NEVADA ORGANIC PHOSPHATE

Research Note- March 15, 2024

Prepared by: RAK Consultants CANADA Inc.

"The Organic Phosphate Rock Fertilizer Demand Surge is Off and Running - Climate Change, Regenerative Ag Focus and Battery Tech Growth Dynamics Will Super-Charge It!"

Nevada Organic Phosphate Inc Com (NOP:CNX)

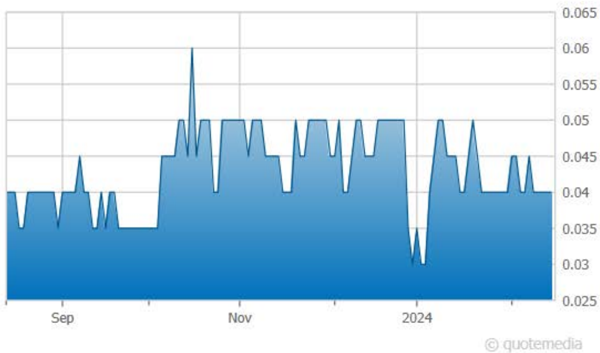
$0.04 0.00 (0.00%)

Bid: 0.04 x 12000 Ask: 0.045 x 61000

February 14, 2024 2:26 PM ET Volume: 0

CAD | CANADIAN SECURITIES EXCHANGE | DELAYED PRICE

Detailed Quote



Last	0.04	Prev. Close	0.04
Bid	0.04	Ask	0.045
Bid Size	12000	Ask Size	61000
Beta	-2.00791	VWAP	0.04
Year High	0.20	Year Low	0.03
Market Cap	1.59m	Total Shares	39.84m
PB Ratio	55.46	Shares Out	39.84m
		Exchange	CSE

Investment Case

Nevada Organic Phosphate is Rapidly Moving Ahead to Become One of the Only Certified Pure Phosphate Rock Producers in the World as Accessible Global Supply Dwindles and Climate Change Concerns Super-Charge Demand

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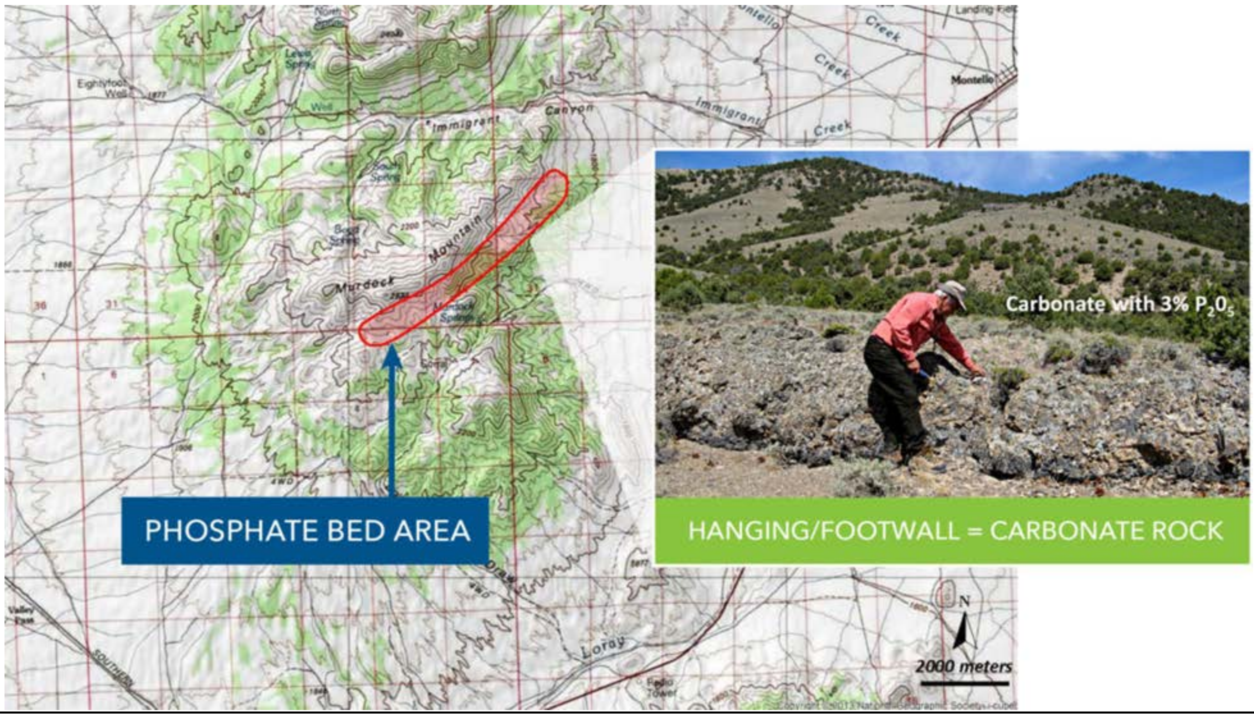
- The Company hosts one of the world's **rare clean & high purity phosphate rock+ deposits** at Murdock Mountain, part of the Leach Mountain Range in northeastern Nevada, in one of the most mining friendly & politically stable jurisdictions anywhere.
- Less that 5 % of known global phosphate rock deposits have no trace amounts of toxic contaminants (heavy metals, uranium, etc.) and by-products (Figure 1) and as such, **needs no acid-chemical treatments during production** (Appendix A). This flat-lying deposit is easily accessible and has substantial transportation and handling infrastructure already in place (Figure 2).

Figure 1. Contaminant Analysis- Murdock Mountain Phosphate

Element (ppm)	Max Value (ppm)	Lower Limit	Mean (n=27) (ppm)
Arsenic (As)	30	<10	<10
Cadmium (Cd)	<5	<5	<5
Cobalt (Co)	<5	<5	<5
Mercury (Hg)	5	<5	<5
Molybdenum (Mo)	<5	<5	<5
Nickel (Ni)	55	<5	14.7
Lead (Pb)	20	<10	<10
Zinc (Zn)	170	<10	64.6
Chromium (Cr)	356	ND	125.6
Vanadium, (V)	85	<5	24.3
Selenium (Se)	0.30%	<0.05	<0.05
Mercury (Hg)	5	<5	<5
Copper (Cu)	<5	<5	<5
Uranium (U)	0.005%	-*	-*
Thorium (Th)	0.010%	-*	-*

Table: Johansing (43-101) states *"Inspection of Table 7 (2012 data) and Table 5 (June, 2018 samples) reveals that minor and trace elements values for the limited Murdock Mountain samples are an order-of-magnitude lower than thresholds established by the AAPFCO."*
**Not specified by OMRI for certification and well below detection limits.*
ND – not detected

Figure 2. Murdock Mtn. Phosphate Bed Area



- With an expanded Bureau of Land Management (BLM) application (four accepted applications in Nevada at Murdock Mountain) totaling over 7,800 acres (3,245 hectares) or 12.25 square miles (31.7 square km), the Company is poised to apply for an **Application to Prospect** on the property that may yield significant P2O5 values with easy access (the site is a nearly flat sedimentary rock phosphate exploration target) and with a low-cost, non-evasive mining process opportunity available. **The intent is to confirm and extend the current resource potential.**
- It is believed that **this deposit could be mined at very low cost with a direct shipping "rock to soil" product with "slow release" attributes**. In other words, the Company can (on a full contractual basis, with no direct corporate CAPEX) quarry mine it, grind it, bag it and ship by rail to the booming California organic market. All infrastructure, including rail & roads are in place just 6 km away from the project site, close by the town of Montello, NV.

- **The project has extremely low (estimated) drilling and prove-up costs to determine the full extend of the deposit and mine life.** The Murdock Mountain deposit is part of the huge "Western Phosphate Field" encompassing parts of six western states in the United States. It specifically lies in a very rare ore type hosted by oolitic limestone near surface and will likely be easy to extract with company estimated exploration and mine plan costs of only US$ 400-500K in total. The Company plans to execute a simple and efficient shallow underground mining operation, with no strip mining, blasting, or backhoeing.
- Nevada Organic Phosphate **intends to become a significant and certified (pending) producer of raw organic fertilizer** by using a "direct-ship, pit-run system" to deliver phosphate fertilizer to the growing $US120 billion "organic food" market in North America*. American farming environmental practices are rapidly moving towards direct application of "organic slow-release" rather than "soluble chemical" phosphate. Raw apatite is rarely reactive, but dissolves slowly over time to release phosphate, thus not polluting groundwater or adjacent waterways Therefore, **the Company does not have to compete with the conventional chemical agricultural input industry and the granular end- product will be suitable for direct application in organic farming.**
- Certified, pure slow-release organic phosphate rock currently sells for $US 500-550/ton at the commercial level (bulk- delivered California). Prices moved up again in the 2H:2023, while the market **demand for organic phosphate is expected to grow by + 8-9 % year for the next several years.** It should also be noted that **pricing for 7% organic granular rock phosphate at the retail level is currently at C$69/20kg bag, or at a C$3450/tonne equivalent!** (www.optimizeorganics.ca).
- **The global supply of critical organic phosphate rock that cash crop farmers value and are demanding in larger volumes is shrinking as older, domestic mines are close to being exhausted or have significant contaminant issues**. As well, geopolitical instability in countries that previously where largely a secure source of phosphate rock (i.e., China, Western Sahara & Syria) are quickly becoming variable, unstable, and non-secure, with export volumes dropping and import restrictions emanating from these regions. To add to this, the largest source of P2O5 organic rock is found in Morocco and

Chinese EV battery manufacturers are tying up supply for their operations by buying into various mines and processers.

- While traditional organic & chemical-based fertilizer demand is putting pressure on already dwindling phosphate rock stocks worldwide, **added demand is ballooning in the form of Lithium Iron Phosphate batteries (LiFePO4 battery) or more commonly known as LFP (lithium ferro-phosphate) batteries for EV, electrical storage and other numerous industrial end-uses.** Current global capacity for purified phosphoric acid may need to double (but more likely triple or quadruple) by 2045 according to CRU (see Figure 11) to satisfy expected demand.
- **The management team is experienced, focused, and will be shovel-ready enabled when all the resource confirmation pieces are in place.** Possessing a vast knowledge and operational expertise base in geology, mineral exploration, fertilizer distribution and finance, **the Company is ready to move forward with the next phases of the Murdock Mountain project as soon as the updated 43-101 is completed sometime later this year.**
- **Relative to its peer group, Nevada Organic Phosphate is significantly undervalued on a market capitalization per share basis**. With numerous upcoming significant & compelling corporate and industry sector milestones ahead of it, as well as having an experienced and industry savvy management team and Board of Directors, we recommend to investors that are intent on early-stage exploration plays in the critical mineral/fertilizer space to **buy the common stock at this "deep-value" price, as it represents a relatively low-risk entry point into the rapidly expanding organic & specialty phosphate sector.**
- **The early-stage status of Nevada Organic Phosphate's clean phosphate rock project means that a potential valuation surge is not priced in yet**. A valuation premium for a rapid path to an uncomplicated, low disturbance, and low-cost processing start-up, along with strong demand & pricing could be substantial once an updated Company resource estimate is provided and validated. **Interim valuation estimates are to be provided once drill results and a formal resource estimate update are made public by the Company.**

RISKS

➢ The value of the Company will ultimately be dependent on phosphate rock prices, its ability to achieve production and length of the property's mineral reserve life

➢ Exploration and development costs and uncertainties

➢ Permitting timelines & hurdles

➢ Access to capital and potential for share dilution

Upcoming Milestones- **Rapidly moving ahead with exploration drilling to confirm and extend the historic resource.**

- After the Company **added significantly to the project's Application to Prospect land area size** (see company's press release dates January 4th, 2024 here: Nevada Organic Phosphate Adds Significantly to Murdock Property Size – NEVADA ORGANIC PHOSPHATE (nevadaphosphate.com), it is waiting for the **Phosphate Prospecting Permit** acceptance from the BLM of Nevada, so the Company can carry out exploration drilling on the site.
- **The BLM will soon complete its Environmental Assessment** (which includes a biological and cultural study) of the entire site likely by the end of March/April of this year. The Murdock Property Applications are subject to on-going environmental impact assessments (EIAs) conducted by the BLM, and potential mitigation strategies as guided by the National Environmental Policy Act (NEPA).
- **When the above permits and plans are approved, the company will be able to start drilling this year, possibly by late spring/early summer.** This will allow the project team to do some extension drilling. The company's geologists believe that the phosphate deposits trend semi-horizontally underneath the overburden to the northeast of the property, so targeted drilling will be the key to optimizing the evaluation of the phosphate beds.
- Now that the project area has been increased in size, **the next phase of the exploration program will also include the Leach Mountain area where a**

significant amount of additional high quality phosphate rock deposit may be found and added to the historical resource.

