NUTRIEN LTD.

ANNUAL INFORMATION FORM
Year Ended December 31, 2018

February 20, 2019

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Following is a table of contents of this Annual Information Form ("AIF") referencing the applicable requirements of Form 51-102F2 of the Canadian Securities Administrators. Certain portions of this AIF are disclosed in Nutrien Ltd.'s Management's Discussion & Analysis ("2018 MD&A") and Consolidated Financial Statements for the year ended December 31, 2018 ("2018 Financial Statements") and are incorporated by reference herein to the extent noted below and are available on the Canadian Securities Administrators' SEDAR website at www.sedar.com and on the EDGAR section of the United States Securities and Exchange Commission's ("SEC") website at www.sec.gov.

ITEM 2 – ADVISORIES

2.1 FORWARD-LOOKING INFORMATION

This AIF, including the documents incorporated by reference, contains and incorporates by reference "forward-looking statements" or "forward-looking information" (within the meaning of the United States ("US") *Private Securities Litigation Reform Act of 1995,* and other US federal securities laws and applicable Canadian securities laws) (collectively, "forward-looking statements") that relate to future events or our future financial performance. These statements can be identified by expressions of belief, expectation or intention, as well as those statements that are not historical fact. These statements often contain words such as "should," "could", "expect", "may", "anticipate", "forecast", "believe", "intend", "estimates", "plans" and similar expressions. These statements are based on certain factors and assumptions as set forth in this AIF and the documents incorporated by reference herein, including with respect to: foreign exchange rates, expected synergies, expected growth, results of operations, performance, business prospects and opportunities, and effective tax rates. While Nutrien Ltd. considers these factors and assumptions to be reasonable, based on information currently available, they may prove to be incorrect.

Forward-looking statements are subject to risks and uncertainties that are difficult to predict. The results or events set forth in forward-looking statements may differ materially from actual results or events. Several factors could cause actual results or events to differ materially from those expressed in forward-looking statements including, but not limited to, the following:

- a number of matters relating to the Merger (as defined herein), including the failure to realize the anticipated benefits of the Merger;
- the risk that our credit ratings may be downgraded or there may be adverse conditions in the credit markets;
- any significant impairment of the carrying amount of certain of our assets;
- variations from our assumptions with respect to foreign exchange rates, expected growth, results of operations, performance, business prospects and opportunities, and effective tax rates;
- fluctuations in supply and demand in the fertilizer, sulfur and petrochemical markets;
- changes in competitive pressures, including pricing pressures;
- risks and uncertainties related to any operating and workforce changes made in response to our industry and the markets we serve, including mine and inventory shutdowns;
- adverse or uncertain economic conditions and changes in credit and financial markets;
- economic and political uncertainty around the world;
- changes in capital markets;
- the results of sales contract negotiations;
- unexpected or adverse weather conditions;
- changes in foreign currency and exchange rates;
- risks related to reputational loss;
- the occurrence of a major safety incident;
- inadequate insurance coverage for a significant liability;
- inability to obtain relevant permits for our operations;
- catastrophic events or malicious acts, including terrorism;
- certain complications that may arise in our mining process, including water inflows;

- risks and uncertainties related to our international operations and assets;
- our ownership of non-controlling equity interests in other companies;
- our prospects to reinvest capital in strategic opportunities and acquisitions;
- risks associated with natural gas and other hedging activities;
- security risks related to our information technology systems;
- imprecision in mineral resource and reserve estimates;
- costs and availability of transportation and distribution for our raw materials and products, including railcars and ocean freight;
- changes in, and the effects of, government policies and regulations;
- earnings and the decisions of taxing authorities which could affect our effective tax rates;
- increases in the price or reduced availability of the raw materials that we use;
- our ability to attract, develop, engage and retain skilled employees;
- strikes or other forms of work stoppage or slowdowns;
- rates of return on, and the risks associated with, our investments and capital expenditures;
- timing and impact of capital expenditures;
- the impact of further innovation;
- adverse developments in new and pending legal proceedings or government investigations; and
- violations of our governance and compliance policies.

In addition to the factors mentioned above, see "Risk Factors" discussed in this AIF for a description of other factors affecting forward-looking statements. As a result of these and other factors, there is no assurance that any of the events, circumstances or results anticipated by forward-looking statements included in this AIF will occur or, if they do, of what impact they will have on our business, our performance, the results of our operations and our financial condition.

These forward-looking statements are based on certain assumptions and analyses made by us in light of our experience and perception of historical trends, current conditions and expected future developments as well as other factors Nutrien believes are appropriate in the circumstances. Readers are cautioned not to place undue reliance on the forward-looking statements which involve known and unknown risks and uncertainties that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements.

Forward-looking statements in this AIF are given only as of the date of this AIF and Nutrien disclaims any obligation to update or revise any forward-looking statements included in this AIF, whether as a result of new information, future events or otherwise, except as required by law.

2.2 BASIS OF PRESENTATION

2018 Nutrien consolidated financial information and 2017 and 2016 Potash Corporation of Saskatchewan Inc. ("PotashCorp") and Agrium Inc. ("Agrium") consolidated financial information presented and discussed in this AIF are prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board ("IFRS"). This AIF is dated February 20, 2019, and the information contained herein is current as of such date, unless otherwise specified.

ITEM 3 – CORPORATE STRUCTURE

In this AIF, unless otherwise specified, the term "Nutrien" refers to Nutrien Ltd. and, unless the context requires otherwise, the terms "we", "us", "our", "Nutrien" and the "Company" refer to Nutrien and its direct and indirect subsidiaries, including PotashCorp and Agrium, individually or in any combination, as applicable. References to "dollars", "$", and "US$" are to United States dollars and references to "CA$" are to Canadian dollars.

3.1 NAME, ADDRESS AND INCORPORATION

Effective January 1, 2018, pursuant to the merger of equals transaction ("Merger") contemplated by the arrangement agreement dated as of September 11, 2016 ("Arrangement Agreement"), between PotashCorp and Agrium, PotashCorp and Agrium became wholly-owned subsidiaries of Nutrien pursuant to a plan of arrangement under the *Canada Business Corporations Act* ("CBCA"). Nutrien is a corporation incorporated under the CBCA on June 2, 2017 for the sole purpose of participating in the Merger. Prior to completion of the Merger, Nutrien did not conduct any business activities, other than those required for its formation and matters contemplated by the Arrangement Agreement.

Nutrien's registered head office is Suite 500, 122 – 1st Avenue South, Saskatoon, Saskatchewan, Canada S7K 7G3. It also has corporate offices at 13131 Lake Fraser Drive SE, Calgary, Alberta, Canada T2J 7E8 and 5296 Harvest Lake Drive, Loveland, Colorado, US 80538.

3.2 INTERCORPORATE RELATIONSHIPS

Principal Subsidiaries [1]	Jurisdiction of Incorporation or Organization	Ownership
Potash Corporation of Saskatchewan Inc.	Canada	100%
Agrium Inc.	Canada	100%
Agrium Canada Partnership	Alberta, Canada	100%
Agrium Potash Ltd.	Canada	100%
Agrium U.S. Inc.	Colorado, US	100%
Cominco Fertilizer Partnership	Texas, US	100%
Landmark Operations Ltd. ("Landmark")	Western Australia	100%
Nutrien Ag Solutions (Canada) Inc.	Canada	100%
Nutrien Ag Solutions, Inc.	Delaware, US	100%
PCS Nitrogen Fertilizer, LP	Delaware, US	100%
PCS Sales (USA), Inc.	Delaware, US	100%
Phosphate Holding Company, Inc.	Delaware, US	100%
Potash Holding Company, Inc.	Delaware, US	100%

(1) In aggregate, our remaining subsidiaries not listed herein accounted for less than 20 percent of our total consolidated assets or 20 percent of our total consolidated sales as at and for the year ended December 31, 2018.

ITEM 4 – GENERAL DEVELOPMENT OF THE BUSINESS

4.1 THREE YEAR HISTORY

NUTRIEN

The Merger

Effective January 1, 2018, PotashCorp and Agrium completed the Merger by way of a court approved plan of arrangement under Section 192 of the CBCA, involving, among others, Nutrien, PotashCorp and Agrium.

Pursuant to the Merger, the holders of common shares of PotashCorp ("PotashCorp Shares") received common shares of Nutrien ("Common Shares") at a ratio of 0.40 of a Common Share for each PotashCorp Share ("PotashCorp Exchange Ratio") and the holders of common shares of Agrium ("Agrium Shares") received Common Shares at a ratio of 2.23 Common Shares for each Agrium Share ("Agrium Exchange Ratio").

Upon completion of the Merger, each share-based compensation award of PotashCorp and Agrium was assumed or replaced by Nutrien based on the PotashCorp Exchange Ratio and Agrium Exchange Ratio, as applicable, and all other material terms and conditions of each such share-based compensation award remained substantially similar with their pre-Merger terms and conditions. Nutrien also assumed the obligations in respect of awards under PotashCorp's and Agrium's non-share-based compensation plans.

