EXHIBIT 2

WATER POLLUTION CONTROL PERMIT APPLICATION
(WITHOUT ATTACHMENTS)

WATER POLLUTION CONTROL PERMIT APPLICATION
Thacker Pass Project

Prepared For:

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ATTACHMENTS

WATER POLLUTION CONTROL PERMIT APPLICATION
Thacker Pass Project

PART 1
NAC 445A.394 - GENERAL

Prepared For:

LithiumNevada

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS PART 1

PART 1: NAC 445A.394 - GENERAL

1.1 APPLICATION REQUIREMENTS CHECKLIST

☐ Permit Application and Fee (NAC 445A.394.1).

The signed permit application and proof of payment is presented in ***Attachment A – Permit Application and Proof of Payment.***

☐ The name, location and mailing address of the: Facility, Owner, Operator, Authorized Agent (NAC 445A.394.2a).

This information is included in ***Sections 1.2.1, 1.2.2 and 1.2.3***

☐ The legal structure of the applicant, including, but not limited to, whether the applicant is a sole proprietorship, partnership or corporation (NAC 445A.394.2b).

This information is included in ***Section 1.2.4, Legal Structure (NAC 445A.394 Part 2(b))****.*

☐ The name of the owner of the land or mining claim or claims on which the facility will be located (NAC 445A.394.2c).

This information is included in ***Section 1.2.5, Claim Information and Land Status (NAC 445A.394 Part 2(c))****.*

☐ Documentation that notice of the proposed development has been provided to the local board of county commissioners (NAC 445A.394.2d).

This information is included in ***Attachment C – Notice of Proposed Development.***

☐ The rate at which the facility is anticipated to be chemically processing ore in tons of ore per year (NAC 445A.394.2e).

This information is included in ***Section 1.4, Mining and Processing Rate (NAC 445A.394 Part 2(e))****.*

1.2 OPERATOR INFORMATION (NAC 445A.394 PART 1)

1.2.1 Project Facility (NAC 445A.394 Part 2(a1))

The Thacker Pass Project (Project) is located in Humboldt County, Nevada, approximately 20 miles west-northwest of Orovada, and 62 miles north-northwest of Winnemucca, Nevada. The site is accessed from SR 293, off US Highway 95. The Plan of Operations (POO) Project area will encompass 10,468 acres, with an estimated life-of-mine disturbance of approximately 5,545 acres. The Project area sits at the southern end of the McDermitt Caldera Complex in Township 44 North (T44N), Range 34 East (R34E) within Sections 1 and 12; T44N, R35E within Sections 2, 3, 4, 5, 6, 7 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17; and T44N, R36E, within sections 7, 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 29.

1.2.2 Project Owner and Operator (NAC 445A.394 Part 2(a2)(a3))

The Project is 100 percent owned and operated by Lithium Nevada Corporation (LNC), a Nevada corporation that is a wholly owned subsidiary of Lithium Americas Corporation (LAC). The contact information is listed below. Additional information is included in **Attachment A – Permit Application and Proof of Payment.**

Project Owner/Operator
Lithium Nevada Corporation
3685 Lakeside Drive
Reno, Nevada 89509
(775) 827-3318

1.2.3 Nevada Registered Authorized Agent (NAC 445A.394 Part 2(a4))

The Nevada registered Authorized Agent for LNC is Mr. Thomas P. Erwin. Registered agent contact information is listed below. Additional information is included in **Attachment A – Permit Application and Proof of Payment.**

Project Registered Authorized Agent
Thomas P. Erwin
241 Ridge Street, Suite 210
Reno, Nevada 89501
(775) 786-9494

1.2.4 Legal Structure (NAC 445A.394 Part 2(b))

LNC, a Nevada corporation, is a wholly owned subsidiary of Lithium Americas Corporation (LAC). LAC's common shares are listed for trading on both the New York Stock Exchange and the Toronto Stock Exchange. As a publicly traded company, LAC is subject to applicable securities legislation in respect of all of its disclosure, including disclosure made by LNC in this document. As a result, LAC advises that statements in this document that are not historical fact are forward looking statements and information, which are subject to the risks, assumptions and uncertainties described in LAC's public disclosure documents. Readers are cautioned to review those documents in full prior to trading in LAC's securities.

Additional information is included in **Attachment A – Permit Application and Proof of Payment.**

1.2.5 Claim Information and Land Status (NAC 445A.394 Part 2(c))

LNC owns 492 unpatented lode mining claims within the Project boundary that provide the necessary surface and subsurface mineral estate for the Project. The subject unpatented mining claims are located on public lands administered by the Bureau of Land Management (BLM) and have been properly located, filed, recorded, and maintained, in accordance with 30 United States Code (U.S.C.) Part 28, 43 U.S.C. Part 1744, 43 Code of Federal Regulations (CFR) parts 3830 through 3839, and Nevada Revised Statutes (NRS) 46, Ch. 517. All claims are owned or controlled by LNC. Mining claim information can be referenced in **Attachment B – LNC Mining Claims** and are depicted in **Figure 1.1**. The list includes BLM serial numbers of unpatented mining claims and the corresponding claim names, as required by 43 CFR 3809.

1.3 DOCUMENTATION OF PROPOSED DEVELOPMENT TO COUNTY COMMISSIONERS (NAC 445A.394 PART2 (D))

LNC submitted a letter to the Humboldt County Board of Commissioners on December 16, 2019, providing notice of LNC's intent to develop the proposed Project. A copy of this letter is included as **Attachment C – Notice of Proposed Development**.

1.4 ORE PROCESSING RATE (NAC 445A.394 PART 2(E))

The rate of ore processing will average approximately 2.28 million tons per year, with a maximum rate of approximately 2.52 million tons per year on a dry basis for Phase 1. LNC may enter into Phase 2 operations as early as year 5, increasing ore processing rates up to an average of approximately 6.83 million tons per year and a maximum of approximately 7.64 million tons per year on a dry basis. Implementation of Phase 2 will ultimately depend on market conditions and lithium demand.

WATER POLLUTION CONTROL PERMIT APPLICATION
Thacker Pass Project

PART 2
NAC 445A.395 – ASSESSMENT OF AREA REVIEW

Prepared For:

LithiumNevada

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS PART 2

LIST OF TABLES

PART 2: NAC 445A.395 – ASSESSMENT OF AREA REVIEW

2.1 APPLICATION REQUIREMENTS CHECKLIST

☐ Hydrogeological and lithological information which defines the subsurface conditions of the site beneath and adjacent to all point sources to a minimum depth of 100 feet (NAC 445A.395.1a).

*A summary of the subsurface explorations is presented in **Section 2.4, Subsurface Exploration**; detailed information of subsurface exploration is included in **Attachment E**. Hydrogeological and lithological information is presented in **Section 2.5, Hydrogeology and Lithology.** Detailed information regarding the hydrogeology and lithology at the Thacker Pass Project is presented in the Baseline Hydrologic Data Collection Report prepared by Piteau Associates USA Ltd. (Piteau) (**Attachment E**) and the Engineering Design Report prepared by NewFields **(Attachment J)**.*

☐ A geological map covering the area within a 1-mile radius of the process components (NAC 445A.395.1b).

*The Regional Geology and Local Geology are described in **Sections 2.5.1**. The general geology map for the site and 1-mile radius from the facilities is included as **Figure 2.3**.*

☐ A topographic map which identifies:

(I) All known surface waterways, streams, springs and seeps within a 1-mile radius of the facility (NAC 445A.395.1c(1));

*A topographic map of the area showing the known surface water bodies, streams, springs and seeps is presented as **Figure 2.7**.*

(II) All existing habitable buildings within a 1-mile radius of the facility (NAC 445A.395.1c(2));

*There is one habitable building within a 1-mile radius of the permit boundary and is located to the northeast of the Clay Tailings Filter Stack (CTFS). The location of this building is included in the topographic map presented as **Figure 2.10**.*

(III) The boundaries and area of the upgradient watershed and the degree to which the 100-year, 24-hour storm event will affect the process components (NAC 445A.395.1c(3)); and

*This information is presented in **Section 2.7, Upgradient Watersheds**, and the hydrographic basin boundaries is shown on Figure 2.5 and the upgradient watersheds that affects the facilities is included within the topographical map presented as **Figure 2.6.***

(IV) All wells constructed for supplies of drinking water within 5 miles downgradient of the site identified in the records of the Division of Water Resources of the Department or known to the applicant (NAC 445A.395.1c(4)).

This information is presented in ***Section 2.8, Known Downgradient Water Wells****. The location of the wells in the vicinity of the Project are included in the topographical map presented as* ***Figure 2.10****. The location of all known wells within 5 miles downgradient of the site are shown on the map included as* ***Figure 2.9.***

2.2 INTRODUCTION

LNC proposes to construct, operate, reclaim, and close the Thacker Pass Project – an open pit claystone lithium mining and processing operation, located on public lands in northern Humboldt County, Nevada. The Project is currently planned to be developed in two phases. This Water Pollution Control Permit (WPCP) application is for the first 10 years of mining and processing operations (Phase 1), which will be implemented upon construction of the mine. If market conditions and lithium demand warrant progression to a further mining phase, LNC will submit an amended WPCP application.

The Project site is located approximately 20 miles west-northwest of Orovada, 62 miles north-northwest of Winnemucca, between the Kings River Valley to the west, the Quinn River Valley to the east, the Montana Mountains to the north, and the Double H Mountains to the south in an area known as Thacker Pass. The elevation in the Project area ranges from approximately 4,200 to 5,650 feet above mean sea level (amsl).

The proposed activities and facilities associated with the Project for Phase 1 include:

- Development of an open pit mine;
- Concurrent backfilling of the open pit using waste rock and coarse gangue material;
- Construction of two Waste Rock Storage Facilities (WRSFs) for permanent storage of excavated mine waste rock;
- Construction and operation of mine facilities;
- Construction of a Run-of-Mine (ROM) ore stockpile;
- Construction and operation of an attrition scrubbing process and ore slurry pipeline;
- Construction of a coarse gangue stockpile;
- Construction and operation of a lithium processing facility;
- Construction and operation of a sulfuric acid plant;
- Construction and operation of a Clay Tailings Filter Stack (CTFS);
- Construction and maintenance of haul and secondary roads;
- Construction and maintenance of stormwater management infrastructure (diversions and sediment ponds);
- Construction of three growth media stockpiles;
- Construction of electricity transmission lines, substations, and distribution;
- Installation of water supply wells and associated infrastructure; and
- Construction of ancillary facilities to support the Project such as septic systems, communication towers, guard shacks, reclaim ponds, monitoring wells, weather station, fiber optic line, buffer areas, and fencing.

A project location site map is shown in **Figure 2.1** and a general facility layout of the proposed facilities is shown in **Figure 2.2**.

2.3 PURPOSE

The purpose of this WPCP Assessment of Area Review (AAR) is to provide an assessment of the Project's surrounding geology, hydrogeology, lithology, surface water, habitable buildings, upgradient watersheds and storm events, nearby drinking water wells, and potential uses of ground and surface water. The AAR has been completed in accordance with Nevada Administrative Code (NAC) 445A.395.

2.4 SUBSURFACE EXPLORATION

Subsurface exploration of the McDermitt Caldera and Thacker Pass area started in 1975 by Chevron who were exploring for uranium in the volcanic rocks located throughout the McDermitt Caldera. The United States Geological Survey (USGS) notified Chevron of the presence of anomalous concentrations of lithium associated with the caldera. Chevron initiated a clay analysis program, which confirmed the presence of high lithium concentrations using airborne gamma ray spectrometry, although their exploration program continued to focus on uranium.[1]

Chevron drilled 234 holes in the 1970s and 1980s that broadly outlined the lithium deposit. Between 1980 and 1987, Chevron conducted a drilling program that focused on lithium targets and conducted extensive metallurgical testing to determine the viability of extracting lithium from the clays.

In 2007, Western Lithium USA Corporation (WLC) began an exploration drilling program focused on the southern portion of the caldera. WLC drilled 232 exploration holes over the course of four years in the Project area, which identified an anomalously high-grade lithium deposit. As part of a merger, WLC officially changed its name to LAC in March of 2016 and ownership of the Project was placed in LAC's Nevada-based subsidiary, LNC.

LNC continued exploration drilling in 2017 and 2018, drilling an additional 142 holes. The WLC/LNC drilling exploration program drilled a total of 374 HQ (2.5") core holes for a total of 113,951 feet with a range of depths from 20 feet to 760 feet. The average depth of drilling is 302 feet. The HQ core was drilled with either a truck or track mounted core rig capable of 1,500 feet of depth.

2.5 HYDROGEOLOGY AND LITHOLOGY

Thacker Pass lithology consists of lacustrine sediments that were deposited within the southern margin of the McDermitt Caldera. The lacustrine sediments are comprised of alternating layers of thick claystone and thin volcanic ash layers; these units are sub-horizontal and often finely interbedded due to the shallow lacustrine depositional environment. Mineralogical analyses of core samples show that the clay mineralogy transitions from predominantly smectite at the

---

[1] "Technical Report on the Pre-Feasibility Study for the Thacker Pass" prepared by Advisian (February 2018)

surface to illite at depth with a thin mixed smectite-illite transition. Calcite and lesser dolomite comprise the bulk of the carbonate minerals in the system. Sulfate and sulfide mineralogy are dependent on oxidation. A further analysis of Thacker Pass lithology can be found in **Attachment D** and **Attachment G**.

The hydrogeology of Thacker Pass is predominantly controlled by low-permeability claystone. This claystone is interbedded with thin layers of volcanic ash and vesicular basaltic lavas with slightly higher permeabilities. Underlying the claystone ore is the basement volcanic tuff with low permeability. The highest permeability occurs within the surface alluvial sediments which contain greater pore spaces and connectivity than all other lithologies in the deposit. The majority of the project is situated within the Quinn River Valley Basin, draining to the east; a small portion of the proposed pit area is within the Kings River Valley Basin and drains to the west. A further analysis of Thacker Pass hydrogeology can be found in **Attachment D** and **Attachment E**.