- **The project site is composed of sedimentary rock that also has substantial calcium carbonate deposits also yielding 3-5% P2O5 that could significantly increase the historical resource estimate to yield an average blended grade of 8% P2O5,** which is the average grade used in most organic farms.
- **Mining operations could be underway as soon as the end of 2024**, if all site studies, resource estimates, mine plan and permits are approved by the state and local regulators. Funding for all of the above activities will be undertaken soon as the studies are approved by the BLM.
- **There is a good chance that phosphate will be elevated to the "Critical Minerals List" in USA, as it already is in the European Union and Canada (Quebec)**. There is a bill before Congress that could be passed before year-end that would establish the first step in tapping the country's capacity for domestic production to reduce costs for farmers and bolster demand of local fertilizer products, as well as provide secure source of supply of PPA for LFP batteries. **Such a move will open up funding sources from federal & state agencies and renew investor interest in phosphate mining projects that are sustainable and have minimal impacts on the environment.**

The Resource- The Murdock Mtn. project site could contain significantly more P2O5 than first surveyed.

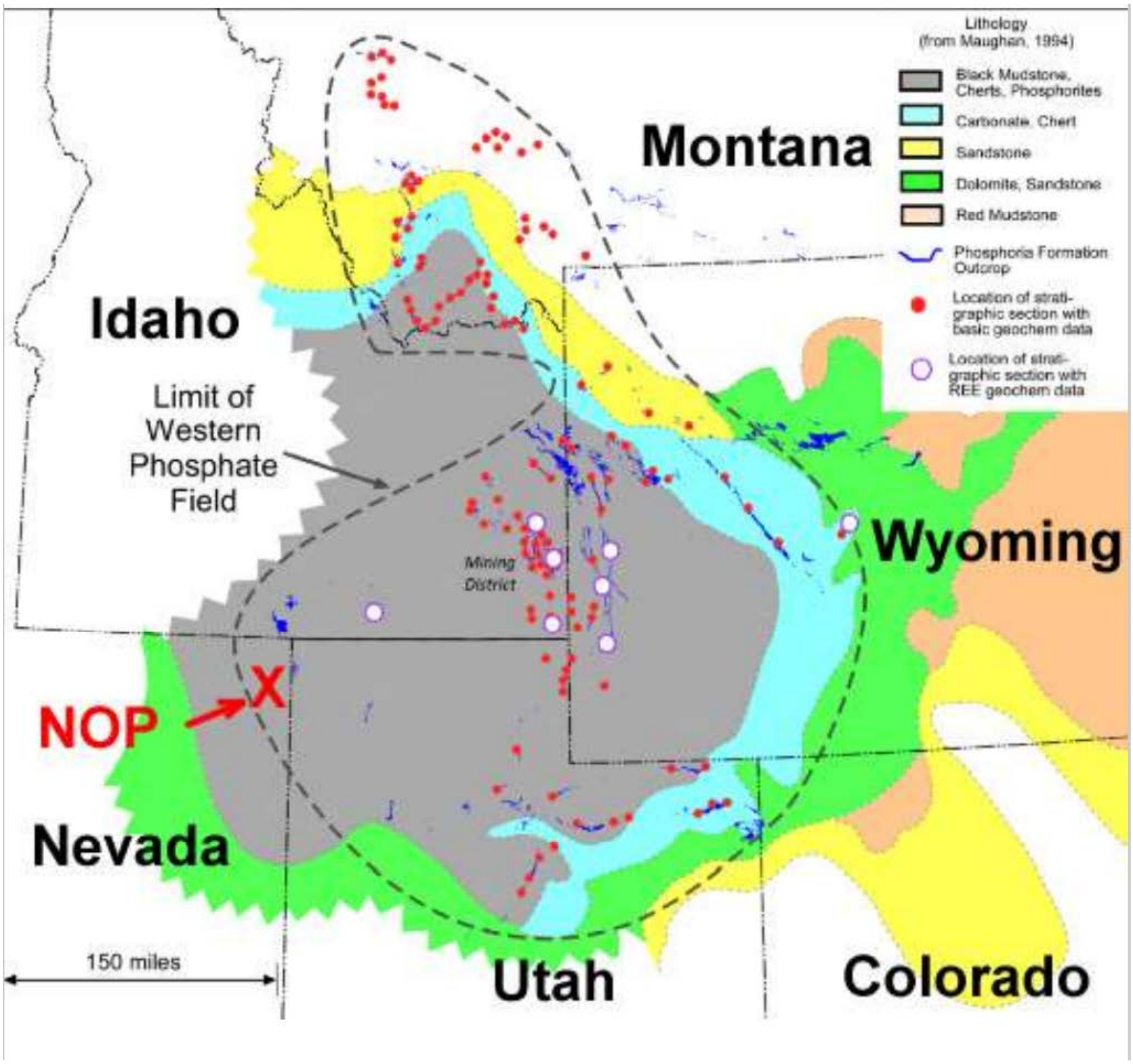
Located in the southwest corner of the Great Western Phosphate Field (Figures 3-6), Nevada Organic Phosphate's **exploration license extends over 12 square miles** at Murdock Mountain in the northeastern tip of Nevada.

Figure 3. Project Location- Nevada, USA


MURDOCK MOUNTAIN
WINNEMUCCA
BATTLE MOUNTAIN
ELKO
CARLIN
LOVELOCK
NEVADA
RENO
FALLON
CARSON CITY
McGILL
ELY
YERINGTON
GABBS
HAWTHORNE
TONOPAH
CALIENTE
OVERTON
LAS VEGAS
BOULDER CITY


Montello
ELEV 4880

Figure 4. Great Western Phosphate Field (US Geological Survey 1995)



The Murdock Property is a nearly flat-lying sedimentary rock phosphate exploration project. The initial 1,813-acre application target is believed to host a potential 10 to 46 million tonnes (non-43-101 compliant) ranging in grade from 3-15% P2O5 based on an average thickness of 3.5 metres and a specific gravity of 2.6. **These ranges are based on previous workers' and researchers' estimates and have not yet been verified by the Company according to current 43-101 standards of disclosure.**

The apatite minerals of igneous and metamorphic origin are generally regarded as less reactive because of their crystalline form. However**, the apatite minerals of this sedimentary rock deposit possess an optimal micro-crystalline structure that is of major commercial importance for an organic certified direct application soil fertilizer.**

The project site is composed of sedimentary rock that also has substantial calcium carbonate deposits in the limestone layer above the main phosphate target zone yielding 3-5% P2O5. This could significantly increase the historical resource estimate to yield an average blended grade of 8% P2O5, which is the average grade already used by most organic farmers. **The addition of calcium carbonate to the Company's bagged final product would be an added bonus as it provides the soil with natural lime buffer to counteract excessive acidity issues**(Calcium carbonate - Wikipedia; Agricultural lime - Wikipedia).

Based on this geological model and historic ranges, **the Company's three new secured applications, totaling 6,011 acres, may provide an additional 215-220 million tonnes of P2O5 exploration target potential to the Murdock Property.**

However, investors should take note that the potential quantity and grade is conceptual in nature and there has been insufficient exploration to define a mineral resource, therefore it is uncertain if further exploration will result in the target being delineated as a mineral resource or expand the historical one.

Please refer to the historic 43-101-report completed in July, 2018 and revised on October 1st, 2022, here: NOP_Murdock-Mtn-Prosphate-Project-Technical-Report-Oct2022.pdf)

KEY ADVANTAGES- Organic, close-to-surface, and easy to mine.

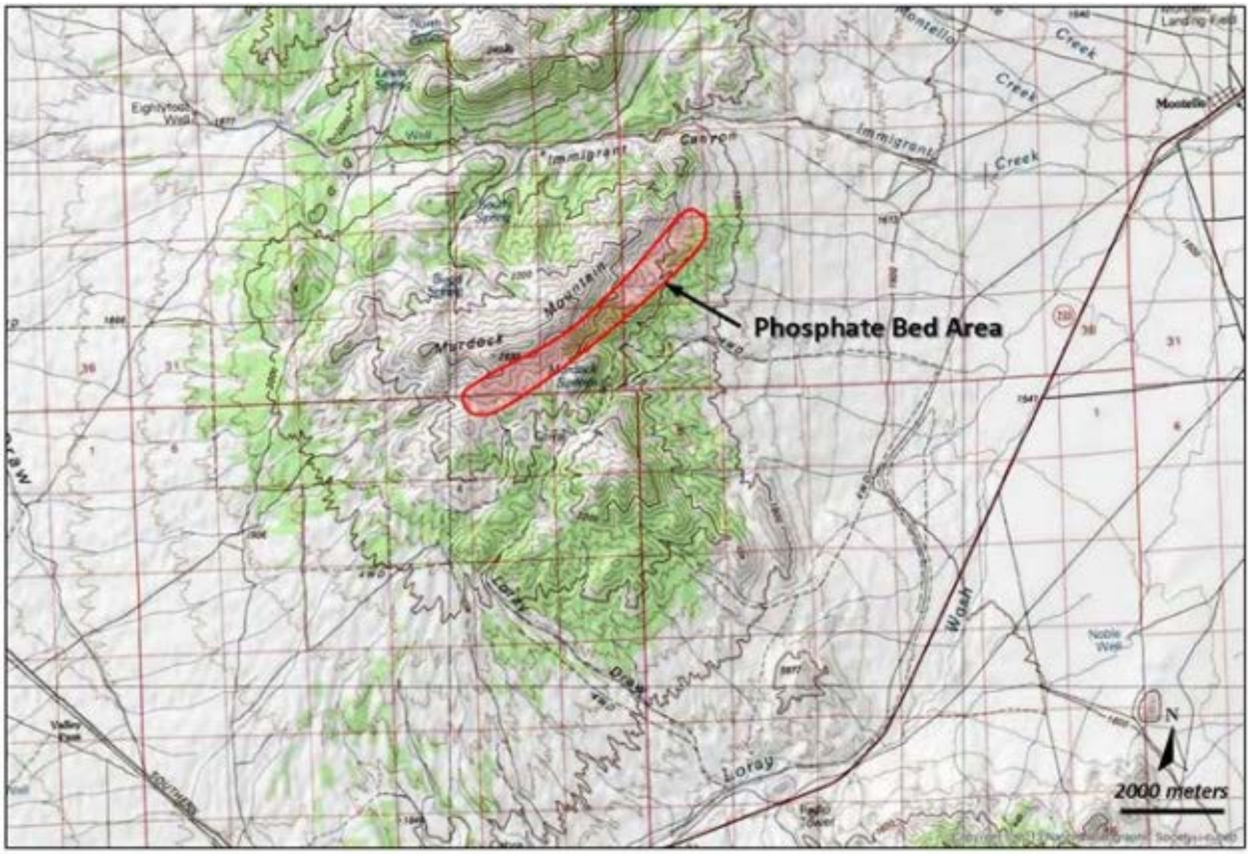
The key aspect of the Murdock deposit is that it demonstrates **an almost total lack of contaminants** (i.e., cadmium and uranium, etc.) and this is a critical advantage as the world searches for non-polluting and non-toxic sources of fertilizers. Typical phosphate fertilizers used in broad field crop applications are chemical acid-based ones in the form of MAP (mono-ammonium phosphate) and/or DAP (di-ammonium phosphate) (blog-crop-news.extension.umn.edu-Confused about differences in phosphorus fertilizer sources Here are the facts.pdf). These are usually over-applied on large farming operations, and uptake by plants and crops in the soil is partial, with large amounts being washed away by rains and minor flooding as run-off. Environmental degradation of the surrounding ecosystems is usually the end-result, with far-reaching consequences for biodiversity harm and loss.

