## NI 43-101 TECHNICAL REPORT



## UPDATED INFERRED LITHIUM MINERAL RESOURCE ESTIMATE ZEUS PROJECT, CLAYTON VALLEY ESMERALDA COUNTY, NEVADA, USA

Prepared for Noram Ventures, Inc. Effective Date: February 20, 2019

Qualified Person:Bradley C. Peek, MSc., CPGQualified Person:C. Tucker Barrie, Ph.D,. P. Geo.

## Contents

1	Summary	1
2	Introduction	
3	Reliance on Other Experts	5
4	Property Description and Location	6
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography	10
6	History	12
7	Geologic Setting and Mineralization	13
7	7.1 Geology – Zeus Claims	16
7	7.2 Mineralization	
8	Deposit Types	23
9	Exploration	24
10	Drilling	25
1	10.1 Phase II Drilling	25
1	10.2 Phase III Drilling	
11	Sample Preparation, Analyses and Security	29
12	Data Verification	35
13	Mineral Processing and Metallurgical Testing	36
1	13.1 Mineralogy and Initial Leaching Tests	
	13.1.1 X-Ray Diffraction Mineralogy Studies	36
	13.1.2 Initial leach tests	37
1	13.2 Other Projects	38
	13.2.1 Lithium Americas – Thacker Pass	39
	13.2.2 Bacanora Lithium – Sonora Project	39
	13.2.3 Ioneer Ltd. – Rhyolite Ridge	40
	13.2.4 Cypress Development – Dean and Glory	40
14	Mineral Resource Estimates	42
1	14.1 General	42
1	14.2 Economic Factors	42
1	14.3 Lithium Pricing	44
1	14.4 Cut-off Grade	45
1	14.5 Model Parameters	46

14	1.6	Density Determination	51
14	1.7	Variography	52
14	1.8	Model Results	52
23	Adjac	ent Properties	54
24	Other	Relevant Data and Information	55
25	Interp	retation and Conclusions	56
26	Recor	nmendations	57
27	Refer	ences	58

# List of Figures

Figure 4.1 - Property location map
Figure 4.2 – Overview of Noram Ventures' claims in the Clayton Valley. Lode claims are in red,
and placer claims are in blue
Figure 5.1 – Daily high and low temperatures for Tonopah, Nevada
Figure 7.1 – Physiographic features surrounding Clayton Valley, Nevada
Figure 7.2 - Generalized geologic map from Zampirro (2005) with Noram Ventures' Zeus claim
outline (blue shaded area) added15
Figure 7.3 - Example of the ridges and washes encountered on the Zeus claim group
Figure 7.4 - N-S and W-E cross sections showing the main lithologic units logged in drill core.
Mdst = mudstone; Sdy = sandy. Vertical exaggeration is 4X
Figure 7.5 - Example of gypsum (?) blebs in a tuffaceous, calcareous mudstone
Figure 7.6 - Example of algal mats in the Esmeralda Formation on the Zeus claims
Figure 7.7 - Digitate algal structures in the Esmeralda Formation on the Zeus claims
Figure 7.8 - Split reduce core after about one week's exposure to air
Figure 7.9 - Schematic deposit model for lithium brines (Bradley, 2013)
Figure 10.1 - "Cat Rig" onsite on the Zeus claims
Figure 10.2 - Locations of all sites drilled during the 3 drilling phases
Figure 11.1 - Sealed shipping containers, before and after applying duct tape
Figure 11.2 - Range of values for MEG-Li.10.13
Figure 11.3 - Range of values for MEG-Li.10.14
Figure 11.4 - Distribution of Blank Standard results
Figure 11.5 - Comparison of duplicate sample pairs
Figure 13.1 - Results of initial leach tests for two Zeus property lithium clay samples. See text
for discussion
Figure 14.1 - Histogram of all Li values from all drill holes used in resource model
Figure 14.2 - Image showing the constraining polygon (in yellow) used in the resource model. 48
Figure 14.3 - N-S and W-E cross sections - 4X vertical exaggeration
Figure 14.4 - Variography analysis results

## List of Tables

Table 1.1 - Sensitivity analysis at various cutoff grades	2
Table 2.1 - Abbreviations and Acronyms Used in Report	4
Table 4.1 - Claims with BLM NMC numbers.	8
Table 10.1 - Phase II drill hole locations.	25
Table 10.2 - Additional Phase II drill hole data	25
Table 10.3 - Phase III drilling location data.	27
Table 11.1 - QA/QC samples used for all 3 Phases of drilling	30
Table 13.1 - Quantitative XRD1 modal mineralogy2 for Zeus Property lithium clay samples.	36
Table 13.2 - Quantitative XRD <sup>1</sup> modal mineralogy <sup>2</sup> for two Zeus Property lithium clay samp	oles,
including amorphous material	37
Table 13.3 - Relative proportions of clay minerals in the < 4 um size fraction <sup>1</sup>	37
Table 14.1 - Estimated costs to produce one tonne of lithium carbonate.	44
Table 14.2 - Statistics for all Li values from all drill holes used in the resource model	47
Table 14.3 - Inferred Mineral Resource final numbers	53
Table 14.4 - Sensitivity analysis at various cutoff grades.	53
Table 26.1 – Recommended Phase IV Drilling and Metallurgical Testing Budget	57

#### 1 Summary

This Technical Report is prepared for Noram Ventures, Inc. (Noram or the company). Noram is a publicly traded Canadian corporation with corporate offices in Vancouver, BC, Canada. The company is listed on the TSX Venture Exchange (Noram's symbol is TSX-V:NRM. Alba Minerals Ltd. (Alba) had previously entered into an option agreement with Noram and its wholly-owned subsidiary, Green Energy Resources (Green Energy) to purchase a 25% interest, with an option to acquire a further 25% interest, in the properties (also herein called the "claims") described in this report. Since the original agreement, Alba relinquished its interest in the properties.

Noram originally acquired a land position in the Clayton Valley of Nevada consisting of 888 placer claims. The land package covered 17,738 acres (7,178 hectares). That initial land holding has now been trimmed to a core holding of 150 Zeus placer and 140 Zeus lode claims that cover approximately the same ground. The perimeter of Noram's claims are located within 1 mile (1.6 kilometers) of Albemarle Corporation's (Albemarle's) Silver Peak lithium brine operations. Lithium is produced at Albemarle's plant from deep wells that pump brines from the basin beneath the Clayton Valley playa. The plant is the only lithium producer in the United States and has been producing lithium at this location continuously for more than 50 years.

Between Albemarle's operation and Noram's land position lie properties held by Pure Energy Minerals Limited, Cypress Development Corporation, and Enertopia Corporation.

Pure Energy has announced revised Preliminary Economic Assessment (PEA) for their brine deposit, with an inferred resource of 200,000 tonnes of lithium hydroxide monohydrate over a 20 year period (Molnar, et al, 2018). This resource occurs as basinal subsurface brines like those at Albemarle's project.

Cypress Development has issued a PEA (Lane, et al, 2018) for their lithium clay deposit which lies south and west of Noram's Zeus property, with the following economic parameters:

"at a lithium carbonate price of \$13,000/tonne of lithium carbonate, over the 40-year schedule, projects an after-tax Net Present Value @ 6% (NPV@6%) of \$1.97 billion, NPV@8% of \$1.45 billion, and NPV@10% of \$773 million, and Internal Rate of Return (IRR) of 32.7%. The expected maximum negative cash flow is \$488 million."

Enertopia completed a 5-hole drilling program in 2019 in similar lithium clays and has reported lithium grades similar to that of the Zeus lithium deposit (Enertopia News Release, February 2018).

Although the resources of the neighboring properties of Cypress and Enertopia appear very similar to the lithium clays described in this report for Noram's deposit, the resources of the other companies have not been verified by the authors and are not necessarily indicative of the mineralization that is the subject of this technical report.

One phase of core drilling in 2016-2017 and two phases of core drilling in 2018 provide the basis for an updated Inferred Lithium Resource for Noram Ventures' property in Clayton Valley,

Nevada. The lithium assays from the drilling provide results that are reasonably consistent over a large area of the Zeus claim holdings. The model generated for the Inferred Mineral Resource estimate indicates zones with higher lithium contents that remain open to the south, east and at depth. The drilling only tested approximately one third of the area covered by the Zeus claim block.

There is considerable upside potential for increasing the size of the deposit. However, such potential is conceptual in nature. There has been insufficient exploration beyond the modeled resource and it is uncertain if further exploration will result in an enlargement of the deposit.

Within the model that was generated from all 3 phases of drilling, involving 60 drill holes, the potential exists for a viable mining operation. The model herein reports an Inferred Mineral Resource of approximately 330 million metric tonnes at a grade of about 858 ppm Li, or 1,500,000 LCEs. Sensitivity analyses for the modeled deposit are listed in Table 1.

	Cutoff Grade		
	Inferred ResourceSensitivity(a) 300 ppm(a) 600 ppm		Sensitivity @ 900 ppm
Tonnes (1000s)	330,670	251,526	145,168
Grade (ppm)	858	984	1145
Contained Li (kg)	283,796,297	247,569,218	166,238,452

Table 1.1 - Sensitivity analysis at various cutoff grades.

Preliminary economic analysis indicates that the deposit may be economically extractable in the future. The level of confidence, i.e., the category, of a resource estimate may change with additional exploratory work, such as sampling, drilling and metallurgical testing.

Initial mineralogical studies and leaching tests were conducted on Zeus lithium clay samples in 2018, including work by Actlabs of Ancaster, Ontario, and Autec Innovative Extractive solutions Ltd., Vancouver, British Colombia. Results of initial leach tests are highly encouraging. They suggest that only moderate temperatures and moderate amounts of sulfuric acid are necessary to remove >80% of the lithium in the samples. Further testing is necessary to develop sequential precipitation of magnesium (and other cation) sulfates prior to precipitating lithium sulfate for conversion to a marketable lithium carbonate (or hydroxide) product.

Testing by other companies on their lithium clay properties, including Lithium Americas (Thacker Pass Project, Nevada), Bacarona Minerals (Sonora Project, Mexico), Ioneer (Rhyolite Ridge Project, Nevada) and Cypress Development (Clayton Valley Project) have all indicated that economic extraction of the lithium may well be possible.

This report recommends a Phase IV core drilling program to deepen some of the Phase III holes and step-out holes to the south and east. Concurrent with the drilling, it is recommended that metallurgical testing be continued. These two endeavors would require a budget estimated to be US\$281,000. The next logical phase for the project would be to advance the deposit to the PEA level with an estimated budget of US\$500,000.

#### 2 Introduction

This Technical Report is prepared for Noram Ventures, Inc. (Noram or the company). Noram is a publicly traded Canadian corporation with corporate offices in Vancouver, BC, Canada. The company is listed on the TSX Venture Exchange (TSX-V:NRM) and Frankfurt Exchange (N7R / OTCPINK: NRVTF).

The Zeus property has been the subject of three previous Technical Reports, one for Noram dated October 24, 2016, one for Alba Minerals Ltd.(Alba was a previous partner in the property.) dated January 13, 2017, and one for both Noram and Alba with an effective date of July 24, 2017.

The majority of information contained in this report was generated by the first author, during, and in conjunction with trips to the properties. Other information was gleaned from various sources and, when possible, verified by the author. These other sources include:

- Published literature
- Noramventures.com website
- U. S. Bureau of Land Management LR2000 website for verification of claim status
- Websites and NI43-101 reports of competitor companies

Sources are also referenced in the text of this document, where appropriate.

The first author has made seven trips to the Zeus property that is the subject of this report. The property visits were on the following dates:

- May 5 7, 2016 (Phase 1 Surface Sampling)
- July 21 25, 2016 (Phase 2 Surface Sampling)
- August 3 6, 2016 (Phase 3 Surface Sampling)
- December 12 22, 2016 (Phase I Drilling)
- January 8 27, 2017 (Phase I Drilling)
- April 22 May 15, 2018 (Phase II Drilling)
- November 17 December 12, 2018 (Phase III Drilling)

During the visits, the first author supervised core drilling, collected samples for assay, noted some aspects of the geology, took photographs and, on a rare occasion, assisted with the claim staking. These activities were conducted through Harrison Land Services, who was under contract with Noram and Noram's wholly owned subsidiary, Green Energy Resources, to stake claims, to collect samples and geologic information and to test a portion of the property by core drilling.

BLM	U. S. Bureau of Land Management		
LCE Lithium Carbonate Equivalent (Li <sub>2</sub> CO <sub>3</sub> )			
Li Chemical symbol for lithium			
Mg	Chemical symbol for magnesium		
PEA	Preliminary Economic Assessment		
PPM	Parts per million		
RQD	Rock quality designation		

#### 3 Reliance on Other Experts

Co-author C. Tucker Barrie, Ph.D,. P. Geo. and a Qualified Person as defined by NI43-101 is responsible for Section 13 – Mineral Processing and Metallurgical Testing. C. Tucker Barrie is currently serving as President and CEO of Noram.

Gavin Harrison of Harrison Land Services, who is not a Qualified Person, supplied most of the information regarding the staking and locations of the placer and lode mining claims. Mr. Harrison has more than 10 years of experience staking and recording claims on BLM land in several states in the western U. S. Author Brad Peek verified the presence and location of many of the claim stakes and location documents on the ground. Harrison Land Services was also responsible for claim corner locations used in the claim location map in this report.

Star Point Enterprises, Inc. was responsible for a scoping study of the water rights situation in the Clayton Valley, Nevada (Section 24).