2.5.1 Local and Regional Geology

The Thacker Pass Project is located in north-central Nevada at the northern end of the Basin and Range tectonic province. Regional geology stretches from southern Oregon to Mexico and is characterized by a series of extension-related normal faults trending roughly north-south resulting in a repetitive series of mountain ranges separated by valleys. The project site is bounded to the north by the Montana Mountains; to the south by the Double H Mountains; to the west by the Kings River Valley; and to the east by the Quinn River Valley.

Local geology of the Thacker Pass Project is controlled by the McDermitt Volcanic Field, a volcanic complex containing four large calderas (or “super volcanoes”) that formed in the middle Miocene. The McDermitt Volcanic Field is located within the southeastern-propagating swarm of volcanism from the Steens Mountain into north-central Nevada. The largest and southeasternmost caldera of the McDermitt Volcanic Field, the McDermitt Caldera, hosts the ore body of the Thacker Pass Project. Prior to collapse of the McDermitt Caldera at 16.33 Ma, volcanism in the northern portion of the McDermitt Volcanic Field and locally small volumes of lavas erupted near the present-day Oregon-Nevada border. These lavas and the flood basalts are exposed along walls of the McDermitt Caldera and are approximately 16.5 to 16.3 million years old[2].

A large lake formed in the caldera basin following the eruptions in the McDermitt Volcanic Field. Associated caldera lake sediments that host the Thacker Pass deposit were deposited on top of the horsts and grabens formed during the faulting associated with the Tuff of Thacker Creek. The lake captured sediments that were eroded from the surrounding drainages.

---

[2] “Technical Report on the Pre-Feasibility Study for the Thacker Pass” prepared by Advisian (February 2018)

Lacustrine claystone sediments which host lithium ore are found intimately interbedded with thin, repetitive water lain ash sequences. Ash layers are well sorted, medium to coarse sized lapilli grains deposited across wide extents, particularly in the Southwest Basin where thick sequences of basal ash beds were encountered across multiple exploration boreholes. Diagenesis at depth has silicified claystone beds in finely laminated, mudstone sequences. The ratio of ash to claystone in these lacustrine units is a continuum, with thick sequences of ash beds found more abundantly in basal lacustrine deposits in the Southwest Basin Area, and greater components of claystone found in the open pit footprint. The rhyolitic Tuff of Long Ridge is found underlying lacustrine sediments and is present in latite textures of felsic phenocrysts to a fine-grained groundmass. In some instances, the Tuff of Long Ridge was deposited as viscous lava, forming flows and pseudo bedding planes. These deposits are referred to as Rheomorphic Tuffs. Further analyses of Thacker Pass geology are included in **Attachment D**, **Attachment E**, and **Attachment G**. A geological map covering the area within a 1-mile radius of the process components is shown in **Figure 2.3**.

2.5.2 Subsurface Conditions

The geologic units in the Project area have been grouped by Piteau Associates (**Attachment E**) into the following seven hydrogeologic units or zones of similar properties, with some compartmentalization of groundwater flow by faults:

- Basin fill alluvium (Quinn River and Kings River Valleys): Basin fill alluvium transitions from the basin margins towards the basin center and are formed by bulk alluvial, younger alluvial fans, and floodplain deposits. Materials are comprised of sub-angular gravels, sands, and silts, with generally less than 30 percent fine-grained content. Basin fill is incised by younger reworked alluvium and pinches out towards the basin margins.
- Thacker Pass Alluvium: Alluvium in Thacker Pass is generally thin, ranging from a few feet to less than 100 feet, and comprised of fine-grained sands, silt, and clays. Alluvium is thicker near structural fault boundaries as observed in PZ18-04. Stream drainages, such as Thacker Creek, are thought to have some structural control, thus relatively thicker sequences of alluvial materials.
- Thacker Pass claystone/ash: The claystone unit is dominantly composed of moat sediments in the form of clays, lithified claystone, and ash. Thin beds of volcanic ash, ranging from less than one foot to five feet in thickness are regularly interbedded within claystone deposits. The claystone unit is approximately 300 to 400 feet thick in the Project area. This unit hosts the lithium-rich hectorite clays which compose the ore body and is the unit in which open pit mining will occur.
- Thacker Pass basal ash: The basal ash unit is found in the Southwest basin, south of Silica Hill, and lies stratigraphically below the claystone/ash unit. Basal ash is primarily composed of rhyolitic volcanic lapilli ranging from 50 to 200 feet thick. Claystone is interbedded in the ash, but less abundant than in the claystone/ash unit.

- Thacker Pass indurated claystone: Indurated claystone is comprised of compacted, and possibly silicified, claystone beds with less abundant ash beds. This unit is located in the northeast sector of the Thacker Pass Project.
- Thacker Pass volcanic tuff: Volcanic tuff (primarily the Tuff of Long Ridge or McDermitt Tuff) is located stratigraphically below the claystone/ash unit. The top of the lithic tuff is a lithified, competent silicic volcanic rock which serves as the boundary between claystone and tuff. Groundwater flow principally occurs through secondary fractures and along structural features.
- Thacker Pass drainages: Stream channels in the Montana Range represent corridors of enhanced transmissivity, interpreted as tectonic shear zones. These zones connect springs and streams to upgradient recharge areas but are enveloped by unfractured bedrock.

2.5.3 Groundwater Resources

As determined by Piteau Associates, the Thacker Pass Project resides along a hydrographic basin divide between two designated hydrographic basins; the Kings River Valley to the west and the Quinn River Valley to the east. The two basins have fully allocated water rights, with perennial yields of 17,000 acre-feet per year and 66,000 acre-feet per year respectively.

Recharge in Quinn River and Kings River valleys begins in mountain blocks with elevations above 5,000 feet amsl, and is distributed to the alluvial basin via two processes: (1) deep bedrock recharge representing precipitation and snowmelt percolation in bedrock mountain blocks; and (2) runoff recharge derived from infiltration of surface water runoff as it flows across alluvium material along basin margins.

Groundwater discharge from Quinn River and Kings River valleys occurs primarily through four processes: (1) evapotranspiration through phreatophytes; (2) irrigation pumping; (3) seeps and springs; and (4) groundwater outflow to adjacent basins. Prior to the 1950s, discharge occurred primarily through evapotranspiration of phreatophytes. However, with the increase in agricultural production during the 1950-60s, irrigation pumping is the largest component of groundwater discharge.

Groundwater levels have been monitored in the vicinity of Thacker Pass through a series of monitoring wells shown in **Figure 2.4**. Groundwater levels tend to reside between 4,625 ft amsl to 5,034 ft amsl. The highest water levels were observed at WSH-7 (approximately 5,285 ft amsl) that was drilled north of the principal E-W fault which functions as a hydraulic flow barrier. Water levels in the western portion of the Thacker Pass Project decline to an elevation of approximately 4,625 ft amsl, observed at PZ18-05. This is approximately 20 ft higher than the headwater of Thacker Creek. To the east, water levels decline to 4,513 ft amsl, observed at MW18-02 which serves as the down gradient monitoring point. Water level data indicated the groundwater divide is shifted approximately 3,500 ft east of the hydrographic divide. The groundwater divide corresponds with a corridor of elevated water levels from WSH-7 (5,285 ft amsl), PH-1 (5,034 ft amsl), and WSH-17 (4,861 ft amsl) which are compartmentalized by minor faults (**Attachment E**).

2.5.4 Groundwater Chemistry and Groundwater Quality

As determined by Piteau Associates, groundwater chemistry ranges from calcium/sodium – bicarbonate to calcium/sodium – sulfate types, possessing nearly equal components of calcium and sodium cations. Monitoring wells WSH-3, WSH-13, and WSH-17 have increasing components of calcium and sodium, which may be related to groundwater age and ion exchange. Major ion chemistry of seeps and springs is similar to that of monitoring wells with slightly higher calcium composition and lack any sodium-rich outlying springs. Chemistry correlation between monitoring wells and springs supports that springs, where they have perennial flow, are expressions of the groundwater system, and are recharged by younger groundwater with shorter flow paths and residence times.

Minor ion composition of groundwater chemistry possesses elevated background concentrations of several constituents (arsenic, fluoride, iron, manganese) which exceed Nevada Reference Values (NRVs). The abundance of arsenic, fluoride, iron and manganese is common for groundwater hosted in volcanic rocks or their weathered derivatives. A summary of groundwater quality is presented in **Table 2-1** and a summary of groundwater Profile I exceedances in the existing groundwater is presented in **Table 2-2**.

Table 2-1: Summary of Groundwater Quality

Averages of Water Quality Analysis For Each Sample																
Parameter	Method	Units	Profile I	MW18-01	MW18-02	MW18-03	MW18-04	PH-1	WSH-03	WSH-11	WSH-13	WSH-14	WSH-17	TW18-02	QRPW18-01 Dis	QRPW18-01 Total
Number of Samples				6	6	6	6	4	4	4	18	4	17	7	8	8
pH	SM 4500-H+	pH	6.5-8.5	7.66	7.57	7.74	7.22	7.92	8.44	7.92	8.27	7.81	8.02	7.28	8.21	8.18
Bicarbonate (HCO3)	SM2320B	mg/L	-	112	145	150	65	190	260	225	208	207	176	140	110	120
Carbonate (CO3)	SM2320B	mg/L	-	0.1	0.1	0.1	0.1	0.1	1.8	0.1	1.9	0.1	0.1	0.1	0.1	0.1
Hydroxide (OH)	SM2320B	mg/L	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Alkalinity	SM2320B	mg/L	-	112	145	150	65	157	226	185	202	167	169	140	-	120
Chloride	EPA 300	mg/L	400	22	97	8	14	73	68	43	27	130	33	12	24	24
Fluoride	EPA 300	mg/L	4	0.24	1.57	1.5	0.18	1.64	2.96	4.31	5.05	1.4	4.02	0.72	-	-
Sulfate	EPA 300	mg/L	500	22	78	26	15	63	6	41	44	61	37	19	-	-
Nitrate + Nitrite Nitrogen	EPA 353.2	mg/L	10	1.03	1	0.11	0.15	0.11	0.08	0.07	0.11	0.07	0.01	0.01	-	-
Total Kjeldahl Nitrogen	EPA 351.2	mg/l	-	0.04	0.26	0.25	0.04	0.07	0.45	0.01	0.15	0.01	0.17	0.04	-	-
Total Nitrogen	Calulation	mg/l	10	1.16	1.25	0.32	0.32	0.11	0.11	0.11	0.33	0.11	0.11	0.05	-	-
Total Dissolved Solids (TDS)	SM 2540C	mg/L	1000	201	455	228	138	407	412	332	331	502	286	220	-	-
WAD Cyanide	SM 4500CNI	mg/L	0.2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-	-
Aluminum, Dissolved	EPA 200.7	mg/L	0.2	0.04	0.005	0.04	0.09	0.005	0.26	0.005	0.03	0.005	0.005	0.01	0.01	0.01
Barium, Dissolved	EPA 200.7	mg/L	2	0.02	0.08	0.08	0.04	0.09	0	0.06	0.05	0.08	0.06	0.05	0.002	0.002
Beryllium, Dissolved	EPA 200.7	mg/L	0.004	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Bismuth, Dissolved	EPA 200.7	mg/L	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Boron, Dissolved	EPA 200.7	mg/L	-	0.01	0.26	0.06	0.01	0.24	0.38	0.22	0.87	0.25	0.35	0.01	0.17	0.17
Cadmium, Dissolved	EPA 200.7	mg/L	0.005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00012	0.0001	0.0001	0.00001	0.0001	0.0001
Calcium, Dissolved	EPA 200.7	mg/L	-	31.8	45.5	30.6	15.3	47.5	3	26.2	12	53.8	21.1	31	27	27
Chromium, Dissolved	EPA 200.7	mg/L	0.1	0.001	0.003	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt, Dissolved	EPA 200.7	mg/L	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Copper, Dissolved	EPA 200.7	mg/L	1	0.004	0.004	0.004	0.004	0.01	0.01	0.01	0.01	0.01	0.024	0.004	-	-
Gallium, Dissolved	EPA 200.7	mg/L	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-
Iron, Dissolved	EPA 200.7	mg/L	0.6	0.04	0.04	0.04	0.09	0.02	0.1	0.02	0.021	0.013	0.021	0.28	0.044	0.047
Lithium, Dissolved	EPA 200.7	mg/L	-	0.01	0.06	0.08	0.01	0.2	0.28	0.35	0.22	0.26	0.22	0.01	0.01	0.01
Magnesium, Dissolved	EPA 200.7	mg/L	150	11	16.1	8.6	4.2	25	1.2	21.5	8.4	31.4	11.8	6.7	5.6	5.5
Manganese, Dissolved	EPA 200.7	mg/L	0.1	0.007	0.006	0.034	0.016	0.01	0.018	0.051	0.026	0.001	0.052	0.083	0.001	0.001
Molybdenum, Dissolved	EPA 200.7	mg/L	-	0.002	0.002	0.05	0.002	0.08	0.01	0.01	0.08	0.03	0.02	0.002	0.002	0.002
Nickel, Dissolved	EPA 200.7	mg/L	-	0.003	0.003	0.003	0.003	0.001	0.001	0.001	0.002	0.001	0.002	0.003	0.003	0.003
Phosphorus, Dissolved	EPA 200.7	mg/L	-	0.05	0.05	0.05	0.05	0.05	0.45	0.05	0.05	0.05	0.05	0.05	-	-
Potassium, Dissolved	EPA 200.7	mg/L	-	1.5	3.8	4	2.5	3.3	2.2	1.2	1.3	3.3	1.1	1.6	7	7
Scandium, Dissolved	EPA 200.7	mg/L	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-
Silver, Dissolved	EPA 200.7	mg/L	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0001	0.001	0.001
Sodium, Dissolved	EPA 200.7	mg/L	-	17	82	33	19	46	152	62	111	65	71	35	41	41
Strontium, Dissolved	EPA 200.7	mg/L	-	0.1	0.3	0.2	0.1	0.9	0.01	0.6	0.3	0.8	0.4	0.1	0.2	0.2
Tin, Dissolved	EPA 200.7	mg/L	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Titanium, Dissolved	EPA 200.7	mg/L	-	0.01	0.01	0.01	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Vanadium, Dissolved	EPA 200.7	mg/L	-	0	0.03	0.001	0.001	0.02	0.001	0.01	0.01	0.02	0.01	0.001	0.01	0.01
Zinc, Dissolved	EPA 200.7	mg/L	5	0.01	0.002	0.01	0.03	0.04	0.02	0.001	0	0.001	0	0.002	0.002	0.002
Mercury, Dissolved	EPA 200.7	mg/L	0.002	0.00002	0.00002	0.00002	0.0001	0.0001	0.00001	0.00001	0.0001	0.00001	0.00008	0.00001	0.00001	0.00001
Antimony, Dissolved	EPA 200.7	mg/L	0.006	0.0003	0.0003	0.002	0	0.005	0	0	0.001	0.002	0.0003	0.0003	0.0003	0.0003
Arsenic, Dissolved	EPA 200.7	mg/L	0.01	0.011	0.024	0.043	0.003	0.034	0.001	0.027	0.003	0.018	0.028	0.016	0.001	0.001
Lead, Dissolved	EPA 200.7	mg/L	0.015	0.0003	0.0003	0.0003	0.002	0	0	0	0	0	0	0	0	0
Selenium, Dissolved	EPA 200.7	mg/L	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Thallium, Dissolved	EPA 200.7	mg/L	0.002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Uranium, Dissolved	EPA 200.8	mg/L	0.03	0.001	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0001	-	-
Anions	Calculation	meq/L	-	3.43	7.429552628	3.933415515	2.040567834	6.56649578	6.934144782	5.974486147	6.09117921	8.409747321	4.958205791	3.63	-	-
Cations	Calculation	meq/L	-	3.27	7.274388372	3.8609963	2.164547378	6.56285618	6.98053378	5.796021771	5.84577408	8.201138881	4.836185016	3.68	-	-
Error	Calculation	%	-	1.73	1.025489157	1.789785743	2.865515096	0.76219912	1.704051239	1.009853407	1.9028536	1.760841976	1.251927537	<1.00	-	-