As well, **to remove most heavy metals and toxins form phosphate rock that is not organic like Murdock Mountain's, requires significant amounts of energy, water and chemicals, thus raising the costs and environmental risks substantially** (https://www.youtube.com/watch?v=xYcv0kQ9YRI&t=1s).

The other advantage of the Murdock deposit is that first surveys revealed that **the sedimentary rock deposits are nearly flat-lying, close to the surface and have limited overburden, which makes it ideal for low-cost and low-impact mining.** However, these observations are historical and do not comply with current regulator disclosure requirements and this is why the company is going ahead with its drill plan application with the BLM, likely by the late spring.

The third key advantage for the project is that **the deposit lies close to major transportation routes (Interstate Hwy 223 and Southern Pacific rail line) with direct routes to California.**

Figure 5. Location Map Showing Murdock Mountain and the target phosphate zone along with the town of Montello, access roads & Southern Pacific rail line.



Organic Rock Phosphate Granules, Crushed and Dust

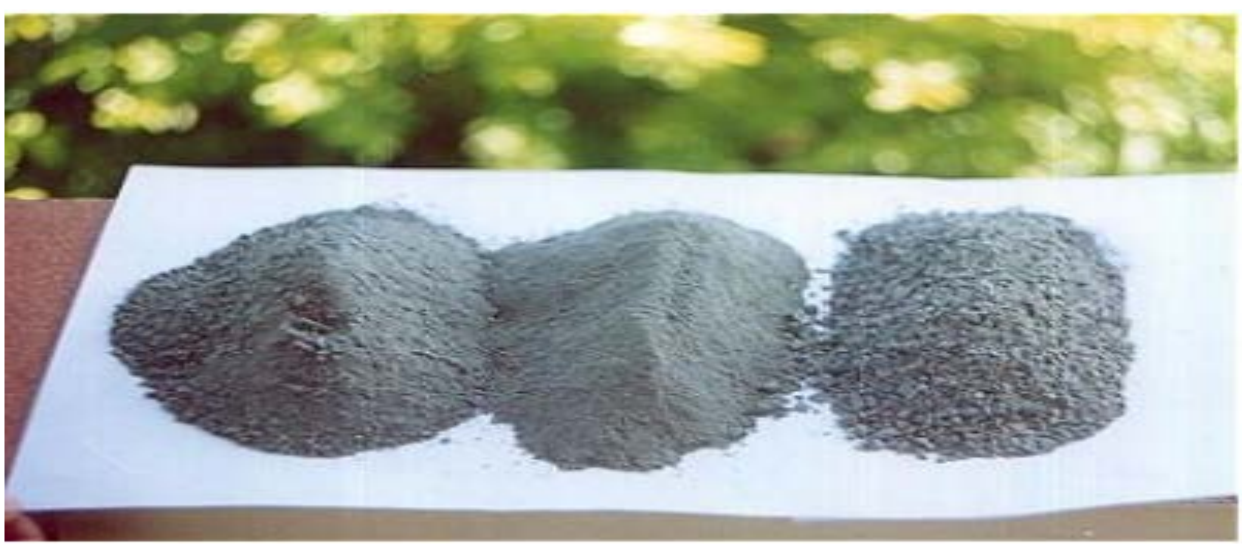
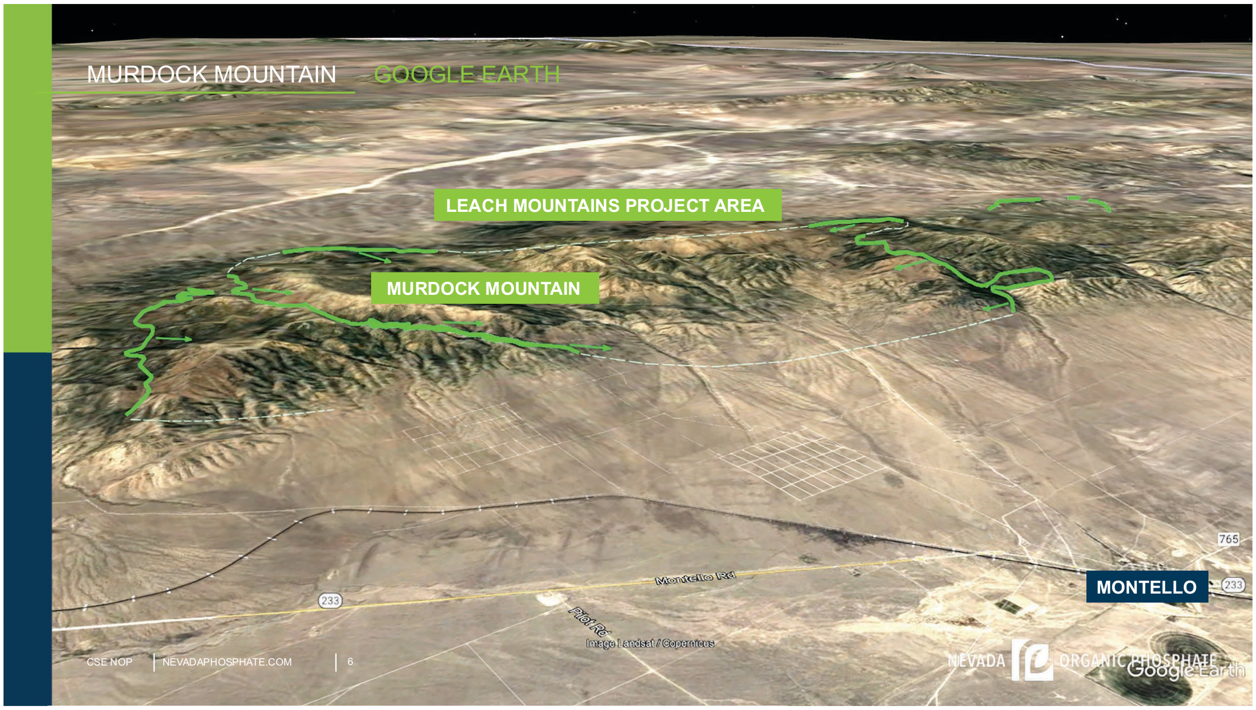


Figure 6. Google Earth Satellite Image of the Project Site (2023)



PHOSPHATE- Why it is a "Critical Mineral" for Agriculture and for the "Carbon Neutral" Future

Phosphorus is the basis for all life on earth (Figure 7). It is the sixth most abundant element in living organisms, is one of 19 essential plant nutrients, is a necessary constituent of DNA and our genetic code and provides the energy for all metabolic processes.

In addition to being a core ingredient in much of the world's fertilizer, the mineral is also used as a food preservative, to supplement animal feed and in new emerging specialty technology products such as **lithium iron phosphate batteries**.

Figure 7. Without Phosphate Plant Growth is Not Possible

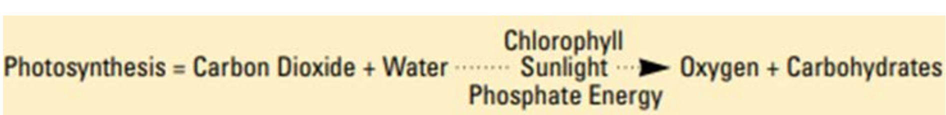
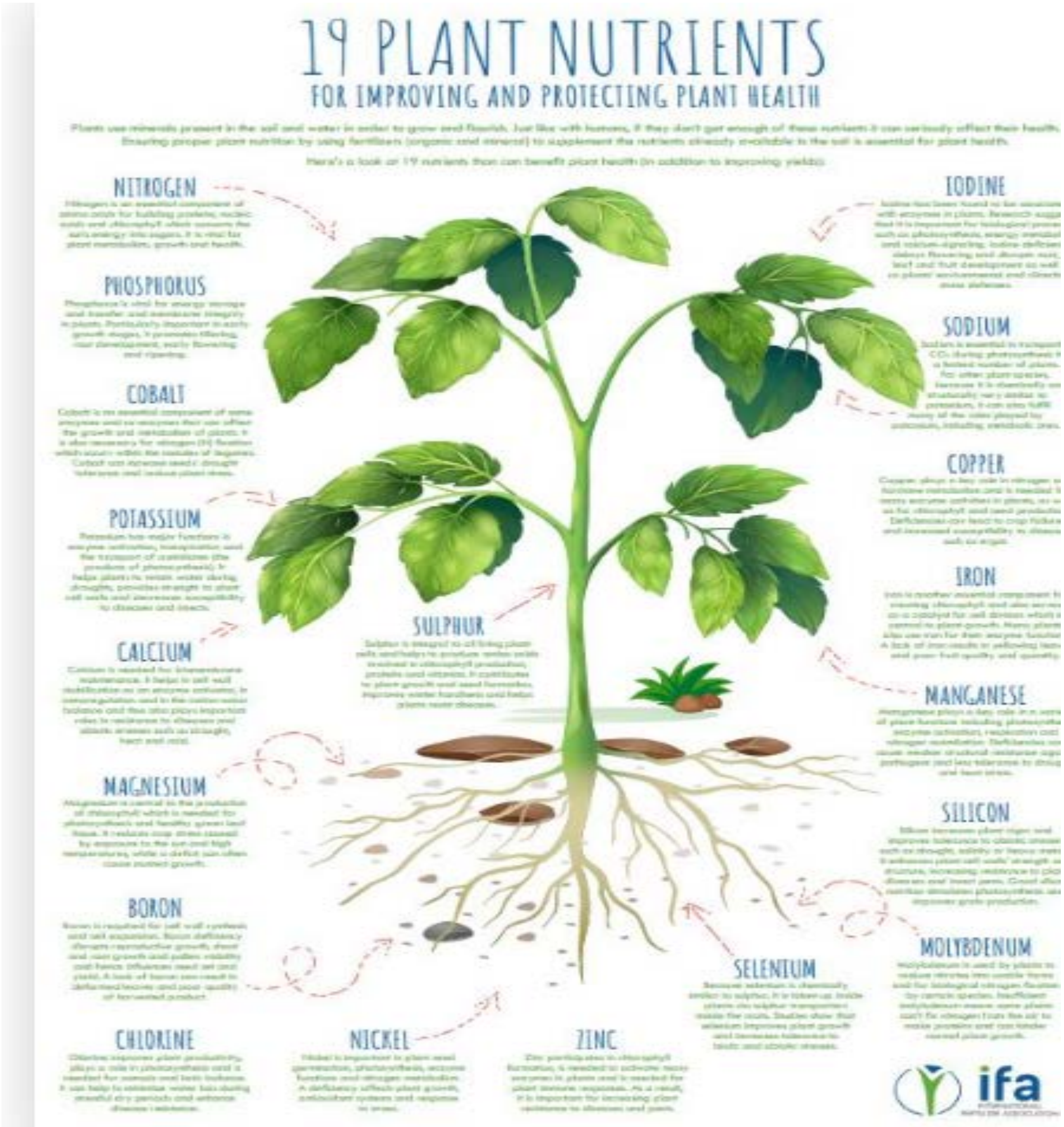


Figure 8. Phosphorus as an Essential Plant Nutrient



As a Fertilizer: Phosphorus is essential to global food security. The production of food, feed, fiber, and energy supporting population growth would not be possible without it. Yet according to the International Fertilizer Association (IFA), almost 75% of the world's soils are phosphorus deficient (www.ifa.com).