Acquisitions and Investments

In 2018, we expanded our retail operations by acquiring 53 farm centers in North America and Australia, in addition to acquiring companies operating within the digital agriculture, proprietary products and agricultural services segments, for total consideration of $433 million. Benefits of the acquisitions include expansion of geographical coverage for the sale of crop input products, increased customer base and workforce, continued growth in the digital agricultural field and the ability to realize synergies between Nutrien and the acquired businesses. See note 3 of the 2018 Financial Statements for additional information.

On February 5, 2019, we announced the planned acquisition of Actagro, LLC, a developer, manufacturer and marketer of environmentally sustainable soil and plant health products and technologies, for an estimated purchase price of $340 million. Closing of the transaction is subject to US regulatory approval and is expected to be completed in the first half of 2019.

Dispositions

In connection with antitrust approvals necessary for the completion of the Merger, during 2018, we completed the disposition of the following minority equity interests: (i) sale of shares in Israel Chemicals Ltd. ("ICL") through a private secondary offering for proceeds of $685 million, net of commissions; (ii) sale of shares in Arab Potash Company ("APC") for proceeds of $501 million, net of commissions; and (iii) sale of shares in Sociedad Química y Minera de Chile S.A. ("SQM") for proceeds of $5.1 billion, net of commissions.

In addition to the above dispositions of minority equity interests, in 2018, we also completed the sale of our (i) Conda, Idaho phosphate production facility and adjacent phosphate mineral rights; and (ii) North Bend, Ohio nitric acid facility and related assets.

See note 10 of the 2018 Financial Statements for additional information.

New Brunswick Potash Operations

After a strategic portfolio review was completed during the third quarter of 2018, it was determined the New Brunswick Potash operations would no longer be part of our medium term or long-term strategic plans. As a result, the New Brunswick Potash operations will be taken out of care and maintenance and permanently shut down. The decision to shut down these operations resulted in a non-cash impairment of $1,809 million to the property, plant and equipment of the New Brunswick Potash operations. For additional information, refer to note 16 of the 2018 Financial Statements.

Normal Course Issuer Bid

During 2018, we completed the repurchase of 36,332,197 Common Shares for cancellation, representing approximately six percent of our outstanding Common Shares, under a normal course issuer bid ("NCIB"), which our Board of Directors ("Board") had approved earlier in 2018. See note 24 of the 2018 Financial Statements for additional information. As of the date hereof, an additional 5,933,135 Common Shares have been acquired under the NCIB in 2019.

On February 20, 2019, our Board of Directors approved the renewal of the share repurchase program of up to 5 percent of our outstanding Common Shares over a one-year period through the NCIB. Purchases under the NCIB will be made through open market purchases at market price as well as by other means as may be permitted by applicable securities regulatory authorities, including private agreements.

Debt Exchange

In 2018, an aggregate of $7,578 million of PotashCorp senior notes and Agrium debentures (other than Agrium's debentures due 2027) were tendered and accepted in exchange for the same amount of new notes issued by Nutrien ("Nutrien Notes"). The Nutrien Notes have interest rates and maturities identical to those of the applicable exchanged series of senior notes or debentures. In addition, we solicited consents from the holders of PotashCorp senior notes and Agrium debentures to amend the terms and remove certain financial reporting covenants and events of default under the indentures governing those senior notes and debentures. A small portion of senior notes and debentures were not exchanged and remain outstanding with the issuing subsidiary. See note 23 of the 2018 Financial Statements for additional information.

Credit Facilities

In 2018, we replaced the existing $3.5 billion unsecured revolving credit facility of PotashCorp and the $2.5 billion multijurisdictional unsecured revolving credit facility of Agrium with a new Nutrien $4.5 billion unsecured revolving term credit facility ("Nutrien Credit Facility"). The Nutrien Credit Facility matures April 10, 2023, subject to extension at the request of Nutrien provided that the resulting maturity date shall not exceed five years from the date of the request.

In 2018, we also entered into an amending agreement to replace PotashCorp's existing $75 million unsecured line of credit with a new $500 million uncommitted revolving demand facility.

See note 22 and note 23 of the 2018 Financial Statements for additional information.

Commercial Paper Program

In 2018, we launched a commercial paper program having an aggregate authorized amount of $4.5 billion. The amount drawn under the commercial paper program is backstopped by the Nutrien Credit Facility. Concurrent with the launch, we discontinued new issuances under the commercial paper programs of PotashCorp and Agrium that existed prior to the completion of the Merger. See note 22 of the 2018 Financial Statements for additional information.

Accounts Receivable Securitization Program

In 2016, Agrium established a trade accounts receivable securitization program which was continued by Nutrien in 2018. Under this program, we sell certain trade account receivables to a special purpose vehicle, which is a consolidated entity within Nutrien. We control and retain substantially all of the risks and rewards of the receivables sold to the special purpose vehicle. Should we wish to draw funds under the program, the sold accounts receivable balances may be used as capacity for collateralized borrowings from a third-party financial institution. As at December 31, 2018, there were no outstanding funds drawn under this program. For additional information, see note 22 of the 2018 Financial Statements.

POTASHCORP

Incremental Expansion

In 2016, PotashCorp completed its expansion project to increase the nameplate capacity from 3.0 million tonnes to approximately 6.0 million tonnes at its Rocanville mine operations in Saskatchewan, Canada. Production was ramped up through 2017, reaching a nameplate capacity of 6.5 million tonnes of finished potash product. For additional information, refer to Item 5.3 and "Schedule B – Mineral Projects – d) Rocanville Potash Operations".

Bond Offerings

In 2016, PotashCorp completed an offering for $500 million aggregate principal amount of four percent senior notes due December 15, 2026. The senior notes were issued pursuant to an existing indenture and registered under a shelf registration statement of PotashCorp on Form S-3 (No. 333-212301) filed in 2016 with the SEC. These senior notes were included in the exchange of notes completed in 2018, as discussed above under *Nutrien – Debt Exchange*.

New Brunswick Potash Operations

In 2016, in light of challenging market conditions, PotashCorp indefinitely suspended Potash operations at its Picadilly facility in New Brunswick. These potash operations will be permanently shut down, as discussed above under *Nutrien – New Brunswick Potash Operations.*

AGRIUM

Acquisitions and Investments

In 2017 and 2016, Agrium acquired 44 and 71 Retail facilities, respectively, located in North America for consideration of $145 million and $251 million, respectively, excluding working capital.

Incremental Expansion

In 2017, Agrium completed the commissioning of the 610,000 tonnes per year urea facility in Borger, Texas, the construction of which was completed during 2016 as part of Agrium's brownfield expansion project at Borger. The project was undertaken to leverage Agrium's distribution network in the region and to enable the Borger, Texas facility to become a competitive and low-cost producer of nitrogen, enhancing its long-term viability.

4.2 SIGNIFICANT ACQUISITIONS

The Merger was considered a significant acquisition for the purposes of Part 8 of National Instrument 51-102 – *Continuous Disclosure Obligations* and, therefore, Nutrien filed a Business Acquisition Report (Form 51-102F4) on February 26, 2018 under its SEDAR profile on www.sedar.com in respect of the Merger. For additional information, see note 3 of the 2018 Financial Statements.

ITEM 5 – DESCRIPTION OF THE BUSINESS

5.1 BUSINESS OF NUTRIEN

We are a world-class integrated provider of crop nutrients and services, playing a critical role in helping growers increase food production in a sustainable manner. We directly supply growers through our leading global retail network – including crop nutrients, crop protection products, seed, as well as agronomic and application services. We operate more than 1,700 retail facilities across the US, Canada, Australia and key areas of South America, servicing more than 500,000 grower accounts.

Nutrien is the world's largest crop nutrient company by capacity, producing the three crop nutrients: potash, nitrogen and phosphate. We produce and distribute approximately 27 million tonnes of crop nutrient products from our facilities in Canada, the US and Trinidad, and our Canadian potash operations represent more than one-fifth of global nameplate capacity.

As of December 31, 2018, Nutrien estimates its potash operations represented 22 percent of global potash capacity, its nitrogen operations represented 3 percent of global nitrogen capacity and its phosphate operations represented 3 percent of global phosphate capacity.

a) SUMMARY

i) Retail Operations

Nutrien's Retail segment markets crop nutrients, crop protection products, seed, merchandise, as well as agronomic application services and solutions through more than 1,700 retail locations across the US, Canada, Australia and key areas of South America. North American retail locations include more than 800 branches, which are facilities supporting a specific market area and customer base, and more than 450 satellites, which are used to position equipment and product to specific markets and customers in support of a branch. Retail's market is primarily retail sales directly to growers, but also includes wholesale sales of

crop protection products to third party retail operations. Retail also has an in-house lending program called Nutrien Financial Services™ to provide competitive crop input loans to customers.

Crop nutrients sales accounted for approximately 36 percent of Retail's total third-party sales in 2018. Crop nutrients are generally mixed in a custom blend to suit the particular nutrient requirements for each grower's field based on soil fertility tests or plant tissue sampling. Nutrien offers custom crop nutrient application services and employs a large fleet of application equipment to custom-apply these nutrients at the prescribed rates. Many of the Company's crop nutrient application rigs are also capable of precision application using global positioning system ("GPS") technology, which allows nutrient application rates to be adjusted when required, based on GPS grid soil sample test results and other data.