All other sections of the report are the sole responsibility of co-author Bradley C. Peek, MSc., CPG.

#### 4 Property Description and Location

The property is located in Esmeralda County, Nevada approximately halfway between Las Vegas and Reno (Figure 4.1). The property position consists of a total of 150 placer claims and 140 lode claims. Both sets of claims (placer and lode) cover approximately the same area which is approximately 3,000 acres (1,214 hectares) in size. The claims are staked on U. S. Government land administered by the U. S. Bureau of Land Management (BLM). Each claim covers an area of 20 acres (8.1 hectares). The claims are in one contiguous group. These claims are located in portions of Sections 1, 2, 10, 11, 12, 13, 14, 22, 23 and 24 of township T2S, R40E, Mt. Diablo Principal Meridian (Figure 4.2). Lode claims in Figure 4.2 are in red and placer claims are in blue.

#### Updated NI 43-101 Inferred Resource February 2019



Figure 4.1 - Property location map.

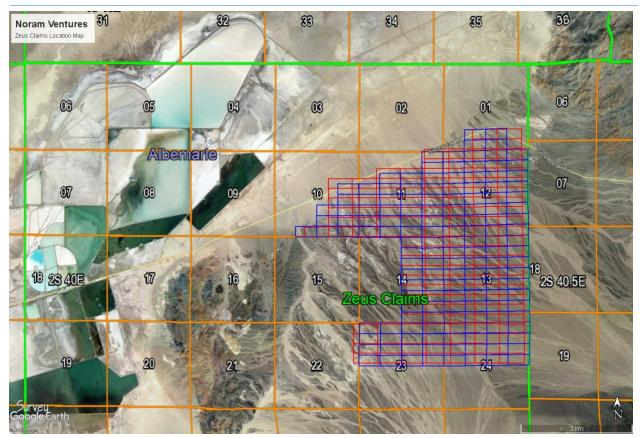


Figure 4.2 - Overview of Noram Ventures' claims in the Clayton Valley. Lode claims are in red, and placer claims are in blue.

All claim corners and location monuments were located using handheld Garmin GPS units (Gavin Harrison, personal communication, and in part, witnessed by author Peek).

The claim acquisitions were accomplished through claim staking by wholly owned subsidiary Green Energy Resources using Harrison Land Services as the claim staking contractor (Gavin Harrison, personal communication) (Noramventures.com news releases dated May 26, June 7 and June 29, 2016). All 150 placer claims and 140 lode claims are owned 100% by Noram, beneficially through Green Energy Resources. Table 4.1 is a listing of all of the claim names and BLM NMC numbers for the claims.

Claim	Claim No.	Claim No.	BLM No.	BLM No.
Туре	From	То	From	То
Lode	Zeus II-001	Zeus II-140	NMC1173665	NMC1173796
Placer	Zeus-001	Zeus-150	NMC1126587	NMC1126736

Table 4.1 - Claims with BLM NMC numbers.

All claims are located on unencumbered public land managed by the BLM. Annual holding costs for the claims are \$155 per claim per year to the BLM, due August 31<sup>st</sup>. There is also a \$4

per claim annual document fee to be paid to Esmeralda County each year, due November 1<sup>st</sup>. There is no set expiration of the claims as long as these payments are made annually.

In May of 2018, Noram became aware that their claims (held by Green Energy Resources) were being overstaked by Centrestone Resources LLC (Centrestone). Legal action against Centrestone ensued. The legal action resulted in a settlement on January 10, 2019, wherein Centrestone relinquished all rights to Green Energy's Zeus claims, along with other stipulations.

Currently, there are no known significant factors or risks that may affect access, title or the right or ability to perform work on the Noram claim areas.

The land under claim contains no buildings or other structures. There are no known mineralized zones on or below the surface of Noram's staked land, other than those defined by the drilling described in this report and the surface sampling described in previous Technical Reports. To the author's knowledge there are no environmental liabilities associated with the property position, nor any mine workings or development of any sort.

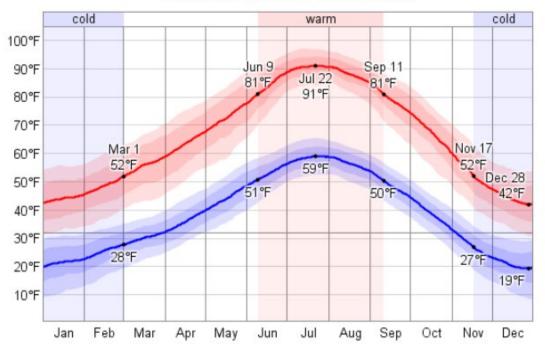
Exploration Plans of Operations to deepen 9 of the Phase I core holes, which constituted the Phase II drilling and to core 17 new core holes for Phase III drilling were submitted on behalf of Green Energy Resources to the Tonopah, Nevada office of the BLM. The BLM in Nevada works in conjunction with the Nevada Bureau of Mines and Geology for the permitting processes on public lands. Since the surface disturbance for the drilling for each of these programs was held to less than 5 acres (2.02 hectares), only Notices of Intent were required. The BLM responded with determinations of the amounts of the bonds that would be required prior to commencement of operations. The bonds were submitted and accepted by the BLM for each drilling phase prior to the commencement of drilling.

# 5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

Generally speaking, all the Noram claims fall between elevations of 4300 and 4800 feet (1311 and 1463 meters) above sea level. The topography is mostly gently sloping basin margins consisting of unconsolidated to poorly consolidated sediments. These sediments are cut by typical desert washes, which can be steep sided. The area can mostly be traversed by 4-wheel drive vehicles, but often with some difficulty. There are few roads crossing the property.

The vegetation of the region is sparse, mostly consisting of widely spaced low brush. No trees are present. The area lies in the eastern rain shadow of the Sierra Nevada and is high desert. Tonopah, the nearest town of any size has average annual precipitation of 5.14 inches (130.6 mm). In July, the hottest month, it has an average high temperature of 91.9°F (33.3°C) and an average low temperature of 57.5°F (14.2°C). In December, the coldest month, it has an average high temperature of 19.4°F (-7°C) (Source: Wikipedia.com). Figure 5.1 below is a graphic representation of the Tonopah average temperatures (Source: Weatherspark.com).

The mild climatic conditions allow for field work to continue throughout the year, however drilling can be temporarily limited in winter by the problem of freezing water lines.



#### Daily High and Low Temperature

*Figure 5.1 – Daily high and low temperatures for Tonopah, Nevada.* 

The property can be accessed from Tonopah by driving south on U. S. Highway 95 for a distance of 7 miles (11 kilometers) and then southwest on the Silver Peak gravel road for a distance of 20 miles (32 kilometers). Both of these roads underwent upgrades during the summer of 2016. It is

now possible to drive to the edge of the property entirely on paved roads by driving south 21 miles (34 km) on Highway 95 and then driving 11 miles west on the newly paved Silver Peak Road.

Power lines that supply electricity to the town of Silver Peak and to the Albemarle lithium operations crosses Noram's Zeus claim group.

## 6 History

The Albemarle Corporation operation at Silver Peak, Nevada, within the Clayton Valley, is the site of the only lithium brine production in North America. Brines containing lithium are pumped from wells that penetrate the playa sediments. The brines are concentrated through a series of evaporation ponds and the resulting salts are processed to extract lithium at the plant at Silver Peak.

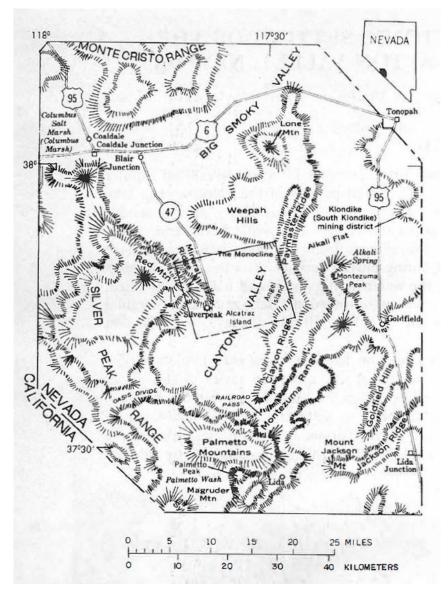
Following the lithium price rise in recent years, several exploration companies became interested in the Clayton Valley resulting in several thousand new claims being staked, surrounding the Albemarle land holdings. In early 2016 Harrison Land Services became aware of some unstaked land in close proximity to the Albemarle land holdings. Harrison Land Services was put in touch with Noram Ventures, who eventually funded the staking program that eventually resulted in their current claim position. Successful surface sampling for lithium and the resulting market's reaction provided the impetus to stake additional claims. At one point the company held 888 placer claims that covered most of the eastern portion of Clayton Valley. Those holdings have recently been trimmed to the core Zeus placer and lode claims described in Section 4 of this report.

The claims that comprise the properties have been staked on U. S. Government land that was open to staking. There have been no previous owners, nor has there been previous production from the properties.

Noram Ventures has conducted exploration for lithium on the property since the spring of 2016. Exploration to date has included three phases of surface sampling, three phases of core drilling and metallurgical testing. The maiden mineral resource for the property was reported in a technical report entitled, "Lithium Inferred Mineral Resource Estimate, Clayton Valley, Esmeralda County, Nevada, USA" with an effective date of July 24, 2017.

#### 7 Geologic Setting and Mineralization

The Clayton Valley is a closed basin playa surrounded by mountains. Figure 7.1 (from Davis and Vine, 1979) shows the physiographic features in the Clayton Valley area.

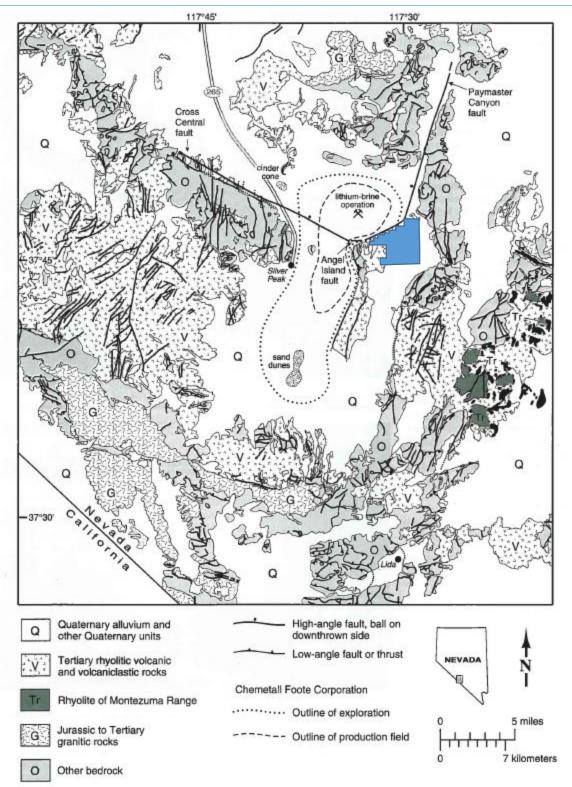


*Figure* 7.1 – *Physiographic features surrounding Clayton Valley, Nevada.* 

Clayton Valley is flanked on the north by the Weepah Hills, on the east by Clayton and Paymaster Ridges and on the west and south by the Silver Peak Range and the Palmetto Mountains. The playa floor is approximately 40 square miles (100 square kilometers). Altitudes range from 4,265 feet (1300 meters) on the playa floor to 9,450 feet (2,880 meters) at Piper Peak (Davis and Vine, 1979).

Tectonically, the Clayton Valley occurs in the Basin and Range Province. Figure 7.2, from Zampirro (2005) is a generalized geologic map of the Clayton Valley area with the Noram land

position superimposed. The province is dominated by horst and graben faulting and some right lateral motion since Tertiary time, which continues to the present (Foy, 2011). The basement is made up of Neoproterozoic to Ordovician carbonate and clastic rocks that were deposited along the ancient western passive margin of North America. The basin is bounded to the east by a steep normal fault system toward which basin strata thicken (Munk, 2011). Structural and stratigraphic controls have divided the playa into six economic, yet potentially interconnected, aquifer systems (Zampirro, 2005). The sediments deposited in the basin are primarily silt, sand and gravel interbedded with illite, smectite and kaolinite clays (Kunasz, 1970 and Zampirro, 2005). These sediments include a substantial component of volcaniclastics. Green and tan tuffaceous claystones and mudstones on the eastern margin and above the current playa sediments, best described by Davis (1981), have been the primary objective of Noram's exploration effort and are considered by Kunasz (1979) and Munk (2011) to be the primary source of the lithium for the basin brines.



*Figure* 7.2 – *Generalized geologic map from Zampirro (2005) with Noram Ventures' Zeus claim outline (blue shaded area) added.* 

#### 7.1 Geology – Zeus Claims

The Zeus claim block, which was the primary focus of the Phases I, II and III drilling, covers a large area that gently slopes toward the northwest. The drainages, or washes, cut through the Tertiary Esmeralda Formation. The Esmeralda in this area is made up of fine grained sedimentary and tuffaceous units which generally dip to the northwest, but while the strike and dip can be quite varied locally, most of the sediments dip at less than 5°. Some bedding undulations were noted, possibly caused by differential compaction.