Rock phosphate establishes a long-term supply of phosphorus in the soil by releasing its total phosphorus slowly over the course of a few years. It can also be a significant source of calcium. As one of the soil's and plant's most important nutrients (Figure 8), it provides the following:

- Supports healthy development of plant fruits & flowers
- Is essential for biologically active soil and healthy plant development
- Helps prevent calcium deficiency in soil
- Supports beneficial soil microbes
- Aids in water uptake and provides drought resistance

The raw material for making P fertilizer, rock phosphate, is a non-renewable resource making it not only a valuable mineral for traditional agriculture (for plant & soil health -including drought resistance) but is vital for the expansion of various forms of emerging regenerative agriculture, protected-grow agriculture, and vertical farming (BC-2019-1.pdf (ipni.net).

Rapidly growing population stresses, diet upgrades and general food insecurity in developing regions have demanded more advanced agricultural outputs, which in turn has put tremendous pressure on global farmers to push for higher yields with more intensive fertilizer use. **Since most crops take up only about 5-10% of applied chemical-based P applications, phosphorus loss from agriculture can cause many problems with water quality resulting in eutrophication and other detrimental environmental degradation and biodiversity loss causations.**

By-products from the chemical creation of MAP & DAP, such as **phosphogypsum (PG),** which is a reaction by-product from the making of phosphoric acid by treating phosphate ore (apatite) with sulfuric acid, is particularly nefarious as it can be radioactive and highly toxic. Annual world production of PG has been estimated at 300 million (M) tons, but only a small percentage (4-5%) finds use by either agriculture or industry. The remainder is either disposed of in the ocean or stockpiled near production facilities. Leakage or a break in any of these containment facilities could be disastrous for people and the environment surrounding them International Plant Nutrition Institute (IPNI) (Figure 9).

Figure 9. Large Phosphogypsum Storage Site in Florida (source: IPNI-2019)

While the world is in no danger of running out of ordinary rock phosphate in the foreseeable future, it is experiencing a decline in the contaminate-free and geopolitically secure supply that cash crop and regenerative farmers are demanding more of. Cost pressures of producing chemical-based fertilizers, as well as supply chain issues are having an inflationary affect on food prices and dietary habits that can result in general human health declines, especially in disadvantaged regions of the world.

Organic P can be applied cheaply & directly to the soil in regulated (even manually, by hand) amounts, provides both health and growth benefits to the soil and to the plant for many years after one application, is non-toxic to the environment, nor does it release excessive amounts of CO2 into the atmosphere compared to chemical-based fertilizers (in their original manufacturing methodology and eventual breakdown and release in the soil). Run-off is almost non-existent as the soil absorbs rock phosphate gradually and the applied fine granules (without using water or a mixed solution) are rooted into the soil quickly.

As a Critical Mineral: Phosphates are increasingly in demand, not just for fertilizers, but also for the fight against climate change as the world moves to greener sources of electrification for energy use & storage, transportation, etc.

and away from fossil fuels. Specialty phosphates for **Purified Phosphoric Acid (PPA)** production**,** are rapidly gaining in demand for **LFP (lithium ferro-phosphate) batteries** (Figure 10) which are used for electric- powered vehicles (EVs) and other numerous industrial end-uses.

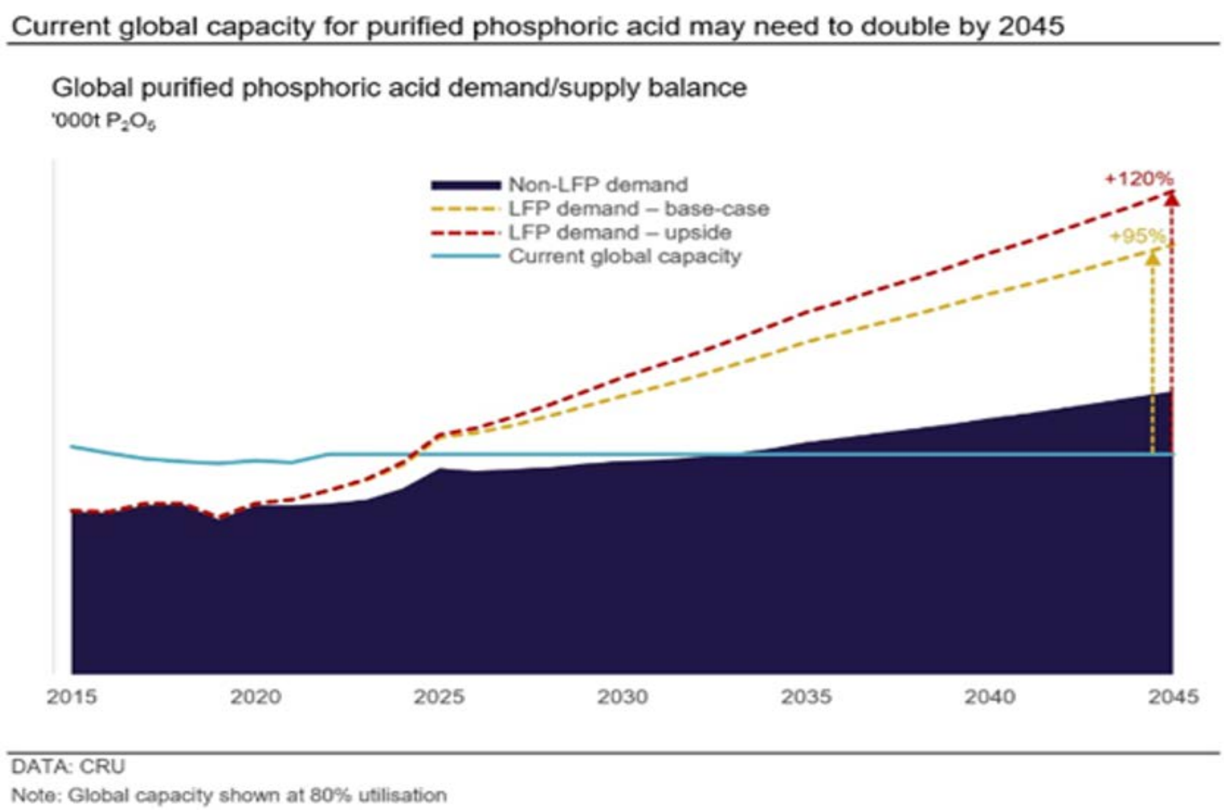
Lithium iron phosphate (LFP) batteries are **a type of lithium-ion battery that uses lithium iron phosphate (LiFePO4) as the cathode material and a graphitic carbon electrode with a metallic backing as the anode**. They are becoming increasingly popular in vehicle use, utility-scale stationary applications, and backup power due to their lower cost, high safety, low toxicity, long cycle life, and improved discharge and charge efficiency compared to lead-acid batteries and other lithium batteries. **LFP batteries are already powering the majority of electric vehicles in the Chinese market, and major automotive producers like Tesla and Ford are introducing LFP-powered vehicles into their catalog of EVs**. LFP batteries are not the cheapest in the market, but due to a long-life span and zero maintenance, they are likely cost-effective over time. They are also prevalent in the field of solar energy and are being used in off-grid solar systems (Benchmark Minerals).

Figure 10. Lithium Ferro Phosphate Batteries (Source: CRU Group)

A conservative estimate by the CRU Group provided recently (Purified phosphoric acid industry may need to double | CRU (crugroup.com)) indicates that **the world will need anywhere from 2-3X (but likely more) the current amount of PPA produced for projected LFP battery requirements alone (Figure 11).**

Almost all the supply of LFP batteries and the phosphate for use in these batteries comes out of China at present. China's raw phosphate reserves are finite and could become seriously constrained by 2028 or earlier because of increased fertilizer production and LFP battery usage, according to CRU. Chinese phosphate export restrictions came into play in the summer of 2022 and have had a lasting upward impact on pricing.

Figure 11: CRU Projected PPA Demand for LFP and Non-LFP Uses (2015-2045)



Phosphate is so important for fertilizers, EV batteries and other uses that US lawmakers are pushing to have P included (as well as potassium K, in the form of potash) on the US government's Critical Minerals List of the Department of the Interior. A bill was introduced last June by several Congress members and the background is presented here: Text - H.R.4059 - 118th Congress (2023-2024): To include phosphate and potash on the final list of critical minerals of the Department of the Interior. | Congress.gov | Library of Congress. We expect the full bill to be passed this year before the US elections in November.

The key to all of this is that with geopolitical uncertainties (as a result of the Russian/Ukrainian conflict and persistent moves by China to control & corner certain critical mineral sources, specially in Morocco) hovering over the global supply of critical minerals and their role in advanced defense and electronics technology advancements, it is vital that the US make this move and develop secure sources of their own, as has both the European Union and Canada. **Not only will this improve the ability of new domestic critical minerals mining and converting projects to get off the ground, but domestic and sustainable sources of critical minerals supply in North America and in the EU will be able to demand higher prices abroad (if also produced sustainability), provide quicker delivery times and more secure & stable supply chains at home.**

As an Agricultural Disruptor: As climate change and its detrimental global impacts become more and more apparent with each issued UN COP report and new temperature records are broken, **the momentum towards climate-smart regenerative agriculture practices (www.regenorganic.org) is gaining ground with a renewed sense of urgency**. Historically confined to smaller "hobby"farms, climate change impacts are forcing larger scale farming operations to re-think their soil management and synthetic fertilizer uses(Regenerative Ag Outlook-2023.pdf).

Since agriculture currently accounts for about a quarter of the world's greenhouse gas emissions, its is now critical that farmers and consumers alike embrace lower-impact and organic types of food production because the current food production system in most developed regions of the world is not economically or environmentally sustainable (FSEC-Food System Economics Commission-Global_Policy_Report-2024.pdf.

American farming environmental practices are rapidly moving to a direct application of "slow release" rather than "soluble chemical" phosphate. The phosphate rock that Nevada Organic Phosphate intends to produce does not have to compete with the conventional chemical agricultural input industry and will likely save the farmer repetitive application time and money.

The market for truly certified organic produce- both for field crops and cash crops- is growing exponentially, even with current food price inflation. The Economic Research Office of the US Department of Agriculture estimates that **the market for organic foods in the US alone is US$120 billion (2020 data, pre-Covid) and is estimating it to grow at a rate of 8-9% per year from 2021-2027.**

To give the reader an idea how quickly this market is growing and evolving, legislation was recently billed in Congress this past fall (The Continuous Improvement and Accountability in Organic Standards Act-CIAO) that would amend the Organic Foods Production Act of 1990 to provide a streamlined and predictable process to review and revise organic standards implemented by the US Department of Agriculture. **Nevada Organic Phosphate is working to achieve the "Organic Certification Seal" of the Organic Materials Review Institute (OMRI), one of the most trusted organic labels in the world (Figure 12).**

It is the author's view that climate change amelioration practices will mean farming in North America will experience a sea-change shift, in terms of fertilizer use towards more organic sources just like the toxin-free phosphate that will eventually be supplied by the Company.