Table 2-2: Summary of Groundwater Profile 1 Exceedances

Constituent	Wells (82 total samples)		
	No. Exceedance Samples	Percentage (%)	Key Wells
Aluminum	5	6	WSH-03
Antimony	5	6	PH-1, WSH-13, WSH-14
Arsenic	61	66	Most wells
Fluoride	26	35	WSH-series wells
Iron	5	5	PH-1, MW18-04
Manganese	1	1	-

Detailed groundwater chemistry and groundwater quality information can be found in the Water Quantity and Quality Impacts Report (**Attachment D**), the Baseline Hydrogeologic Data Collection Report (**Attachment E**), and the Baseline and Model Workplan Report (**Attachment F**) prepared by Piteau Associates, and the Baseline Geochemical Characterization Report (**Attachment G**) prepared by SRK Consulting.

2.5.5 Surface Waterways

Lands within the proposed Project area primarily drain eastward in the direction of the Quinn River Valley. A small portion of the proposed mine pit area and West WRSF resides in the Kings Valley hydrographic basin and thus drains west in the direction of Thacker Creek (**Figure 2.5)**. The hydrological characterization of the basins that affect the project are described in the Climate Analysis Technical Memorandum included as **Attachment H**. The location of the surface water bodies in and around in the vicinity of the Project area are shown in **Figure 2.7**. The proposed Project provides for on-site drainage and fluid management and does not consider off-site discharge of process fluids. As described below, the Project site does not contain jurisdictional Waters of the United States (Approved Jurisdictional Determination SPK-2011-01263 included as **Attachment I**).

Perennial and ephemeral surface water creeks located near the Project area include Thacker Creek, Pole Creek, Rock Creek, and Crowley Creek (**Figure 2.7**). Thacker Creek is a perennial stream fed by springs and is located nearest to the Project area. Pole and Rock creeks are ephemeral streams whose headwaters reside in the Montana Mountains and ultimately discharge to Crowley Creek when flow is present, as described by Piteau Associates in **Attachment E**. The lower reach of Crowley Creek, below the confluence with Rock Creek, is ephemeral while the upper reach is perennial.

In April 2018, surface water monitoring stations were established in Crowley Creek, Upper Thacker Creek, and Lower Thacker Creek to assess baseflow conditions, evapotranspiration (ET) consumption, and monitor stream responses to storm events. Key findings from this year of stream flow monitoring include the following:

- Discharge varies seasonally in Crowley Creek, peaking in March to April and tapering off during summer months. Dry, no flow conditions were observed from July through November 2018 corresponding to peak ET consumption.
- Flow in Upper Thacker Creek peaked in spring months (220 gallons per minute [gpm]) and tapered off during summer months (less than 5 gpm). Flow in Upper Thacker Creek is perennial due groundwater baseflow, which gains as the creek flows downstream.
- Flow at Lower Thacker Creek is also perennial, with smaller seasonal variation than observed at the Upper Thacker monitoring station. Springtime flows are approximately 270 gpm to 330 gpm during March and April with baseflow rates estimated to be 234 gpm.

2.5.6 Seeps and Springs

A review completed by Piteau Associates in August 2019 (**Attachment E**) of the Thacker Pass Project area of interest (AOI) and of potential seeps and springs from previous surveys, aerial photography, and topographic maps identified fifty-six (56) potential seeps and springs within an expanded spring survey boundary. Twenty (20) of the seeps and springs are new locations of which sixteen (16) were found in 2018 and four (4) in 2019. Twenty-two (22) of the seeps and springs identified prior to 2018 have been sufficiently characterized with at least four consecutive quarters of data collection and do not require continued monitoring per the workplan described in **Attachment F**. The remaining fourteen (14) seeps and springs have been chosen for continued monitoring because they represent important water supplies or the prior baseline surveys were less than four quarters. A total of thirty-four (34) are currently being monitored on a quarterly basis as part of the baseline data collection program. One location, SP-056, is a confluence location in upper Rock Creek designed to monitor flow at potential fish habitat. At this stage, a total of fifty-two (52) seeps and spring location count with a set of at least 4 quarters of consecutive data, while the four (4) newest locations had only two quarters of monitoring and then were dry in the third quarter of monitoring.

Seep and spring survey data is further discussed in **Attachment E**. The seeps and springs identified within a 1-mile radius of the Project area are shown in **Figure 2.7**.

2.6 HABITABLE BUILDINGS

There is one parcel of land with a habitable building located within a 1-mile radius of the permit boundary. A private ranch house is located to the northeast of the ultimate CTFS. The location of this building relative to the Project area is shown in **Figure 2.10.** Hydrologically, this building is located outside the project basins as shown in **Figure 2.10**, and upstream from all project's surface water runoff and groundwater outflows.

2.7 UPGRADIENT WATERSHEDS

The Thacker Pass Project straddles the topographic divide separating the Kings River Valley hydrographic basin (Rio King Subarea) and the Quinn River Valley hydrographic basin (Orovada Subarea) as shown in **Figure 2.5**. The Kings River Valley hydrographic basin is divided into the Rio King Subarea to the north and the Sod House Subarea to the south. The Quinn River Valley hydrographic basin is divided into several subareas beginning with the Oregon Subarea furthest north, the McDermitt Subarea, and the Orovada Subarea furthest south. Topography surrounding the mine is typical of the Basin and Range province, consisting of narrow, short mountain ranges with moderate to high relief. The ranges are separated by broad valleys composed of basin fill and lacustrine deposits.

The project local watershed has been divided into six subareas located directly upgradient from the project that affect the proposed facilities as shown on **Figure 2.6**. Relative to the macro hydrographic basins, subareas 1 and 6 belong to the Rio King subarea (Kings River Hydrographic Basin), and subareas 2 through 5, belong to the Orovada subarea (Quinn River Hydrographic Basin). The size of these subareas as defined for the hydrological model are summarized in **Table 2-3**.

Table 2-3: Project Surface-Water Subareas

Watershed denomination	Area (acre)
Subarea 1	832
Subarea 2	864
Subarea 3	2,048
Subarea 4	2,879
Subarea 5	99
Subarea 6	230

Structural stormwater controls around the Project area include stormwater diversion and sediment control facilities. Structural controls are designed to mitigate increased peak flows created by disturbance of pervious surfaces and will work towards reducing scour and/or energy, preventing run-on, and managing runoff quantity and quality. Structural controls are either permanent as part of the overall stormwater management plan (including post reclamation) or are temporary as part of stormwater management during construction and operations.

Diversion of stormwater upgradient of roads, disturbed areas, and other potential pollution sources to avoid comingling with potentially impacted waters will be accomplished by using a combination of berms, channels/swales, culverts, and water bars. Where scour is a concern, check dams, vegetation, riprap and/or synthetic lining will be installed as necessary, to reduce flow velocity and/or armor the channel and banks.

Drainage channels employed during operations that are deemed to be temporary are sized to convey a 25-year, 24-hour design storm except where they are positioned upgradient of process facilities. These drainage channels are sized to convey the 100-year, 24-hour design storm event. Drainage channels that will remain during final closure of the Project are sized to convey the 500-year, 24-hour design storm.

Management of stormwater quantity and quality on disturbed lands include ditches, rip-rap lining, synthetic lining, vegetative lining, and sediment control structures, and lined and unlined ponds. Down-gradient structural controls will capture stormwater originating on WRSFs, ROM stockpile, coarse gangue stockpile, CTFS, and growth media stockpiles. Stormwater originating on roads will be captured in roadside channels with engineered outlets that allow diversion to natural drainage ways.

Sediment ponds will be constructed within the Project area to collect and settle out solids transported by stormwater runoff from disturbed areas. All the sediment ponds with the exception of the West WRSF Sediment Pond will be designed to store a minimum two-year, 24-hour storm event and release excess water using riser pipes or spillways. Water will also be removed by infiltration and evaporation. Sediment ponds with riser pipes will discharge flows in excess of the two-year, 24-hour storm event through the top of the riser pipe and flows in excess of 25-year, 24-hour storm event will overflow through the engineered spillways. All overflow will be directed to a natural drainage or diversion channels. Sediment removal from the ponds will occur routinely using excavators to maintain adequate storage capacity. The ponds were designed to store up to two (2) feet of sediment. Sediment removed will be placed upstream of the control structures and revegetated to resist further migration.

The CTFS reclaim pond and drainage channels are designed to manage runoff from the 100-year 24-hour design storm.

These structural stormwater controls are depicted in **Figure 2.8** and further description of the surface water control features is included as part of the stormwater pollution prevention plan (SWPPP) in **Attachment N**.

2.8 KNOWN DOWNGRADIENT WATER WELLS

The State of Nevada Division of Water Resources (NDWR) Well Log Database was used to determine if any wells were constructed within 5 miles downgradient of the site for the supply of drinking water (NAC445A.395.1.C(4). Relevant Sections in T44N, R34E; T44N, R35E; and T44N, R36E were searched for wells that were installed for bottling, commercial, domestic, institution, irrigation, medicinal, municipal (public supply) and other uses. A total of twenty (20) domestic, forty-one (41) irrigation, and one (1) municipal water wells were identified. These wells are depicted on **Figure 2.9**.

2.9 CONTAMINANT MIGRATION POTENTIAL

2.9.1 Ability of Geologic Formation at the Site of Facility to Inhibit Contamination Migration

The geologic conditions at the site are summarized in section 2.5 above and described in detail at Section 2.3 of the Piteau Water Quantity and Quality Impacts Report (**Attachment D**). The Impacts Report include a Water Quantity Impacts Analysis (Section 7.1), Water Quality Impacts Analysis (Section 7.2), and an Infiltration Model (Section 6.2) which addressed the Waste Rock and Gangue Storage Facilities. A Fate and Transport Analysis (**Attachment S**) completed by Piteau Associates provides a further assessment of antimony levels in groundwater and contamination migration potential from the Proposed Action.

The hydrogeology of Thacker Pass is predominantly controlled by low-permeability claystone, as described in in the Impacts Report and section 2.5 above. Claystone is the dominant rock type and is frequently deposited with ash beds of <1 ft to 5 ft thick. Several minor NE-SW trending faults offset claystone and ash beds. The magnitude of offset in these faults is minor, on the order of tens of feet. However, their presence is hydrogeologically important in compartmentalizing groundwater flow by truncating thin but transmissive ash beds inter-deposited within claystone. (**Attachment D**, pp. 9-10.) The region possesses several compartmentalized bedrock zones, aiding the adequate representation of water levels near the pit. **Id**. at 37.

The site is underlain by rhyolitic Tuff, which is conceptually characterized as low permeability material unless tectonic stress and shearing has opened fractures to transmit water, such as those inferred in the stream channels of Pole, Rock, and Thacker Creeks (**Attachment D**, p. 12). The overall permeability and storage of the volcanic tuff are quite low, even after accounting for fractures (**Attachment D**, p. 16).

The hydrogeologic modeling identifies no-flow boundaries along most of the model perimeter. North and south no-flow boundaries correspond to topographic ridges and surface water flow divides. The western boundary corresponds to the hydrographic divide between Pine Forest Valley and Kings River Valley Basins. The eastern boundary corresponds to the hydrographic divide between Paradise Valley and Quinn River Valley Basins. (**Attachment D**, p. 20 & **Figure 3.6**).