Faulting was also noted in some zones, mostly in the northern regions of the claims. The faults appear to trend at N30°E to N45°E, approximately parallel to the edge of the playa in this part of Clayton Valley. Faulting is difficult to trace on surface due to the homogeneity and semi-consolidated nature of the sediments and was only possible in select areas of the property. In addition to ancient faulting, recent faults are in evidence around the basin that have formed as a result of pumping brines from the aquifers over the past 50+ years to produce lithium.

The resulting topographic configuration consists of long rounded "ridges" of Esmeralda Formation separated by gravel filled washes. The ridges were generally 50 feet (15 meters) to 100 feet (30 meters) wide and had lengths of a few hundred to a few thousand feet and trended northwest. These geomorphic features have been described by some authors (Davis, 1981; Kunasz, 1974) as a "badlands" type topography. Figure 7.3 is an example of such topography.

The depth of the Esmeralda Formation was not determined by the author, since the base of the formation was not seen in any of the washes and was not found in the drilling to date. Davis (1981) measured this section at approximately 100 meters (328 feet) thick and Kunasz (1974) described it as being approximately 350 feet (107 m) thick. In some areas it was noted by the author to be in excess of 100 feet (30 m) thick on the surface where washes cut through the thicker exposures. The ridges are topped with weathered remnants of rock washed down from the surrounding mountainous areas; a weathering phenomenon typical of the desert terranes.



Figure 7.3 - Example of the ridges and washes encountered on the Zeus claim group.

The Esmeralda Formation in the main area of interest on the Zeus claims was mostly soft and crumbly siltstones, mudstones and claystones, but contained several thin beds of harder, more consolidated sediments. Most beds were tuffaceous, as evidenced by fine crystal shards. Nearly all of the sediments are calcareous, indicating lakebed deposition. Figure 7.4 shows two generalized cross sections through the area of drilling with the main lithologic types displayed.

Several of the samples contained vugs or voids partially filled with a white soft evaporite (?) mineral, probably gypsum (Figure 7.5). A further indication of lakebed sedimentation is evidenced by algal mats (Figure 7.6) and digitate algal features (Figure 7.7).

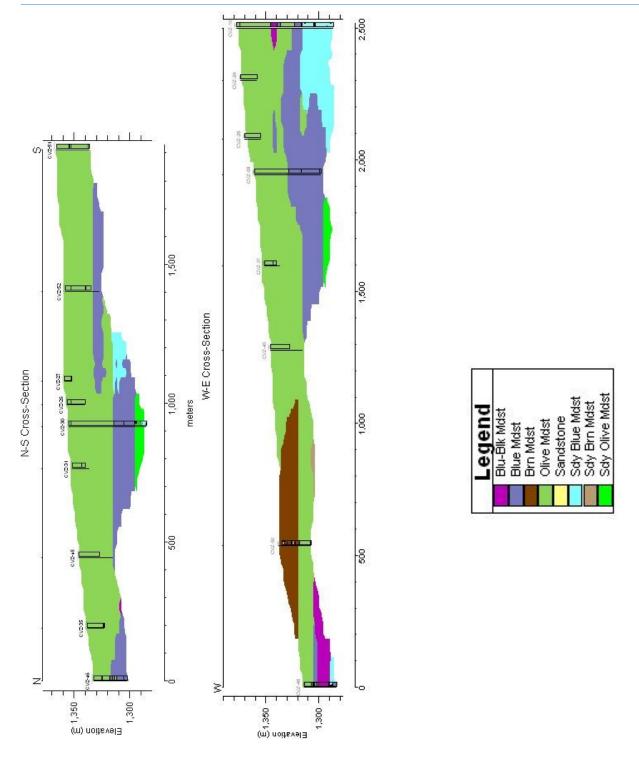


Figure 7.4 - N-S and W-E cross sections showing the main lithologic units logged in drill core. Mdst = mudstone; Sdy = sandy. Vertical exaggeration is 4X.



Figure 7.5 - Example of gypsum (?) blebs in a tuffaceous, calcareous mudstone.



Figure 7.6 - Example of algal mats in the Esmeralda Formation on the Zeus claims.



Figure 7.7 - Digitate algal structures in the Esmeralda Formation on the Zeus claims.

During the Phase II and Phase III drilling the "reduced" clay units were encountered. These units have a distinctive blue or black coloration. It was noted that after exposing the core to air that the reduced core quickly began to oxidize to the olive coloration seen in the oxidized sediments. Figure 7.8 is a photo of some reduced core that was originally black when it came out of the drill hole. The photo shows the core that was split after about one week after drilling. The inner core remained black (reduced) while the outer rind of the core has turned olive (oxidized).



*Figure 7.8 - Split reduce core after about one week's exposure to air.* 

#### 7.2 Mineralization

The brine mineralization within the Clayton Valley has been documented by numerous studies spanning several decades. Brine targets have not yet been investigated on Noram's claims.

The targeted mineralization investigated by Noram occurs at surface in the form of sedimentary layers enhanced in lithium to the extent that the lithium appears to be extractable from them economically, although this has not yet been demonstrated through in-depth economic analysis. The relationship of these targeted lithium-bearing sedimentary layers with respect to brine-related Li-extraction evaporation ponds is illustrated schematically in Figure 7.9. Noram's claim locations with respect to an existing evaporation-pond Li recovery operation is shown in Figure 4.2 above.

The targeted layers occur primarily as light green, interbedded tuffaceous mudstones and claystones. The beds are nearly always calcareous and most often salty. The mudstones are usually poorly consolidated, whereas the thin claystone beds can be well consolidated and commonly form nodules. The units contain sandy beds locally.

The units occur as lakebed sediments that have been mapped (Albers and Stewart, 1972; Davis, 1981) as Miocene or Pliocene Esmeralda Formation. Algal mats and even digitate algal features have been noted locally, but these are generally not well preserved. The beds are gently dipping, usually to the northwest, but with local undulations. These units have been shown by Kunasz (1970) to be the probable source of lithium for the basin brines. Exploration for this mineralization, which confirmed the existence of anomalously high levels of lithium within sediments on Noram's claims is documented in Section 9 below. The deposit that is the subject of this report is part of a section of ancient lakebed sediments that were raised above the current Clayton Valley playa by Basin and Range faulting, which is present throughout the region.

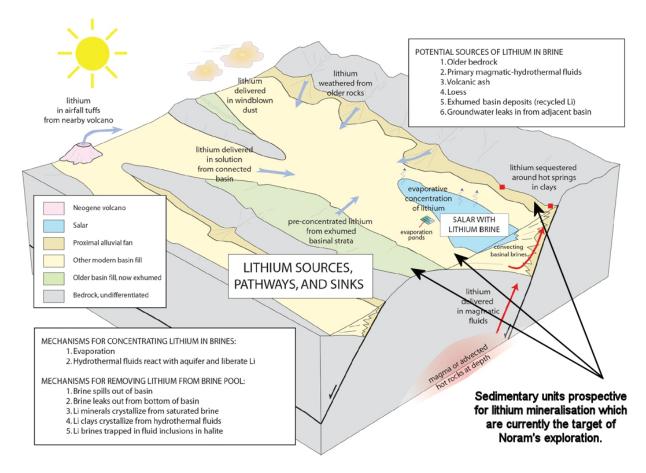


Figure 7.9 - Schematic deposit model for lithium brines (Bradley, 2013).

## 8 Deposit Types

Noram's Clayton Valley claims offer two deposit types that are potential objects of exploration efforts. Type one is the most obvious, which involves drilling for brines in the deep basin similar to those being exploited by Albemarle at their operations at Silver Peak. The lithium brine potential of Noram's claims has not been investigated to date, and it is not known whether brines exist in the sediments beneath Noram's Zeus claims.

The second deposit type involves the production of lithium from playa lakebed sediments that have been raised to surface through block faulting. This process requires the development of new lithium extraction processes currently being developed. Such processes are being tested by competitor companies, and Noram has conducted initial testing on bulk samples from its Zeus claims (See Section 13). The processes being tested would extract lithium directly from lithium-rich mudstones and claystones, which occur at surface over large portions of the Zeus claim group. To the authors' knowledge, globally there are no operations that currently produce lithium from clays on a commercial scale, although several companies are working toward that goal.

## 9 Exploration

Competitor companies are known to be active in the Clayton Valley. They are sampling, performing geophysical surveys and drilling, among other activities. Until very recently, competitors were mostly searching for the deeper brine targets. Cypress Development Corporation, Spearmint Resources Inc. and Enertopia Corporation are other companies in the Clayton Valley, besides Noram, known to be investigating lithium-rich sediments occurring at or near surface as potential targets for lithium extraction.

At this moment in time, exploration activity conducted by Noram on its claims has included:

- 1. Three phases of surface sampling with assaying of all surface samples
- 2. Collection of bulk samples from surface deposits (oxidized material) and from reduced sections of drill core (reduced material) for metallurgical testing.
- 3. Completion of 3 phases of drilling on its Zeus claim group

The geological portion of the exploration work has been principally conducted by the primary author as a contractor, working alongside and through Harrison Land Services. The objective of the exploration program has been to develop a resource of high lithium values in sediments over a large area of the Noram claims.

Details of the three phases of surface sampling and collection of two bulk samples were enumerated in two previous NI 43-101 reports (for Noram Ventures Inc., dated October 24, 2016 and for Alba Minerals Ltd., dated January 13, 2017). Details of the Phase I drilling were described in the maiden NI 43-101 resource estimate with an effective date of July 24, 2017. To avoid redundancy, the descriptions of these previous programs will not be repeated herein, although the results of the Phase I drilling are incorporated into the inferred mineral resource estimate discussed in Section 14.

#### 10 Drilling

#### 10.1 Phase II Drilling

Phase II drilling began on April 20, 2018. The object of the program was to deepen 9 of the holes originally drilled during the Phase I program to around 300 feet (91.4 meters). All of the 9 core holes were within the polygon that circumscribed the maiden NI 43-101 inferred resource estimate with the objective of increasing that resource, since the original Phase I core holes had only reached an average depth of 46.2 feet (14.1 meters). Table 10.1 shows the locations of the 9 holes that were deepened. A few of these locations vary slightly from the locations listed in the maiden resource estimate primarily to accommodate the larger drill rigs (Phase I drilling was completed using backpack-style drills).

	UTM	UTM	Elev
Hole ID	East	North	(m)
CVZ-05	455617	4180385	1336.4
CVZ-06	455844	4180386	1341.3
CVZ-08	455694	4180604	1332.8
CVZ-15	456191	4180711	1350.1
CVZ-16	456197	4180790	1348.0
CVZ-17	455865	4180954	1334.0
CVZ-18	455861	4180750	1336.7
CVZ-22	455932	4180656	1341.9
CVZ-30	455431	4180595	1327.0

Table 10.1 - Phase II drill hole locations.

Six of the holes were cored using a track-mounted Longyear 44 rig (See photo on title page). The other three holes were cored with a new custom-built drill rig attached to a small Caterpillar track loader (See Figure 10.1) that has been designated "Cat Rig" in Table 10.2 below.

	Depth	Depth		
	Before	After		
Drill	Deepening	Deepening	Drilled	Core
Hole	(ft)	(ft)	With	Recovery
CVZ-05	44	202	Cat Rig	56.8%
CVZ-06	36	302	Longyear 44	77.0%
CVZ-08	47.5	206	Longyear 44	63.6%
CVZ-15	40	300	Cat Rig	71.8%
CVZ-16	55	302	Longyear 44	66.7%
CVZ-17	52	287	Longyear 44	69.7%
CVZ-18	51	302	Longyear 44	55.0%
CVZ-22	40	297	Longyear 44	64.0%

Table 10.2 - Additional Phase II drill hole data.

CVZ-30	50	228	Cat Rig	53.3%
Total (ft)	415.5	2426	Average	64.8%
Total (m)	126.6	739.4		
Average (ft)	46.2	269.6		
Average (m)	14.1	82.2		

The core was split onsite and samples were taken at 5-foot (1.52-meter) intervals. A total of 403 Phase II samples (35 of which were QA/QC samples) were sent to ALS Laboratories in Reno, Nevada for analysis.



Figure 10.1 - "Cat Rig" onsite on the Zeus claims.

#### 10.2 Phase III Drilling

Phase III drilling on Noram's claims commenced on the 18th of November 2018 with a plan to drill 17 sites to a depth of 100 feet (30.5 meters) each with the idea that the better holes would be deepened at a later date. During the Phase III drilling program 16 holes were completed, rather than the planned 17 holes. All the Phase III holes were drilled with the "Cat Rig" as described in the previous section. As with the rest of the previous drilling, all the Phase III holes were vertical. The holes were located using a handheld Garmin GPS with the elevation calibrated by a

nearby U. S. Coast and Geodetic Survey benchmark. The drilling was completed on December 12, 2018. A total of 1,535 feet (467.9 meters) were drilled and 544 Phase III core samples and 44 QA/QC samples were dispatched to the ALS laboratory in Reno for analysis.

