ponds were approved for construction in the early 1980s but had not been built.

Access roads were first constructed on the natural playa surface followed by dike construction. Building the new dikes required the placement and compaction of soil lifts on the new access road to the height needed to hold brine. Once the new dikes on the south and west side were completed, these and the lifted road (dike) along the east side required installation of a clay core that penetrates the playa clays. Playa clays in this area are extremely low permeability and are effective natural pond liners. The current method of installing a clay core into an existing dirt dike requires excavation through the center, followed by installation and compaction of clay into the void.

The new clay cores of the east, west, and south dikes were tied into the existing clay core of the southern dike of 17-West and 17-East. Once the cores were tied into the core system of the 17-East and 17-West ponds, a final dirt cap was installed, and rip-rap utilized to protect specific dikes facing the prevailing wind direction.

Facility Upgrades
To further optimize process operations, an EDC approved by the Division on February 1, 2023, authorized several upgrades to the Silver Peak facility during the 2023 planned maintenance down. The upgrades included the following:

- *Liming Facility Upgrade*: The new liming facility will be installed in the same location as the previous facility. The new system will have a throughput of 5 short tons per hour. Lime will be transferred pneumatically from delivery trucks to silo, mixed with water to form 20 percent solids slurry (by weight) with coarse grit removed, and discharged to the milk-of-lime storage tank for use in the lithium carbonate (Li_2CO_3) circuit.
- *Replacement Boiler*: The existing York Shipley (Donlee) propane fired boiler will be replaced with a new 800 hp Superior propane boiler in the same location.
- *Hydrocyclone Assembly Replacement*: The existing hydrocyclone assembly has met its design life and requires replacement. A new hydrocyclone assembly constructed of Alloy 20 (to minimize corrosion and wear from chloride on the inner and outer tubs) will be installed. The new unit will have seven individual hydrocyclones installed compared to five on the exiting unit. The maintenance of the new hydrocyclones will require an acid wash with 3 to 5 percent hydrochloric acid (HCl) to minimize solid build up and scale on the tubs.
- *Settler Tank Repair*: The settler tank will be emptied and cleaned to verify the integrity of the tank due to years of continued operation. The existing lid panels of the settler Tank are being replaced with fiberglass panels.
- *Replacement of Mother Liquor Tank, Pump and Piping*: The existing Mother Liquor Tank will be replaced with a new Fiber-Reinforced Plastic (FRP) tank. New vent pipe will be installed and routed to the Settler Tank and the tank overfill pipe will be replaced.
- *HCl Acid Scrubber Tank and Piping Replacement*: A new FRP tank (5-foot diameter and 8-foot 9-inch height) will replace the existing tank. All associated pipes will be replaced with new pipes. A new level transmitter and magnetic level indicator will be installed on the tank for level measurements with high level alarm wired to the exiting strobe and horn.
- *Acid Wash Automation and Piping Project*: Planned upgrades include the replacement of the existing flexible hoses with permanent hard piping. Automated on/off valves will be installed in place of the existing hand-operated valves for improved optimization of the acid wash system. A flow restriction orifice will be installed in the 36 percent HCl line to each reactor to limit the maximum HCl addition rate and minimize the risk for overpressure from rapid CO_2 generation.
- *Acid Kill Safety Improvements*: This upgrade will allow for reclamation of off-spec products previously managed as waste. A larger capacity pump will replace the

existing pump and a level transmitter with remote readout will be installed to monitor the tank liquid level and foaming during neutralization. A camera with remote viewing screen will be installed to monitor the Acid Kill Tank.

Phase 1 Evaporation Pond Reactivation
To allow for the continued operation of the SPLP and evaporation of lithium-bearing brines, an EDC approved 12 April 2023 allowed for the rehabilitation of three (3) existing evaporation ponds (Ponds 45, 13S, and 16E). The rehabilitation work will include vertical expansion of existing pond embankments for Pond 45, Pond 13S, and Pond 16E and the installation of geomembrane liner in Pond 45.

The vertical expansion of Pond 13S and Pond 16E embankments will be unlined and constructed to 2H:1V (horizontal:vertical) sideslopes. Riprap erosion protection will be placed to the maximum anticipated operating level and an access road width of 14 feet on the safety berms.