Based on the geologic site conditions, the vertical and lateral movement of constituents at the Thacker Pass site is constrained (**Attachment D**, section 2.). Findings of the Impacts Report and Fate and Transport Report are also set forth in Section 3.5 of this application.

While the overall results of the Fate and Transport Analysis show very limited migration, a detailed Monitoring and Mitigation Plan **(Attachment M)** has been completed to provide assured protection against degradation of groundwater and surface water as mining operations progress.

2.9.2 Waste Rock and Coarse Gangue Infiltration Analysis

Contaminant migration potential was also analyzed for the Coarse Gangue Stockpile and Waste Rock Storage Facilities (WRSFs). Infiltration rates through WRFSs and the Gangue Stockpile were simulated by Piteau (**Attachment D**) utilizing a 1D HYDRUS model. Infiltration rates are simulated to be 1.5% of mean annual precipitation (MAP) for WRSFs and 0.9% of MAP for gangue materials. This corresponds to approximately 4.6 mm/yr and 2.8 mm/yr respectively. Outflow from the WRSFs were simulated to begin discharging after 150 years post-closure whereas the Gangue Stockpile begins discharging approximately 192 years post-closure.

Gangue material has a lower infiltration percentage of MAP than waste rock because the gangue's coarser unsaturated hydraulic properties which form a Richard's barrier below the growth media. Infiltration is limited by the gangue's unsaturated properties, therefore the moisture which remains stored in the surface cover is removed via transpiration. Finer grained waste rock materials are able to transmit water in the unsaturated flow regime faster than gangue. Given measured performance at other sites and the growth capability of vegetation, the numerical simulations performed by Piteau (**Attachment D**) are conservative with respect to infiltration.

Infiltration from WRFs and the Gangue Stockpile is not anticipated to have any impacts to groundwater quality, as addressed in Section 3.5. Sensitivity analysis confirmed that no groundwater impacts are anticipated in the event infiltration is increased or groundwater flow is reduced by a factor of 3.5 to 4 times. This is unlikely because infiltration through vegetated covers on mine facilities is anticipated to be less than simulated.

2.9.3 Population in Area

There is one resident at a private ranch house located within a 1-mile radius of the proposed permit boundary. The Property's Assessor Parcel No. is 03-0311-02 and is located to the northeast of the ultimate CTFS. The location of this building relative to the Project area is shown in **Figure 2.10.**

2.9.4 Depth from Surface to All Groundwater

As mentioned in Piteau's report, included as **Attachment E**, groundwater levels reside between 4,625 feet amsl to 5,034 feet amsl across the Project. According to the groundwater contours developed by Piteau, the approximate depths from the surface to the groundwater are:

- Between 100 and 650 feet below the pit area
- Between 10 and 500 feet below the West WRSF
- Between 150 and 250 feet below the mine facilities area
- Between 50 and 200 feet below the East WRSF

- Between 20 and 200 feet below the Coarse Gangue Stockpile
- Between 0 and 100 feet below the CTFS

Water levels have remained steady over time except for well WSH-17. The continuous drainage of WSH-17 suggests the borehole intercepted the fault barrier and is slowly re-equilibrating to the downgradient hydrologic block. Most monitoring locations equilibrate in a period of months and then remain steady over time. Recharge is thus interpreted as predominantly bedrock percolation from higher and wetter elevations rather than from infiltration of surface runoff.

2.9.5 Distance to All Surrounding Bodies of Water

Surface water delineation and subsequent consultation with the United States Army Corps of Engineers (USACE) has determined there are no Waters of the United States within or immediately adjacent to the Project area. All features delineated were isolated with no connection to foreign or interstate commerce. All ephemeral channels lacked a significant nexus to any Traditional Navigable Water. Aquatic resources did not meet the criteria of jurisdictional Waters of the United States. This was confirmed by USACE, which issued an Approved Jurisdictional Determination (AJD) on February 8, 2019, providing that no aquatic resources within the Survey area are regulated by the USACE (Identification Number SPK-2011-01263, document included as **Attachment I**).

This finding was consistent with previous AJDs made by the USACE on October 11, 2012, and July 26, 2017. Both previous AJDs also determined that aquatic resources within the area were not subject to federal Clean Water Act Section 404 permitting requirements because all wetlands and streams were isolated with no interstate or foreign commerce connection.

2.9.6 Water Quality, Uses, and Potential Uses of the Ground and Surface Water within the Area of Review

Minor ion composition of groundwater possesses elevated background concentrations of several constituents (arsenic, fluoride, iron, and manganese) which exceed NRV for drinking water (NDEP Profile I). Groundwater at the Thacker Pass Project does not currently serve as a source of drinking water and will not serve as a source of drinking water.

Water chemistry analyses completed by Piteau Associates **(Attachment E**) indicate that most springs exceed NRVs for arsenic. This is representative of background groundwater chemistry conditions derived from host rock which is primarily volcanic tuff, claystone, or basalt and conducive to leaching arsenic. A number of other seeps and springs also demonstrated elevated levels of other constituents including aluminum, antimony, iron and magnesium.

WATER POLLUTION CONTROL PERMIT APPLICATION
Thacker Pass Project

PART 3
NAC 445A.396 – METEOROLOGICAL REPORT AND WASTE CHARACTERIZATION

Prepared For:

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS PART 3

LIST OF TABLES

PART 3: NAC 445A.396 – METEOROLOGICAL REPORT AND WASTE CHARACTERIZATION

3.1 APPLICATION REQUIREMENTS CHECKLIST

☐ A summary of historical monthly averages of rainfall obtained from the nearest recording station to the site adjusted for conditions (NAC 445A.396.1);

This information is presented in ***Section 3.2, Monthly Average Rainfall.***

☐ The 24-hour storm events with an interval of recurrence of 10 years, 25 years, and 100 years (NAC 445A.396.2);

This information is presented in ***Section 3.3, 10-, 25-, 100-year, 24-hour Storm Event.***

☐ The diurnal temperature variation from the nearest recording station to the site adjusted for conditions at the site (NAC 445A.396.3); and

This information is presented in ***Section 3.4, Diurnal Temperature Variation****.*

☐ Results from testing samples from the facility's mine site which are representative of the overburden, waste rock and ore at the proposed mine site that have:

(a) Characterized the samples by a multi-element spectrographic assay or an equivalent analytical procedure (NAC 445A.396.4a)

(b) Evaluated the samples for their potential to release pollutants (NAC 445A.396.4b).

This information is presented in ***Section 3.5, Waste Rock, Gangue, Ore and Tailings .***

3.2 MONTHLY AVERAGE RAINFALL

In November 2019, Ecological Resource Consultants Inc. (ERC) conducted an evaluation of precipitation and evaporation data to establish climate-related design criteria for mine planning and engineering design (**Attachment H**). Site and regional data were gathered for this analysis.

Recording of detailed climatological data began at the site in October of 2011. Hourly data is recorded at the site. Regional precipitation data is available from the Western Regional Climate Center (WRCC) for the McDermitt Station (COOP No. 264935-1), Orovada 3W Station (COOP No. 262818-1) and the Kings River Valley Station (COOP No. 264236-1). Monthly data was available from the regional sites. McDermitt started collecting data in 1892, Orovada 3W started in 1911 and Kings River Valley started in 1956. Analyses performed by ERC show that site data correlates better with the Orovada 3W Station than the McDermitt or Kings River Valley Stations.

Monthly estimates of site data were developed for the full period of record where data is available at the Orovada 3W site. For October 2011 – October 2019 monthly site estimates were taken as actual data recorded at the site. For earlier times, monthly site data was estimated from correlations with Orovada 3W data. This analysis produced a synthetic 91-year precipitation data set for the site. The estimated average monthly precipitation is presented in Table 3-1.

Table 3-1: Monthly Average Precipitation

Month	Precipitation Depth (inches)	Month	Precipitation Depth (inches)
January	1.27	July	0.32
February	1.14	August	0.34
March	1.17	September	0.58
April	1.47	October	0.99
May	1.58	November	1.10
June	1.16	December	1.18
Average Annual Precipitation Depth			12.29
Source: Thacker Pass Climate Analysis by ERC (Attachment H)			

The data collected by the site weather station includes precipitation, temperature at 2 meters above ground, temperature at 10 meters above ground, wind speed, relative humidity, atmospheric pressure, and solar radiation. This extensive climatological data set allowed ERC to estimate site-specific evaporation. Monthly pan evaporation estimates at the site were then compared with pan evaporation measured taken from the Rye Patch Dam site for verification. A summary of the calculated site evaporation data is provided in Table 3-2.

Table 3-2: Monthly Evaporation Rates

Month	Calculated Pan Evaporation rate (inches)	Month	Calculated Pan Evaporation rate (inches)
January	1.48	July	12.89
February	2.13	August	11.40
March	3.87	September	7.73
April	5.64	October	4.54
May	7.41	November	2.30
June	10.36	December	1.27
Average Annual Pan Evaporation rate			71.01
Source: Thacker Pass Climate Analysis by ERC (Attachment H)			

3.3 10-, 25-, 100-YEAR, 24-HOUR STORM EVENT

Precipitation estimates for various frequency storm events were obtained using the site location and the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimator from the NOAA website. The design standard for process components is storage of the 25-year, 24-hour storm event and withstanding the 100-year, 24-hour storm event (NAC 445.433). During closure conditions, the 500-year, 24-hour storm event is required for the design of stormwater diversion channels. **Table 3-3** presents values for the various storm events used in the design.

Table 3-3: 24-hour Storm Events

Recurrence Interval (years)	Precipitation Depth (inches)
10	1.64
25	1.96
100	2.48
500	3.12
From NOAA Atlas 14: Latitude: 41.696° N and Longitude: 118.0206° W; Elevation = 4,622.8 feet	

3.4 DIURNAL TEMPERATURE VARIATION

The climate at the site is typical for northern Nevada, with the warmest months occurring during the period of June through August and the coldest months occurring in December, January and February. Piteau (**Attachment E**), describes project climatic conditions as arid, high desert with mild-cool winters and hot-dry summers. Average winter temperature is near freezing (32.5° F), with daily temperatures ranging from highs of ~50°F to lows of ~10°F. Summer temperatures range from highs of ~95°F to lows of ~50°F. Air moisture is generally arid, with relative humidity ranging from ~25% during summer months to ~65% in the winter.

Table 3-4 shows the temperature ranges recorded at the Orovada 3W station, which covers a period of record between 1911 and 2016.

Table 3-4: Monthly Average Maximum and Minimum Temperatures

Month	Average Max. / Min. Temperature (°F)	Month	Average Max. / Min. Temperature (°F)
January	40.1 / 18.1	July	91.8 / 51.5
February	46.2 / 23.1	August	90.1 / 49.1
March	53.6 / 26.8	September	80.8 / 40.7
April	61.6 / 31.2	October	67.4 / 32.2
May	71.3 / 38.2	November	51.9 / 24.6
June	80.9 / 44.6	December	41.4 / 19.3
Source: WRCC – Station Orovada 3W, NV (265818)			

3.5 WASTE ROCK, GANGUE, ORE AND TAILINGS CHARACTERIZATION

3.5.1 Sample Collection and Testing

3.5.1.1 Waste Rock and Ore Samples

Waste rock and ore samples were first collected from the Thacker Pass Project, formerly the Kings Valley Lithium Project, in 2011 initially by Tetra Tech and then by SRK. The Tetra Tech characterization program consisted of 28 waste rock and ore samples, and the SRK characterization program consisted of 71 waste rock and ore samples. The selected sample intervals represent the range of rock material types that would be encountered during mining of the pit as designed at that time. These samples comprise a total of 99 samples collected for the 2011 geochemical characterization program.

SRK initiated a secondary geochemical characterization program in 2018, which included two phases of core sampling. The first phase of sampling was conducted in October 2018, and the second phase in February 2019, where 48 additional samples of waste rock and ore were collected from drill core to ensure thorough spatial coverage of the Thacker Pass pit. A total of 120 samples were collected for the 2018 and 2019 geochemical characterization program.

Representative sample intervals were selected by reviewing the mine plan, multi-element data and proposed pit boundaries for the Thacker Pass pit. Sample intervals were selected from the exploration drill holes with the intent of developing a dataset that is as geochemically, lithologically and spatially representative of the deposit as possible with the mine plan, drill core and multi-element data available for sample selection.

The number of samples selected for each material type reflects the relative proportion of each material type in the final pit wall and the proportion of mined material. The spatial distribution of samples from the complete geochemical characterization dataset relative to the final pit wall geology is detailed in **Attachment G**.

The majority of the selected sample intervals range from approximately 5 to 20 feet in length depending upon the material availability, geology, and ore grade. In all cases, the material collected across the sample interval is identical in character (i.e., lithology, oxidation, grade).

3.5.1.2 Gangue and Ore Feed Material

Gangue material consists of coarse material (+75µm) that is removed from the ore circuit during the attrition scrubbing and hydrocyclone classification process, which mechanically rinses and breaks down claystone ore. The process of physical scrubbing results in a clayey sand and gravel gangue material that is subsequently removed from the clay slurry by hydrocyclone classification. No leaching or chemical rinsing of the ore occurs at this stage of the process and, therefore, gangue material has only been in contact with water and no reagents.

Samples of oxidized gangue material were generated at the LNC research and development facility in Reno, Nevada from bulk ore samples collected within the upper, oxidized portion of the deposit. Samples that are representative of the corresponding ore feed material (i.e., unprocessed material) have also been submitted for static testing for comparison purposes.