The growing demand for pure rock phosphate will continue to surge while supplies are dwindling, thus impacting prices as climate change and biodiversity protection supercharges the supply/demand balance dynamics for organic solutions (A-Rock-Dust-Primer1.pdf (nevadaphosphate.com)) and specialty phosphates.

Figure 12. Organic Certification Seal-OMRI (www.omri.org)

SUPPLY/DEMAND DYNAMICS- A Pinch Point is Developing and Will Super-Charge Prices Over the Medium to Longer Term

Very seldom do fertilizer markets experience a supply squeeze and a demand push simultaneously. This is what is developing in the phosphate sector with current phosphate rock mine capacity in decline and demand pressure coming from an organic/regenerative agriculture resurgence and a super-charged EV and battery technology push on critical minerals, including specialty phosphates.

https://www.crugroup.com/knowledge-and-insights/insights/2021/lithium-iron-phosphate-batteries-breathe-new-life-into-specialty-phosphates-market/

Not only is demand for phosphates coming from several new areas like EV and storage batteries (https://investingnews.com/battery-raw-materials-supply-cliff/), but supply of suitable, toxic free phosphate rock is diminishing and secure sources of production are declining as domestic sources will soon fade out. Even China's output is falling, and export restrictions are making a tough situation even worse for western nation's requirements, according to CRI Group and Benchmark Minerals.

Reduction in P applications is not an option for farmers if regular P2O5 in the form of MAP and DAP continues to be used, since most crops only intake 5-10 % of these mixtures and the rest runs-off or evaporates. Recycling programs will not be enough to balance the scale to keep pricing low, since PPA demand is already tight in North America and will worsen over the next decade.

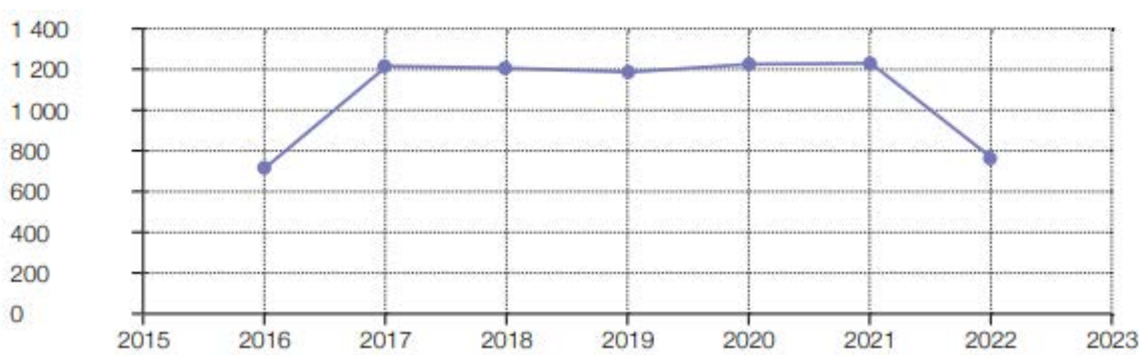
Organic phosphate rock can be applied in much smaller quantities, directly to the soil. Since uptake is gradual, but continual for several years farmers can reduce their overall fertilizer costs and provide environmental benefits for the soil and local ecosystems by protecting biodiversity and watersheds.

As far as global supplies are concerned, easy extractable deposits of phosphate rock, with a high content of P2O5, are often used first, while using low P2O5 content deposits result in more impurities and higher production costs. Some studies claim that global concentrations have been, and are currently, declining steadily. Such a trend implies that the "easy deposits" have already been exhausted and that future production would be forced to develop lower quality deposits with more associated costs and challenges. This has been described as a vital mechanism behind the generation of "production peaks" and the resultant pricing surges (Figures 13-15) afterwards (Phosphate: All hopes rest on Morocco with 75% of remaining reserves | Peak Everything, Overshoot, & Collapse (energyskeptic.com).

Figure 13. World and regional phosphorus supply, demand, and balance 2016-2022 (thousand tonnes P2 O5) FAO

	2016	2017	2018	2019	2020	2021	2022
WORLD							
Posphoric acid - capacity	57 295	60 224	61 464	62 357	62 612	63 552	63 702
Phosphoric acid - supply capability	46 308	47 564	48 620	49 510	50 520	51 520	52 066
Posphoric acid - other uses	6 444	6 677	7 036	7 170	7 291	7 482	7 734
Phos. acid - available for fertilizer	39 864	40 887	41 584	42 340	43 229	44 038	44 332
Phosphorus - fertilizer demand	44 481	45 152	45 902	46 587	47 402	48 264	49 096
Phos. acid - fertilizer demand	39 136	39 664	40 368	41 149	41 999	42 799	43 562
Non-phos. acid - fertilizer demand	5 345	5 488	5 534	5 438	5 403	5 465	5 534
Phosphoric acid -potential balance	728	1 223	1 217	1 191	1 231	1 238	771

Figure 14. Potential world balance of phosphorus as P2O5: 2016-2022 (thousand tonnes)-FAO



Global supply of P2O5 seems to be in balance according to data complied by the Food & Drug Organization (FAO) of the United Nations (World fertilizer trends and outlook to 2022 (fao.org). However, these numbers do not fully portend the rapidly increasing use of phosphates for others uses other than for fertilizers, food preservatives and supplements for animal feed.

World phosphate fertilizer consumption fluctuated between 42 and 49 Mt P_2O_5 between 2010 and 2020 according to IFASTAT of the International Fertilizer Industry Association (Three things to know about world phosphate rock resources and reserves -

Fertilizer), which equates to a growth rate per year of 1.7% per year, just for fertilizer use. IFA has further projected that world phosphate fertilizer demand would increase to 63-72 Mt P_2O_5 by 2050, or an approx. growth rate of only 1.3%, depending on the agricultural and nutrient management scenarios used. Accounting for non-fertilizer uses and processing losses, the study projects annual phosphate rock production requirements of between 78 and 100 Mt P_2O_5 in 2050, or a growth rate averaging only 2.7% per year for 20 years. Total demand is assumed to plateau beyond 2050.

The surge in demand for purified phosphoric acid (PPA) in North America, Asia and in the EU for LFP EV and storage batteries (lithium iron phosphate) is likely going to cause the supply/demand balance (Figure 14) to drop towards zero by 2025-26 and may even be in a deficit position with the expected push coming from PPA over the next decade, according to Benchmark Minerals (https://investingnews.com/battery-raw-materials-supply-cliff/; https://www.benchmarkminerals.com/forecasts/phosphate).

We believe that many forecasters have not accounted for this immense swing in demand vs. supply in their projections and **demand growth will likely be in the 5-5.5% range per year from 2025-35, possibly higher (Source: Report Linker/Argus Media).**

Figure 15. Historic major revisions of global phosphate rock reserves, 2000-21

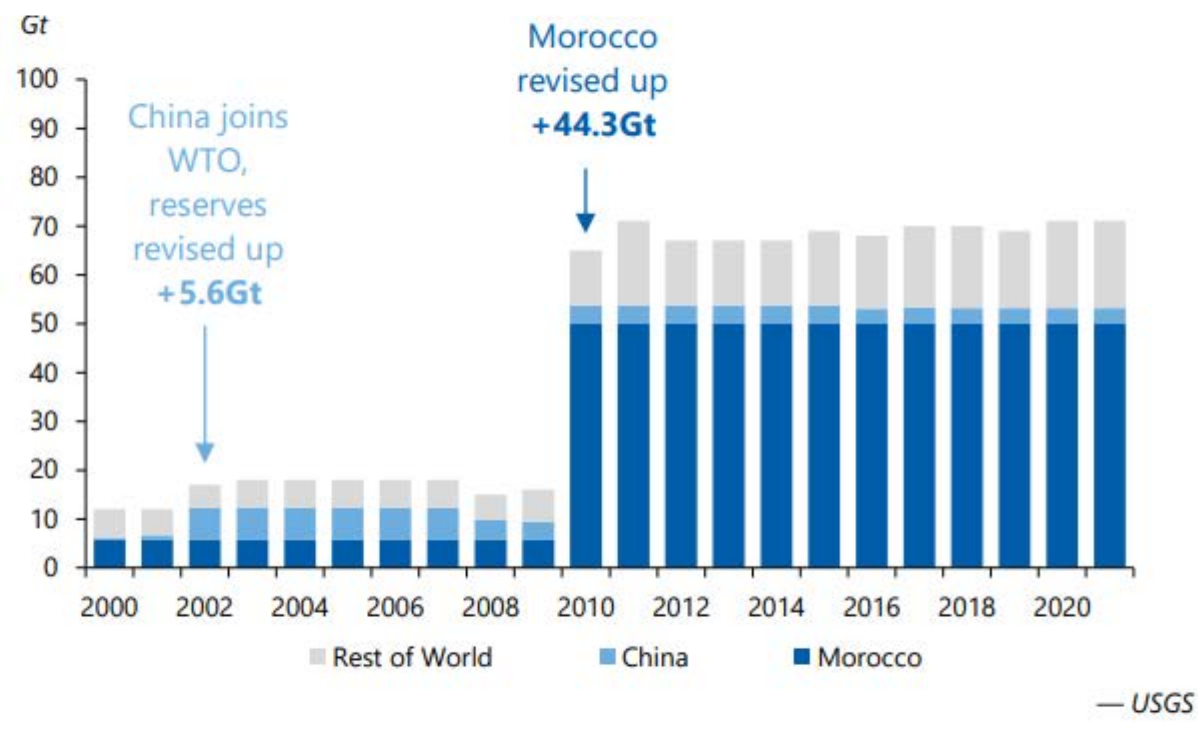
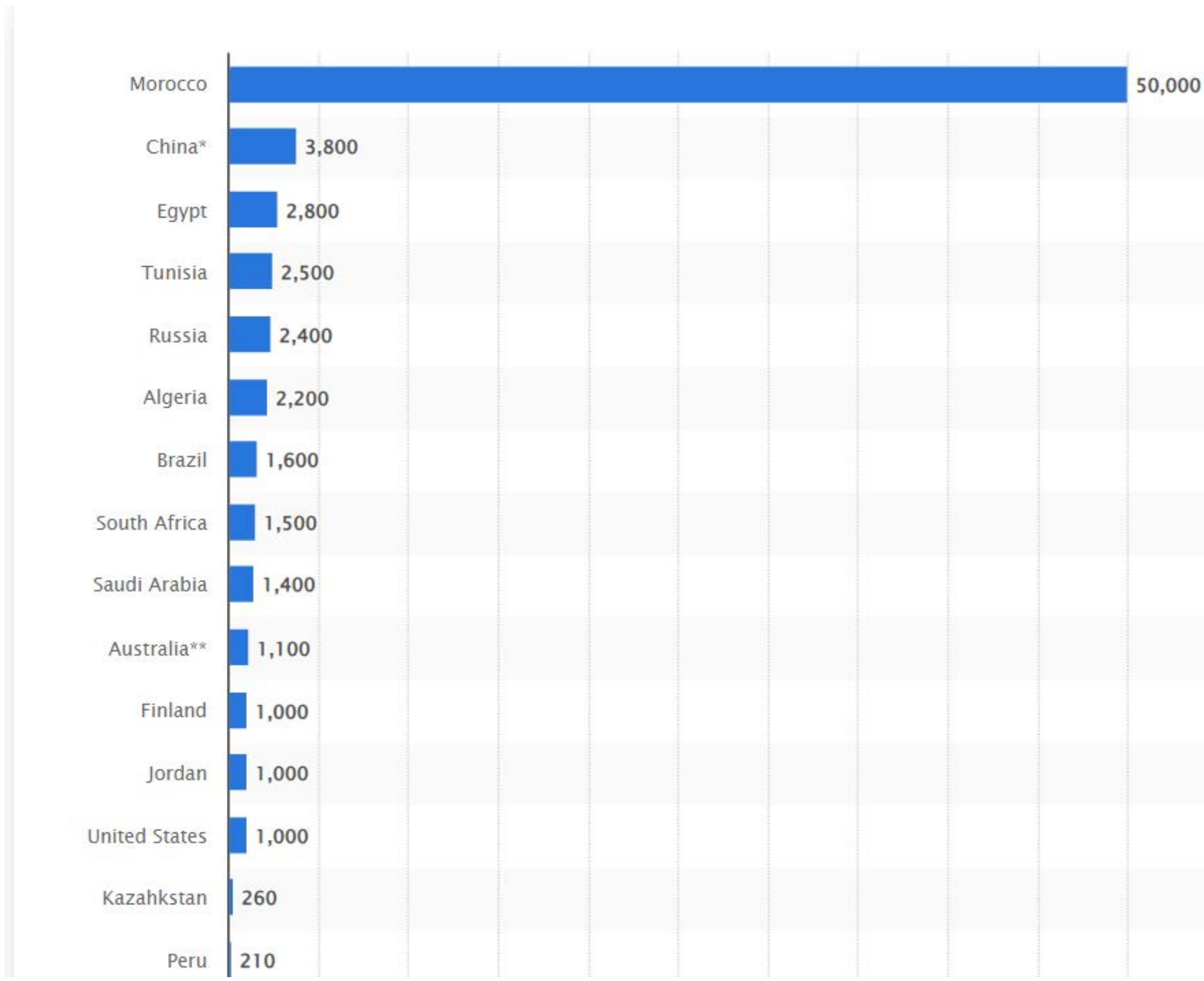