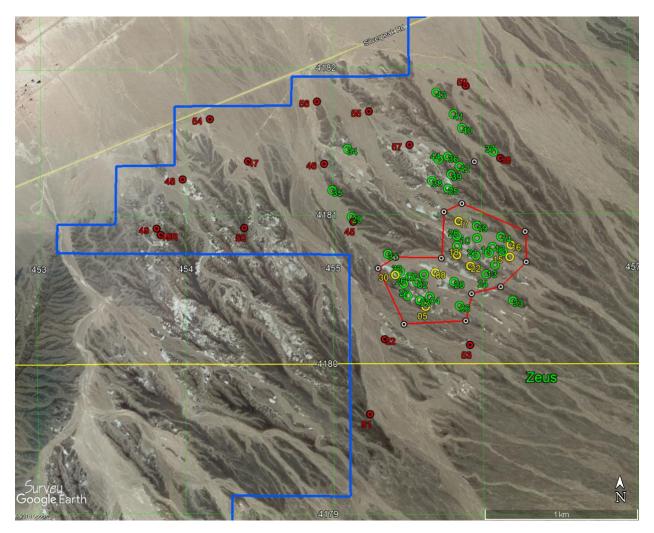
The average hole depth for Phase III was 96.25 feet (29.2 meters). The 16 holes (labeled CVZ-45 through CVZ-59, plus CVZ-49R) were all drilled on the Zeus claims. Two of the holes (CVZ-49 and CVZ-54) encountered only gravel and therefore had no core recovery or very poor core recovery. No samples were collected from these two holes.

After drilling CVZ-49 a closer inspection of the geology of the area surrounding the hole revealed a fault located very near the hole. Permission was obtained to redrill the hole approximately 165 feet (52 meters) southeast of the first hole on the other side of the fault. The redrilled hole was labeled CVZ-49R.

The spacing of the Phase III holes was much wider than the holes previously attempted by Noram and averaged around 300 to 500 meters between holes. The wider spacing was justified by knowledge gained during the first two drilling phases and by Cypress Development Corp's drilling on their property adjacent to Noram's Zeus property. Table 10.3 lists the Phase III boreholes and their location information.

	Easting	Northing	Collar Elevation	Depth
Drill Hole	(UTM)	(UTM)	(m)	(m)
CVZ-45	455144	4180957	1346	30.5
CVZ-46	454947	4181350	1332	30.5
CVZ-47	454428	4181371	1325	30.5
CVZ-48	453981	4181252	1313	30.5
CVZ-49	453802	4180919	1319	30.5
CVZ-49R	453832	4180876	1323	18.3
CVZ-50	454402	4180920	1337	30.5
CVZ-51	455249	4179668	1366	30.5
CVZ-52	455351	4180167	1358	29.0
CVZ-53	455921	4180129	1378	30.5
CVZ-54	454168	4181660	1325	30.5
CVZ-55	455253	4181704	1331	30.5
CVZ-56	454901	4181774	1326	30.5
CVZ-57	455527	4181474	1343	30.5
CVZ-58	456135	4181376	1363	30.5
CVZ-59	455909	4181869	1346	24.4
			Average	29.2
			Total	467.9

Table 10.3 - Phase III drilling location data.



*Figure 10.2 - Locations of all sites drilled during the 3 drilling phases.* 

Figure 10.2 is an overview map of all of the Phases I, II and III drill holes with the CVZ- prefix removed for clarity. The green symbols represent the shallow Phase I drilling. The yellow symbols are for the 9 holes deepened during Phase II. Phase III holes are denoted by the red circles. The red outline is the area encompassed by the maiden resource estimate of 17 million tonnes at a grade of 1060 ppm Li. The blue line represents the western and northern boundary of the Zeus claim block. The grid displayed is UTM NAD 83, Zone 11S with 1000 m spacing. Photo source – Google Earth Pro. Grid source = Nearby.org.uk.

## 11 Sample Preparation, Analyses and Security

Core samples from the Phase II and Phase III drilling were collected from the drillsites by the primary author of this report and were transported to the staging area box trailer via ATV or they were delivered to the trailer by the drillers. At the trailer the core was logged for RQD, and lithology. The core was then photographed. The core was split by the onsite geologist. Half of the core was retained in the core boxes for future viewing or sampling. The other half of the core was placed in consecutively numbered sample bags, along with numbered sample tags, to be shipped to the same ALS laboratory in Reno as was utilized for surface samples and for the Phase I drill core. Samples from Phase II and Phase III holes were almost entirely collected at 5-foot (1.52-meter) intervals.

There were indications from Noram's and Noram's competitors' testing that the lithium may be taken into solution relatively easily, even with normal deionized water. For this reason, sawing the core was not considered. The core was relatively soft, so it was found that, with some exceptions, the core could be split using a putty knife. Where hard layers or nodules were encountered, the core was split using a hammer and 3-inch wide chisel. It is estimated that the hard layers or nodules constituted less than 2% of the core.

The core was only handled by the drillers and the geologists and was locked in the trailer when no one was onsite. Samples for assay were transported back to the author's hotel room where they were secured until shipment to the laboratory.

For all 3 phases of drilling, the bagged samples were placed in 5-gallon plastic pails for shipment along with the sample submittal sheets. As an additional security measure, two globe-type metal seals were inserted through the side and top of each pail and sealed. Duct tape was then used to cover the globe seals to prevent accidental damage to the seals during shipment. Figure 11.1 shows photographs of the sealed shipping containers. A message was taped to the top of each pail indicating that, if the seals were compromised, the lab personnel were to contact the author by phone or email. The pails were then shipped via United States Postal Service to the lab in Reno, NV. There were no indications from the lab that any of the seals had been compromised.



Figure 11.1 - Sealed shipping containers, before and after applying duct tape.

All samples were sent to ISO-17025 accredited ALS Laboratories in Reno, Nevada for analysis. ALS is a public company listed on the Australian stock exchange and is entirely independent of Noram. All samples were prepared using ALS' PREP-31 sample preparation process, which is presented in the ALS Fee Schedule as:

"Crush to 70% less than 2mm, riffle split off 250g, pulverize split to better than 85% passing 75 microns."

Each sample was then analyzed using ALS' ME-MS61 analytical method which uses a Four Acid Digestion and MS-ICP technologies. All samples were analyzed for 48 elements. Samples were kept in the care of the author at all times until mailed via the United States Postal Service to the ALS lab in Reno.

For all 3 drilling phases, four types of QA/QC samples were used and are listed in Table 11.1:

Sample Type	Number of Samples
MEG-Li.10.13	26
MEG-Li.10.14	23
MEG-Blank.14.03	32
Duplicate samples	23

Table 11.1 - QA/QC samples used for all 3 Phases of drilling.

The MEG samples were purchased from Minerals Exploration & Environmental Geochemistry of Reno, Nevada. Figures 11.2 and 11.3 show the distributions of the assay results for the MEG lithium standards assayed by Noram. All values fell within the high and low range values determined by MEG from MEG's 43 test samples for MEG-Li.10.13 and 40 test samples for MEG-Li.10.14. The MEG standards were processed by ALS Laboratories in Vancouver, BC using aqua regia digestion. The somewhat higher lithium values for the Noram analyses as opposed to the MEG values are believed to be due to the difference between the aqua regia digestion used by MEG and the four acid digestion used by ALS for the Noram samples.

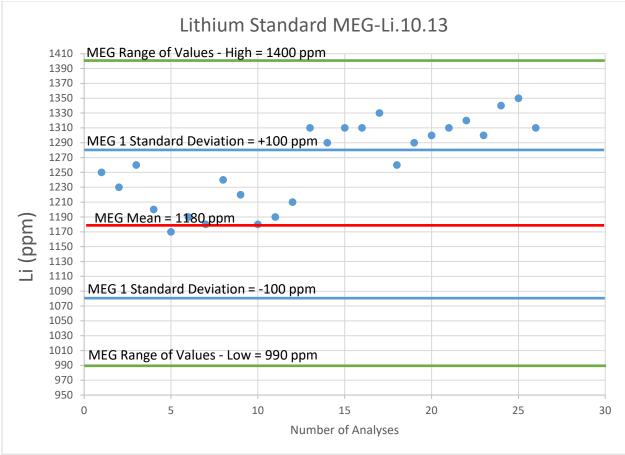


Figure 11.2 - Range of values for MEG-Li.10.13.

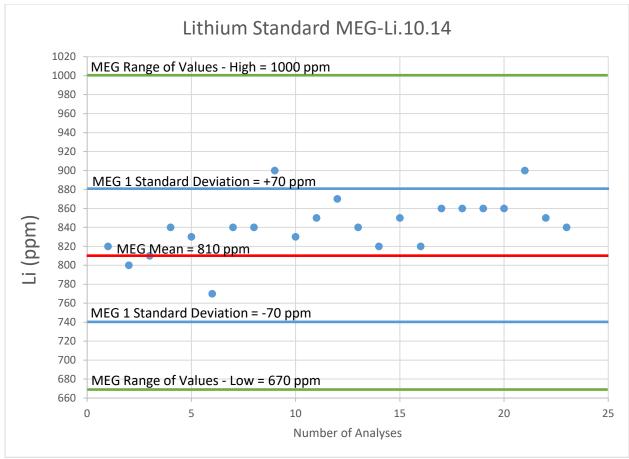


Figure 11.3 - Range of values for MEG-Li.10.14.

Thirty-two MEG Blank Standard 14.03 samples were also used as QA/QC samples during the 3 drilling programs. All Blank sample results were judged to be within an acceptable range. The distribution of lithium values from the blank sample results is shown in Figure 11.4.

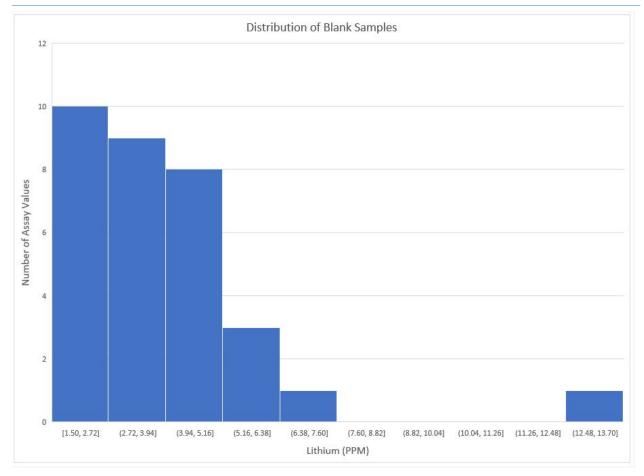


Figure 11.4 - Distribution of Blank Standard results.

Duplicate samples were obtained by collecting  $\frac{1}{2}$  of the  $\frac{1}{2}$  core remaining after splitting the sample for assay. Most duplicate sample results were very close to the original sample results. The largest variation was 9.9% between one sample pair. The next largest sample pair variation was 3.5%. Figure 11.5 is a graph showing the relationship between sample pairs.

All QA/QC sample results were judged to be within reasonable ranges and therefore acted as adequate checks on the laboratory results.

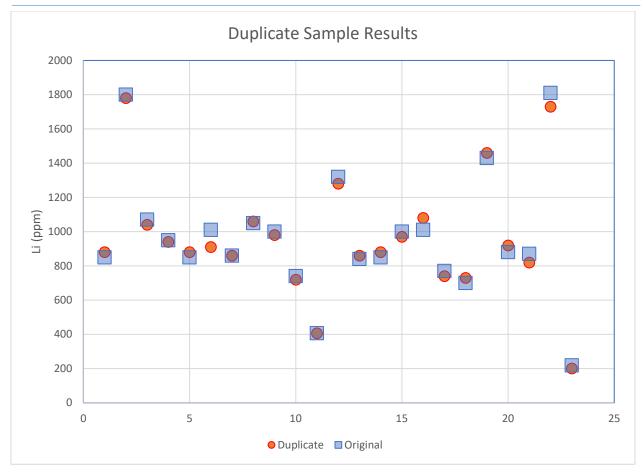


Figure 11.5 - Comparison of duplicate sample pairs.

# 12 Data Verification

In regard to the drilling program, the author has been able to confirm the accuracy of locations of drill holes by checking a number of them with his own handheld GPS unit. During his visits to the property during the drilling programs, the first author confirmed that sampling was being conducted according to the protocols described in Section 11 above, and therefore data collected on drill samples to date is accurate.

Assay data used in the Inferred Mineral Resource model was cross-checked against the original assay certificates after the data had been imported into the model. Assay values were also spot checked against those displayed in cross sections. Cross sections of the model were generated and volumetrics were checked by the cross-sectional method to verify the model's accuracy.

The primary author is of the opinion that there have been no limitations on his verification of any of the data presented in this report, except for his not having verified the resources reported on a neighboring properties and similar clay-based lithium properties reported in the various news releases and NI 43-101 reports. The author is of the opinion that all data presented in this report are adequate for the purposes of this report.

# 13 Mineral Processing and Metallurgical Testing

### 13.1 Mineralogy and Initial Leaching Tests

Initial mineralogical studies and leaching tests were conducted on Zeus lithium clay samples in 2018, including work by Actlabs of Ancaster, Ontario, and Autec Innovative Extractive solutions Ltd., Vancouver, British Colombia.

### 13.1.1 X-Ray Diffraction Mineralogy Studies

Initial x-ray diffraction (XRD) mineralogy studies were conducted on two lithium clay samples from the Zeus property: a surface more oxidized sample, and one from "reduced" material from a drill hole. Results indicate that the clay fraction comprises ~50% of each sample, and includes smectite, illite/muscovite, chlorite, and a significant amount of amorphous matter believed to be poorly crystalline smectite + illite. The non-clay fraction has calcite, quartz and orthoclase/ sanidine and chlorite. Hectorite, a lithium clay mineral that is relatively refractory, has not been identified in the samples, nor have sulfates, borates or halides. The results, first reported in Barrie (2018) and Barrie et al. (2018), are given in tables 13.1 and 13.2.