For the oxidized material, the following ore feed and gangue material types were included in the characterization program:

- Run-of-Mine (ROM) Ore Feed – consists of unprocessed ore material from the bulk bags.
- -1" Ore Feed – consists of ore material that has been sieved to remove +1” particles and is fed into the attrition scrubber.
- +1" Gangue – the +1” particles removed from the sieving step.
- +100 µm Gangue – material from the cyclone (+100 µm) that has been passed through the attrition scrubber.

Samples of unoxidized gangue material were also generated at LNC research and development facility; they were collected from coarse reject bags and split cores representing unoxidized ore material (i.e. ore that contains sulfide). Samples that are representative of the corresponding ore feed material have also been submitted for static testing for comparison purposes.

For the unoxidized material, the following ore feed and gangue material types were included in this characterization program:

- ROM Ore Feed – consists of unprocessed ore material from coarse reject bags and split cores.
- -75 µm Ore Feed – consists of ore material that has gone through the attrition scrubber and is subsequently wet sieved using a 150 mesh screen (75 µm) to remove +75 µm particles.
- +75 µm Gangue – coarse material (+75 µm) that has been wet sieved using a 150 mesh screen (75 µm) after being run through the attrition scrubber.
- Decant solution from the -75 µm ore feed and +75 µm gangue.

Both the oxidized and unoxidized gangue samples have been analyzed using the same static and kinetic test methods used for the waste rock characterization. A total of 16 oxidized samples and 36 unoxidized samples have been submitted for static testing, for a sum total of 52 gangue and ore feed samples. Of these, 2 oxidized gangue samples and 2 unoxidized gangue samples were selected for kinetic testing.

3.5.1.3 Tailings Material

Tailings material included in this characterization program consist of the clay tailings, neutralization solids, and sulfate salts produced during the extraction of lithium. These materials will be co-disposed in the lined tailings impoundment.

Static testing has been initiated for six samples of clay tailings, four samples of neutralization solids, and one sample representative of sulfate salts generated at the LNC research and development facility. One sample of clay tailings and one sample of neutralization solids have undergone kinetic testing.

3.5.2 Waste Rock, Gangue, Ore and Tailings Characterization Results

3.5.2.1 Waste Rock and Ore Characterization Results

As described in the Baseline Geochemical Characterization Report for the Thacker Pass Project, prepared by SRK (included as **Attachment G**), the results of the static testing demonstrate that the Thacker Pass waste rock and ore will be net neutralizing with an average neutralization potential ratio (NPR) greater than 3 for all material types. This low potential for acid generation was confirmed by the kinetic testing program. Based on the static testing, a minor component of the ash, claystone, and claystone/ash material types (i.e., 2% of the total samples) exhibit a higher potential for acid generation and is predicted to be potentially acid generating (PAG). Kinetic testing is currently ongoing for a sample of ash material (HC-15) that is predicted to be acid generating based on the acid base accounting (ABA) results. This cell (HC-15) has been running for 29 weeks (as of early January 2020), and thus far the pH has remained relatively stable, with weekly pH ranging from 6.36 to 8.01 s.u. and monthly pH ranging from 7.25 to 8.02 s.u.

Even though acidic conditions have not been observed in the kinetic testing program, a conservative estimate of PAG material within the deposit has been developed by LNC geologists using the multi-element data from the exploration program. Total sulfur and calcium were used to assign an acid generation potential (AGP), acid neutralization potential (ANP), and NPR values to each mine block within the geologic block model. Based on an NPR cut-off of 1.2, the material within each block was classified as either PAG or non-PAG. Based on this evaluation, the quantity of PAG material is negligible and estimated to comprise 0.25% of the total waste rock and approximately 1% of the final pit wall surface. Due to the acid neutralization potential of the waste rock and ore and the limited quantity of estimated PAG, segregated waste rock management is not necessary for the Thacker Pass project.

Although the excess of neutralizing capacity means that net acid conditions are unlikely to develop, there is still a potential for the Project's material types to leach some constituents of concern under neutral to alkaline conditions. Based on kinetic testing of waste rock, antimony and arsenic are consistently released at concentrations above Nevada Reference Values (NRVs) through the test duration. Other constituents were initially flushed from the HCT from weeks 0 to 4 at concentrations above NRVs including fluoride, iron, magnesium, manganese, and sulfate. However, these constituents equilibrate to lower concentrations after the initial flush. Baseline groundwater quality results from monitoring wells in the area indicate arsenic is naturally elevated in groundwater.

Low levels of uranium are also initially flushed from the HCTs at concentrations above Profile I-R (i.e., 0.03 mg/L); however, concentrations rapidly decrease to levels below Profile I-R within the first few weeks of testing. Based on groundwater monitoring data, uranium does not occur in groundwater above laboratory analytical detection limits in wells proximal to the site. Based on monitoring done as part of the monitoring program for WPCP NEV2015108 for the Kings Valley Lithium Exploration Project, radionuclides (radium 226/radium 228 and thorium) are locally present in groundwater but at low concentrations below the Profile I-R reference values.

Kinetic testing is currently ongoing for a sample of unoxidized ash material that is predicted to be acid generating based on the ABA results; however, at week 29, neutral conditions were still being maintained. This cell will be continued for a minimum of 40 weeks, or until the objectives of the test have been met and BLM and NDEP-BMRR approval for test termination has been obtained. At 40 weeks, data will be reviewed in detail and recommendations for continuation or termination will be provided to the BLM and NDEP-BMRR for their approval at that time.

Waste rock will be placed, without constraint, in the waste rock dump facility or in the open pit as backfill material. In order to determine the potential for waste rock from the Thacker Pass Project to degrade groundwater, numerical predictive calculations have been carried out to predict, in quantitative terms, the possible concentrations of solutes emanating from the backfilled pit and determine their potential concentrations upon mixing with groundwater.

As mentioned above, none of the geochemical units are classified as acid-generating, nevertheless PAG and non-PAG materials are delineated in the geochemical model. Claystone/ash and ash geochemical units comprise the majority of the pit wall and backfill material. As a result, the resulting pore water chemistry in the backfill will reflect the chemical release functions of these source materials. Claystone/ash materials were characterized as releasing elevated concentrations of fluoride, molybdenum, sulfate, and uranium during initial flushing. Arsenic and antimony complexes were steadily released throughout testing.

Among the alternatives evaluated, the Backfilled Pit Proposed Action produced the fewest number of Profile I exceedances which are primarily arsenic, antimony, and sulfate. Pore water chemistry is anticipated to improve through time. In this configuration, only 36 gpm will cumulatively discharge from backfill.

3.5.2.2 Gangue Characterization Results

Preliminary geochemical characterization data show that oxidized ore feed samples are net neutralizing with an average NPR value of 17 and a potential to leach arsenic and antimony under neutral to alkaline conditions. Oxidized gangue material shows similar results to the ore feed material and is net neutralizing with an average NPR value of 24. Based on meteoric water mobility procedure (MWMP) results, there are notable increases in some of the constituents as a result of the wet attrition process including aluminum, arsenic, antimony, iron and manganese. This is presumably a result of the breakdown of mineral grains during the attrition process and the enrichment of these constituents in the coarse gangue fraction. In addition, calcium, chloride, sodium, sulfate and total dissolved solids (TDS) concentrations decrease indicating these constituents are rinsed from the material during the attrition process.

Data for the unoxidized ore feed and gangue samples show that they are generally comparable to the oxidized ore feed and gangue with a few notable exceptions. The unoxidized ore feed samples have lower overall NPR values than the oxidized ore feed samples, with an average NPR value of 2.8; the same is true of the unoxidized gangue material, which has an average NPR value of 4 due to the presence of sulfides in the unoxidized ore. The unoxidized ore feed and gangue samples exhibit a more comparable range of AGP and ANP values to the waste rock and ore samples, whereas the oxidized ore feed and gangue exhibit a lower range of AGP and ANP values. Despite these differences, both the oxidized and unoxidized ore and gangue samples are mainly non-acid generating with a few samples exhibiting uncertain acid generation potential.

The MWMP leachates are consistently neutral for all of the unoxidized gangue samples, with pH values ranging from 8 to 8.2 s.u. A comparison of MWMP leachate chemistry to NDEP Profile I and Profile III reference values shows that the majority of constituents are below their respective reference values with the exception of antimony, arsenic, fluoride, manganese and molybdenum. For all of the unoxidized gangue samples analyzed to date, antimony, arsenic and manganese are elevated above Profile I reference values, and fluoride and molybdenum are elevated above

Profile III reference values. Exceedances of Profile I and Profile III reference values were also observed for the oxidized gangue samples for antimony, arsenic and fluoride; manganese and molybdenum results do not exceed their respective reference values in the oxidized gangue samples.

A comparison of the unoxidized and oxidized gangue MWMP results shows that, in general, unoxidized gangue exhibits higher concentrations of antimony, calcium, manganese, molybdenum, sulfate and uranium; oxidized gangue exhibits higher concentrations of aluminum, arsenic, iron and mercury.

MWMP leachate from three of the oxidized gangue samples and two of the oxidized ore feed samples was submitted for Profile I-R analysis that includes analysis of uranium, gross alpha, radium 226/radium 228 and thorium. Results indicate that these radionuclides are leached from gangue material and ore feed samples at concentrations below the NDEP Profile I-R reference values.

MWMP leachate was also submitted for Profile I-R analysis for three of the unoxidized gangue samples. These results show that the majority of radionuclides are also leached from the unoxidized gangue samples at concentrations below NDEP Profile I-R reference values. The exceptions to this include uranium, which is elevated in two out of three of the unoxidized gangue samples along with gross alpha. Radium 226/Radium 228 is elevated in one out of three unoxidized gangue samples.

Geochemical characterization of gangue material will continue as mining advances to deeper portions of the deposit and the lithium extraction process is optimized to ensure material used as backfill meets appropriate criteria.

Two samples of oxidized gangue (HC-13 and HC-18) were selected for humidity cell testing. Cells HC-13 and HC-18 have generated slightly alkaline pH in the range of 7.4 to 8.8 s.u. and sulfate is leaching at low, stable levels (less than 10 mg/kg/week). These results are consistent with the static test results that predict both samples are non-acid generating. All metals show stable or decreasing leaching trends. Aluminum and arsenic were elevated above NDEP Profile I reference values throughout the test for both HCTs. Antimony and iron were elevated throughout the test in HC-13 and were elevated sporadically in HC-18. Fluoride was elevated during the initial flush in HC-18. Both cells have over 95% of the original ANP remaining.

A few of the leachates from the oxidized gangue HCTs (HC-13 and HC-18) exhibited cation-anion balances greater than 75% and were re-analyzed after being filtered using a 0.2µm filter. Results for the re-filtered solution indicate that these samples generate leachate with solid particles consisting of fine clays or iron oxyhydroxide colloidal particles that are smaller than 0.45µm that either have metals adsorbed to them or contain trace metals within the colloids. Consequently, constituents that are actually present in the solid phase (i.e., colloids) are reported erroneously as part of the dissolved phase, which results in an overestimate. By using the higher concentrations from the 0.45µm filtered solution, the approach provides an upper estimate that can be considered conservative in terms of element release.

Samples of the unoxidized gangue have completed 2 weeks of testing as of early January 2020 and will be operated until the objectives of the test have been met and BLM and NDEP-BMRR approval for test termination has been obtained. After 40 weeks of testing, the HCT data will be reviewed in detail and recommendations for continuation or termination will be provided to the BLM and NDEP-BMRR for their approval at that time. Samples of post-leach material from the HCT program will be submitted to a Nevada-approved laboratory for optical petrography, XRD, and SEM analysis.

In order to determine the potential for gangue material to degrade groundwater, numerical calculations have been carried out to predict in quantitative terms, the possible concentrations of solutes emanating from the backfilled pit and determine their potential concentrations upon mixing with groundwater as described in Section 3.5.4 below.

3.5.2.3 Tailings Characterization Results

Static and kinetic testing has been conducted for six samples of clay tailings, four samples of neutralization solids, and one sample representative of sulfate salts generated at the LNC research and development facility. The results of the tailings characterization program indicate that the clay tailings do not contain appreciable sulfide sulfur and are unlikely to generate acid from the oxidation of sulfides. This has been confirmed by mineralogical analysis. However, the clay tailings contain residual sulfuric acid from the lithium extraction process that is flushed from the material resulting in the generation of low pH values in the ABA and net acid generation (NAG) tests. In addition, aluminum, arsenic, antimony, beryllium, cadmium, chromium, copper, fluoride, iron, lead, magnesium, manganese, mercury, nickel, sulfate, thallium, TDS and zinc were leached under low pH conditions at concentrations above NDEP Profile I reference values. Samples of neutralization solids and sulfate salts produced circum-neutral to alkaline leachate and constituent concentrations are lower in comparison to the clay tailings.

MWMP leachate from one sample of clay tailings, one sample of neutralization solids and one sample of sulfate salts was submitted for Profile I-R analysis that includes uranium, gross alpha, radium 226/radium 228, and thorium. The results of this testing indicate that for the clay tailings sample, uranium, gross alpha and radium 226/radium 228 exceed the Profile I-R reference values. For the neutralization solids and sulfate salts, these radionuclides are below Profile I-R reference values.

Geochemical testing of the tailings is currently ongoing, including kinetic testing of one sample of clay tailings and one sample of neutralization solids. These tests will be continued for a minimum of 20 weeks, or until the objectives of the test have been met and BLM and NDEP approval for termination has been obtained. Samples of post-leach material from the HCT program will be submitted to a Nevada-approved laboratory for optical microscopy, XRD, and SEM analysis to confirm the mineralogy of the clay tailings and neutralization solids inferred from the static test results. Due to the potential to leach metals and radioactive elements from the tailings at concentrations that exceed Profile I-R reference values, the tailings impoundment will be constructed as a zero discharge facility and covered with cover soil/growth media at closure; therefore, no degradation to groundwater will occur.