Figure 16. Reserves of phosphate rock worldwide in 2023, by country *(in million metric tons-Source: USGA*



There are three main forms of phosphate deposits: sedimentary marine phosphorite, igneous apatite and guano. Today, sedimentary deposits account for three-fourths of the world phosphate rock output, igneous deposits for one-fourth, while guano deposits are negligible. **While there may be plenty of phosphate rock deposits globally, finding them and economically mining them is another matter all together.**

2023_Argus_IFA_Phosphate_Rock_Resources_and_Reserves_Final.pdf (fertilizer.org).The grade and quality of a deposit is important to consider as well because it determines its suitability and costs of processing. Deposits tend to be classified on the basis of their potential: can they be mined with current technology, sustainability and at current prices?

From this perspective, there are almost no organic (high purity) rock phosphate discoveries on the global horizon like Nevada Organic Phosphate's. Purity, sustainability, low cost-base (exploration, development & mining/processing operations) and speed of development are all unique to the Murdock Mtn. project.

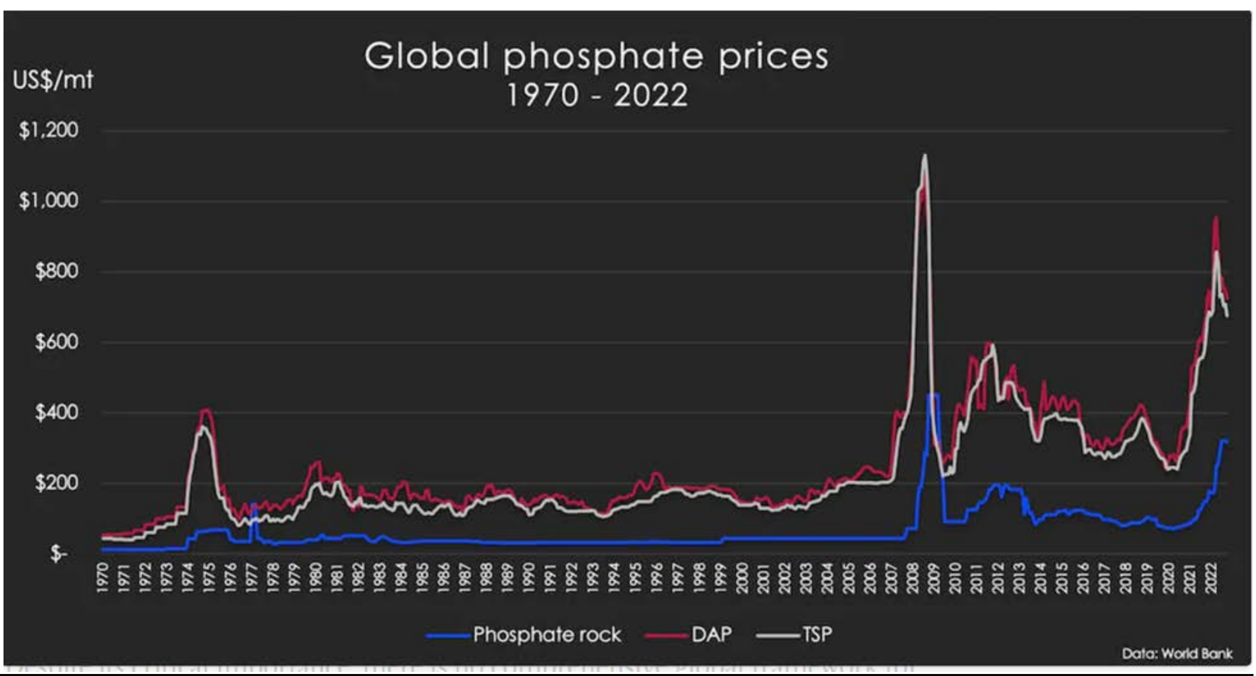
However, another key determinant of available accessible and sustainable supply – **geopolitical security**- is not always factored into pundit's forecasts because of the transitory and sometime nebulous nature of this data point, especially when viewed from past experience.

With China & Russia controlling a sizeable portion of the world's phosphate rock resources and Morocco in the midst of a reserve and processing facility purchase frenzy by the Chinese, it will not be difficult to gauge the significant risks to supply for Western nations.

The world has changed since COVID hit the world in 2020 and supply certainty for many commodities is now a thing of the past**. Prices are bound to continue their march upwards in the foreseeable future.**

Figure 13. Rock Phosphate Prices- Mine Gate (Morocco)

Figure 14. Global Phosphate Prices- Delivered US Gulf



Phosphate rock/**DAP**- diammonium phosphate/ **TSP**-triple super phosphate (all prices fob US Gulf)

Figure 15. - Recent Fertilizer Prices

World Bank Commodities Price Data (The Pink Sheet) — **January 3, 2024**

	Unit		Annual Averages			Quarterly Averages					Monthly Averages		
			Jan-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Oct-Dec 2022	Jan-Mar 2023	Apr-Jun 2023	Jul-Sep 2023	Oct-Dec 2023	October 2023	November 2023	December 2023
Fertilizers													
DAP	$/mt		601.0	772.2	550.0	671.9	616.5	533.9	505.1	544.7	534.8	535.6	563.8
Phosphate rock	$/mt	b/	123.2	266.2	321.7	305.8	322.5	344.8	345.4	282.5	347.5	…	152.5
Potassium chloride **	$/mt	b/	542.8	863.4	383.2	566.5	486.2	369.3	348.8	328.5	341.9	331.9	311.9
TSP	$/mt	b/	538.2	716.1	480.2	628.1	551.5	475.2	434.8	459.4	468.1	462.6	447.5
Urea, E. Europe **	$/mt	b/	483.2	700.0	358.0	581.5	371.6	310.0	366.8	383.6	411.4	385.5	354.0

Source: World Bank Commodities-2023 Review

Figure 16. PEER GROUP COMPARISON (as of March 09, 2024- TSXV & CSE data)

PEER COMPARISON

COMPANY	SYMBOL	SHARES O/S MIL	MARKET PRICE 09/03/24	MARKET CAP MIL	PRODUCT	EST TIME TO PRODUCTION	EST CAPEX
FIRST PHOSPHATE	PHOS	48	$0.23	$11	PHOS ACID	EST 2030?	$1.5 BIL
ARRIANNE	DAN	190	$0.28	$53	PHOS ACID	EST 2030?	$1.5 BIL+
FOX RIVER	FOX	52	$0.23	$12	P MAP	CURRENT	
CHATHAM	NZP	85	$0.08	$7	P	CURRENT	
VERDE	NPK	52	$1.23	$64	K.P	CURRENT	
ITAFOS	IFOS	186	$1.23	$228	MAP/DAP	CURRENT	
NEVADA	**NOP**	**43**	**$0.04**	**$1.72**	**ORG.P**	**EST 2024**	**$500K**

*As of market close March 8, 2024.

CSE NOP | NEVADAPHOSPHATE.COM | 14

NEVADA ORGANIC PHOSPHATE

While the company is significantly undervalued compared to its junior phosphate peer group in terms of market capitalization per share, investors should **note the company's extremely low-cost estimate for the full mining operation development compared to other projects that have made their**

estimates public (Figure 16). Since NOP's project logistics will be likely consist of near flat mining, loading, hauling, granulizing, and bagging the finished organic fertilizer in its raw form, no excessive infrastructure expenditures (i.e., roads, power, water usage or waste, housing, deep open pit) will be required. **Compared to Nevada Organic Phosphate's peer group project characteristics, this core advantage is absolutely a game-changer in the fertilizer mineral mining space.**

However, since these observations are historical and do not comply with current regulator disclosure requirements, the company is going ahead with its drill plan application with the BLM, likely by the late spring, **followed by an updated NI 43-101 report planned for release in the fall of this year.**

Management & Directors- Poised for Rapid Project Advancement

Robin Dow | HBA, MBA, FCSI

Chairman & CEO

Mr. Dow has an honours BA in Business and an MBA, both from Western, where he also taught Business, and is a Fellow of the Canadian Securities Institute.

In 1976, he joined Burns Fry in Calgary as a retail and institutional broker, as well as doing research. After 12 years he left the brokerage business and created Dow Group Inc. – where he has since built an extensive and successful record as a public venture capital entrepreneur.

For over 35 years, Mr. Dow has been responsible for creating over 30 private and public companies in mining, energy, cannabis/psilocybin, and technology. The resource operations cover four continents, ten countries, four US states, four Canadian provinces and three Canadian territories. Mr. Dow has raised close to C$200 million for these companies.

Eric Szustak | CPA, CA

Director

Mr. Szustak is a Chartered Public Accountant, CA with over 39 years of financial service, business development, marketing, accounting, and CFO experience.

Mr. Szustak has worked at both small and large accounting firms advising mid- sized businesses. His background includes 14 years with three national brokerage firms- Midland Walwyn, Merrill Lynch and BMO Nesbitt Burns in various positions, including private client wealth group, management and securities compliance. Mr. Szustak holds a B.A. Honors Chartered Accountant Studies and Economics from the University of Waterloo and received his Chartered Accountant designation in 1985.

Mr. Szustak is the former President and now Chairman of the Board of Quinsam Capital Corporation. Quinsam is a public merchant bank based in Canada. The merchant banking business encompasses a range of activities including acquisitions, advisory services, lending activities and portfolio investments.