Table 13.1 - Quantitative XRD1 modal mineralogy2 for Zeus Property lithium clay sa	amples.
--	---------

Mineral	Ideal Chemical Formula	Sample H	Lithium 1	Lithium 2
in wt.%				
Quartz	SiO <sub>2</sub>	6.2	6.0	1.5
Orthoclase	KAlSi <sub>3</sub> O <sub>8</sub>	54.3	55.8	60.4
Clinochlore <sup>3</sup>	$Mg_{3.75}Fe^{2+}_{1.25}Si_{3}O_{12}(OH)_{8}$	18.4	12.7	10.3
Phengite/Muscovite <sup>4</sup>	KAl <sub>2</sub> (AlSi <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>	8.5	14.5	14.1
Calcite	CaCO <sub>3</sub>	12.5	11.1	13.1

1. X-ray diffraction analysis using Bruker D8 powder diffractometer by Autec Innovative Extractive solutions Ltd., Vancouver, British Colombia; Dr. P. Whittaker, Mineralogist. XRD patterns analyzed using Reitveld refinement algorithm.

2. Modal mineralogy normalized to 100% after correcting for corundum spike standard. Very fine-grained and amorphous material not considered in modal calculation: see table 2.

3. Clinochlore likely includes smectite and is presumably a main carrier of lithium.

4. Phengite/Muscovite is likely illite and is presumably a main carrier of lithium.

<i>Table 13.2 - Quantitative XRD<sup>1</sup></i>	modal mineralogy <sup>2</sup> for two Ze	eus Property lithium clay samples,
including amorphous material.		

	Ideal		
	Chemical		
Mineral	Formula	Lithium 1	Lithium 2
in wt.%			
Quartz	$SiO_2$	5.5	1.0
Orthoclase/Sanidine	KAlSi <sub>3</sub> O <sub>8</sub>	28.9	36.0
Chlorite	$Mg_{3.75}Fe^{2+}_{1.25}Si_{3}O_{12}(OH)_{8}$	3.3	2.9
Muscovite/Illite	KAl <sub>2</sub> (AlSi <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>	18.5	15.9
Calcite	CaCO <sub>3</sub>	7.9	6.8
Smectite <sup>3</sup>		22	9
Amorphous <sup>4</sup>		14.0	28.4

1. Analyses by X-ray diffraction using a Panalytical X'Pert Pro diffractometer at Actlabs,

Ancaster, Ontario; Dr. E. Hrischeva, mineralogist.

2. Modal mineralogy calculated using X'Pert HighScore plus software and PDF4/Minerals ICDD database.

and employing the Rietveld method for modal calculation. Crystalline mineral modes recalculated based on known percent of spike corundum and the remainder attributed to amorphous (poorly crystalline) material.

3. Smectite identified on the basis of the broad reflection at ~15 Angstroms that shifted to 17 Angstroms after treatment with ethylene glycol.

4. Amorphous material clay mineralogy for <4 um size fraction estimated in Table 13.3.

*Table 13.3 - Relative proportions of clay minerals in the* < 4 *um size fraction*<sup>1</sup>*.* 

Mineral	Lithium 1	Lithium 2
in wt.%		
~ .		•
Smectite	53	36
Illite	45	62
Chlorite	2	2.

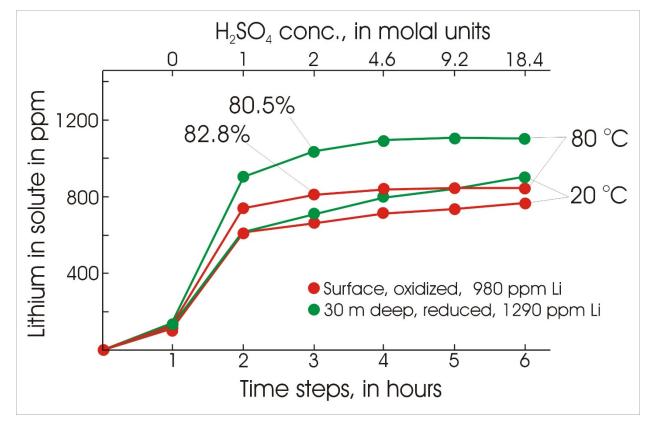
1. See footnotes 3 and 4 for Table 13.2.

#### 13.1.2 Initial leach tests

The aforementioned two Zeus lithium clay samples were also the subject of initial leach tests at Actlabs Ltd. Sequential leach tests were conducted at room temperature and at 80°C, with 1 hour time increments, in an agitated (stirred) vessel (Fig 13.1). For the first hour, distilled water was used, and then progressively more sulfuric acid was added. For both samples, 2 molal H<sub>2</sub>SO<sub>4</sub>

concentration resulted in >80% of the lithium going into solution at 80°C. The total time for this leaching was three hours, with the first hour in water alone.

These results are highly encouraging. They suggest that only moderate temperatures and moderate amounts of sulfuric acid are necessary to remove >80% of the lithium in the samples. Further testing is necessary to develop sequential precipitation of magnesium (and other cation) sulfates prior to precipitating lithium sulfate for conversion to a marketable lithium carbonate (or hydroxide) product.



*Figure 13.1 - Results of initial leach tests for two Zeus property lithium clay samples. See text for discussion.* 

### 13.2 Other Projects

At present, there are three advanced lithium clay projects relevant to the development of the Zeus property lithium clays: 1) Lithium Americas Corp.'s Thacker Pass project in northern Nevada, 2) Bacanora Lithium's Sonora project in Sonora Mexico; and 3) Ioneer Resources' Rhyolite Ridge boron + lithium project in Nevada, 40 km WNW of the Zeus property and outside of Clayton Valley proper. In addition, Cypress Development Corp. has conducted initial extraction studies for their lithium clay property that is adjacent and to the southwest of the Zeus Property in Clayton Valley; and Enertopia Resources, a company with a small property adjacent to Zeus to the southwest, has conducted high pH leach tests on samples (www.enertopia.com). Finally,

Pure Energy Resources plans to use a solvent extraction technology for lithium extraction from brines on their property in South Clayton Valley (www.Pureenergyminerals.com).

#### 13.2.1 Lithium Americas – Thacker Pass

The Thacker Pass lithium clay deposit is perhaps most similar to the Zeus lithium clay deposit, although it is considerably larger and higher grade. Thacker Pass lies within the 16.3 Ma McDermitt Caldera in Humboldt County, northern Nevada. Lacustrine clay deposits within the caldera contain 179 million tonnes at 3283 ppm Li as Proven and Probable Mineral Reserves (2000 ppm Li cut-off: Ehsani et al., 2018). The clay material has a significant granular sand/gravel component that can be separated by scrubbing. The remainder is predominantly clay, with sub-equal amounts of smectite (0.46% Li) and illite (0.28% Li: Ehsani et al., 2018; Henry et al., 2018).

The following is paraphrased from the Lithium Americas website:

The initial steps of processing envisioned involve crushing and screening, and then transferring the material as a slurry to the agitation leaching vats where sulfuric acid is added to dissolve the clay and liberate lithium. Leaching occurs over three hours, and the resulting lithium bearing solution is pH-neutralized with calcium carbonate. The lithium solution then undergoes a crystallization step to produce magnesium hydroxide using steam and electricity from the sulfuric acid production plant. Soda ash is added to precipitate lithium carbonate. The total time envisioned from original material to lithium carbonate product is less than 24 hours, with a recovery rate of 83%.

"Lithium Americas continues to collaborate with Ganfeng on the development of the pilot plant testing programs for Thacker Pass. A pilot plant and laboratory is being constructed in Reno, Nevada to optimize the process (predominantly to reduce the consumption of sulfuric acid) and to provide feed samples to crystallizer vendors who will design the equipment and provide performance guarantees." (Lithium Americas website).

The pre-feasibility study envisions a 46 year mine life, a Capex of \$US 1.059 billion, an Opex of \$US2,570/T lithium carbonate, an estimated NPV (8% discount of \$US2.6 billion and an IRR of 29.3% (Lithium Americas Corporate Presentation 208-11).

#### 13.2.2 Bacanora Lithium – Sonora Project

The Sonora deposit in Sonora, Mexico is a surface-mineable lithium clay deposit with Proven and Probable Reserves that total 243 million tonnes with an average grade of 3480 ppm Li (1500 ppm Li cut-off). The clay deposits are altered volcanic ash tuff units, likely deposited in a lacustrine setting, are 20-40m thick, and dip gently into a west-facing hillside. (Bacanora Lithium website and corporate presentation, 2018-10).

Bacanora has a large pilot plant that has been operating for over two years to optimize the design and produce a lithium carbonate product. Their processing differs from that of Lithium Americas in that they pre-concentrate and then roast the clay material, probably because some of the lithium clay is refractory (e.g., hectorite and similar smectite minerals). The following is a summary of the pilot plant process taken from the Bacanora Lithium website:

"The process plant design comprises a pre-concentration stage to produce an initial concentrate prior to roasting. The concentrate is subsequently heated in a kiln, at approximately 950 degrees Celsius, in combination with re-cycled sodium sulphate ('Na<sub>2</sub>SO<sub>4</sub>'), which is a by-product produced from the Sonora lithium plant, to produce an intermediate lithium sulphate ('Li<sub>2</sub>SO<sub>4</sub>') product. This sulphate material then undergoes hydrometallurgical treatment, filtration, cleaning, precipitation and packaging, to produce a >99.5% Li<sub>2</sub>CO<sub>3</sub> final battery grade product. The integrated plant has been designed to initially process 1.1 Mt of ore per year, during Stage 1 of the Project, subsequently increasing to some 2.2 Mt per year at Stage 2, producing 17,500 tpa and 35,000 tpa of lithium carbonate, respectively." The plant design also includes a circuit to produce up to 30,000 tpa of K<sub>2</sub>SO<sub>4</sub>/SOP product through a series of evaporation and precipitation stages."

The most recent feasibility study (Ausenco Services, 2018) determined a phase one Capex of \$US420 million, a life-of-mine Opex of \$US3910/T lithium carbonate for a 19 year mine life, an after tax NPV(8% discount) of \$US 802.5 million, and a pre-tax IRR of 26.1% for the Sonora mine and plant.

#### 13.2.3 Ioneer Ltd. – Rhyolite Ridge

Another project underway is (ASX listed) Ioneer Ltd.'s Rhyolite Ridge lithium – boron project, located ~25km WNW of Clayton Valley, in Nevada. The near-surface lithified clay – borate deposits have been the subject of an initial pre-feasibility study in 2018 prepared by Amec Foster Wheeler. Pit-constrained Indicated and Inferred resources are 26 million tonnes at 1400 ppm Li and 1.24% B, in clay minerals (lithium), and in searlsite and other borate minerals. The processing flow sheet envisions both heap and vat leach processing at this stage of study (Ioneer website, 2019-01).

The Rhyolite Ridge pre-feasibility Capex is \$US 599 million (mine, acid plant and processing plant included), the Opex is <\$US 2000/tonne lithium carbonate equivalent), and initial economics indicate a NPV 8% discount after tax estimated of \$US ~900 million (using \$12,000/T lithium carbonate equivalent price) and an after tax internal rate of return of 28% (Ioneer corporate presentation 2018-11).

#### 13.2.4 Cypress Development – Dean and Glory

The Dean and Glory project is located adjacent to and along strike to the southwest of Noram's Zeus property in Esmeralda County, Nevada. The geology, and initial mineralogy studies for Dean and Glory indicate very similar lithium clays as on the Zeus property; therefore Cypress Development's pre-feasibility study (Lane et al., 2018) is directly relevant to Zeus.

The Dean and Glory properties are underlain by the Esmeralda Formation clay deposits and are described as calcareous and salty interbedded tuffaceous mudstones and claystones.

Cypress metallurgical work consisted of mineralogical studies, crushing work index and abrasion testing, physical property tests, agitated leaching tests at variable temperatures, and review of other procession techniques (Lane et al., 2018). For lithium, they determined: 1) optimal leach temperatures at 70-80°C; and 2) optimal leach times of 120-180 minutes, using a 5% H<sub>2</sub>SO<sub>4</sub> solution; and 3) oxidized material had ~20% higher extraction rates than the reduced material under the same conditions, but both types were similar if the reduced sample had a longer residence time in solution.

# 14 Mineral Resource Estimates

### 14.1 General

This Inferred Mineral Resource estimate is an early stage deposit definition effort and is intended to add to the maiden inferred resource estimate with the effective date of July 24, 2017 (Peek and Spanjers, 2017). While the economic factors listed in this report will be important to the possible viability of the deposit, the deposit has yet to undergo the much more rigorous testing that must be performed before a mining decision can be made. Mineral Resources are not Mineral Reserves, and as such, have not demonstrated economic viability.

The deposit is held by placer and lode mining claims staked on U. S. Government lands administered by the Bureau of Land Management. Therefore, the permitting process for any mining operation is well established and has been tested on many past BLM projects. There are no known unusual legal, environmental, socio-economic, title, taxation or permitting problems associated with the subject claims that would adversely affect the development of the property, other than the possible necessity to develop water rights for the extraction of the lithium (See discussion in Section 24).

The Inferred Mineral Resource estimate, herein, is defined by 60 core drill holes (CVZ-01 through CVZ-59, plus CVZ-49R), for a total of 1718.9 meters of drilling and an average hole depth of 28.6 meters. A total of 1,130 lithium assay results from core, not including QA/QC samples, were used for the model.

The data for the Inferred Mineral Resource estimate were generated using the Rockworks 17 program, sold by Rockware, Inc.