Crop protection products sales were approximately 39 percent of Retail's total third-party sales in 2018. Similar to its crop nutrient application services, Nutrien employs a large fleet of crop protection application equipment. By its nature, Retail's crop protection business operates within a framework of government regulation and oversight. Nutrien formulates and distributes private label and proprietary crop protection products through its Loveland Products, Inc. business across North America, South America and Australia.

Seed sales accounted for approximately 13 percent of Retail's total third-party sales in 2018. Seed treatment is also a growing service that we provide growers. This service involves applying chemical to seeds prior to planting to protect them from pests and disease. Our seed sales have been further supported by growth in our private label seed product line under the brand names Dyna-Gro® and Proven™.

Merchandise sales accounted for approximately 6 percent of Retail's total third-party sales in 2018. In addition to offering crop nutrient, crop protection and seed, our Retail business in Australia also offers a wide variety of livestock-related merchandise, including fencing, animal identification merchandise and various animal health products and services.

Services and other revenues accounted for approximately 6 percent of Retail's total third-party sales in 2018. Retail has a large group of qualified crop advisors throughout the organization who help develop crop input recommendations and monitor customers' crops in order to optimize yields and maximize grower's bottom line. Nutrien's Retail segment offers a variety of agronomic services to our growers, including custom application services and soil and leaf testing. The Company owns and operates laboratories across the US performing soil and leaf testing for growers. In the Western US, the Company uses a system of weather tracking stations to monitor crop disease conditions and irrigation requirements in high-value crops. Retail offers digital tools that provide customer account management, agronomic insights and hands-on customer support that drive economic value and can provide environmental benefits for our growers, including our Echelon® precision agriculture offering, which includes services such as yield data mapping, record keeping, soil fertility management, variable-rate fertility and variable-rate seeding recommendations. In Australia, Retail offers various other services, including wool sales and marketing, livestock marketing and auction services, insurance products, financial services and real estate agency services. Retail also offers financial services to its US customers.

ii) Potash Operations

Our Potash operations include the mining and processing of potash, which is predominantly used as fertilizer.

The Saskatchewan Ministry of Energy and Resources has granted Nutrien the exclusive right to mine potash on approximately 345,300 hectares (or approximately 853,000 acres) of Crown land pursuant to subsurface mineral leases. Of the approximately 345,300 hectares, roughly 244,000 hectares are comprised of our Potash operations at the Allan, Cory, Lanigan, Patience Lake, Rocanville, and Vanscoy mines. Leases also exist with freehold mineral rights owners within the Crown subsurface mineral lease areas and elsewhere in Saskatchewan.

Our subsurface mineral leases with the Province of Saskatchewan are for 21-year terms, renewable at our option. Our significant leases with other parties are also for 21-year terms. Such other leases are renewable at our option, provided generally that production is continuing and that there is continuation of the applicable lease with the Province of Saskatchewan.

Potash we produce in Canada for sale to destinations outside Canada and the US is sold exclusively to Canpotex Limited ("Canpotex"). Since January 1, 2018, Canpotex has been owned in equal shares by us and another potash producer in Canada. Prior to the completion of the Merger, Canpotex was owned in equal shares by PotashCorp, Agrium and another potash producer in Canada. Canpotex, which was incorporated in 1970 and commenced operations in 1972, acts as an export company providing integrated sales, marketing and distribution for all Canadian potash produced by its shareholders/producers that is exported to destinations outside the US and Canada. Each shareholder of Canpotex has an equal voting interest as a shareholder and a right to equal representation on the Canpotex board of directors. For 2018, sales of potash to Canpotex represented 59 percent of our total third-party potash sales.

In general, Canpotex sales are allocated among Canpotex producers based on production capacity. In 2018, Nutrien supplied approximately 64 percent of Canpotex's requirements. Canpotex generally sells potash to private and public firms and government agencies pursuant to term and spot contracts at agreed upon prices. Canpotex has a long history of being a reliable supplier of potash to international markets and of proven logistics and marketing capabilities. Other major potash exporting countries include Russia, Belarus and Germany.

iii) Nitrogen Operations

Our nitrogen operations include the production of nitrogen fertilizers and nitrogen feed and industrial products, including ammonia, urea, urea ammonium nitrate ("UAN") solutions, diesel emission fluid ("DEF"), ammonium nitrate, nitric acid and the controlled-release product Environmentally Smart Nitrogen® ("ESN®").

We own and operate eight major nitrogen production facilities in North America, four located in Alberta, Canada and one in each of the following US states: Georgia, Louisiana, Ohio and Texas. We also own and operate a major nitrogen production facility in Trinidad.

The following table sets forth the major nitrogen facility locations and products produced.

Plant Locations	Nitrogen Products Produced
Augusta, Georgia	Ammonia, urea, UAN, DEF, nitric acid and ammonium nitrate
Borger, Texas	Ammonia, urea and DEF
Carseland, Alberta	Ammonia and urea
Fort Saskatchewan, Alberta	Ammonia and urea
Geismar, Louisiana	Ammonia, UAN, DEF and nitric acid
Joffre, Alberta	Ammonia
Lima, Ohio	Ammonia, urea, UAN, DEF, nitric acid and ammonium nitrate
Point Lisas, Trinidad	Ammonia and urea
Redwater, Alberta	Ammonia, urea, ammonium nitrate and UAN

We also operate a number of facilities that upgrade ammonia and urea to other products such as UAN, ammonium nitrate, nitric acid and ESN®.

Plant Locations	Nitrogen Products Produced
Americus, Georgia	Rainbow plant food
Carseland, Alberta	ESN®
Florence, Alabama	Rainbow plant food
Granum, Alberta	UAN
Kennewick, Washington	UAN, ammonium nitrate and nitric acid
New Madrid, Missouri	ESN®
Standard, Alberta	UAN

Our owned and operated facilities have a combined annual gross ammonia nameplate capacity of approximately 7.1 million tonnes.

We also have a 50 percent joint venture ownership in Profertil S.A. ("Profertil"), a joint venture that owns a nitrogen facility in Bahia Blanca, Argentina. In addition, through our ownership of shares of Misr Fertilizers Production Company S.A.E., we hold a 26 percent interest in a nitrogen facility located in Egypt.

iv) Phosphate and Sulfate Operations

Our Phosphate and Sulfate operations include the manufacture and sale of solid and liquid phosphate fertilizers, phosphate feed and purified phosphoric acid, which is used in food and industrial products. We have phosphate mines and mineral processing plant complexes in White Springs, Florida and Aurora, North Carolina. We also have three Phosphate feed plants in the US and produce phosphoric acid and granular ammonium sulfate at Redwater, Alberta using purchased imported rock. In 2018, we made the decision to repurpose our Redwater Phosphate facility in order to increase our ammonium sulfate capacity. The production of phosphoric acid at the Redwater Phosphate facility is expected to cease in the second quarter of 2019 once phosphate rock inventory at the facility is depleted. Rock for the Redwater facility had been sourced through a long-term supply agreement with OCP S.A. ("OCP") which ended in 2018. To facilitate the transportation of the remaining phosphate rock to North America, we entered into a freight contract in December 2018 to complete delivery of the final rock purchased. In 2018, we also made the decision to close our Geismar, Louisiana Phosphate facility, with production of merchant grade phosphoric acid ("MGA") ceasing in December 2018.

In addition to our production facilities, we have also entered into a supply and offtake agreement with Itafos Conda LLC to market an estimated 330,000 tonnes per year of monoammonium phosphate ("MAP") produced at Conda, Idaho.

Our other Phosphate properties include:

- animal feed plants in Marseilles, Illinois, Joplin, Missouri, and Weeping Water, Nebraska;
- a technical and food grade phosphate plant in Cincinnati, Ohio; and
- a terminal facility at Morehead City, North Carolina.

Plant Locations	**Primary Products Produced** (1)
Aurora, North Carolina	DAP, MAP, SPA, animal feed, liquid fertilizer, purified acid, MGA, hydrofluosilicic acid, deflourinated merchant grade acid and low magnesium SPA ("LOMAG")
Cincinnati, Ohio	Blended purified acid products
Geismar, Louisiana	MGA (ceased production in December 2018)
Joplin, Missouri	Animal feed
Marseilles, Illinois	Animal feed
Redwater, Alberta	MAP and ammonium sulfate
Weeping Water, Nebraska	Animal feed
White Springs, Florida	SPA, MGA (2), LOMAG and MAP

(1) The following scientific terms have the following meanings:
DAP diammonium phosphate, 46% P_2O_5 (solid)
MAP monoammonium phosphate, 52% P_2O_5 (solid)
SPA superphosphoric acid, 70% P_2-O_5 (liquid)

(2) All of the MGA from White Springs is consumed internally in the production of additional products.