3.5.3 Waste Rock and Gangue Management

The Waste Rock and Gangue Management Plan (**Attachment R**) summarizes the management approach as follows:

- Waste rock is characterized as material that contains less than 2,000 ppm lithium and is comprised mainly of claystone and ash lithologic units. Small fractions of basalt, Tv, and HPZ materials will also be included in the waste rock. As evidenced by the geochemical characterization data presented in **Attachment R**, Section 5.1, the waste rock at the Project exhibits high acid neutralization potential and only a limited fraction of the waste rock is estimated to be PAG (0.25% of the total waste rock); therefore, segregated waste rock management is not recommended for the Project and waste rock can be placed without constraint during operations. Up to 45.9 M CY of waste rock material is expected to be generated from open pit operations; this material will be placed in two proposed WRSFs, located west and east of the pit. WRSF design and construction is described in **Attachment R**, Section 8.1. Waste rock material will be placed in the WRSFs until it can be backfilled directly into the mined-out panels (after 4 years of operation). Waste rock will be directly backfilled when possible. LNC may also combine waste rock material in the coarse gangue stockpile to increase pile stability and facilitate haul truck traffic. Waste rock material will also be used as construction material for haul roads and the CTFS.
- Coarse gangue is separated during the attrition scrubbing process, which mechanically rinses and breaks down the claystone ore. The process of physical scrubbing results in a sand and gravel gangue material which has been double rinsed by water. No chemical leaching or rinsing of the gangue material occurs and based on the available geochemical characterization data, the gangue material is predicted to be net neutralizing. Therefore, no special handling of the gangue material is recommended. During the initial phase of mining, coarse gangue material produced during ore processing will be conveyed to the coarse gangue stockpile located east of the open pit. After mining operations have been ongoing for about 13 years, approximately 75.2 M CY of gangue material will be placed in the pit as backfill. The gangue backfill material will be combined with waste rock material when and where feasible.
- The numerical predictions conducted by Piteau (**Attachment D**) support the waste rock and gangue management approach and indicate that there will be no new exceedances of NDEP ProfileI reference values against current groundwater quality within the WRSF and gangue stockpile footprints. Numerical predictions for the backfilled pit demonstrate that although arsenic, antimony and sulfate are elevated above NDEP reference values within the pore

water of the backfill, no impacts to downgradient receptors are predicted (**Attachment R**, pp. 22).

3.5.4 Potential to Release Pollutants

3.5.4.1 Mining Area

The risk assessment contained in the Piteau Impacts Report (**Attachment D**) provided a mass conservative evaluation of solute concentrations down gradient of the pit backfilled with waste rock and gangue material. The risk assessment indicated:

- Sulfate concentrations in backfill outflow will be below NRVs immediately when mixed with groundwater.
- Background groundwater concentrations of arsenic are elevated above NRVs, and thus the contribution of arsenic from backfill is not an impact with regard to arsenic.
- Antimony concentrations are predicted to meet NRVs before reaching any down-gradient stakeholder (i.e. Thacker Creek, springs, or production wells). Travel time for backfill outflow is slow at approximately 14 ft to 25 ft per year.

To study constituent migration potential from the pit area, the Piteau Fate and Transport Report simulated antimony transportation at 0.006 mg/l through groundwater for a 300-year period. **Attachment D.** The Fate and Transport Report provided a refined analysis that tiered off of the Infiltration model, with a focus on antimony as the one constituent identified that could exceed regulatory values in the groundwater. The Fate and Transport Report found that the magnitude of antimony concentration is lower in groundwater than presented in the Infiltration Model. This is attributable to the physical processes of dispersion, advection, and discharge from the saturated backfill and is a more realistic expectation of concentrations through time.

- The overall distribution of antimony after 300 years remains within the Thacker Pass Project's permit boundary and mining 'facility' per 445A.359 & .424.
- Groundwater outflow from the North sub-pit discharged in a south to south-east vector and was aligned with the South sub-pit.
- With respect to the South sub-pit, after 300 years, the lateral extent of antimony migrated approximately 0.5 to 0.75 miles east of the backfill, within the POO boundary, and then decreased below 0.006 mg/l. Antimony concentrations from the backfill did not reach monitoring wells WSH-3 and MW18-02 in the simulation. Antimony did not migrate west of the backfill.
- Discharge from the West sub-pit, which is almost entirely unsaturated, was toward the south. After 300 years, antimony migrated from the east-central west pit area in limited quantities approximately 0.5 miles southward (**Attachment S**, Figure 2.10). Concentrations below the unsaturated portion of the West sub-pit backfill are below NRVs and do not approach Thacker Creek.

- Potential impacts to Thacker Creek are not anticipated and potential impacts to other water stakeholders in Quinn River Basin are also not anticipated by the fate and transport model, without accounting for LNC's Monitoring and Mitigation Plan.

Piteau Associates also completed a sensitivity analysis related to the Fate and Transport Analysis (**Attachment S**, Section 2.3). Sensitivity analyses were performed on transport parameters to evaluate the potential to impact groundwater stakeholders under a range of conditions. Based on the Sensitivity Analysis:

- Increased hydraulic conductivity and lower effective porosity had approximately the same effect on increasing the travel distance of antimony in groundwater. Of the two scenarios, a lower porosity has a greater likelihood because variation to calibrated hydraulic conductivity values produced poor matches to observed water levels. The simulation of antimony at 0.006 mg/l for either sensitivity scenario did not extend beyond the Thacker Pass Project's permit boundary and does not reach other groundwater stakeholders, without considering LNC's Monitoring and Mitigation Plan.
- Antimony concentrations in the "Infiltration through backfill" sensitivity match the footprint of unsaturated backfill. Mass loading from infiltration was diluted by a much greater flux of underlying groundwater residing below the unsaturated backfill. Thus the migration of antimony is constrained by the flux of infiltration and mixing with underlying groundwater and antimony is not predicted to migrate as a result of unsaturated percolation. This sensitivity validates that solute transport is controlled by discharge from the saturated backfill.

LNC has proposed a groundwater monitoring and mitigation plan to address the possibility of impacts from the Thacker Pass Project operation, which as identified are focused on antimony concentrations (**Attachment S**, Part 3). This plan addresses site-wide operations. Four proposed mitigation options are presented that would each directly mitigate the affected groundwater area or provide source control during backfilling. Each of these options is expected to be an effective control to counter contaminant migration, if required. An additional mitigation option (Option 5) is proposed to mitigate potential impacts to surface water features in the Montana Mountains. Two other mitigation options are studies to be administered during operations to better understand potential source control options that may be included during the placement of backfill. Their objective is to evaluate options to reduce or attenuate antimony mass prior to discharge from the backfill. The proposed monitoring and mitigation set forth in this plan does not consider the possibility of a regulatory exemption under NAC 445A.424(2).

3.5.4.2 Waste Rock and Gangue

Geochemical characterization of ore and waste rock has been on-going since 2011 (**Attachment G**). As evidenced by the geochemical data, the waste rock at the Project exhibits high acid neutralization potential. Humidity cell testing is ongoing for some samples; the ash and unoxidized gangue samples have continued to maintain neutral conditions under the accelerated weathering conditions within the cells. Therefore, segregated waste rock management is not recommended, and waste rock can be placed without constraint during operations.

Coarse gangue is separated during the attrition scrubbing process, which mechanically rinses and breaks down the claystone ore. The process of physical scrubbing results in a sand and gravel gangue material which has been double rinsed by water. No chemical leaching or rinsing occurs, and based on the available geochemical characterization data, the gangue material is predicted to be net neutralizing. Therefore, no special handling of the gangue material is recommended.

The numerical predictions conducted by Piteau (**Attachment D**) support the waste rock and gangue management approach and indicate that there will be no new exceedances of NDEP Profile I reference values against current groundwater quality within the WRSF and gangue stockpile footprints. Applying the site geochemistry assembled by SRK (**Attachment G**), the Infiltration Model conducted by Piteau (**Attachment D**) concluded as follows:

- **East WRSF** and **Gangue Stockpile**: Geochemical mixing of infiltration with underlying groundwater flow indicates that no new exceedances to groundwater quality will occur below either the East WRSF or Gangue Stockpile. The only exceedance NRV below mine facilities is arsenic and it is a result of elevated background concentrations rather than infiltration from the facility (0.021 mg/l, Table 6.8 in **Attachment D**).
- **West WRSF**: Geochemical mixing indicates that no new exceedances will occur outside the facility footprint. Arsenic concentrations are above NRVs, but are similarly elevated in background groundwater [0.42 concentration, versus 0.43 mg/l background], (**Attachment D**).

Applying a Sensitivity Analysis (**Attachment D**), Piteau found that an increase or decrease in groundwater flow would not alter these conclusions:

- The sensitivity analysis confirms that no groundwater impacts are anticipated in the event infiltration is increased or groundwater flow is reduced by a factor of 3.5 to 4 times.
- Furthermore, infiltration through vegetated covers on mine facilities is anticipated to be less than simulated.

The simulated groundwater geochemical concentrations are set forth in Table 3-5 below.

Table 3-5: Simulated Groundwater Geochemical Concentrations (Attachment D, Table 6.9)

Facility	Fluxes			Mixed Concentrations				
	Groundwater (gpm)	Facility Infiltration (gpm)	Combined Flow (gpm)	Al (mg/l)	As (mg/l)	Sb (mg/l)	Fe (mg/l)	SO_4 (mg/l)
West WRF	37.2	1.53	38.7	0.00	0.042[1]	0.003	0.04	51
East WRF	45.5	0.66	46.2	0.00	0.021[2]	0.002	0.01	59
Gangue Stockpile	88.7	1.5	90.2	0.00	0.007	0.001	0.07	9

[1] Background value is 0.043 mg/l (MW18-03)

[2] Background value is 0.021 mg/l (WSH-17 / WSH-14)

WATER POLLUTION CONTROL PERMIT APPLICATION

PART 4
NAC 445A.397 – ENGINEERING DESIGN

Thacker Pass Project

Prepared For:

LithiumNevada

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS PART 4

LIST OF FIGURES

PART 4: NAC 445A.397 – ENGINEERING DESIGN

4.1 APPLICATION REQUIREMENTS CHECKLIST

☐ An engineering design report must be prepared and submitted to the Department by a professional engineer registered in Nevada. The report must include the following information, if applicable

(a) Engineering plans for the process components used for beneficiation;

(b) The general specifications and calculations for the process components;

(c) Topographic maps showing the location of all potential sources at the facility including, but not limited to:

(I) The extraction sites;

(II) The process components used for beneficiation;

(III) The disposal sites for waste rock; and

(IV) The disposal sites for spent ore;

(d) Drawings which indicate the layout of the structures and devices for controlling process fluids;

(e) Methods for the control of storm flow runoff;

(f) The existing geological and hydrogeological conditions beneath and adjacent to the site of the fluid management system and waste rock disposal sites and the degree to which these conditions provide natural containment, preferential flow pathways and structural stability;

(g) A description of the liner material and installation procedures for all leach pads, ponds and ditches, including a description of the subbase preparation;

(h) Details of leak detection and site-monitoring systems; and

(i) Process schematics of the facility.

☐ Specifications for constructing the fluid management system and for the material to be used must be submitted to the Department with the application for a permit, and must include, but not be limited to, the methods to be utilized for inspecting, testing, and quality assurance and control.

4.2 ENGINEERING PLANS

Engineering designs for the Thacker Pass Project were completed by NewFields, North American Mining and Kiewit.

NewFields designed the West and East Waste Rock Storage Facilities (WRSF's), the Coarse Gangue Stockpile (CGS), the Clay Tailings Filter Stack (CTFS) and Process Plant stormwater controls. NewFields also assisted North American Mining in completing the Mine Facilities stormwater control designs. Kiewit completed the secondary containment designs for structures in the Process Plant and Mine Facilities areas that required secondary containment. The overall site layout for the project is shown on Figure 4.0.

The NewFields and North American Mining designs were combined into a single engineering design report stamped by NewFields which describes the major components, design criteria, evaluations and calculations for the project. The report is titled, "Engineering Design Report For Clay Tailings Filter Stack, Waste Rock Storage Facilities, Coarse Gangue Stockpile, Mine Facilities and Process Plant Stormwater Management and is included in **Attachment J**. Kiewit performed design of concrete secondary containment structures for areas of the Process Plant and Mine Facilities area where transfer and storage of solution and solids have a potential to degrade the waters of the state. A list of the 27 areas requiring secondary containment at the Process Plant and Mine Facilities is presented on the cover sheet of the **Drawings** in **Attachment K**.

4.3 CALCULATIONS AND SPECIFICATIONS

Numerous calculations were completed to design the major project components which include hydrologic, hydraulic, civil and geotechnical calculations for the West and East WRSF, CGS, CTFS, Process Plant and Mine Facilities. The calculations for the NewFields and North American Mining components are included in **Appendices A through E** in **Attachment J** and for the Kiewit components on the **Drawings** in **Attachment K**.

The NewFields technical specifications provide material and construction method requirements as well as the QA/QC testing program. The specifications include earthworks, geosynthetics, pipe and concrete and are included in **Appendix F** in **Attachment J**. The Kiewit concrete specifications are listed on the **Drawings** in **Attachment K**.

4.4 TOPOGRAPHIC MAPS

The major facilities that make up the project include the Pit, West and East WRSF's, CGS, CTFS, Mine Facilities and the Process Plant. Figures 4.0 through 4.5 show the topography and cross sections for the waste disposal sites which include the WRSF's, CGS and CTFS as well as the layouts for the Mine Facilities and Process Plant. More detailed information about the facilities is shown on the Drawings and explained in the NewFields Engineering Design Report in **Attachment J**.