### 14.2 Economic Factors

For the development of this inferred mineral resource estimate, consideration has been given to economic factors such as mining and processing costs to determine that the deposit has reasonable prospects for economic extraction. The primary factors in favor of the economic extraction determination are:

- The deposit occurs at or very near the surface, greatly reducing mining costs.
- The deposit is almost entirely unconsolidated or semi-consolidated, which will not require drilling and blasting, but could require ripping with a bulldozer (yet to be determined), further lowering mining costs.
- The mining method that is foreseen would be an open pit involving bulldozers (if required) to rip the sediments and front-end loaders to load the sediments into trucks to be hauled to the processing plant. If the deposit eventually evolves into sufficient size, some type of continuous miner might also be involved. The size and number of pieces of equipment will be determined by mining engineers once the final size and configuration of the operation is determined. The location of the processing plant with regard to the deposit is yet to be determined.
- Preliminary testing for the extraction of the lithium from the mined material (See Section 13) has indicated that the material will be relatively inexpensive to process.

- From the preliminary testing, the sediments will not require crushing or grinding prior to processing.
- The type of processing envisioned will have a much smaller footprint than lithium brine operations, which now employ large evaporation ponds, making the proposed operation more environmentally friendly.
- The deposit occurs in Nevada, a mining-friendly environment, on BLM land, with nearby producing properties.
- Electric power, developed transportation routes and a mining workforce are located proximally to the deposit.

Estimates of economic parameters are based heavily on other similar projects which are more advanced than Noram's Clayton Valley Lithium Project. The parameters have changed considerably from those used in Norm's maiden inferred resource estimate. The other projects and their levels of announced economic analysis are:

- Thacker Pass Project, Humboldt County, Nevada Pre-feasibility Study August 1, 2018
  - Owner = Lithium Americas
  - Host Rocks = Lithium-rich clays
  - Stripping Ratio = 1.8:1
  - Mining Cost per Tonne of Waste = US\$2.80
  - Mining Cost per Tonne Ore = US\$2.80
- Sonora Lithium Project, Sonora, Mexico Feasibility Study October 2018
  - Owner = Bacarona Minerals Ltd.
  - Host Rocks = Lithium-bearing clays
  - Stripping Ratio = 2.85:1
  - Mining Cost per Tonne Overall = US\$1.75
- Rhyolite Ridge Project, Esmeralda County, Nevada Pre-feasibility Study October 22, 2018
  - $\circ$  Owner = Ioneer Ltd.
  - Host Rocks = Finely bedded marls
  - Stripping Ratio = N/A
  - $\circ$  Mining Cost per Tonne of Ore = US\$2.70
- Clayton Valley Lithium Project, Esmeralda County, Nevada Preliminary Economic Assessment October 1, 2018
  - Owner = Cypress Development Corporation
  - $\circ$  Host Rocks = Lithium-rich clays
  - Stripping Ratio = 0.1:1
  - Mining Cost per Tonne Overall US\$1.73

The project most similar to the Noram deposit is Cypress Development's Clayton Valley Lithium Project since it occurs on land adjacent to Noram's and is considered to be a part of the same mineral deposit as Noram's. Therefore, many of the economic parameters used by Cypress can reasonably be applied to Noram's deposit. All four of the projects listed above are hosted in similar rock to that of Noram's Clayton Valley project. Based on the above information, it is the opinion of the primary author that using a mining cost of US\$2.00 per tonne for the Clayton Valley project would be a reasonable figure and the actual mining cost could be significantly less.

Table 14.1 shows estimates of the mining, processing and other operating costs for the average lithium grade of the deposit, based on the mining cost of US\$2.00/tonne, to produce one tonne of lithium carbonate.

	1	2	3	4	5	6	7	8
Cutoff Grade (Li ppm)	Material Grade (Li ppm)	Li Metal Per Tonne (kg)	Material Required for 1 Tonne Li2CO3 (Tonnes)	Material Required with 80% Recovery (Tonnes)	Mining Cost at US\$2.00 per Tonne Material (US\$)	Processing Cost @ US\$13.00 Per Tonne (US\$)	Total Mining + Processing Cost Per Tonne Li <sub>2</sub> CO <sub>3</sub> (US\$)	Total Mining + Processing + Other Operating (US\$)
300	858	0.86	219	274	\$ 548	\$ 3,560	\$ 4,108	\$ 4,382
600	984	0.98	191	239	\$ 478	\$ 3,104	\$ 3,582	\$ 3,821
900	1145	1.15	164	205	\$ 410	\$ 2,668	\$ 3,078	\$ 3,283

Notes:

Column 1 Average grade of material in the Inferred Mineral Resource model.

Column 2 Column 1 divided by 1000

Column 3 1 divided by Column 2 divided by 5.32 times 1000 (5.32 is the multiplier to convert Li metal to Li<sub>2</sub>CO<sub>3</sub>)

Column 4 Column 3 divided by 80% projected recovery rate = approximation from the 4 projects listed above

Column 5 Column 4 times US\$ 2.00 = conservative mining cost per tonne

Column 6 Column 4 times US\$ 13.00 = from Cypress Development PEA

Column 7 Column 5 plus Column 6

Column 8 Column 7 plus estimated additional operating costs from Cypress Development PEA

Although the numbers in Table 14.1 are preliminary, they indicate that the cost to produce a tonne of lithium carbonate will be approximately US\$ 4,382/tonne for the average grade of the deposit at a 300 ppm Li cutoff. Current lithium carbonate (99.5% purity) prices in China are \$12,500 - \$14,500 per tonne (as of Feb. 9, 2019: <u>www.metalbulletin.com</u>) (see also Section 14.3 – Lithium Pricing). The economic factors serve to show that there is a reasonable chance that the deposit could be economically exploited.

### 14.3 Lithium Pricing

Future prices for lithium carbonate are a complicated proposition, given the price rise over the past three years. There appear to be wide variations in the projections of both lithium demand and lithium supply. Due to the projected high future demand for lithium batteries for electric vehicles and other storage devices, lithium prices have soared. Because of the price rise, companies who are producing lithium are increasing their production and there are many start-up companies that are attempting to put lithium deposits into production. With both supply and demand in a state of flux, there are many competing scenarios as to how quickly the new production will come onstream and how rapidly demand will rise. Further complicating the

pricing picture is the fact that lithium is mostly sold by private contracts, the terms of which are generally not published.

For this study it was considered most favorable to look at "Consensus Pricing", or the recent price projections of peer companies as yardsticks to measure the Noram deposit's reasonable prospects for eventual economic extraction. Below are examples of "Consensus Pricing" scenarios taken from similar projects with recently published studies.

- Thacker Pass Project, Humboldt County, Nevada Pre-feasibility Study August 1, 2018
  - Owner = Lithium Americas
  - $Li_2CO_3$  Price = US\$12,000/tonne
- Sonora Lithium Project, Sonora, Mexico Feasibility Study October 2018
  - Owner = Bacarona Minerals Ltd.
  - $Li_2CO_3$  Price = US\$14,300/tonne
- Rhyolite Ridge Project, Esmeralda County, Nevada Pre-feasibility Study October 22, 2018
  - $\circ$  Owner = Ioneer Ltd.
  - $Li_2CO_3$  Price = US\$10,000/tonne
- Clayton Valley Lithium Project, Esmeralda County, Nevada Preliminary Economic Assessment October 1, 2018
  - Owner = Cypress Development Corporation
  - $\circ$  Li<sub>2</sub>CO<sub>3</sub> Price = US\$13,000/tonne

An average of these 4 prices gives us US\$12,325, which corresponds well with the metalbulletin.com February 9, 2019 quote.

#### 14.4 Cut-off Grade

The cut-off grade for the Noram / Alba deposit was calculated by using the cost to produce a tonne of lithium carbonate (See Section 14.2 - Economic Factors) using various lithium grades in the deposit and comparing those values against the projected lithium carbonate price (See Section 14.3 - Lithium Pricing). In this manner, a lithium value of 300 ppm Li was chosen for a cut-off grade. The calculations used for the 300-ppm figure are shown below:

Grade of Deposit Material = 300 ppm Li

Lithium Metal Per Tonne @ 300 ppm = 0.30 kilograms

Material Required to Produce 1 Tonne of Lithium Carbonate = 627 tonnes ( $1 \div 0.30 \div 5.32$  X 1000)

Material Required to Produce 1 Tonne of Lithium Carbonate with 80% Recovery = 783 tonnes  $(627 \div 0.8)$ 

Mining Cost at US\$2.00/tonne = \$1,566 (783 X \$2)

Processing Cost (from Cypress Development PEA at US\$13.00/tonne) = \$10,182 (783 X \$13.00)

Total Mining + Processing Cost = US\$11,748 (\$1,566 + \$10,182)

Total Mining + Processing + Other G & A Costs = \$12,531 (\$11,748 + \$1 X 783) (\$1/tonne estimated G & A costs from Cypress Development PEA)

Therefore, the total cost of producing a tonne of lithium carbonate from 300 ppm Li deposit material compares well with the projected price of lithium carbonate of US\$12,325 (See Section 14.3 – Lithium Pricing).

### 14.5 Model Parameters

The histogram of all the lithium values in all 3 phases of drilling (not composited), generated by Rockworks 17 is shown in Figure 14.1. The statistics for the histogram are listed in Table 14.2. The data approaches a log-normal distribution. Very few of the data points can be considered outliers. Only 7 values occur outside 2 standard deviations from the mean. From this is was determined that high grade capping was not necessary.

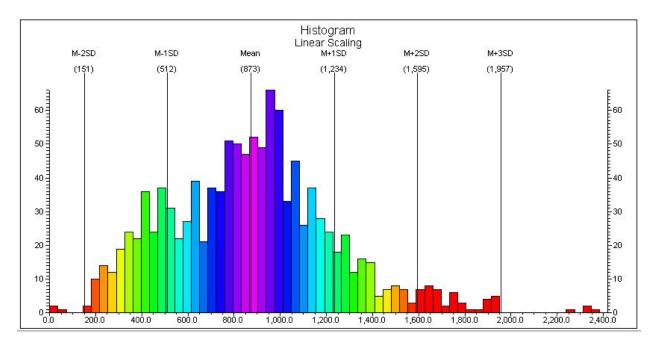


Figure 14.1 - Histogram of all Li values from all drill holes used in resource model.

Statistical Summary				
Population	1146			
Minimum Value	0.01			
Maximum Value	2,380.0			
Range	2,379.99			
Mean	873.18928			
Standard Deviation	361.14038			
Standard Error	10.66802			
Median	870.0			
Sum	1,000,674.92			
Sum of Squares	1,023,112,236.4102			
Variance	130,422.3747			
Skewness	0.49912			
Kurtosis	0.62971			
Coefficient of Variation	0.41359			
Mean - 1 Standard Deviations	512.0489			
Mean - 2 Standard Deviations	150.90852			
Mean - 3 Standard Deviations	-210.23186			
Mean - 4 Standard Deviations	-571.37224			
Mean + 1 Standard Deviations	1,234.32967			
Mean + 2 Standard Deviations	1,595.47005			
Mean + 3 Standard Deviations	1,956.61043			
Mean + 4 Standard Deviations	2,317.75081			
Background Population	776			
Slightly Anomalous Population	321			
Moderately Anomalous Population	45			
Strongly Anomalous Population	1			
Extremely Anomalous Population	3			

Table 14.2 - Statistics for all Li values from all drill holes used in the resource model.

The lithology found in the Noram drilling appears to be somewhat more variable than that reported for Cypress Development's adjacent property (Cypress PEA, October 1, 2018 and NI43-101 Technical Report (Marvin, 2018)). This may be a result of the more consistently deeper holes drilled by Cypress, exposing more of the lithologic section. The lithium concentrations encountered in the Noram drilling tend to grade into each other with little respect for lithologies and Cypress' Middle Reduced Mudstone does not appear to be as consistent thus far on Noram's Zeus claims. Therefore, it was decided that the model should not be constrained by lithology. The vertical thickness of the model was only constrained by the depth of the drill holes. Many of the holes bottomed in good grade material and should be deepened.

To constrain the model horizontally, a 12-sided polygon was constructed around the drill holes. The polygon constrained the model on the southwest and in part on north sides by the boundaries of the Zeus claim block. The model was constrained on the east side by an artificial line placed 300 meters from the easternmost holes. The 300-meter extension to the eastward mineralization was based on knowledge gained from cross sectional analysis and previous model iterations. The southeast side of the model was limited by a northeast trending fault that is visible on aerial photographs. There has been no drilling by Noram on the southeast side of the fault and to the author's knowledge, no competitor companies have drilled there either. Therefore, it is currently unknown if lithium mineralization exists beyond (southeast of) the fault.

Figure 14.2 shows the 12-sided constraining polygon in yellow, a portion of the Zeus claim block outline in blue and the drill holes used in the resource calculation. Phase I holes are in

green, Phase II holes are in yellow and Phase III holes are in red. The "CVZ-" designations of the drill holes have been removed for clarity.