The Company executes offshore marketing and sales for its solid phosphate fertilizer through PCS Sales (USA), Inc.

In 2019, the performance of sulfate products will be reviewed as part of the Nitrogen operating segment, rather than the Phosphate and Sulfate operating segment. See note 4 of the 2018 Financial Statements for additional information.

v) Transportation, Storage and Distribution

We have an extensive infrastructure system to store and transport our products strategically located across distribution points in Canada and the US to serve our customers. In addition to storage located at our production facilities, we leased or owned approximately 400 terminal and warehouse facilities within North America, some of which have multi-product capability. To complement our distribution system in Canada and the US, we also leased or owned approximately 15,000 railcars and approximately 31,000 retail vehicles and application equipment.

Retail

Our North American Retail distribution assets include 83 terminals and 17 distribution centers to support distribution of crop nutrients, crop protection products and seed. Terminals are major crop nutrient storage facilities used to receive large quantities of crop nutrient for redistribution to retail centers and to growers directly. Distribution centers are used to more effectively distribute crop protection products and seed. These facilities are used to coordinate product supply to the retail centers and allow us to manage inventory levels across our distribution network.

Due to the bulk nature of our crop nutrient and seed products, delivery to end users through the supply chain can often take a significant amount of time. Supply chain management, utilizing our extensive storage and distribution network and transportation capabilities, allows us to ensure that crop nutrient and seed product is available to customers at the necessary time as growers have a short application and planting window, the precise timing of which is unpredictable due to both the seasonal nature of crop planting and the impact of weather.

Potash

Transportation costs can be a significant component of the total cost of potash. Producers may have an advantage in serving markets close to their sources of supply depending on prevailing transportation costs. International shipping cost variances permit offshore producers to effectively compete with our potash production in many geographies.

Most of our potash for North American customers is shipped by rail. We believe we have a strategic advantage in this market with approximately 260 owned or leased potash distribution points and a fleet of approximately 6,100 owned and leased railcars. We believe this is the most extensive domestic distribution network in the potash business. Shipments are also made by rail from each of our Saskatchewan mines to Thunder Bay, Ontario for shipment by lake vessel to our warehouses and storage facilities in Canada and the US.

In the case of our sales to Canpotex, potash is transported by rail to port facilities which store potash pending overseas shipment by ocean-going vessels. We have an equity interest in Canpotex Bulk Terminals Limited, which is a part owner of the port facilities utilized by Canpotex in Vancouver, British Columbia. Through Canpotex, we also transport potash to a port facility in Thunder Bay, Ontario and we have an interest in and transport potash to, a port facility located in Portland, Oregon. Following the suspension of PotashCorp's New Brunswick potash operations in early 2016, storage and loading facilities at the Port of Saint John – including our capacity of up to 2.5 million tonnes per year – has been made available to Canpotex for offshore shipping.

Nitrogen

We distribute our Nitrogen products by vessel, barge, railcar, truck and direct pipeline to our customers and, in high consumption areas, through our strategically located storage terminals. We lease or own approximately 210 storage terminals in Western Canada and throughout the US, as well as a fleet of approximately 4,000 owned or leased railcars. We also own and lease dry and liquid storage capacity in Europe. These locations provide a network of field and production site storage capacity sufficient to serve local dealers during the peak seasonal demand period and are also used to provide off-season storage.

We distribute products from Trinidad primarily to markets in the US, South America, Europe and North Africa. We employ four long-term chartered ocean-going vessels and utilize short-term and spot charters as necessary for the transportation of ammonia for our marine distribution operations in Trinidad. All bulk urea production from Trinidad is shipped through third-party carriers. In addition, Profertil's terminal on the Parana River includes a dedicated berth and two 100,000-tonne dry storage buildings in a key agricultural region of Argentina.

Phosphate and Sulfate

With respect to Phosphate, we have approximately 130 owned or leased phosphate distribution points and a fleet of approximately 4,900 owned and leased railcars. We also own one multi-purpose vessel used for molten sulfur and phosphoric acid transportation. We have long-term leases on shipping terminals in Morehead City and Beaufort, North Carolina through which we receive and store Aurora facility raw materials and finished product. Most of our offshore phosphate sales are shipped through the terminal at Morehead City. We use barges and tugboats to transport solid products, phosphoric acid and sulfur between the Aurora facility and shipping terminals. Raw materials and products, including sulfur, are also transported to and from the Aurora facility by rail and truck.

Purchased rock for our Redwater facility was imported into the port of Vancouver using ocean-going vessels and shipped by rail to Alberta. Our contract for phosphate rock from Africa to supply the Redwater phosphate facility ended as of December 31, 2018 and we expect to deplete our phosphate rock inventories in the second quarter of 2019. Sulfur used in production at our Redwater facility is sourced locally in Alberta and delivered exclusively by truck. MAP and ammonium sulfate are shipped out of the plant by either railcar or truck to customers primarily in Western Canada.

Sulfur is delivered to the White Springs facility by rail and truck from Canada and the US. Most of the phosphoric acid and chemical fertilizers produced at the White Springs facility are shipped to North American destinations by rail. Ammonia for Aurora and White Springs is supplied by rail and truck from our production facilities in Lima, Ohio; Geismar, Louisiana; and Augusta, Georgia.

vi) Selected Financial Information

Sales classified by operating segment and applicable category of products and services for the Company's 2018 fiscal year are provided in note 4 to the 2018 Financial Statements. 2018 sales or transfers to certain entities in which the Company has an investment that is accounted for under the equity method are provided in note 30 of the 2018 Financial Statements.

For the year ended December 31, 2017, sales classified by operating segment and applicable category of products and services are provided in note 3 to the consolidated financial statements of PotashCorp as at and for the year ended December 31, 2017 ("PotashCorp 2017 Financial Statements") and note 2 to the consolidated financial statements of Agrium as at and for the year ended December 31, 2017 ("Agrium 2017 Financial Statements"). 2017 sales or transfers to certain entities accounted for under the equity method are provided in note 28 to the PotashCorp 2017 Financial Statements and note 15 to the Agrium 2017 Financial Statements.

b) PRODUCTION METHODS

Production methods for Nutrien's manufactured products are set out below.

Potash

We produce potash using primarily conventional methods, but we also have a solution mine. In conventional operations, shafts are sunk to the ore body, which is approximately one kilometer below the surface. Mining machines cut out the ore, which is hoisted to the surface for processing. The ore is a mixture of potassium chloride, salt and insoluble particles. In solution mining, the potash is dissolved in warm brine and pumped to the surface for processing. Removing the clay and salt through a milling process produces saleable potash. Seven grades of potash are produced to suit different preferences of the various markets we serve.

In 2018, our conventional potash operations mined 39.58 million tonnes of ore at an average mineral grade of 23.60 percent potassium oxide ("K_2O"). In 2018, our potash production from all our operations consisted of 12.84 million tonnes of potash ("KCl" or "finished product") with an average grade of 60.94 percent K_2O, representing an estimated 56 percent of North American production.

In 2018, our nameplate capacity represented an estimated 56 percent of the North American total capacity (based on our nameplate capacity, see table below for further information). We allocate production among our mines on the basis of various factors, including cost efficiency and the grades of product that can be produced. The Patience Lake mine, which was originally a conventional underground mine, began employing a solution mining method in 1989. The other Saskatchewan mines we own employ conventional underground mining methods.

The following table sets forth, for each of the past two years, the production of ore, grade and finished product for each of our potash mines:

	Annual Nameplate Capacity [1]	Annual Operational Capability [2]		2018 Production			2017 Production		
		2019	2018						
	Finished Product (Millions of tonnes)	Finished Product (Millions of tonnes)	Finished Product (Millions of tonnes)	Ore (Millions of tonnes)	Grade % K_2O	Finished Product (Millions of tonnes)	Ore (Millions of tonnes)	Grade % K_2O	Finished Product (Millions of tonnes)
Rocanville	6.5	5.4	5.2	16.74	22.7	5.22	15.10	23.7	4.86
Allan	4.0	2.8	2.6	6.55	25.9	2.41	5.22	25.1	1.83
Vanscoy	3.0	2.2	2.7	6.49	26.1	2.24	7.37	24.38	2.42
Lanigan	3.8	2.1	2.0	6.98	21.0	1.96	6.31	21.0	1.82
Cory [3]	3.0	1.0	0.8	2.82	24.1	0.81	3.41	24.0	0.99
Patience Lake [4]	0.3	0.3	0.3	–	–	0.20	–	–	0.30
Totals	20.6	13.8	13.6	39.58		12.84	37.41		12.22

(1) Represents estimates of capacity as of December 31, 2018. Estimates are based on capacity as per design specifications or Canpotex entitlements once determined. In the case of Patience Lake, estimate reflects current operational capability. Estimates for all other facilities do not necessarily represent operational capability.

(2) Estimated annual achievable production level at current staffing and operational readiness (estimated at beginning of year). Estimate does not include inventory-related shutdowns and unplanned downtime.

(3) In November 2016, we announced operational changes at Cory to produce only white potash, with an expected operational capability of approximately 0.8 million tonnes per year. In 2019, Cory commenced partial operation of the red mill. Additional operational capability is achievable with increased staffing.