4.5 DRAWINGS

Four Issued for Construction (IFC) drawing sets were completed for inclusion in the Water Pollution Control Permit which are listed as follows:

- Clay Tailings Filter Stack & Process Plant Stormwater (**Drawings** section in **Attachment J**)
- Waste Rock Storage Facilities and Coarse Gangue Stockpile (**Drawings** section in **Attachment J**)
- Mine Surface Water Control Features (**Drawings** section in **Attachment J**)
- Thacker Pass Processing Facilities (**Attachment K**)

The drawings include a layout of the structures and devices for controlling process fluids. Only the CTFS and Process Plant will contain process liquids or solids that have the potential to degrade the waters of the state. For this reason, the CTFS is geomembrane lined at the base and drains to a double-lined Reclaim Pond to keep seepage water or stormwater runoff from draining onto the natural ground. Water that drains to the Reclaim Pond can be pumped back to the Process Plant or left to evaporate if within the operational pond volume.

The Process Plant uses concrete slabs, curbs and walls to provide secondary containment and storage of process fluids should a spill occur as shown on the Kiewit Drawings in **Attachment K**.

There are no process fluids at the Mine Facilities Area but the Fuel Island and Equipment Wash Bay have will have petroleum products that have potential to degrade the waters of the state. Both of these areas have concrete slabs and walls to provide secondary containment as shown on the Kiewit Drawings in **Attachment K**.

The Engineering Design Report in **Attachment J** and the Process Fluid Management Plan in **Attachment L** provides more information on monitoring and controlling process fluids for the project.

4.6 STORMWATER RUNOFF

Rainfall amounts were determined using information collected from the National Oceanic and Atmospheric Administration (NOAA) database and used to complete hydrologic evaluation for various facilities around the site. Stormwater runoff from areas that contain process fluids and solids or petroleum fluids will be contained within the secondary containment areas. For the major non-contact disturbed areas, stormwater runoff will be directed into sediment ponds located around the site to allow sediments to settle out over time before draining into natural drainages.

The Engineering Design Report in **Attachment J** and the Stormwater Pollution Prevention Plan in **Attachment N** provides more information about the stormwater management controls at the site.

4.7 GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

The geological and hydrogeological conditions for the site are described in detail in the Piteau reports located in **Attachments D, E, and F**. Stability analysis of the WRSF's, CGS and CTFS was completed by NewFields and detailed in the Engineering Design Report in **Attachment J**. All facilities were designed to meet the minimum factors of safety or were within allowable deformation limits as defined in the NDEP stability requirements.

4.8 LINED FACILITIES

As described earlier, facilities that contain liquids or solids that can potentially degrade the waters of the state are contained in a concrete or geomembrane lined facility. The Mine Facilities and Process Plant area have concrete slabs and walls to store stormwater runoff or capture spills from pipes and tanks that contain process solution. The CTFS and Reclaim Pond are lined with High Density Polyethylene (HDPE) geomembrane to contain potential seepage and stormwater runoff from the facility.

For all lined facilities the subgrade will be moisture conditioned (if necessary), compacted and graded to the requirements specified on the Drawings and technical specifications prior to placing concrete or geomembrane. A more detailed description of the lined facilities is provided in **Attachment J**.

4.9 LEAK DETECTION AND MONITORING SYSTEMS

The CTFS Reclaim Pond will be double lined with a 60-mil HDPE double-sided textured secondary geomembrane liner on bottom overlain by a 200-mil thick layer of geonet and an 80-mil HDPE double-sided textured primary geomembrane liner above the geonet. The pond will be equipped with a leak detection and recovery system (LCRS) consisting of a collection sump between the two liners and a riser pipe laid along the slope, providing access for monitoring and recovering any leakage through the primary liner.

Monitoring of the LCRS system will be performed routinely as part of the pond inspections. Any potential leakage detected will be recorded and evaluated against the NDEP allowable leakage rates of 150 gallons per day for the quarter or 50 gallons per day annually. More details about the monitoring the LCRS system can be found in the Monitoring Plan in **Attachment M.** More information about the LCRS design can be found in the NewFields Engineering Design Report in **Attachment J**.

4.10 PROCESS SCHEMATICS

The general process block flow diagram which shows the various processes and sequencing to extract the lithium is included as **Figure 4.6**. Ore is loaded on the ROM stockpile with trucks. The ore is then crushed and processed in the attrition/scrubbing area and pumped through a series of hydrocyclones in the classification area, were the oversize material will be stockpiled at the CGS. The undersize ore slurry will be pumped through the process plant where the lithium concentrates are extracted and the spent ore tailings materials are conveyed to the CTFS temporary stockpile area for placement in the CTFS using haul trucks. A more detailed description of the mining and processing is explained in Part 5 (Operating Plans) of this WPCP.

WATER POLLUTION CONTROL PERMIT APPLICATION

PART 5
NAC 445A.398 – OPERATING PLANS

Thacker Pass Project

Prepared For:

LithiumNevada

Lithium Nevada Corp.
3685 Lakeside Drive
Reno, Nevada 89509

Prepared by:

NewFields

NewFields Mining Design & Technical Services
1301 N. McCarran Blvd., Suite 101
Sparks, Nevada 89431

Revision 0

NewFields Project No. 475.0385.000
April 2, 2020

TABLE OF CONTENTS PART 5

PART 5: NAC 445A.398 – OPERATING PLANS

5.1 APPLICATION REQUIREMENTS CHECKLIST

☐ A description of the mineral processing circuit which includes a flow chart of the facility and the range of operating conditions for which the process components were designed (NAC445A.398.1).

The mineral processing circuit is described in ***Section 5.2.1****. The process flow block diagram is included as* ***Figure 4.6****. The range of operating conditions for the major components of the processing facilities are summarized in* ***Section 5.2.3****.*

☐ A plan for the management of process fluids which describes the methods to be used for the monitoring and controlling of all process fluids (NAC445A.398.2). The plan must provide a description of the means to evaluate the conditions in the fluid management system so as to be able to quantify the available storage capacity for meteoric waters and to define when and to what extent the designed containment capacity has been exceeded.

The plan for the management of process fluids is provided as ***Attachment L****. The detailed calculations and plans for the process fluid containments is presented in* ***Attachment K****.*

☐ A plan for monitoring the facility (NAC445A.398.3) which describes:

(a) The water quality in the area (NAC445A.398.3a);

(b) The monitoring locations the applicant proposes to sample routinely in order to evaluate surface and groundwater at the site that may be affected by the operation of the facility (NAC445A.398.3b);

(c) An analytical profile of each surface and groundwater that may be affected by the operation of the facility (NAC445A.398.3c); and

(d) The locations of the leak detection systems, the frequency for sampling these systems and the analytical profile to be used for evaluation of the samples (NAC445A.398.3d).

A Monitoring Plan has been prepared and is summarized in ***Section 5.4****; the detailed plan is presented in* ***Attachment M****. The best management practices (BMP's) that are designed to reduce the discharge of pollutants in stormwater runoff are presented in* ***Attachment N****.*

☐ A plan for responding to emergencies (NAC445A.398.4) which:

(a) Describes what actions must be initiated and by whom as a result of various possible failures in the fluid management system which would result in releases of pollutants (NAC445A.398.4a); and

(b) Is designed to minimize the environmental impact resulting from the release of process fluids (NAC445A.398.4b).

*An Emergency Response Plan is presented in **Attachment O** and has been prepared in accordance with 29 Code of Federal Regulations (CFR) 1910.38(a), and the general aspects covered by this plan are described in **Section 5.5**.*

☐ A temporary closure plan.

*A Temporary Closure Plan is presented in **Attachment P** and has been developed by LNC in accordance with NAC 445.398.5 and NAC 445A.444, and is described in **Section 5.6.1**. The plan includes operating procedures for temporary closure, including seasonal closures.*

☐ A tentative plan for the permanent closure of the facility which describes the procedures, methods and schedule for stabilizing spent process materials (NAC445A.398.6). The plan must include:

(a) Procedures for characterizing spent process materials as they are generated (NAC445A.398.6a); and

(b) The procedures to stabilize all process components with an emphasis on stabilizing spent process materials and the estimated cost for the procedures (NAC445A.398.6b).

*To satisfy the NDEP-BMRR requirements, a Tentative Plan for Permanent Closure (TPPC) has been prepared for the Thacker Pass Project and is summarized in **Section 5.6.2.*** The full plan *is presented in **Attachment Q**. The reclamation cost estimate was completed using the Nevada Standardized Reclamation Cost Estimator and is included in **Attachment Q**.*

5.2 PROCESS DESCRIPTION

5.2.1 Description of Mineral Processing Circuit (NAC 445A.398.1)

The mineral processing circuit flow diagram is shown on **Figure 4.6**. Effectively, the flow diagram is separated geographically into 5 distinct functional processing areas: (1) mine, (2) mineral classification, (3) chemical plant, (4) tailings management, and (5) sulfuric acid plant and electricity production.

The flowsheet begins at the mine where ore will be delivered from the mine pit to the Run-of-Mine (ROM) ore stockpile. On the ROM stockpile, dozers will push the ore into dozer trap feeders that feed ore to the attrition scrubbers via a belt conveyor.

5.2.1.1 Mine

Mining will be conducted by open pit method using either truck loaders, a continuous surface miner, or excavators. Occasional drilling and blasting will be required as part of mining operations for removal of basalt waste rock. Mined ore will be hauled to the ROM ore stockpile located south of the open pit, while waste rock generated during mining activities will be placed either in the WRSFs (initial years of operation) or within the pit limits as backfill (later years of operation).

The ROM ore stockpile will be designed to store approximately 494,000 cubic yards of ore. Ore will be end-dumped by haul trucks while dozers and motor graders will be used to move the ore around the stockpile area. The ore may be segregated within the pile based on lithium grade to allow the ore to be blended prior to feeding the mineral classification facility. Two dozer trap-type feeders with lump breakers will be located on the south side of the ROM ore stockpile which feed ore onto a belt conveyor that will deliver the ore to the attrition scrubbers. While being conveyed to the attrition scrubbers, ore may pass through a mineral sizer to ensure that there are no clumps of ore larger than 4 inches in diameter. Once the ore passes through the mineral sizer, it will be conveyed to a surge bin that feeds attrition scrubbers via belt feeders located at the bottom of the surge bin.

The attrition scrubbers will use high speed agitators to cause slurry particles to impact one another, thereby creating a scrubbing effect between particles. By exploiting differences in breakage characteristics between lithium-rich and low-grade lithium bearing particles, the attrition scrubbers reduce lithium bearing particles to a size fraction less than approximately 100 microns, while harder, low-grade lithium bearing particles remain in a size fraction larger than approximately 100 microns. Water recycled from the attrition scrubbing process will be added to the attrition scrubbers with any deficit made up from well water. The solids in the attrition scrubber will be slurried to a solids content of approximately 20 percent by weight. Slurry from the attrition scrubbers will gravity discharge onto vibrating screens to remove oversize material prior to pumping the undersize slurry to the mineral classification facility adjacent to the chemical plant via the interplant pipeline. The screened oversize will discharge onto a belt conveyor which will generate a stockpile for periodic haulage to the same location as the waste rock from mining.

5.2.1.2 Mineral Classification

The classification area is designed to separate the lithium-rich, fine clay material from the low-grade, coarse material referred to as coarse gangue.

The classification circuit will separate the coarse gangue from the fine-grained clay ore via a series of hydrocyclones. The underflow from the hydrocyclones will contain the coarse gangue material and the overflow will contain the lithium-bearing clay. After separation, the coarse gangue will be pumped to a dewatering screen and then conveyed to the coarse gangue stockpile. The fine-grained, lithium-bearing clay will be transferred to a paste thickener from which the underflow reports to the acid leaching circuit and the overflow is recycled back to the attrition scrubbing circuit in the mine area. It is estimated that as much as one million dry tons per year of coarse gangue will be separated from the ore during mine operation.

5.2.1.3 Chemical Processing

5.2.1.3.1 Sulfuric Acid Leaching Circuit

Fine lithium-bearing clay ore slurry from the classification process described in **Section 5.2.1.2** will be combined with concentrated sulfuric acid in a series of agitated tanks designed to optimally control the amount of lithium leached. The sulfuric acid will be supplied from an on-site sulfuric acid plant. The undissolved solids and the solids generated during acid leaching, primarily gypsum, will be removed by pressure filtration and blended with filter cake from the neutralization process. The combined filter cake product will be dried to optimal moisture content for structural stability in the CTFS before being conveyed to the CTFS for disposal.

5.2.1.3.2 Neutralization Circuit

The acidic, lithium-bearing solution from acid leaching will be neutralized in agitation tanks by mixing with recycled alkaline solids from the downstream magnesium precipitation and causticizing process areas. Solids generated during the neutralization process will be thickened and filtered by pressure filtration prior to being combined with the clay solids from the leaching process and conveyed to the CTFS for disposal.

5.2.1.3.3 Magnesium Sulfate Crystallization

Magnesium is removed from the neutralized lithium-bearing filtrate in two steps. The first step removes magnesium as a hydrated magnesium sulfate salt in a triple effect evaporation system. The magnesium sulfate salt is separated from the lithium-bearing mother liquor using a centrifuge. Prior to being conveyed to the CTFS for disposal, the magnesium sulfate salt is combined with other sulfate salts produced in downstream chemical processes.

5.2.1.3.4 Magnesium Precipitation

In the second magnesium removal step, residual magnesium and other divalent cations in the lithium-bearing solution that remain after crystallization will be removed by chemical precipitation at alkaline pH. Chemical precipitation takes place by adding quicklime in a conventional vertical mill lime slaker followed by agitated precipitation tanks, thickening and pressure filtration. Soda ash solution is also added in this step to precipitate calcium carbonate. The filter cake will be recycled to the neutralization process as previously described in **Section 5.2.1.3.2**. Further refinement of the filtered lithium-bearing solution will be done by an ion exchange process prior to being sent to the lithium carbonate and/or lithium hydroxide processes.