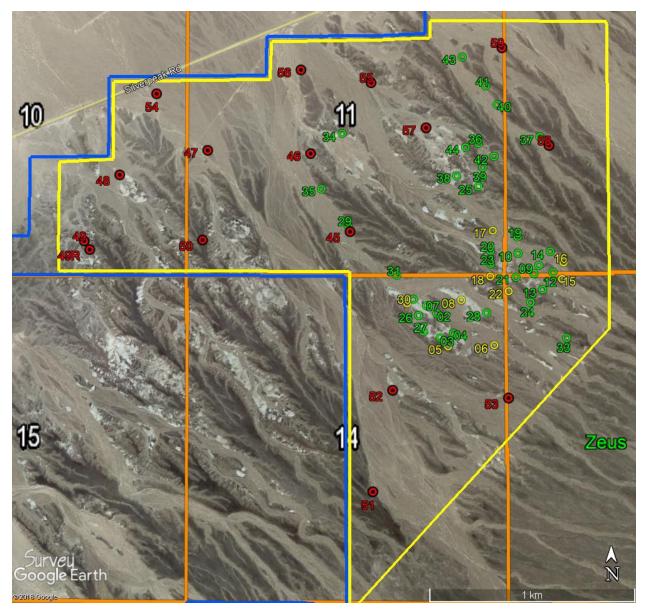
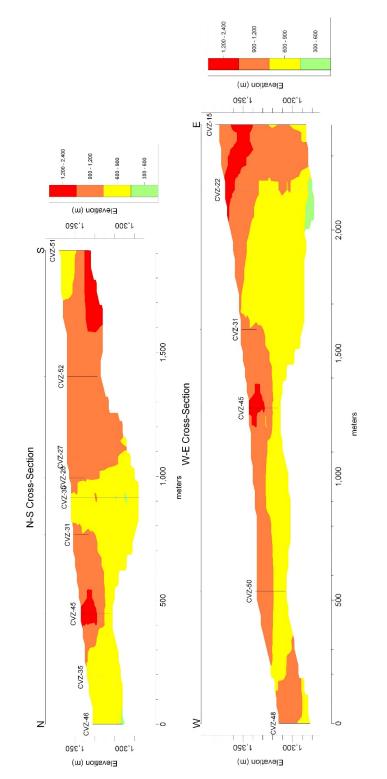


Figure 14.2 - Image showing the constraining polygon (in yellow) used in the resource model.

Most of the drill holes were located in the fringe area between the washes and the elongate ridges to facilitate the drilling process. Therefore, for the most part, the model only includes the volume of material below the level of the washes and does not take into account the ridges of material between the washes. The mass of the material above the washes is estimated to be approximately 2 to 3 million tons, but the data involving the grade of the material (surface sampling) was considered too widespread to be included in the resource model. The material in the ridges does, however, provides considerable upside tonnage potential which may at some future point be included in a mineral resource.

Figure 14.3 shows North-South and West-East cross sections through the resource model. The sections have been simplified for presentation purposes. The vertical exaggeration of the cross sections is X4. Careful examination of the more detailed cross sections, as well as profiles created at right angles, were used to verify the accuracy of the model.



*Figure 14.3 - N-S and W-E cross sections - 4X vertical exaggeration.* 

Page 50

The inverse distance squared model was constructed using voxels with dimensions of 50m X 50m horizontally by 2m vertically, reflecting the relatively thin vertical component and large horizontal extent of the deposit. A mining bench height for such a deposit has not been developed at this point.

Due to the relative simplicity of the deposit, not being complicated by structure or nugget effect, the model chosen was deemed to be adequate for the purposes of this Inferred Mineral Resource estimate.

#### 14.6 Density Determination

Density determinations for Noram's maiden inferred resource estimate (Peek and Spanjers, 2017) were made by using density analyses by ALS Laboratories in Reno, Nevada, USA on 20 randomly selected pulps from core samples. The determinations used method OA-GRA08c which employs an automated gas displacement pycnometer to determine density by measuring the pressure change of helium within a calibrated volume. The average of the 20 samples resulted in a density of 2.66 tonnes/meter<sup>3</sup>, which was used for the density in the 2017 resource calculation.

Although the above density measurements were based on sound scientific testing, since Noram's maiden resource estimate, Lithium Americas, Bacarona Lithium, Ioneer and Cypress Development have published results of investigations on their lithium clay properties which call into question the 2.66 specific gravity used in the previous Noram estimate. The other companies' density values and the estimates in which they appeared are as follows:

- Thacker Pass Project, Humboldt County, Nevada Pre-feasibility Study August 1, 2018
  - Owner = Lithium Americas
  - Density of Claystones = 1.79 Tonnes/meter<sup>3</sup>
- Sonora Lithium Project, Sonora, Mexico Feasibility Study October 2018
  - Owner = Bacarona Minerals Ltd.
  - Density of Clay Units = 2.23 2.32 Tonnes/meter<sup>3</sup>
- Rhyolite Ridge Project, Esmeralda County, Nevada Pre-feasibility Study October 22, 2018
  - $\circ$  Owner = Ioneer Ltd.
  - Density Range = 1.8 2.11 Tonnes/meter<sup>3</sup>
- Clayton Valley Lithium Project, Esmeralda County, Nevada Preliminary Economic Assessment October 1, 2018
  - Owner = Cypress Development Corporation
  - $\circ$  Reduced Clays = 1.68 Tonnes/meter<sup>3</sup>. Oxidized Clays = 1.76 Tonnes/meter<sup>3</sup>

Since no additional density determinations have been undertaken by Noram and in an effort to be conservative, the densities used by the other companies were used as a guide for the Noram resource model herein with heavy emphasis on the property adjacent to Noram's Zeus claims held by Cypress Development. The Cypress clays were determined to have densities of 1.68 (reduced) and 1.76 (oxidized). Since the Noram clays are mostly oxidized, a reasonable density to use for the Noram resource estimate would be 1.74 tonnes/meter<sup>3</sup>. This was the density used

for the Noram model calculated herein without regard for whether the material was reduced or oxidized.

### 14.7 Variography

Variography performed using Rockworks 17 software on the data revealed that the closest fit to the data was the Gaussian model without nugget, having a 0.95 correlation as shown in Figure 14.4, below. The anisotropy ratio was 0.95, so no adjustment to the direction of search distances was made to the inverse distance squared model.

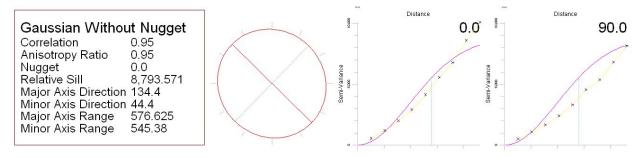


Figure 14.4 - Variography analysis results.

### 14.8 Model Results

The reader of this report should be aware that the deposit being defined is for an Inferred Mineral Resource and does not include any other classifications of Mineral Resource or Mineral Reserve. An Inferred Mineral Resource is the lowest level of confidence for mineral resource categories as defined by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM). The CIM definition of an Inferred Mineral Resource includes the statements that, "Geological evidence is sufficient to imply but not verify geological and grade or quality continuity" and "It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration".

Table 14.3 lists the final tonnage and grade of the entire Inferred Mineral Resource deposit. The result of approximately 330 million tonnes at a grade of 858 ppm Li is considered to be a reasonable estimate for the deposit, having been checked using other computer-generated and manual methods.

Table 14.4 shows the sensitivity of the deposit using cutoff grades of 600 ppm and 900 ppm in relation to the inferred resource at 300 ppm cutoff (bolded).

Li Range (ppm)	>300 ppm
Total Mass (Tonnes)	330,670,000
Weighted Avg. Li (ppm)	858
Weighted Avg. Li %	0.086
Tonnes Li	283,800
Tonnes Li <sub>2</sub> CO <sub>3</sub> (LCE)	1,510,700

Table 14.3 - Inferred Mineral Resource final numbers.

#### Table 14.4 - Sensitivity analysis at various cutoff grades.

	Cutoff Grade			
	Inferred Resource @ 300 ppm	Sensitivity @ 600 ppm	Sensitivity @ 900 ppm	
Tonnes (1000s)	330,670	251,526	145,168	
Grade (ppm)	858	984	1145	
Contained Li (kg)	283,796,297	247,569,218	166,238,452	

The deposit occurs at or near surface. Preliminary extraction analyses using Rockworks 17 indicate that the stripping ratio for the 300 ppm cutoff inferred resource would be less than 0.02:1.

## 23 Adjacent Properties

The perimeter of Noram's claims are located within 1 mile (1.6 kilometers) of Albemarle's lithium brine operations. It is a matter of public record that lithium at Albemarle's plant is produced from deep wells that pump brines from the basin beneath the Clayton Valley playa (Kunasz, 1970; Zampirro, 2005 and Munk, 2011).

Between Albemarle's operation and Noram's land position lies Pure Energy Minerals' Clayton Valley South project. Pure Energy has announced in a revised Preliminary Economic Assessment (PEA) dated March 23, 2018 an inferred resource of 200,000 metric tonnes of lithium hydroxide monohydrate to be extracted over a 20-year period (Molnar, et al, 2018), with a Net Present Value of US\$264.1 million (after tax at 8% discount rate) and an estimated Internal Rate of Return of 21.0% (after tax). The Pure Energy resource occurs as basinal subsurface brines similar to those at Albemarle's project.

East of Pure Energy's claims and adjacent to the west of Noram's holdings, Cypress Development has completed a PEA with an effective date of September 4, 2018. The results of the economic analysis from the PEA reports:

"at a lithium carbonate price of \$13,000/tonne of lithium carbonate, over the 40-year schedule, projects an after-tax Net Present Value @ 6% (NPV@6%) of \$1.97 billion, NPV@8% of \$1.45 billion, and NPV@10% of \$773 million, and Internal Rate of Return (IRR) of 32.7%. The expected maximum negative cash flow is \$488 million."

On February 19, 2019 Enertopia Corporation, which holds claims that border both Cypress Development and Noram, announced assay results from 4 core holes and one metallurgical hole. The average grade and thickness from the 4 core holes were approximately 1,120 ppm Li over and average thickness of 284 feet.

The mineralization reported for these adjacent properties has not been verified by the author and is not necessarily indicative of mineralization that may be found on Noram's property.

# 24 Other Relevant Data and Information

Because of the desert conditions in the Clayton Valley area, water is of major importance to any potential mining operation. In this regard, a scoping study (Hamilton, 2016) was commissioned with Star Point Enterprises, Inc. of Moab, Utah. Star Point's report has indicated that obtaining water rights for the proposed operation could be an involved and somewhat costly undertaking, since the Clayton Valley Basin is over-appropriated (current water rights are in excess of water volumes available for an average year). The report concludes:

"Project water is available in the area for exploration and development primarily through the purchase of water rights from other mining entities within the Clayton Valley groundwater basin. Once quantities for exploration and development are determined, quick research can reveal the likely path towards water delivery. Initial research has revealed that water right purchases in this basin will be in excess of \$900/acre-foot annually as a direct result of large mining operations presently holding the majority of the limited Clayton Valley Basin water resources."

Early indications from studies of the lithium extraction process is that a large portion of the process water can be recycled. Additional testing is required to determine just how much of the water will be recyclable.

# 25 Interpretation and Conclusions

One phase of core drilling in 2016-2017 and two phases of core drilling in 2018 have provided a basis for an updated Inferred Lithium Resource for Noram Ventures' property in Clayton Valley, Nevada. The lithium assays from the drilling provide results that are reasonably consistent over a large portion of Noram's Zeus claims. The model generated for the Inferred Mineral Resource estimate indicates zones of higher lithium grades that remain open to the south, east and at depth. The drilling only tested approximately one third of the area covered by the Zeus claim block. There is considerable upside potential for increasing the size of the deposit. However, such potential is conceptual in nature. There has been insufficient exploration beyond the modeled resource and it is uncertain if further exploration will result in an enlargement of the deposit.

Within the model that was generated from all 3 phases of drilling, the potential exists for a viable operation. The model herein reports an Inferred Mineral Resource of approximately 330 million metric tonnes at a grade of about 858 ppm Li, or 1,500,000 tonnes lithium carbonate equivalent (LCEs). Preliminary economic indicators are that the deposit may be economically extractable at some point. The level of confidence, i.e., the category, of a resource estimate may change with additional exploratory work, such as sampling, drilling and metallurgical testing.

The success of this sediment mining scenario depends on whether an efficient method of lithium extraction can be found. Should it be shown by the current and future drilling programs that the lithium grades discussed above (and present in the metallurgical samples which yielded promising results) are continuous over mineable distances, the greatest challenge, and risk, to the project's economic viability will be the development of an economic lithium extraction process. Noram and other companies with lithium clay properties have undertaken metallurgical testing with positive, although preliminary, results.

## 26 Recommendations

Noram Ventures has successfully completed the early phases of exploration for sediment hosted lithium mineralization, including completing 3 phases of drilling on the most promising of its claims. The data obtained from the drilling has been sufficient to update the Inferred Mineral Resource estimate to move the project forward.

The primary recommendation of this report is to follow the Phase III drilling program with a fourth round (Phase IV) of exploratory drilling. At least 9 of the holes drilled in Phase III should be deepened to a depth of at least 300 feet (100 meters). These holes ended in good grade lithium mineralization.

In addition, at least another 5 to 6 holes should be drilled to similar depths to the south and east of the previous drilling. At least one of these holes should be drilled on the southeast side of the northeast trending fault noted on aerial photos to determine if potential for additional mineralization exists on that side of the fault.

Simultaneous with the drilling program, work should be continued on the metallurgical properties of the lithium clays. Testing of bulk samples is advised to determine the most economical method of processing the clay and sandy clay materials with emphasis on optimal temperature, acid concentration and the optimal methods for removing detrital matter prior to processing the clays with acid.