(4) Solution mine.

The mining of potash is a capital-intensive business subject to the normal risks and capital expenditure requirements associated with mining operations. The production and processing of ore may be subject to delays and costs resulting from mechanical failures and hazards, such as unusual or unexpected geological conditions, subsidence, water inflows, and other conditions involved in mining potash ore.

Nitrogen

Ammonia is produced by taking nitrogen from the air and reacting it with a hydrogen source, usually natural gas reformed with steam.

Ammonia is the feedstock used to produce a full line of upgraded products, including urea, ammonium nitrate, nitric acid and nitrogen solutions, including both UAN solutions and DEF products, and ESN®. Urea is produced by combining ammonia with carbon dioxide ("CO_2") and forming liquid urea, which can be further processed into a solid form. UAN solutions are liquid fertilizers that are produced by combining liquid urea, liquid ammonium nitrate and water. Urea solutions are produced by combining liquid urea with water. ESN® is a patented coated-fertilizer product that is made by coating the urea substrate with layers of polymers, allowing for more efficient delivery of nitrogen to the plant.

Ammonia, urea and nitrogen solutions are sold as fertilizers to agricultural customers and to industrial customers for various applications. Nitric acid and ammonium nitrate are sold to industrial customers for various applications. Urea is also sold for feed applications. ESN® is sold to agricultural customers.

Phosphate and Sulfate

We extract phosphate ore using surface mining techniques. At each mine site, the ore is mixed with recycled water to form a slurry, which is pumped from the mine site to our processing facilities. The ore is then screened to remove coarse materials, washed to remove clay and floated to remove sand to produce phosphate "rock". The annual production capacity of our mines is currently 7.4 million tonnes of phosphate rock. During 2018, the Aurora facility's total production of phosphate rock was 4.03 million tonnes and the White Springs facility's total production of phosphate rock was 1.85 million tonnes. The sequence for mining portions of the Aurora property was identified in the permit issued by the US Army Corps of Engineers in June 2009. The permit authorizes mining in excess of 22 years. Phosphate rock is the major input in our phosphorus processing operations. Substantially all the phosphate rock produced is used internally for the production of phosphoric acid, SPA, chemical fertilizers, purified phosphoric acid and animal feed products. At Geismar and Redwater, phosphoric acid was produced using imported rock. The Geismar Phosphate operation ceased production at the end of 2018 and the Redwater Phosphate operation is expected to shut down in the second quarter of 2019. We will continue to manufacture nitrogen fertilizers and industrial products at Geismar and nitrogen fertilizers and ammonium sulfate at the Redwater facility.

In addition to phosphate ore, the other principal raw materials we require are sulfur and ammonia. The production of phosphoric acid requires substantial quantities of sulfur, which we purchase from third parties. Any significant disruption in our sulfur supply to the phosphate facilities could adversely impact our financial results. We produce sulfuric acid at the Aurora, White Springs and Redwater facilities from purchased sulfur. At Geismar we purchased sulfuric acid.

Our phosphate operations purchase all their ammonia at market rates from or through our nitrogen and sales subsidiaries. Phosphoric acid is reacted with ammonia to produce DAP and MAP as well as liquid fertilizers.

We produce MGA at our Aurora and White Springs facilities. Some MGA from Aurora is sold to foreign and domestic fertilizer producers and industrial customers. We further process the balance of the MGA to make solid fertilizer (DAP and MAP), liquid fertilizers, animal feed supplements for the poultry and livestock markets, and purified phosphoric acid for use in a wide variety of food, technical and industrial applications.

Ammonium sulfate is produced by reacting ammonia and sulfuric acid and then granulated to form a solid granular product. We produce approximately 360,000 tonnes of ammonium sulfate at our Redwater, Alberta facility. This capacity is expected to double in the latter half of 2019 once MAP production has ceased and the second ammonium sulfate train is commissioned.

c) SPECIALIZED SKILL AND KNOWLEDGE

Nutrien believes its success is dependent on the performance of its management and key operational employees, many of whom have specialized skills and knowledge relating to the retail, potash, nitrogen and phosphate and

sulfate industries, and to the conduct of the retail, potash, nitrogen and phosphate and sulfate operations. Nutrien believes that it has adequate personnel with the specialized skills and knowledge to successfully carry out the Company's business and operations.

d) COMPETITIVE POSITION

The market for Nutrien's crop nutrients and crop production inputs is highly competitive. The Company's competitors include other large integrated fertilizer producers, co-operatives, divisions of agribusiness companies, regional distributors and independent dealers.

Retail

Retail operates more than 1,700 retail locations across the US, Canada, Australia and key areas of South America. We are a major distributor of crop nutrients, crop protection products and seed in a highly competitive industry. The principal competitors in the distribution of crop production inputs include agricultural co-operatives, other major agriculture retailers and smaller independent retailers and distributors. Retail also produces a range of high quality proprietary crop protection, seed and crop nutrient products that generate higher margins for our Retail segment. Retail offers a digital tool that provides customer account management, agronomic insights and hands-on customer support that drives economic value for our growers.

Potash

Potash is a commodity, characterized by minimal product differentiation, and, consequently, producers compete based on price, quality and service. We price competitively, sell high quality products and provide high quality service to our customers. Our service includes maintaining warehouses, leasing railcars and chartering vessels to enhance our delivery capabilities. The high cost of transporting potash affects competition in various geographic areas. During 2018 our principal competitors in North America included PA Belaruskali, ICL, Intrepid Potash Inc., K+S Group, The Mosaic Company ("Mosaic"), SQM and PJSC Uralkali. In 2018, outside of Canada and the US, Canpotex competed with producers such as APC, PA Belaruskali, Eurochem Group AG, ICL, K+S Group, SQM and PJSC Uralkali.

Nitrogen

Nitrogen-based fertilizer is a global commodity, and customers, including end-users, dealers and other fertilizer producers and distributors, base their purchasing decisions principally on the delivered price and availability of the product. The relative cost of, and availability of transportation for, raw materials and finished products to manufacturing facilities are also important competitive factors.

Within North America, transportation costs play a factor in regional price differences and we compete with other domestic producers, including CF Industries Holdings, Inc., CVR Partners, L.P., Koch Industries, Inc., LSB Industries, Inc., and OCI N.V. and with imported product from suppliers in the Middle East, North Africa, Trinidad, Central and Eastern Europe and China. In the offshore market, we compete with a wide range of offshore and domestic producers. Nitrogen is also an input into industrial production of a wide range of products. Many manufacturers want consistent quality and just-in-time delivery to keep their plants running.

Our North American plants are geographically well positioned to service agriculture, industrial and feed customers across Canada and the US. Our robust North American distribution network provides in-market support, during seasonal peak demand, ensuring timely product availability. Trinidad mainly supplies our international fertilizer and industrial customers.

Our US production has continued to benefit from the low cost of natural gas, and to a greater extent our Western Canadian production, which utilizes natural gas indexed to the Alberta benchmark price, has also benefited. In Trinidad, the price at which we purchase natural gas varies primarily with ammonia market prices, and annual escalating floor prices. Ammonia and urea predominate our offshore sales of nitrogen and originate primarily from Trinidad, with other sales coming from purchased product locations. For 2018, our offshore sales of nitrogen products represented 22 percent of our total third-party nitrogen sales.

Phosphate and Sulfate

Markets for phosphate fertilizer products are highly competitive and based largely on price, reliability and deliverability. Our principal advantages at Aurora and White Springs are that we produce higher value, diversified products and that we operate integrated phosphate mine and phosphate processing complexes. Our Redwater production is well positioned to capture higher regional netbacks, in the Western Canadian market. Our in-market distribution network ensures product supply during peak demand periods.

Our competitors for North American phosphate fertilizer sales are Mosaic, J.R. Simplot Company and offshore imports primarily from China, Morocco and Russia.

In offshore markets, we compete primarily with OCP, as well as producers from Africa and the Middle East. For 2018, our offshore sales of phosphate products represented 18 percent of our total third-party phosphate and sulfate sales.

Within the animal feed supplement business in the phosphate segment, opportunities exist to differentiate products based on nutritional content. We have a significant presence in the domestic feed supplement market segments. We compete with Mosaic, J.R. Simplot Company and Chinese and Russian producers for feed sales.

Industrial products are the least commodity-like of the phosphate products as product quality is a more significant consideration for customer buying decisions. We market industrial phosphate products principally in the US and we compete with ICL, Innophos Holdings, Inc. and Chinese producers for North American industrial sales.

e) SOURCES OF RAW MATERIALS

Potash

The production of potash requires a sustained fresh water supply for the milling process which is sourced from subsurface reservoirs located on the mining projects. These reservoirs provide a sustainable source of process water for the milling operations.