5.2.1.3.5 Lithium Sulfate Brine Purification by Ion Exchange

The filtrate produced from the magnesium precipitation process still contains trace quantities of divalent cationic species. The final step of purification, prior to production of lithium hydroxide and lithium carbonate, uses ion exchange to exchange divalent cations with sodium cations. Hydrochloric acid is used to strip the divalent species from the resin while caustic solution is used to regenerate the resin. The stripped solution is sent to the zero liquid discharge sulfate crystallizer for disposal in the CTFS as sulfate salts.

5.2.1.3.6 Lithium Hydroxide Monohydrate Production

Purified lithium-bearing solution from the ion exchange process will be transferred to lithium hydroxide monohydrate production. In the first step of lithium hydroxide production, all cations except for sodium, potassium and lithium will be precipitated from solution using caustic soda. Precipitated solids will be removed in a pressure filter and recycled into the neutralization process as described in **Section 5.2.1.3.2**. In the second step, the brine resulting from this causticizing process will be flash cooled and chilled to precipitate sodium sulfate (Glauber's Salt) and potassium sulfate. The sodium and potassium sulfate are removed by filtration prior to being conveyed to the CTFS for disposal. In the third and final step of lithium hydroxide production, the lithium-bearing solution is evaporated and crystallized in standard industrial equipment. This equipment will continuously produce crystals of lithium hydroxide monohydrate product as a wet cake from a centrifuge. These crystals will be centrifuged, washed, and potentially dissolved and re-crystalized in the process to meet the product purity and consistency requirements. As the concentration of impurities build up in the mother liquor of the lithium hydroxide crystallization circuit, mother liquor will be purged to the lithium carbonate production circuit to be converted to lithium carbonate. Following the final crystallization step, lithium hydroxide monohydrate will be dried in nitrogen and packaged in a variety of bulk bags ranging from 50 lbs to 2,000 lbs in weight.

5.2.1.3.7 Lithium Carbonate Production

Mother liquor purged from the lithium hydroxide production process will constitute the feed to the lithium carbonate circuit. Lithium carbonate will be precipitated out of solution using delivered and recycled carbon dioxide, filtered, and then dried. The filtrate will be sent to the zero liquid discharge crystallizer for water recovery. The precipitation and filtration system will be engineered to produce consistent, high-quality product that will meet or exceed a variety of industry standards, namely specifications corresponding to lithium ion batteries.

5.2.1.4 Tailings Management

Lithium processing will produce two blends of tailings that will be conveyed to the CTFS by separate conveyors and placed in separate stockpiles. The blends are (1) undissolved solids and neutralization solids, and (2) sulfate salts.

5.2.1.4.1 Undissolved Solids and Neutralized Tailings

Undissolved solids from the leaching process, gypsum produced during the leaching process, and precipitated solids produced during the neutralization process will be combined and dried to optimal moisture content for structural stability in the CTFS before being conveyed to a temporary stockpile within the geomembrane lined area of the CTFS. From the temporary stockpile, tailings will be loaded into trucks, hauled to either structural or non-structural zones of the CTFS and placed in lifts.

5.2.1.4.2 Sulfate Salt Tailings

All non-lithium components in the ore that are dissolved during leaching will be converted to sulfate salts in various stages of the chemical process, combined, and conveyed to the CTFS. Similar to undissolved solids and neutralized tailings, sulfate salt tailings will be conveyed to a temporary stockpile before being loaded into trucks and hauled to non-structural zones of the CTFS and placed in lifts.

5.2.1.4.3 CTFS Design and Operation

The CTFS is planned to be constructed in phases of relative similar size. The entire facility will have a lined footprint of approximately 17 million square feet with dimensions of approximately 5,000 feet by 3,500 feet. The facility will contain the constructed stack of filtered tailings and salts, and a temporary stockpile area located at the southeast corner of the facility. The facility will store 61 million tons of tailings and salts, and will be constructed with 4H:1V slopes and with a maximum height of 200 feet.

The CTFS design consists of a regraded base, 80-mil HDPE geomembrane, solution collection piping and an overliner layer. The natural topography within the CTFS requires minor regrading to promote drainage to a reclaim water pond located near the southeast corner of the facility. The surface of the regraded ground surface will be prepared for placement of the HDPE geomembrane. Above the geomembrane, perforated pipes will be installed to collect precipitation and drainage from the tailings. A two-foot-thick layer of overliner, comprised of either processed sands and gravels or coarse gangue material, will be placed over the geomembrane and perforated pipes. Above the overliner material, tailings will be stacked in conformance with a stacking plan to maintain geotechnical stability of the structure and to control precipitation and wind erosion of the stacked materials.

Drainage and precipitation collected by the perforated pipes will be routed to the reclaim water pond where it will be stored and evaporated or pumped back into the process plant circuit. The reclaim water pond is a double-geomembrane lined pond with an operating capacity of 9.2 million gallons, a 100-year, 24-hour storm event runoff volume of 17.8 million gallons plus 3.6 million gallons of storage available in the top 3 feet of freeboard. The total pond volume to the crest is 30.6 million gallons.

5.2.1.5 Sulfuric Acid Plant and Electricity Production

Sulfuric acid required for the leaching of the lithium-bearing clay ore will be generated onsite in a sulfuric acid plant. The sulfuric acid will be produced by burning molten sulfur with air to produce sulfur dioxide (SO_2), catalytically converting the SO_2 to sulfur trioxide (SO_3) and absorption of SO_3 in acid. This process will generate a large amount of excess heat that will be captured via economizers, a boiler, and a superheater to produce steam. This steam in turn will be used to generate electrical power via the acid plant turbo generator set, and provide heat for crystallizer evaporators and other process heating requirements.

5.2.2 Flow Chart

The block flow diagram that graphically represents the processes described on **Section 5.2.1** is included as **Figure 4.6**.

5.2.3 Design Criteria

The design criteria for process plant tanks and structures was set at a minimum of 110% of the largest tank volume that would drain to each particular containment area. The volumes of the largest tank and the storage capacity of each containment area are provided in **Attachment K**.

The design criteria for process fluid stored at the CTFS Reclaim Pond #1 is to handle the runoff volume from a 100-year, 24-hour storm event which was determined to be 17.8 M gallons, plus 9.2 million gallons of operating volume and 3.6 million gallons of storage in the top 3 feet of freeboard.

5.3 MANAGEMENT OF PROCESS FLUIDS PLAN (NAC 445A.398.2)

The proposed methods for monitoring and controlling process fluids associated with the fluid management system for the CTFS, process water ponds and the process plant are described in the Process Fluid Management Plan included as **Attachment L**.

5.4 MONITORING PLAN (NAC 445A.398.3)

The purpose of the Monitoring Plan (included as **Attachment M**) is to establish monitoring requirements for the Project during lithium mining and processing operations, and reclamation activities. The objectives of the Monitoring Plan are to:

- Demonstrate compliance with the approved Plan of Operations (POO) and other federal or state environmental laws and regulations;
- Provide early detection of potential problems, and to supply information that will assist in directing corrective actions should they become necessary; and,
- Provide details on type and location of monitoring devices (site-wide monitoring and leak detection monitoring), sampling parameters and frequency, analytical methods, procedures for removal and handling of fluids from leak detection sumps, reporting procedures, and procedures to respond to adverse monitoring results (e.g., quantifying and correcting leaks in liner systems).

LNC proposes to monitor the following mine components in compliance with state and federal permits and requirements: open mine pit, WRSFs, coarse gangue stockpile, ROM ore stockpile, processing plant, CTFS, reagent and fuel storage, and stormwater management system. This Monitoring Plan describes the methods to be used for monitoring mine and processing-related facilities and operations, and environmental resources, including groundwater and surface water. The Monitoring Plan identifies specific points that will be monitored to assess potential impacts to environmental resources by the proposed operation. The types of samples, locations from which samples are collected, parameters to which samples are analyzed, and frequency in which samples are collected, are described in detail in the plan included as **Attachment M**.

Another relevant plan that have aspects of monitoring is the Stormwater Pollution Prevention Plan (**Attachment N**). The Monitoring Plan will be revised as needed based upon final permit stipulations prior to Project commissioning.

5.5 EMERGENCY RESPONSE PLAN (NAC 435A.398.4)

The emergency response plan (ERP) is a requirement of Federal, State and Local Authorities and outlines the response procedures and preventive measures that are essential for effective and timely management of an emergency. The ERP was developed and implemented to prepare for potential emergencies and to reduce the impact of any significant adverse event. The ERP will be used to respond to and manage emergency situations and will be administered by LNC's Safety and Environmental Department. The objectives of the ERP are to:

- Provide for an effective response to emergency situations;
- Minimize the effect on personnel and surrounding communities;
- Minimize property and equipment losses;
- Coordinate interdepartmental responses;
- Assure the cooperation of outside agencies; and,
- Provide for the release of accurate information to the public.

The ERP prepared by LNC for the Thacker Pass project is included as **Attachment O**, and covers the following aspects:

- Emergency Services and Contact Information
- Emergency Preparedness (protective equipment, first aid, fire extinguishers, additional fire suppression measures, hazardous materials identification, hazardous material spill prevention and countermeasures, fluid management system, communication systems, alarm system, evacuation plans, ancillary power systems, and plant site action plan)
- Emergency response procedures (release response, emergency coordinators, roles and responsibilities, emergency response actions, coordination with local authorities, and spill and release reporting requirements)
- Training plan
- ERP review and updating

5.6 CLOSURE AND RECLAMATION PLANS

As part of the Plan of operations prepared for the Thacker Pass Project, LNC prepared a temporary and seasonal closure plan (included as **Attachment P**) and a tentative plan for permanent closure (included as **Attachment Q**).

5.6.1 Temporary and Seasonal Closure Plan (NAC 445A.398.5 and 445A.399)

Mine operations (including processing) are expected to operate 365 days per year, 24 hours per day. No temporary or interim closures of the facility are planned; however, it is possible that mining and process facilities may have to be temporarily closed due to mechanical or technical difficulties, unfavorable economic conditions, litigation, or other unforeseen events. The temporary closure plan (included as **Attachment P**) covers these potential unplanned closure scenarios; therefore, it is structured to be applicable, in general terms, to a range of temporary circumstances.

Pursuant to NAC 445A.399, if the facility is in an area where the mean diurnal temperature does not exceed freezing (32° F) for 30 days or more, a plan for the seasonal closure of the process components is required. Even though diurnal temperatures for the Project may not typically remain below 32° F for more than 30 days each year, extended periods of temperatures below 32° F can occur. Current plans do not anticipate closure during the winter months; however, if closure does become necessary, a seasonal closure plan (included in **Attachment P**) has been prepared. The seasonal closure plan describes the impact of low temperatures on the process components, the activities to be undertaken to prepare those process components, the activities to be maintained during closure, and the conditions to resume operation.

5.6.2 Tentative Plan for Permanent Closure (NAC 445A.398.6)

Reclamation of disturbed areas resulting from activities associated with the Project are outlined in the Tentative Plan for Permanent Closure (TPPC) included as **Attachment Q** and will be completed in accordance with BLM and NDEP regulations. The primary objectives for post-mining reclamation of the Project are to:

- Ensure public safety;
- Reduce or eliminate potential environmental impacts;
- Return the site to a condition supporting land uses similar to those in existence prior to mining activities;
- Control infiltration, erosion, sedimentation, and related degradation of existing drainages to minimize offsite impacts; and,
- Employ reclamation practices using proven methods that do not require ongoing maintenance.

Based on these objectives, the reclamation activities described in the attached reclamation plan are specifically designed to:

- Stabilize the disturbed areas to a safe condition;
- Reduce visual impacts; and,
- Protect both disturbed and undisturbed areas from unnecessary and undue degradation.

The attached TPPC has been designed to achieve the primary objectives listed above and to remain consistent with BLM’s Winnemucca District Resource Management Plan. Estimated costs to support the financial surety associated with this plan are included in the Reclamation Cost Estimate, included in **Attachment Q**.

FIGURES

ATTACHMENT A – PERMIT APPLICATION AND PROOF OF PAYMENT

ATTACHMENT B – LNC MINING CLAIMS

ATTACHMENT C – NOTICE OF PROPOSED DEVELOPMENT

ATTACHMENT D – WATER QUANTITY AND QUALITY IMPACTS REPORT

ATTACHMENT E – BASELINE HYDROGEOLOGIC DATA COLLECTION REPORT

ATTACHMENT F – BASELINE AND MODEL WORKPLAN

ATTACHMENT G – GEOCHEMICAL CHARACTERIZATION REPORT

ATTACHMENT H – THACKER PASS CLIMATE ANALYSIS

ATTACHMENT I – APPROVED JURISDICTIONAL DETERMINATION (FEBRUARY 8, 2019), USACE

ATTACHMENT J – ENGINEERING DESIGN REPORT CTFS, WRSF, CGS, MINE FACILITIES AND PROCESS PLANT

ATTACHMENT K – PROCESSING FACILITIES CONTAINMENT DESIGN AND DRAWINGS

ATTACHMENT L – PROCESS FLUID MANAGEMENT PLAN

ATTACHMENT M – THACKER PASS MONITORING PLAN

ATTACHMENT N – STORMWATER POLLUTION PREVENTION PLAN

ATTACHMENT O – THACKER PASS EMERGENCY RESPONSE PLAN

ATTACHMENT P – TEMPORARY CLOSURE PLAN

ATTACHMENT Q – TENTATIVE PLAN FOR PERMANENT CLOSURE

ATTACHMENT R – WASTE ROCK AND GANGUE MANAGEMENT PLAN

ATTACHMENT S – WATER QUANTITY AND QUALITY IMPACTS REPORT – ADDENDUM I (FATE AND TRANSPORT ANALYSIS)