Item			Total
Deepen 9 core holes to depths of approximately	3600ft	\$35/ft	US\$126,000
100m (300ft) and drill 6 core holes from surface			
to 100m			
Assays of core samples	780 samples	\$40/sample	US\$31,000
Geological & Sampling Consumables			US\$24,000
Metallurgical Testing			US\$100,000
Total			US\$281,000

Table 26.1 – Recommended Phase IV Drilling and Metallurgical Testing Budget.

As the second recommended phase of work on the Noram properties, which is not contingent on the results of the Phase IV drilling, it is suggested that a Preliminary Economic Assessment be undertaken to move the project to the next stage toward development. An estimated budget for the PEA would be US\$500,000

### 27 References

Aiken, Stephen R., Gowans, Richard, Hawton, Kevin E., Jacobs, Christopher, Ing, Eur, Pilcher, Bruce, Spooner, Jane and Trueman, David L., 2016, NI 43-101 Technical Report on the Preliminary Economic Assessment of Lithium Hydroxide Production, Separation Rapids Lithium Project, Kenora, Ontario, 262 p.

Albers, John P. and Stewart, John H, 1972, Geology and Mineral Deposits of Esmeralda County, Nevada: Nevada Bureau of Mines and Geology Bulletin 78, 80 p.

Albers, John P. and Stewart, John H., 1965, Preliminary Geologic Map of Esmeralda County, Nevada: U. S. Geol. Surv. Field Studies Map MF-298.

Ausenco Services, 2018, Technical report on the Feasibility Study for the Sonora Lithium Project, Mexico, for Bacanora Minerals Ltd., 261 p.

Barrie, C. T., 2018, The inter-relationship between lithium brines and clays in the playa lake environment: (abstract) Resources for Future Generations Conference, Vancouver, B.C., 1 p.

Barrie, C. T., Peek, B. and Whittaker, P., 2018, Lithium clay deposits of the Zeus property, Eastern Clayton Valley Nevada (abstract and poster), American Geophysical Union Fall Meeting, Washington D.C., 4 p.

Blois, Michael D.S., Weber, Daniel S., Burga, Ernie and Sawyer, Valerie, 2017, Preliminary Economic Assessment of the Clayton Valley Lithium Project, Esmeralda County, Nevada. Technical Report for NI 43-101, Prepared on Behalf of Pure Energy Minerals Ltd.

Baron, Janet, 2017, Summary of Process Bench Testing Reports by MDS: Confidential internal report by AuTec Innovative Extractive Solutions.

Bradley, Dwight, Munk, LeeAnn, Jochens, Hillary, Hynek, Scott, and Labay, Keith, 2013, A preliminary deposit model for lithium brines: U.S. Geological Survey Open-File Report 2013–1006, 6 p.

Burga, Ernest, Burga, David, Rosko, Mike, King, Mark, Abbey, Daron and Sanford, Tony, 2017, NI 43–101 Technical Report, Updated Feasibility Study, Reserve Estimation and Lithium Carbonate Production at the Cauchari-Olaroz Salars, Jujuy Province, Argentina, 318 p.

Davis, J. R., 1981, Late Cenozoic Geology of Clayton Valley, Nevada and the Genesis of a Lithium-Enriched Brine: Ph.D. Dissertation, University of Texas, Austin, 249p.

Davis, J. R. and Vine, J. D., 1979, Stratigraphic and Tectonic Setting of the Lithium Brine Field, Clayton Valley, Nevada: RMAG-UGA 1979 Basin and Range Symposium, pp. 421-430.

Ehsani, R., Fourie, L., Hutson, A., Peldiak, D., Spiering, R., Young, J., and Armstrong, K., 2018, Technical Report on the Pre-Feasibility Study for the Thacker Pass Project, Humboldt County, Nevada, USA: Advisan Worley Parsons Group, for Lithium Americas, 266 p. Foy, Travis A., 2011, Quaternary Faulting in Clayton Valley, Nevada: Implications for Distributed Deformation in the Eastern California Shear Zone – Walker Lane: Georgia Institute of Technology Master's Thesis.

Hamilton, Don, 2016, Scoping Study, Water for Exploration and Development within the Clayton Valley Basin: Internal Noram Ventures company report.

Henry, C., 2018, Li-rich claystone in the McDermitt Caldera, NV: Characteristics and possible origin (abstract), American Geophysical Union Fall Meeting, Washington D.C., 1 p.

Kunasz, Ihor A., 1970, Geology and Geochemistry of the Lithium Deposit in Clayton Valley, Esmeralda County, Nevada: University of Pennsylvania PhD Thesis.

Kunasz, Ihor A., 1974, Lithium Occurrence in the Brines of Clayton Valley, Esmeralda County, Nevada: Fourth Symposium on Salt – Northern Ohio Geological Society, pp. 57-66.

Lane, T., Harvey, J. T., Fayram, T., Samari, H., and Brown, J. J., 2018, Preliminary Economic Assessment Technical Report Clayton Valley Lithium Project, Esmeralda County, Nevada, for Cypress Development Corp., 152 p.

Molnar, Ron, Weber, Daniel S., Burga, Ernie, Sawyer, Valerie, Spanjers, Raymond P., and Jaacks, Jeffery A., 2018, Preliminary Economic Assessment (Rev. 1) of the Clayton Valley Lithium Project, Esmeralda County, Nevada, Prepared for Pure Energy Minerals, 286 p.

Munk, LeeAnn and Chamberlain, C. Page, 2011, Final Technical Report: G10AP00056 – Lithium Brine Resources: A Predictive Exploration Model: USGS Mineral Resources External Research Program.

Peek, Bradley C., 2016, Lithium Exploration Project, Clayton Valley, Esmeralda County, Nevada, USA, Prepared for Noram Ventures, Inc. 50 p.

Peek, Bradley C., 2017, Lithium Exploration Project, Clayton Valley, Esmeralda County, Nevada, USA, Prepared for Alba Minerals Ltd. 55 p.

Peek, Bradley C., and Spanjers, Raymond P., 2017, NI 43-101 Technical Report, Lithium inferred mineral resource estimate, Clayton Valley, Esmeralda County, Nevada, USA, for Noram Ventures Inc. and Alba Minerals Ltd., 67 p.

Zampirro, Danny, 2005, Hydrogeology of Clayton Valley Brine Deposits, Esmeralda County, Nevada: The Professional Geologist, Vol. 42, No. 3, pp. 46-54.

### Certificate of the Author

I, Bradley C. Peek, MSc., CPG do hereby certify that:

- 1. I am currently employed as a Consulting Geologist at 438 Stage Coach Lane, New Castle, Colorado 81647, USA
- 2. This certificate applies to the Technical Report titled "Updated Inferred Lithium Mineral Resource Estimate, Clayton Valley, Esmeralda County, Nevada, USA" with the effective date February 20, 2019 (the "Technical Report").
- 3. I graduated in 1970 from the University of Nebraska with Bachelor of Science degree in Geology and in 1975 from the University of Alaska with Master of Science degree in Geology.
- 4. I am a member in good standing with the Society of Economic Geologists and the American Institute of Professional Geologists (Certified Professional Geologist #11299).
- 5. I have continuously practiced my profession for 49 years in the areas of mineral exploration and geology. I have explored for copper, lead, zinc, silver and gold in 10 states of the USA and 8 foreign countries. I have spent most of 2016 through 2018 exploring for lithium deposits in the Clayton Valley, Nevada and other areas of the USA. I have more than 5 years' experience generating open pit resource estimates for approximately 19 mineral deposits, primarily for gold and base metals using GEMCOM and Rockworks software.
- 6. I visited the Noram Ventures Clayton Valley Lithium property on May 5-7, 2016, July 21-25, 2016, August 3-6, 2016, December 12-22, 2016, January 8-27, 2017, April 22-May 15, 2018 and November 17-December 12, 2018.
- 7. I supervised the preparation of the report entitled "Updated Inferred Lithium Mineral Resource Estimate, Clayton Valley, Esmeralda County, Nevada, USA" with the effective date February 20, 2019, including the conclusions reached and the recommendations made, with the exception of those portions indicated under the heading, "Reliance on Other Experts".
- 8. I am independent of Noram Ventures Inc. applying all of the tests in Section 5.1.1, Part 1.5 of NI 43-101.
- 9. I have had no prior involvement with the property that is the subject of the Technical Report other than that which is stated in this report and previous Noram and Alba NI 43-101 reports.
- 10. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, professional affiliation, and past relevant work experience, I fulfill the requirement to be an independent qualified person for the purposes of this NI 43-101 report.
- 11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, this Technical Report contains all of the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- 12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them of the Technical Report for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated: March 11, 2019

Bradley C. Peek, CPG

# Date and Signature Page

The report herein, entitled "Updated Inferred Lithium Mineral Resource Estimate, Clayton Valley, Esmeralda County, Nevada, USA" has an effective date of February 20, 2019.

Grada, Check

Bradley C. Peek, MSc., CPG



Noram Ventures Inc.

#### **Consent of Qualified Person**

To: British Columbia Securities Commission Alberta Securities Commission Ontario Securities Commission

I, Bradley C. Peek, Co-author of the report, do hereby consent to the public filing of the technical report entitled "Updated Inferred Lithium Mineral Resource Estimate, Zeus Project, Clayton Valley, Esmeralda County, Nevada, USA" with the effective date of 20 February 2019 (the "Technical Report") by Noram Ventures Inc. (the "Issuer"), and I acknowledge that the Technical Report will become part of the Issuer's public record. I also consent to the use of extracts from, or a summary of, the technical report.

Dated this 22<sup>nd</sup> day of March, 2019.

Signed

Grad Car, Check

Bradley C. Peek, MSc., CPG

C. T. Barrie and Associates, Inc. 2184 Braeside Avenue Ottawa, Ontario K1H 7J5, Canada tel.: 613-324-991 email: barriect@sympatico.ca

Certificate of Author

I, Charles Tucker Barrie, of 2184 Braeside Avenue, Ottawa, Ontario, K1H 7J5, do hereby certify that:

1) I am a consulting geoscientist with C. T. Barrie and Associates, Inc., at the same address, and I am an Executive for Noram Ventures Inc., of Vancouver, Canada;

2) This certificate applies to the report "NI43-101 Technical Report, Updated Inferred Lithium Mineral Resource Estimate, Zeus Project, Clayton Valley, Esmeralda County, Nevada, USA " dated March 11, 2018 for Noram Ventures Inc. of Vancouver, Canada;

3) I hold the following degrees: B. Sc. with Distinction, in Geological Sciences, University of Michigan, 1979; M.A. in Geological Sciences, University of Texas at Austin, 1984; and Ph.D., Geological Sciences, University of Toronto, 1990. I am a member in good standing of the Association of Professional Geologists in Ontario. I have practiced my profession continuously since graduation in Economic Geology and Geochemistry;

4) I have not visited the Zeus Property, Esmeralda County, Nevada;

5) In the report entitled, "NI43-101 Technical Report, Updated Inferred Lithium Mineral Resource Estimate, Zeus Project, Clayton Valley, Esmeralda County, Nevada, USA ", I am responsible for Chapter 13 – "Mineral Processing and Metallurgical Testing" only;

6) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of education, experience, and affiliation with a professional association, I meet the requirements of a Qualified Person as defined in the draft national Policy 43-101;

7) I have worked on a variety of mineral exploration projects and properties, including lithium projects, over a 30 year career; and I have given several presentations on lithium brine and clay deposits and published two extended abstracts on the lithium clay and brine deposits in Clayton Valley Nevada;

8) I was separate from the project team that conducted the initial geological mapping, geochemical sampling and drilling at Zeus Property until I became an Executive for

Noram Ventures Inc. on January 23, 2019. I conducted mineralogical studies and was the principal person with oversight of initial metallurgical studies of the lithium clay material in 2018 on contract for Noram Ventures. I am a shareholder in Noram Ventures.

9) I have read National Instrument 43-101, Standards for Disclosure of Mineral Properties and Form 43-101F1. This technical report has been prepared in compliance with that instrument and form.

11) As of the date of this certificate, to the best of my qualified knowledge, information and belief, this technical report contains all the scientific and technical information required to be disclosed to ensure that the report is not misleading.

12) I consent to the filing of the Technical Report entitled, "NI43-101 Technical Report, Updated Inferred Lithium Mineral Resource Estimate, Zeus Project, Clarop Valley, Esmeralda County, Nevada, USA " dated March 11, 2019.

Dated this 11th day of March, 2019:

hoden C. Tucker Barrie, Ph.D., PT APGO # 1209

#### Noram Ventures Inc.

C. T. Barrie and Associates, Inc. 2184 Braeside Avenue Ottawa, Ontario K1H 7J5 tel.: 613-324-9917 email: barriect@sympatico.ca

### **Consent of Qualified Person**

To: British Columbia Securities Commission Alberta Securities Commission Ontario Securities Commission

I, C. Tucker Barrie, Co-author of the report, do hereby consent to the public filing of the technical report entitled "Updated Inferred Lithium Mineral Resource Estimate, Zeus Project, Clayton Valley, Esmeralda County, Nevada, USA" with the effective date of 20 February 2019 (the "Technical Report") by Noram Ventures Inc. (the "Issuer"), and I acknowledge that the Technical Report will become part of the Issuer's public record. I also consent to the use of extracts from, or a summary of, the technical report.

Dated this 22<sup>nd</sup> day of March, 2019.

Signed

<u>"C.Tucker Barrie"</u>\_\_\_\_\_

C. Tucker Barrie, Ph.D., P.Geo