Nitrogen

Natural gas is the primary raw material used for producing ammonia, which is the base for virtually all nitrogen products. In North America, we may enter into natural gas hedging transactions with the goal of minimizing risk from volatile gas prices. In Trinidad, natural gas is purchased under contract using a pricing formula related to the market price of ammonia. In 2018, we entered into a new five-year gas supply contract, which includes minimum take or pay requirements, to provide the entire Trinidad ammonia complex with 90 percent of its expected requirements for 2019 through 2023. With the exception of the Trinidad facility, we purchase most of our natural gas from producers or marketers at the point of delivery of the natural gas into the pipeline system, then pay the pipeline company and, where applicable, the local distribution company to transport the natural gas to our nitrogen facilities. Approximately 90 percent of our North American consumption of natural gas by our nitrogen operations is delivered pursuant to firm transportation contracts, which do not permit the pipeline or local distribution company to interrupt service to, or divert natural gas from, the plant.

Phosphate and Sulfate

Phosphate rock is the major input in our phosphorus processing operations, which is mined at our Aurora and White Springs facilities. Until the end of 2018, we also purchased phosphate rock from OCP for our Geismar and Redwater Phosphate facilities. We closed our Geismar Phosphate facility at the end of 2018 and we also made the decision to repurpose our Redwater Phosphate facility in order to increase our ammonium sulfate capacity.

In addition to phosphate ore, the other principal raw materials we require are sulfur and ammonia. The production of phosphoric acid requires substantial quantities of sulfur, which we purchase from third parties. Any significant disruption in our sulfur supply to the phosphate facilities could adversely impact our financial results. We produce sulfuric acid at the Aurora, White Springs and Redwater facilities from purchased sulfur. Ammonia for Aurora is supplied by rail and truck from our production facilities in Lima, Ohio and Augusta, Georgia.

Ammonia for White Springs is primarily supplied by truck from our Augusta nitrogen plant. At Redwater, ammonia is supplied on site from our nitrogen plants. The Redwater Phosphate facility is expected to be shut down in the second quarter of 2019.

f) INTANGIBLE PROPERTIES

We have registered and pending trademarks in Canada, the US and other countries where our products are sold. In addition, it has been the Company's practice to seek patent protection for inventions and improvements that are likely to be incorporated into its products, where appropriate, and to protect the freedom to use its inventions in its manufacturing processes. We consider several factors in assessing the materiality of our patents including, but not limited to, scope and breadth of claims, sales volumes of products incorporating the technology, strategic importance and patent duration. The Company has registered patents in Canada, the US and other countries where its products are sold.

While these trademarks and patents constitute valuable assets, we do not regard any single trademark or patent as being material to our operations as a whole. Refer to note 17 of the 2018 Financial Statements for disclosure on estimated useful lives of intangible assets.

g) SEASONALITY

The agricultural products business is seasonal. Crop input sales are primarily concentrated in the spring and fall crop input application seasons. Crop nutrient inventories are normally accumulated leading up to each application season. Our cash collections generally occur after the application season is complete, and our customer prepayments are concentrated in December and January. Feed and industrial sales are more evenly distributed throughout the year. See "Risk Factors" below for a description of any risks related to seasonality.

h) ENVIRONMENTAL MATTERS

Our operations are subject to numerous environmental requirements under federal, provincial, state and local laws, regulations and permits of the countries we operate in. These laws, regulations and permits govern matters such as air emissions, wastewater discharges, land use and reclamation, groundwater quality, and solid and hazardous waste management. Many of these laws, regulations and permit requirements are becoming increasingly stringent, and the cost of compliance with these requirements can be expected to increase over time.

Asset retirement obligations typically involve the removal of the asset, remediation of any contamination resulting from the use of that asset and reclamation of the land. We record provisions under IFRS for environmental remediation and asset retirement obligations. See note 20 of the 2018 Financial Statements for the financial impact of asset retirement obligations and accrued environmental costs recorded as operating expenses in earnings and capitalized to property, plant and equipment in 2018. If a matter does not meet the requirements for recognition as a provision under IFRS, it is classified as an environmental contingency. For additional information, see note 31 of the 2018 Financial Statements.

Future environmental capital expenditures are subject to a number of uncertainties, including changes to environmental laws and regulations and interpretations by regulatory authorities or changes in circumstances affecting the Company's operations. At this time, we are unable to estimate the capital expenditures we may make in subsequent years to meet pollution prevention and emissions control objectives, as well as other environmental requirements.

i) Environmental Requirements, Permits and Regulatory Approvals

Many of our operations and facilities are subject to a variety of regulatory requirements, permits and approvals, all of which vary depending on the operation in question. Licenses, permits and approvals at operating sites are obtained in accordance with applicable laws and regulations, which may limit or regulate: operating conditions, rates and efficiency; land, water and raw material use and management; product storage, quality and transportation; waste storage and disposal; and emissions and other discharges. Additional legal requirements may apply in circumstances where site contamination predates the current applicable regulatory framework,

where remediation is ongoing or where there is otherwise evidence that historic remediation activities have not been successful in protecting the environment. These additional requirements may result in an environmental remediation liability that must be resolved.

We believe that we are currently in material compliance with existing regulatory requirements, permits and approvals. Permits and approvals are typically required to be renewed or reissued periodically. We may also become subject to new laws or regulations that impose new requirements or require us to obtain new or additional permits or approvals. However, there can be no assurance that such permits or approvals will be issued in the ordinary course. Further, the terms and conditions of future regulations, permits and approvals may be more stringent and may require increased expenditures by the Company.

Air Quality

With respect to air emissions, we anticipate that additional actions and expenditures may be required to meet increasingly stringent federal, provincial and state regulatory and permit requirements in the areas in which we operate, including existing and anticipated regulations under the US federal Clean Air Act. The US Environmental Protection Agency ("EPA") has issued a number of regulations establishing requirements to reduce air pollutant emissions. We continue to monitor developments in these various programs and assess their potential impact on our operations. The calciners at our Aurora, North Carolina phosphoric acid plant are subject to mercury emission limits adopted by the EPA in 2015, which do not reflect actual emissions during normal operations. The EPA has announced that it intends to issue a revised rule to address the issue and remove the need for the state consent order under which the calciners have been operating while the EPA addresses the issue. In 2015, we entered a consent decree that requires reductions in sulfur dioxide emissions at specified sulfuric acid plants with the final compliance dates occurring at the beginning of 2020. See note 31 of the 2018 Financial Statements for additional information.

Water Quality

There are international, federal, provincial and state regulatory initiatives underway that may result in new regulatory restrictions on discharges of nutrients, including discharges of nitrogen and phosphorus to waters in the US ("Nutrient Criteria"). There are also ongoing litigation efforts in several jurisdictions of the US that seek to require US environmental agencies to develop new Nutrient Criteria. These litigation and regulatory proceedings may result in new Nutrient Criteria that apply to water discharges from several of the Company's facilities in the US. Some of the proposed restrictions imposed through Nutrient Criteria also have the potential to require our customers to reduce or eliminate their uses of the Company's products. These Nutrient Criteria could have a material effect on either the Company or its customers, but the impact is not currently predictable or quantifiable with reasonable certainty because many of these initiatives are in relatively early stages and compliance alternatives may be available that do not create material impacts. The Company is closely monitoring and evaluating the impact of these initiatives on its operations.

Waste Management

In 2003, the EPA began investigating the phosphate industry as part of its National Enforcement Initiative regarding the mineral processing industry. The purpose of the EPA's National Enforcement Initiative is to ensure that waste resulting from mineral processing is managed in accordance with regulations under *The Resource Conservation and Recovery Act*, which is the US federal statute that governs the generation, transportation, treatment, storage and disposal of hazardous wastes. The EPA is also evaluating the mineral processing industry's compliance with certain US *Clean Air Act* programs, including Maximum Achievable Control Technology and Prevention of Significant Deterioration, the US *Emergency Planning and Community Right to Know Act* and the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* ("CERCLA").

Several of the Company's phosphoric acid production facilities have received notices of violation or entered orders with the EPA as a result of the EPA's National Enforcement Initiative. These facilities include the Conda, Idaho Phosphate production facility sold in January 2018, for which Nutrien retained environmental liabilities attributable to its historic activities. The Company is negotiating with the EPA and the relevant state environmental agencies to resolve the matters relating to the Company's facilities, and these negotiations are ongoing. In these negotiations, we are seeking to minimize the costs and impact on our future operations consistent with applicable legal requirements, including financial assurance for the future closure, maintenance and monitoring of phosphogypsum stack systems. The full scope of the costs that we may ultimately incur to bring these matters to a conclusion could be material to our operations, but are not currently predictable or quantifiable with reasonable certainty. See note 31 of the 2018 Financial Statements for additional information.

ii) Asset Retirement Obligations

Provisions are recognized when: (i) the Company has a present legal or constructive obligation as a result of past events; (ii) it is probable that an outflow of resources will be required to settle the obligation; and (iii) the amount can be reliably estimated.

We have recorded in the 2018 Financial Statements provisions for decommissioning obligations (also known as asset retirement obligations) primarily related to mining and mineral activities. The major categories of asset retirement obligations include reclamation and restoration costs at our potash and phosphate mining operations (phosphate mining, in particular), including the management of materials generated by mining and mineral processing, such as: various mine tailings and gypsum; land reclamation and revegetation programs; decommissioning of underground and surface operating facilities; general clean-up activities aimed at returning the areas to an environmentally acceptable condition; and post-closure care and maintenance.