Mr. Szustak holds multiple directorships in public companies listed on various Canadian stock exchanges.

Garry K. Smith | P.Geo

Director

Mr. Smith will work closely with the CEO on Nevada Organic Phosphate's strategic exploration and development plans. Garry has provided exploration management to numerous junior exploration and senior mining companies for over 40 years, including Kerr Addison, Campbell Resources, Teck, Rio Tinto, Lac Minerals and MPH Consulting. In the early days of exploration and mining software development, he joined Micromine Mining Software and helped develop their drill-hole modules and went on to become their North

American Manager. Subsequently, he joined the Visidata Mining Software team and helped develop both Interdex and CoreView drill-hole software and was their Americas Manager.

Mr. Smith is a registered geologist with the Professional Geoscientists of Ontario (PGO) and works through his private consulting company, Devon Geological Services Ltd., which is also registered with the PGO. A Qualified Person (QP), his geoscience consulting services are primarily active in the Americas for gold, VMS, base-metals, Mo, U, REE and REE, agro-minerals, and critical minerals exploration and development. Specialty expertise includes project generation and evaluation, 43-101 Technical Reports, project management and reporting, computer-based 3D geological modelling and data compilation, and metal ion soil geochemistry.

Mr. Smith has a strong commitment to ethical and sustainable exploration practices, with a focus on minimizing environmental impact. His projects follow e3 principles for responsible exploration, and 43-101-based “Best Practice Guidelines”.

Paul W. Pitman | B.Sc (Honors Geology) P.Geo

Consulting Geologist

Mr. Pitman has over 55 years’ experience as an exploration geologist and as a corporate officer of junior mining companies. Since 1983, he has acted as a geological consultant to over 70 clients, providing a full range of services (geological, corporate, and administrative).

Mr. Pitman has been a director, officer (Vice President), and/or President of several junior resource companies that he either founded or co-founded: Aura Silver Resources, Boreal Agrominerals, Continental Precious Minerals, Galahad Metals Inc., Golden Hart Exploration Inc., Hornby Bay Exploration, LKP Solutions Inc., Nuinsco Resources, Olivut Resources, Osoyoos Cannabis Inc., Patrician Gold Mines Inc., Phoenix Matchewan Mines Inc., Pueblo

Lithium Inc., Red Ore Gold Inc., Ualta Resources, and Ur-Energy Inc.
Mr. Pitman is a registered professional geologist in Ontario.

Marco Montecinos | M.Sc

Project Manager, Murdock Mountain

Mr. Montecinos has over 38 years of experience in mineral exploration and business development projects in the Americas and currently works as a Business Development Consultant with several junior exploration companies in the western US.

Mr. Montecinos was instrumental in the discovery of the Marlin Deposit in Guatemala and other gold deposits in Nevada, Mexico, and Central America.

Mr. Montecinos is President of Tigren, Inc., a Nevada based exploration services company, which has provided technical services to the mining industry for 28 years.

Keith Li | CPA, CA

CFO

Keith Li is an experienced Chartered Professional Accountant with over 15 years of corporate accounting and finance experience. He specializes in financial reporting advisory, and also provides services in accounting and regulatory compliance, internal control and risk management and strategic business consulting to both public and private companies from a wide number of industries including junior mining, merchant banking, health and wellness, and cannabis.

Mr. Li began his career in the public accounting sector as an auditor and had also held a senior-level position at Sears Canada. Mr. Li is currently the Chief Financial Officer and a partner of Branson Corporate Services Ltd., a boutique accounting and corporate secretarial services firm through which he serves as the CFO of several reporting issuers listed on the TSXV, the CSE and on the Nasdaq Composite Index, including Quinsam Capital Corporation, Psyched Wellness Ltd., US Critical Metals Corp., Corcel Exploration Ltd., Hercules Silver Corp., Snow Lake Resources Ltd., and Nevada Organic Phosphate Inc.

Mr. Li also holds a Bachelor of Commerce degree from McGill University.

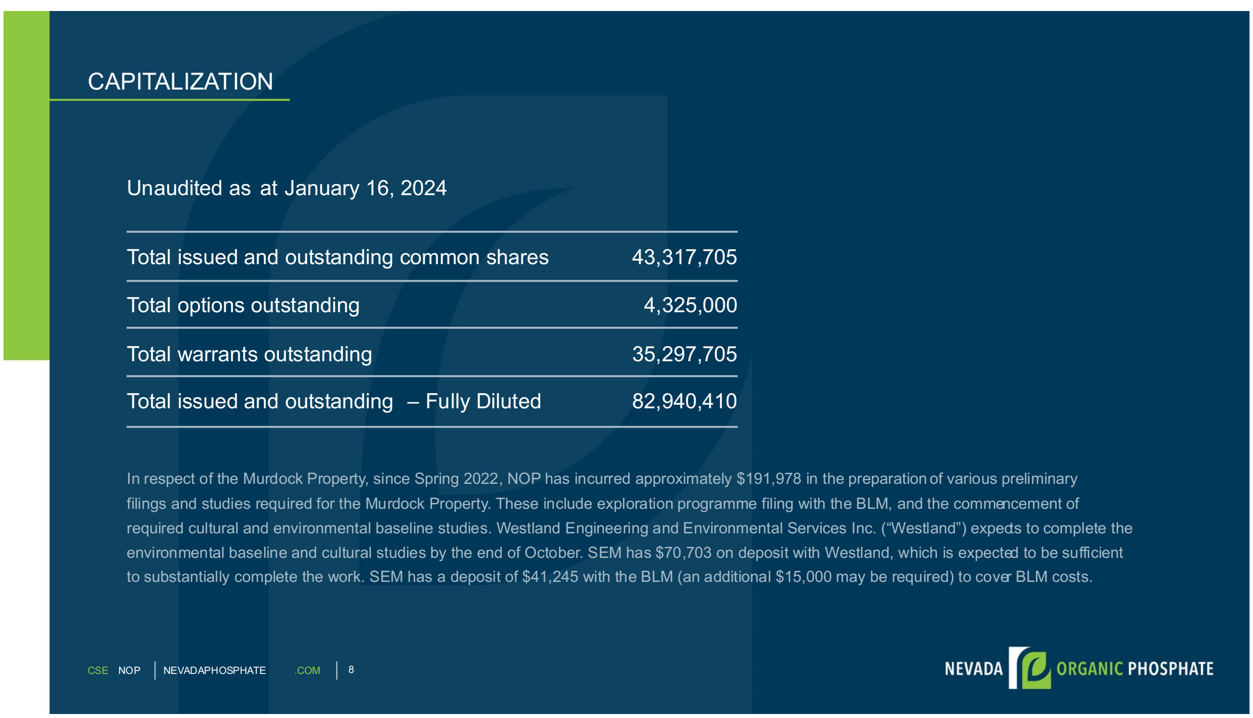
Andrew Brown

Corporate Secretary

Mr. Brown serves as the President of Ardent Corporate Services Inc., bringing extensive experience in corporate governance, corporate secretarial, corporate finance, and business development.

Having held roles as an officer and director for companies listed on both the TSX Venture and Canadian Securities Exchange, Mr. Brown possesses valuable insights into navigating complex regulatory environments.

Figure 17. Nevada Organic Phosphate- Company Capitalization



RECOMMENDATION- This Compelling Valuation Entry Point into the Surging Organic Fertilizer and Specialty Phosphate Sectors Should Not be Missed.

- ✓ **We strongly recommend that investors investigate Nevada Organic Phosphate closely as an early-stage Ag investment.** The Company has the potential to be a low-cost "game-changer" in the organic rock phosphate space, with an extremely low environmental footprint, start-up, and operating cost base.

- ✓ **Climate change impacts on global agriculture outputs are reaching a tipping point.** Organic phosphate will be needed to close the gap between synthetic (chemical acid-based) phosphate fertilizer's adverse environmental affects and healthy soil inputs enhancing plant growth. Sustainable food production increases will demand sustainable fertilizer applications and a lower carbon footprint, along with lower costs for the farmer. **This is occurring while the FAO estimates that global food production will grow by 70% over the next 30 years (2020 base).**

- ✓ **Global supply of phosphate rock is declining rapidly** with China & Morocco jointly controlling just over 85% of the world's remaining high-grade supply. Also, these regions are not always a stable and sustainable source of rock, while others are reaching their economic end-of-life. This makes the global food system extremely vulnerable to disruptions in the phosphorus supply chain that can lead to sudden price spikes. For example, in 2008 the price of phosphate fertilisers rocketed 800**%.** (Source: CRU)

- ✓ **Many acid-based phosphate deposits contain toxic contaminants like uranium, cerium, cadmium, and other toxic metals.** Chemical, acid-based processing is necessary to convert them to useable phosphate fertilizer. Chemical runoff from phosphate mining waste and farming over-applications tends to toxify groundwater, poisons the ecological biodiversity surrounding farms, and is now causing larger area contamination and more frequent and larger toxic algae blooms as the climate warms. **Nevada Organic Phosphate's end product will be virtually 100% pure.**

- ✓ **The traditional process for making acid-based fertilizer involves dissolving phosphate rock in either nitric or sulphuric acid.** Diammonium phosphate (DAP) and monoammonium phosphate (MAP) are created by reacting ammonia and phosphoric acid, which forms a slurry that is then solidified to produce a granulated fertilizer. These widely used types of P2O5 fertilizers are expensive to produce, are potentially toxic to the soil and the environment over time and as little as 10-15% of the acid-based phosphate applications are taken up by the plant. Soil mycorrhiza degradation and general soil health is only one negative result. Ever increasing and damaging algae blooms and negative biodiversity impacts are another. **The Company's rock phosphate needs no chemical treatments or mixtures.**

- ✓ **Slow-release, organic rock phosphate does NOT destroy the micro-organisms in the soil** (or cause any of the other negative environmental impacts as described above) which are vital for the life and health of the soil, unlike synthetic and chemically treated high concentration phosphates (DAP/MAP) which make the majority of phosphate fertilizers on the market. **This is why the Company is applying for the OMRI's Organic Certification Seal and will be able to service the rapidly growing organic food market in the US.**

- ✓ **Organic farmers want this product desperately because of its slow-release properties, zero toxicity, benign environmental footprint, and superior optimum mineral reaction with soil hosted micro-organisms.** Murdock Mountains' oolitic rock phosphate is composed of Francolite (a carbonate rich variety of fluorapatite, which is the fastest acting apatite phosphate mineral, and is ideally suited for organic fertilizer applications).

- ✓ **The Company does not plan to use a large open pit mining operation that exhibits high levels of site disturbance.** It anticipates using shallow underground mining methodologies, shipping the raw rock only 6 km to Montello, NV, grinding the phosphate rock into granules in town, bagging it (into 50-100 kilo bags) and shipping it by rail (Southern Pacific Railway spur right in town, as well as just off Hwy SR 30) directly to farmers in the western US (especially for the organic farming market in California which is booming and growing exponentially). **The shallow dipping, nearly flat-lying deposit will be amenable to simple underground mining methods, thus avoiding any significant surface habitat disturbance or contamination.**

- ✓ **This simplified mining methodology means estimated low operating costs (<US$200/ton) and potential high margins (+50-60%), as pricing for pure, organic phosphate rock fertilizer is currently in the US$500-550/ton (delivered) range. The Company's prime market region is literally just next door.**

- ✓ **The rise of battery & critical minerals and the impeding shortage of purified phosphoric acid (PPA) used in the manufacture of high demand lithium ferrous phosphate (LFP) batteries could mean an extra demand push for the Company's end product**. While not its primary market focus, this rapidly growing segment of the phosphate specialty market could be very lucrative.