In areas where new embankment fill will be placed, the upper 2 feet of native soils (playa sediment and salt) will be removed, and the cut surface prepared in accordance with Technical Specifications for below the prepared subgrade level. The final 2 feet of embankment fill will then be placed and compacted, and safety berms constructed. As an alternative, it may be feasible to construct the clay core as embankment fill is placed, thereby avoiding the need for trench excavation. Albemarle will work closely with the selected earthworks contractor to develop the most efficient approach to clay core construction. Albemarle is currently evaluating the potential to replace the clay embankment core with a vertical wall of high-density polyethylene geomembrane. If Albemarle decides to go this route, Albemarle will notify NDEP-BMRR and NDWR and provide the proposed geomembrane material and installation specifications in advance of construction. The base of Ponds 16E and 13S will not be altered.

Current plans call for the placement of a geomembrane liner in Pond 45. The same embankment expansion measures described above will be implemented for Pond 45, except that a geomembrane liner will be placed over the pond base and sideslopes and a riprap erosion protection layer will not be placed. Refer to Drawings 220 for Pond 45 construction details. The base of Pond 45 will be prepared in accordance with the Technical Specifications to facilitate liner installation. Geotextile and/or geonet may be used to stabilize the subgrade for liner placement if saturated areas are encountered during construction.

***Petroleum-Contaminated Soil (PCS) Management Plan*:** A PCS Management Plan was approved by the Division as an EDC on March 18, 2011, authorizing on-site disposal of PCS at a PCS disposal pad constructed on the Clayton Valley playa 4.5 miles east of the town of Silver Peak. Prior to management under the plan, hazardous waste determinations must be performed to demonstrate that the PCS is not hazardous waste. Hazardous waste must be managed and disposed of in accordance with applicable regulations.

On-site disposal of PCS is also contingent on the results of periodic screening analyses, which must show that the PCS does not exceed screening levels established via risk assessment for various organic constituents. Otherwise, the PCS must be properly disposed of off-site. PCS may be stored on an approved PCS temporary holding pad while screening analyses are performed. The PCS temporary holding pad includes a soil liner that meets the requirements of NAC 445A.438. The liner is protected by a minimum 6-inch thick layer of drain rock and a minimum 6-inch thick sand marker bed.

C. Site Geology, Hydrology and Background Groundwater Quality

Geology: The basement rock of Clayton Valley consists of late Neoproterozoic to Ordovician carbonate and clastic rocks that were deposited along the ancient western passive margin of North America. During late Paleozoic and Mesozoic orogenies, the region was shortened and subjected to low-grade metamorphism, and granitoids were emplaced at about 155 and 85 million years ago (Ma). Extension commenced at approximately 16 Ma and has continued to the present, with changes in structural style as documented in the Silver Peak-Lone Mountain Extensional Complex. A metamorphic core complex just west of Clayton Valley was exhumed from mid-crustal depths during Neogene extension. There is a Quaternary cinder cone and associated basaltic lava flows in the northwest part of the basin.

The basin is bounded to the east by a steep normal fault system toward which basin strata thicken. These basin-filling strata compose the aquifer system which hosts and produces lithium-rich brine. The north and east parts of Clayton Valley are flanked with Miocene to Pliocene sediments containing multiple primary and re-worked volcanic ash deposits within fine-grained clay and silt units. These deposits are a part of the Esmeralda Formation, a sedimentary sequence grading from coal-bearing siltstones, sandstones and conglomerates at the base to fine-grained, tuffaceous lacustrine sediments at the top of the section.

The presence of travertine (a variety of limestone or calcium carbonate) deposits which occur in the northeast part of the valley, as well as the west and central parts of the valley are evidence of past hot spring activity on the valley floor. At the base of Paymaster Canyon, gravity and seismic surveys have been conducted to map the Weepah Hills detachment fault and reveal the presence of tuff at depth coincident with a geothermal anomaly.

Hydrology: The SPLP is located on the eastern side of Clayton Valley, Esmeralda County, Nevada. Clayton Valley is a closed hydrographic basin, approximately 29 miles in length and approximately 19 miles in width. The Clayton Valley hydrographic basin is internally drained, and the approximate area of the topographically closed basin is 555 square miles, or 355,200 acres. There is no permanent, naturally occurring surface water in the basin. Watercourses in the basin are generally ephemeral and flow only during periods of intense precipitation.