The estimation of the costs of asset retirement obligations depends on the development of environmentally acceptable closure and post-closure plans. In some cases, this may require significant research and development to identify preferred methods for such plans that are economically sound and that, in most cases, may not be implemented for several decades. We have continued to use appropriate technical resources, including outside consultants, to develop specific site closure and post-closure plans in accordance with the requirements of the various jurisdictions in which we operate.

The asset retirement obligations are generally incurred over an extended period. As at December 31, 2018, we had accrued a total of $1,295 million for asset retirement obligations, the current portion of which totaled $122 million. For additional information, see note 20 of the 2018 Financial Statements.

iii) Site Assessment and Remediation

We are also subject to environmental statutes that may require investigation and, where appropriate, remediation of contaminated properties. Canadian federal and provincial laws as well as CERCLA and other US federal and state laws impose liability on, among others, past and present owners and operators of properties or facilities at which hazardous substances have been released into the environment and persons who arrange for disposal of hazardous substances that are released into the environment. Liability under these laws may be imposed jointly and severally and without regard to fault or the legality of the original actions, although such liability may be divided or allocated according to various equitable and other factors. We have incurred and expect to continue to incur costs and liabilities in respect of our current and former operations, including those of divested and acquired businesses. We have generated and, with respect to our current operations, continue to generate substances that could result in liability for us under these laws.

As at December 31, 2018, we had accrued environmental costs of $534 million for costs associated with site assessment and remediation, including consulting fees, related to the clean-up of contaminated sites currently or formerly associated with the Company or its predecessors' businesses. As at December 31, 2018, the current portion of these costs totaled $34 million. The accrued amounts include the Company's

and its subsidiaries' expected final share of the costs for the site assessment and remediation matters to the extent future outflow of resources is probable and can be reliably estimated. For additional information, see note 20 of the 2018 Financial Statements.

It is often difficult to estimate and predict the potential costs and liabilities, including natural resource damages, associated with these programs, and there is no guarantee that we will not in the future be identified as potentially responsible for additional costs under these programs, either as a result of changes in existing laws and regulations or as a result of the identification of additional matters or properties covered by these programs. For certain matters, we are unable to make a reliable estimate of the amount and timing of any financial effect in excess of the amounts accrued for reasons including complexity of the matters, early phases of most proceedings, lack of information on the nature and timing of future actions in the matters, dependency on the completion and findings of investigations and assessments, and the lack of specific information as to the nature, extent, timing and cost of future remediation with respect to those matters. Until we have greater clarity as to our liability and the extent of our financial exposure, it is not practicable to make a reliable estimate of the financial effect. For additional information, see note 31 of the 2018 Financial Statements.

iv) Climate Change and Greenhouse Gas ("GHG") Emissions

Nutrien generates GHG emissions directly and indirectly through the production, distribution and use of its products. These emissions may be subject to climate change policies and regulations, all of which are developing in unique ways within various federal, provincial and state jurisdictions. Increasing regulation of GHGs may impact our operations by requiring changes to our production processes or increasing raw material, energy, production or transportation costs in order to ensure compliance. There are also significant differences in the climate change policies of countries where Nutrien operates as some are parties to the Paris Agreement, negotiated in December 2015, under the United Nations Framework Convention on Climate Change, and some are not.

Sources of GHGs from our production operations include emissions from the reforming of natural gas to produce hydrogen, which is used to synthesize ammonia, as well as process emissions from some of our nitric acid plants. We estimate that the production stage of our operations accounts for approximately 95 percent of our overall emissions. About 60 percent of the natural gas required to produce ammonia – the basic building block of all nitrogen fertilizer – is used to provide the necessary hydrogen for the process. Given current economically viable technologies, the CO_2 emissions related to this process are fixed by the laws of chemistry and cannot be reduced. We have developed strategies to attempt to improve energy efficiency in our production operations, to capture and store carbon, and to reduce the amount of nitrous oxide ("N_2O") emissions from our nitric acid facilities. We are also investing in developing new precision agriculture technologies and agronomic services that improve the efficiency of fertilizer applications within our Retail operations, so more grain can be produced with the same amount of fertilizer and with reduced loss to the environment.

Our Canadian facilities are primarily located in the provinces of Alberta and Saskatchewan and are subject to a variety of provincial and federal requirements to reduce GHG emissions ranging from carbon taxes to emissions intensity reduction requirements. The Company attempts to minimize its Canadian compliance costs through the implementation of various efficiency and emissions reduction projects, including: overall efforts to increase operational efficiency; operating a cogeneration facility in partnership with TransCanada Energy Ltd., a subsidiary of TransCanada Corporation, at Carseland, Alberta that captures waste heat and produces emission offset credits; operating a cogeneration facility in partnership with ATCO Power Ltd. and SaskPower at the Company's Cory, Saskatchewan potash mine that captures waste heat and provides all of the mine's steam requirements; and the development and implementation of the Nitrous Oxide Emissions Reduction Protocol designed to generate emission offset credits for farmers who reduce their N_2O emissions.

In 2018, the Alberta government established industrial emission intensity benchmarks for regulated industries. Product benchmarks that are applicable to Nutrien's Alberta facilities are for ammonia and

ammonium nitrate, as well as a site-specific benchmark for other fertilizer products produced at each site. The benchmark for ammonia is based on 90 percent of the Alberta ammonia industry production-weighted average emission intensity. The ammonium nitrate benchmark was based on the best performer in Alberta (Nutrien's Redwater facility), and the site-specific other product benchmark is based on 80 percent of the remainder of each other Alberta facility's emissions.

Alberta is phasing the new Carbon Competitiveness Incentive Regulation ("CCIR") program over 2018 and 2019, where facilities will be allowed an additional transitional emission allowance representing 50 percent of the facility's historical compliance obligation (based on emissions and production) for 2018 and 25 percent of historical compliance obligation for 2019. Starting in 2020, all Alberta facilities will be subject to the full compliance obligation. Also starting in 2020, the "free" emission allowance for each product will be reduced by one percent per year.

With the CCIR program being phased in slowly over the initial years, Nutrien is forecasting aggregate carbon costs of approximately $3.0 million to $5.0 million by 2022 in Alberta based on the increasing emission stringency and forecasted carbon price. These forecasts depend heavily on ammonia plant reliability and turnaround schedules because starting up and shutting down the ammonia plants results in significant greenhouse gas venting over normal operations.

In late 2016, Canada and its provinces, other than Saskatchewan and Manitoba, agreed to the Pan-Canadian Framework on Clean Growth and Climate Change ("Framework"). Manitoba subsequently signed onto the Framework, whereas Ontario and Alberta have since pulled out of it. The Framework is the blueprint by which Canada will attempt to meet its commitment under the Paris Agreement. The *Greenhouse Gas Pollution Pricing Act* ("GGPPA") is Canada's legislative proposal for implementing the Framework and is intended to serve as a regulatory backstop in the event a province does not otherwise implement an adequate provincial GHG regime. Saskatchewan continues to oppose both the Framework and the GGPPA and has launched a constitutional legal challenge to the validity of the GGPPA. Ontario has launched a similar challenge. Until court decisions are rendered in those cases, it is unclear what effect, if any, the GGPPA will have on Nutrien's Canadian operations.

In September 2018, the Canadian federal government announced that the federal backstop would apply in Saskatchewan, Manitoba, Ontario and New Brunswick; however, the Saskatchewan heavy emitters program was deemed equivalent, which allows for a five percent reduction of a specified three-year average by 2030. This applies to all facilities that emit over 50,000 tonnes, which includes all six of Nutrien's potash facilities. Negotiations between the Saskatchewan Ministry of Environment and the federal Department of Environment and Climate Change Canada are underway to develop a system that would apply to power generation and, as a result, pass-through costs on electricity from the backstop are yet to be determined.

In the US, the EPA has issued GHG emissions regulations that establish a reporting program for emissions of CO_2, methane and other GHGs, as well as a permitting program for certain large GHG emissions sources. Beyond that, there is significant uncertainty regarding the likelihood of new or amended federal GHG regulations in the US under the current presidential administration, and the potential impact on the Company cannot be determined at this time. Apart from federal regulation of GHGs, some US states have also enacted laws concerning GHG emissions that we are monitoring for impacts on our operations.