- ✓ **The Company is directed by a seasoned and experienced management team and board.** Their "no-nonsense" style sits well with investors and regulators as they make progress through the various milestones necessary to bring the project into production and cash-flow positive as soon as possible.

- ✓ **Providing a credible company valuation is premature** at this time even though its is significantly undervalued on a market cap/share basis. However, on an estimated mine start-up and production cost/tonne basis (provided by the Company), **we know of no other clean organic rock producer that can match Nevada Organic Phosphate's potential at the present time, simply because there are no mines of this geometry and purity level in existence today.**

- ✓ **The Company's current share price represents a compelling valuation entry point compared to its peers into the surging organic fertilizer and specialty phosphate sectors that should not be missed.**

We recommend investors review the company's recently re-launched website by following this link: [NEVADA ORGANIC PHOSPHATE (nevadaphosphate.com)](nevadaphosphate.com) and view their back story and updated news, corporate presentation, and organic agriculture-based research.

+Phosphorite, **phosphate rock** or **rock phosphate** is a non-detrital sedimentary rock that contains high amounts of phosphate minerals. The phosphate content of phosphorite (or grade of phosphate rock) varies greatly, from 4%[1] to 20% phosphorus pentoxide (P_2O_5). Marketed phosphate rock is enriched ("beneficiated") to at least 28%, often more than 30% P_2O_5. This occurs through washing, screening, de-liming, magnetic separation or flotation.[1] By comparison, the average phosphorus content of sedimentary rocks is less than 0.2%.[2]

***2020A (Pre-Covid): Economic Research Service**- U.S. Department of Agriculture in 2021 (+8.7% annual growth rate between 2021 – 2027)

Appendix A- Chemical Production of Phosphate Fertilizers (Negative Impacts) **^**

Phosphorus in soil is depleted due to crop uptake and erosion, and its replenishment through rock weathering and atmospheric deposition is slow. Hence, the application of inorganic and organic forms of phosphorus has become an essential practice in crop production (Liu and Chen, 2014).

Modern agriculture is dependent on phosphorus derived from phosphate rock (PR), mainly from sedimentary ores (75-80 percent), which is a non-renewable resource (Prud'homme, 2016). Phosphate rock, especially in the sedimentary ores, contains variable levels of trace elements and radionuclides (El-Bahi *et al.*, 2017; Gupta *et al.*, 2014). In the phosphate mining process, trace elements and radionuclides are mobilized, and dust generated is a source of fluoride and radon emissions (Azzi *et al.*, 2017; Reta *et al.*, 2018). This leads to an addition of harmful substances such as arsenic, cadmium, chromium, lead, mercury, fluorine, and radionuclides like uranium, radium and thorium to soil when applying phosphate fertilizer, which may accumulate in plants and enter the food chain (Tiessen, SCOPE and UNEP, 1995). Repeated applications of fertilizers can lead to a significant accumulation of potentially toxic elements into the soil (Jiao *et al.*, 2012). Soils with a long history of phosphorus fertilizer applications had high levels of copper, zinc and cadmium (Maas *et al.*, 2010).

The world's known reserves of phosphate rock are being depleted, and it is estimated that global demand for phosphorus will exceed its supply by 2035 (Cordell, Drangert and White, 2009; Filippelli, 2011), due to an estimated annual increase in demand of 0.7-1.3 percent (Van Vuuren, Bouwman and Beusen, 2010). However, a reassessment by The International Fertilizer Development Center of global phosphate reserves and resources and the opportunities for more efficient extraction and processing technologies indicated that reserves had the potential to last much longer (Van Kauwenbergh, 2010).

Van Kauwenbergh (2010) presented cadmium content of phosphate rock obtained from 35 sedimentary deposits in 20 countries. The average cadmium content of sedimentary phosphate rock deposits across the globe is about 69 times greater than that of non-phosphate containing rocks. Concentration of Cd can vary widely between countries and within deposits in the same country, within a range of less than 1 mg/kg to 150 mg/kg. The highest levels have been reported for phosphates rock from Idaho, the United States of America (40 – 150 mg/kg), and in Tobene, Senegal (60 – 115 mg/kg). Approximately 85 percent of global fertilizer production is from sedimentary deposits. Igneous phosphate rock has average cadmium concentrations of only 2 mg/kg. In the manufacturing process all the cadmium transfers to the product.

The overuse of phosphorus fertilizers can lead to its loss from croplands via erosion or runoff (Smith *et al.*, 2016). Eutrophication of surrounding water bodies from agricultural fields is a result of high quantities of phosphorus lost through erosion or runoff (Withers *et al.*, 2019). Quantifying phosphorus losses in eroding agricultural soils is particularly uncertain, as erosion rates vary widely even within a single field (Liu *et al.*, 2018). It is also because few nations have comprehensive, periodic inventories of their soil erosion (Clearwater, Martin and Hoppe, 2016; Liu and Chen, 2014).

Phosphate extraction to produce phosphate fertilizers is done through wet acid extraction, which produces phosphogypsum as residue. It is estimated that around 100-280 Mt of phosphogypsum are produced each year (Saadaoui *et al.*, 2017; Tayibi *et al.*, 2009). Phosphogypsum may be enriched in radon, uranium and thorium depending on the phosphate rock source (Borrego *et al.*, 2007; Rutherford, Dudas and Samek, 1994), and presents variable content of trace elements, such as barium, cadmium, copper, nickel, strontium, and zinc, depending on the characteristics of the parent rock (Luther, Dudas and Rutherford, 1993; Pérez-López, Álvarez-Valero and Nieto, 2007; Sahu *et al.*, 2014). Therefore, the US EPA (2014, 2015a) has classified phosphate fertilizer production wastes as Technologically Enhanced Naturally Occurring Radioactive Material (TENORM). The residues of phosphate fertilizer production normally end up in open stockpiles and it has been observed that leachates from these stockpiles occur under ambient environmental conditions (Azouazi *et al.*, 2001; Battistoni *et al.*, 2006; Gázquez *et al.*, 2014; Lysandrou and Pashalidis, 2008). Pérez-López, Álvarez-Valero and Nieto (2007) found an enrichment in trace elements associated with the organic fraction in the phosphogypsum waste and a mobilization of U from the crystalline structure in the original phosphate rock to the bioavailable fraction in the waste.

In addition, the production of high analysis phosphate fertilizers via phosphoric acid generates as a by-product phosphogypsum, which has been used as a soil amendment in many countries for several decades to improve soil properties and crop yields. Phosphogypsum is rich in calcium and therefore has a great potential for liming and immobilization of the trace elements (Campbell *et al.*, 2006; Mahmoud and El-Kader, 2015). However there is evidence of possible accumulation of trace elements and radionuclides in soils that have been amended with phosphogypsum, pyrites and other amendments, depending on their source (Abril *et al.*, 2008) (*see section 2.5.1.1*). Therefore, it is pertinent to monitor the content of these contaminants in soils and their transfer to the food chain, because the promotion of such recycling may increase phosphogypsum use (Papastefanou *et al.*, 2006).

^ References (for Appendix A): https://www.fao.org/3/cb4894en/online/src/html/chapter-02-ref.html- from Global Assessment of Soil Pollution-FAO(2021)

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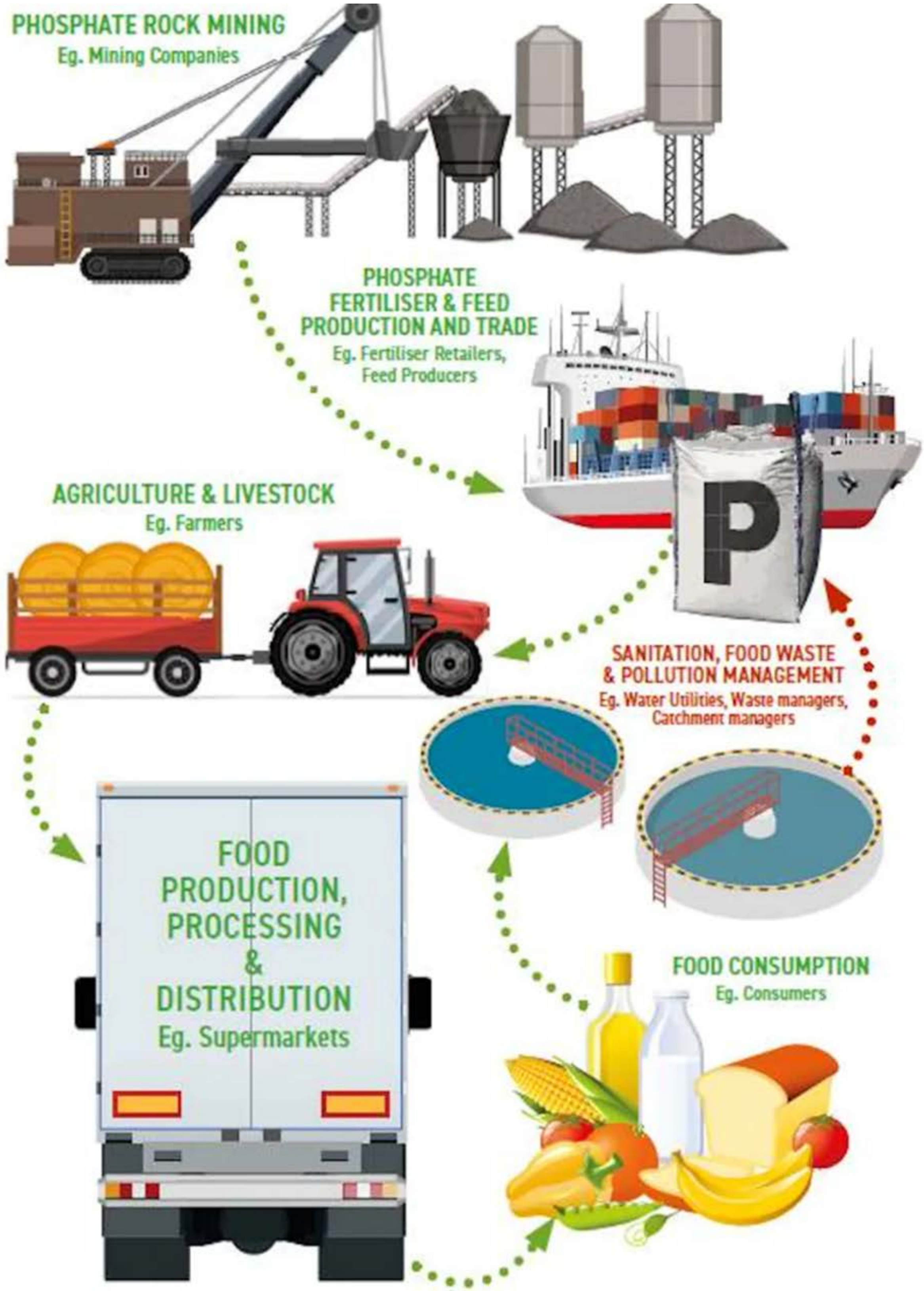
PHOSPHATE ROCK MINING
Eg. Mining Companies
PHOSPHATE
FERTILISER & FEED
PRODUCTION AND TRADE
Eg. Fertiliser Retailers,
Feed Producers
P
AGRICULTURE & LIVESTOCK
Eg. Farmers
SANITATION, FOOD WASTE
& POLLUTION MANAGEMENT
Eg. Water Utilities, Waste managers,
Catchment managers
FOOD
PRODUCTION,
PROCESSING
&
DISTRIBUTION
Eg. Supermarkets
FOOD CONSUMPTION
Eg. Consumers

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