Recharge to the basin from surface water occurs by precipitation and runoff, controlled by the ephemeral streams in alluvial washes and at mountain fronts. Recharge via groundwater to the basin is from Big Smoky Valley inflow and to a lesser extent, inflows from Alkali Springs Valley, and potentially from Fish Lake Valley and Lida Valley basins. Since Clayton Valley is a closed basin, outflow is solely from evapotranspiration occurring in the lowland areas of the valley.

Groundwater flows from the higher elevations toward the center of the valley with steeper gradients in the mountains and extremely flat gradients across the playa. The lowest groundwater elevations based on available data are between 4080 and 4110 feet above mean sea level (ft amsl) and generally occur in the vicinity of the evaporation ponds. Groundwater extraction for this neighboring facility is believed to further contribute to the already internally draining nature of the basin by lowering the groundwater in the playa.

Basin Water Use: Nevada Groundwater Pumping Inventory from 2017 reports that 8,802 acre-ft per annum (AFA) were extracted from Clayton Valley in 2017, with 8.387 AFA (95.3 percent) used for mining and milling, 408 AFA (4.6 percent) used for municipal or quasi-municipal supply, and 6 AFA (less than 0.1 percent) used for livestock.

A hydrographic area summary report indicates there is 23,908 AFA allocated for the Clayton Valley Basin (Hydrographic Area-143). Of this volume, 23,281 AFA were allocated to mining and milling (97.4 percent), 589 AFA (2.5 percent) allocated to municipal or quasi-municipal use, and 38 AFA (less than 0.1 percent) allocated for livestock. Assuming similar usage and approved usage rates in 2022 as compared to 2017, only 36 percent of the groundwater was extracted.

There are no known domestic water users downgradient of the Silver Peak Lithium Project area, drinking water for the town of Silver Peak is obtained from wells located upgradient of the playa floor within the Silver Peak Range to the west and Weepah Hills to the north of Clayton Valley.

Extensive exploration drilling has occurred to define the naturally occurring brine ore body and hydrogeology of the playa and areas surrounding the playa. The dual-tube drilling method is used to define a vertical profile of the hydrogeologic conditions of the subsurface as well as the groundwater chemistry. Freshwater does not exist near the pond system of the playa. However, upgradient of the playa margin yields groundwater that is potable. A monitoring well is located between the R-2 process pond and the freshwater wells (located upgradient) to define the groundwater quality between the playa aquifer and the freshwater aquifer. The topographic surface at the freshwater wells is about 120 meters (390 feet) higher in elevation than the playa surface and the direction of the groundwater flow is toward the playa.

Stormwater runoff and accumulation is directed to the closed hydrogeologic system of the Clayton Valley.

Background Water Quality and Potential Standards Exemption: The Clayton Valley aquifer is not the primary source of drinking water for the region, due to its high TDS and salinity. Drinking water for the unincorporated community of Silver Peak and the surrounding area is obtained from wells upgradient of the basin located within the Silver Peak Range and Weepah Hills.

Historic groundwater quality data for the Clayton Valley Aquifer from numerous locations throughout the valley indicate groundwater exceedances of the NDEP Profile I reference values for several constituents:

Table 1.—Clayton Valley Aquifer historic constituent concentrations

Analyte	NDEP Profile I	Clayton Valley Aquifer		
		Min.	Max.	Avg.
Aluminum	0.2	0.06	28.2	5.65
Arsenic	0.01	0.144	0.224	0.186
Chloride	400	63000	82000	72256
Iron	0.6	0.6	29.6	7.0
Magnesium	150	470	555	505
Manganese	0.1	4.04	5.59	4.57
Sulfate	500	3160	4700	3943
Total Dissolved Solids	1000	16200	170000	107800

Pursuant to NAC 445A.424(2)(b), the Division has the regulatory authority to exempt water from these reference values, if 1) TDS concentration is greater than 10,000 mg/L and 2) it is not reasonably expected to be a source of drinking water. As presented in Table 1, the Clayton Valley aquifer has TDS concentrations that typically range from a low of 450 mg/L around the periphery of the basin to greater than 170,000 mg/L in the vicinity of the SPLP project site and the municipality of Silver Peak. The water is considered economically or technologically impractical to render it fit for human consumption.

In 2021, a neighboring lithium brine extraction pilot facility formally requested and in 2023 received a limited exemption pursuant NAC 445A.424(2), authorizing the discharge into rapid infiltration basins (RIBs) of 50 acre-feet of spent brine (in total) for return to the groundwater aquifer. Any proposed increase in surface discharge and/or groundwater pumping rates by this neighboring facility will require additional water rights be obtained, the submittal of a new, full-scale numerical groundwater flow model for Division approval, and if the model is approved a new WPCP application and fee submitted for review and approval.

Albemarle is of the opinion that based on their current extraction technologies, such an exemption is not necessary. For programmatic consistency, the Division is requiring as a Schedule of Compliance item, Albemarle provide data and a narrative demonstrating an exemption of NAC 445A.424(2) is not necessary. Refer to Part F. Proposed Limitations, Schedule of Compliance, Monitoring, Special Conditions, below.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the discharge, subject to the conditions within the Permit, is being published on the Division website: https://ndep.nv.gov/posts/category/land. The Notice is being mailed to interested persons on the Bureau of Mining Regulation and Reclamation mailing list. Anyone wishing to comment on the proposed Permit can do so in writing within a period of 30 days following the date the public notice is posted to the Division website. 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. The public hearing must be conducted in accordance with Nevada Revised Statutes (NRS) Chapter 233B, unless waived by the applicant.

E. Proposed Determination

The Division has made the tentative determination to issue the new/modified/renewed Permit.

F. Proposed Limitations, Schedule of Compliance, Monitoring, Special Conditions

Schedule of Compliance:

1. Within 60 (sixty) days after the effective date of this Permit, the Permittee shall submit to the Division detailed documentation and data to demonstrate whether the concentration of any constituent in any discharge authorized by the Permit exceeds the greater of:

    a. A state or federal regulation prescribing standards for drinking water; or

    b. The natural background concentration of the regulated drinking water constituent.

And, if so, whether the resultant concentration of that constituent or those constituents renders the receiving groundwater unsuitable for the existing or potential municipal, industrial, domestic, or agricultural use.

2. If the Permittee's demonstration shows degradation, as defined in NAC 445A.424(1)(b) or (c), within 30 days of the Division's written response to the Permittee's demonstration, the Permittee shall:

   a. Apply for an aquifer exemption consistent with the requirements of NAC 445A.424(2); or

   b. Submit to the Division a plan and application for Permit modification to eliminate the discharge exceedance(s).

Permit Limitations:

1. A minimum of 2 feet of freeboard shall be maintained in the R-2 Pond at all times. All other ponds must maintain a freeboard of 1 foot.

2. PCS that exceeds screening levels shall not be placed at an on-site disposal location.

3. Failure to meet a Schedule of Compliance date or requirement.

The Division may require additional actions if warranted in accordance with site conditions and applicable statutes, regulations, orders, and Permit conditions.

G. Rationale for Permit Requirements

The facility is located in an area where annual evaporation is greater than annual precipitation. The groundwaters of the Clayton Valley Playa do not currently serve as a source of drinking water; the Playa produces a mineral fluid that is capable of commercial production, as evidenced by a 40-year history of lithium production from the fluid, and it would be economically or technologically impractical to render the water fit for human consumption. In addition, the total dissolved solids in the groundwater averages 139,000 mg/L, due to the fact that Clayton Playa is the terminal discharging point for deeper water circulation through the adjacent valleys. Therefore, the playa groundwater is exempted from drinking water standards pursuant to NAC 445A.424(1).

The primary method for identification of escaping process solution from components on the playa margin and upgradient thereof, where groundwater quality meets or exceeds Profile I standards, will be placed on required routine monitoring and sampling of monitoring well(s) and inspections. Specific monitoring requirements can be found in the Water Pollution Control Permit.

H. Federal Migratory Bird Treaty Act

The SPLP avian program maintains numerous permits with State and Federal agencies and uses a three-part approach to institutionalizing the development of optimal avian protection. Avian mortalities at the site are minimized by an integrated avian management plan, consisting of hazing, rescue, and power line retrofits. On-site rehabilitation and habitat enhancement mitigate avian distress and maximize the positive habitat aspects of the site for avian populations. Ongoing data collection, reporting, and analysis allow Silver Peak to continually refine its avian protection approach and reallocate avian protection resources to greatest advantage.

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code 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 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 (e.g., by 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 2800 Cottage Way, Room W-2606, Sacramento, California 95825, (916) 414-6464, for additional information.

Prepared by: Rob Kuczynski, P.E., Chief, BMRR
Date: XX May 2023

Permit Revision 00: Permit Renewal 2023