The impacts of climate change and future restrictions on emissions of GHGs on the Company's operations could be material but cannot be determined with any certainty at this time.

v) Facility and Product Security

Through our Safety, Health and Environment department, we regularly evaluate and address actual and potential security issues and requirements associated with our operations in the US and elsewhere using approved security vulnerability methodologies. Additional actions and expenditures may be required in the future. In the US, chemical facilities are regulated under the *Maritime Transportation Security Act*, the *Chemical Facility Anti-Terrorism Standards*, and the *Food Safety Modernization Act* (Mitigation Strategies

to Protect Food Against Adulteration). It is anticipated that the US Congress will continue to consider federal legislation designed to reduce the risk of any future terrorist acts at industrial facilities. We believe that we are in material compliance with applicable security requirements, and we have also developed and adopted security measures and enhancements beyond those presently required at both our regulated and non-regulated facilities. To date, neither the security regulations nor our expenditures on security matters have had a material adverse effect on our financial position or results of operations. We are unable to predict the potential future costs to us of any new governmental programs or voluntary initiatives.

i) EMPLOYEES

At December 31, 2018, we employed 20,300 people. Of these 20,300 employees, our Retail operations employed approximately 12,500 people and our Potash, Nitrogen, Phosphate and Sulfate operations employed approximately 6,600 people, with the remaining approximately 1,200 people employed within our Corporate functions.

We have entered into 16 collective bargaining agreements with labor organizations representing employees. The following table sets forth the plant locations where we have entered into collective bargaining agreements and their respective expiry dates.

Plant Location	Collective Bargaining Agreement Expiry Date
Allan, Saskatchewan	April 30, 2019
Cory, Saskatchewan	April 30, 2019
Lanigan, Saskatchewan	January 31, 2021
Patience Lake, Saskatchewan	April 30, 2019
Regina, Saskatchewan	December 31, 2019
Regina, Saskatchewan	December 31, 2019
Regina, Saskatchewan	December 31, 2019
Rocanville, Saskatchewan	May 31, 2018 (1)
Vanscoy, Saskatchewan	April 30, 2018 (1)
Florence, Alabama	July 14, 2023
Mulberry, Florida	May 31, 2021
White Springs, Florida	December 10, 2021
Americus, Georgia	June 30, 2023
Greenville, Mississippi	August 26, 2019
Cincinnati, Ohio	November 1, 2019
Lima, Ohio	October 31, 2022

(1) The terms of this collective bargaining agreement, including new expiry date, remain under renegotiation as of the date hereof.

We believe we have an effective working relationship with our employees, and the unions representing them.

j) SOCIAL OR ENVIRONMENTAL POLICIES

Code of Ethics

Nutrien's most important assets are our employees, customers, shareholders, suppliers and the communities in which we operate. It is critical that we maintain the trust of each of these stakeholders. Our Code of Ethics ("Code") helps us fulfill our responsibilities by: committing to the public and our stakeholders our uncompromising integrity in every aspect of our business; describing our values and principles of business conduct, including our own high standards and fundamental respect for the rule of law; guiding employees how to engage in ethical decision making in all of our operations around the world; and outlining our approach to interacting ethically with stakeholders and acting in the best interest of shareholders. The Code also outlines our commitment to the safety of people and protection of the environment.

Nutrien actively promotes ethical behavior through the Code and numerous supporting policies, which are reinforced by due diligence procedures, training, and our compliance hotline. In 2018, all Nutrien employees received formal training on the Code and other compliance related topics. Our confidential 24-hour, 365 days a year, externally administered compliance hotline allows employees to report any violations or suspected violations of the Code, other Nutrien policies or any other illegal or unethical behavior. The Code also clearly sets out the Company's non-retaliation policy which is designed to enable employees to raise good faith issues in a safe environment without fear of retaliation.

Anti-Corruption Policy

Nutrien operates in a wide range of jurisdictions and is vigilant and proactive in preventing and detecting corruption. In 2018, we launched a global Anti-Corruption Policy. This policy requires those who work on behalf of Nutrien to ensure that their own conduct fulfils the corporate commitment to compliance with the laws in each applicable jurisdiction. It applies to Nutrien's directors, officers, employees, representatives, consultants, and other agents of Nutrien and each of its subsidiaries and in every country where we do business.

Nutrien maintains an anti-corruption due diligence program that includes:

- identifying high risk third parties, including acquisition targets and potential joint venture partners, and conducting diligence;
- incorporating anti-corruption clauses in contracts or obtaining certifications that include anti-corruption language for high risk third parties; and
- requiring anti-corruption training and other risk mitigation steps where appropriate, such as annual certification or continued monitoring to identify and address any potential issues.

Workplace Policies

In 2018, we established a robust diversity and inclusion strategy that focuses on increasing gender diversity and match-to-market representation of visible minorities, including Indigenous peoples in Canada. Within the strategy, Nutrien is committed to increasing diversity of its workforce while increasing inclusive practices and a sense of belonging for our employees. We implemented a Respect in the Workplace Policy, an Inclusive Workplace Commitment Statement and an Equal Employment and Affirmative Action Policy. Implementation of our workplace diversity and inclusion initiatives is supported by training and workshops, employee resource groups, and ongoing monitoring of internal employment trends (new hires, promotion and turnover) for diverse employee groups. In 2018, we made the decision to benchmark our inclusion maturity using a comparison of our practices to the Global Diversity and Inclusion Benchmark model as a basis for continuous improvement.

Supplier Code of Ethics and Procurement Procedure

In 2018, we launched a Supplier Code of Ethics ("Supplier Code"), aligned with our commitment to the ten principles of the United Nations Global Compact and international standards. The Supplier Code identifies the values that Nutrien expects its suppliers to embrace and applies to those suppliers that provide products or services to Nutrien around the world.

Commitment by our suppliers to the principles of the Supplier Code is significant in Nutrien's decision making process. Our legal and compliance teams support the due diligence process for high-risk suppliers, which includes ensuring that appropriate language is included in contracts with various suppliers and a requirement that the supplier adhere to our Supplier Code. Where suppliers refuse to follow the principles of the Supplier Code or show signs that they are not committed to improving their practices to comply with its principles, Nutrien will review its relationship with the supplier. Where contractual commitments and local law permit, this review may include termination of our relationship with the non-compliant supplier.

Nutrien is also committed to supporting diversity and inclusion throughout the procurement process. Our procurement policies and procedures – including our Procurement Diversity and Inclusion Procedure – are designed to ensure that fair consideration is given to all potential suppliers. We have developed an Aboriginal

Content Playbook to assist suppliers develop local Aboriginal content in their own organizations and supply chains. In addition, Nutrien works with Aboriginal opportunity partner companies to provide contracting opportunities at our worksites. We believe in building and maintaining relationships of mutual respect with Aboriginal communities through our procurement practices, and extend this further by providing employment and training opportunities and community investments.

Safety, Health, Environment and Security Policy

Nutrien is committed to the care and protection of our people, environment, community, and customers. We honor that commitment by making safety a core value of our organization, as we grow our world from the ground up.

In 2018, Nutrien implemented a Safety, Health, Environment and Security ("SHE&S") Policy. Our goals are to:

- Protect our people, assets, facilities, communities and environment;
- Proactively prevent incidents and minimize risk by continuously improving our safety, health and environmental performance;
- Promote employee physical and mental health and well-being; and
- Drive excellence in safety, health and environment (SH&E) across our operations and supply chain.

We strive to accomplish these goals through our SH&E strategy of home safe, every day, which brings our safety vision, principles and priorities to life and guides our daily actions and behaviors. Nutrien will ensure leaders and their teams are well-supported with SH&E expertise and resources to help everyone go home safe, every day.

Nutrien has well-defined SHE&S policies, programs and processes, committed leadership, and a responsible workforce. In addition to a Corporate SHE&S Department, it has established a SHE&S organization in each business unit with clear lines of reporting and accountability. This has enabled Nutrien to focus on both oversight and governance as well as increasing management involvement in its operations and activities. Nutrien stewards to an integrated SHE&S management system, which includes a policy and system of documenting SHE&S management and performance expectations applicable to Nutrien's facilities. Nutrien's business units and, where appropriate, individual facilities augment these requirements with system controls necessary to manage the risks unique to those operations.

Continuous improvement and performance monitoring of Nutrien's operations occur in part through the Board SHE&S Committee ("BSC"), and also through various business unit initiatives and work teams. The development of environmental management systems standards, guidance documents and continuous improvement occurs at the business unit level SHE&S leaders' committee ("Operational Committee") and the Corporate SHE&S Department. The Corporate SHE&S Department reports through the Operational Committee, where performance and risk management issues are addressed. The SHE&S leaders' committee reports through the Corporate SHE&S Committee ("CSC"), which in turn reports to the BSC. Policy and strategy are reviewed annually at the CSC level for relevance and modified as appropriate. The BSC is responsible for the general oversight of SHE&S governance. These committees meet on a recurring basis to monitor performance against annual and longer-term performance goals, to discuss plans and strategies relating to our processes, and to evaluate opportunities for improving our systems.

Technical support and compliance assurance for Nutrien's operations are managed at three levels within the organization: the facilities level, business unit level and corporate level. At the corporate level, Corporate SHE&S staff are responsible for maintaining integrated systems, performance monitoring, providing technical expertise and conducting business unit SHE&S audits. The use of a structured compliance assurance program enables Nutrien to achieve continuous improvement and consistent management practices at its facilities and in its operations.

Nutrien maintains ongoing, close working relationships with industry associations and regulatory agencies. These relationships ensure that new or changing regulations are known, understood, and communicated so risk management strategies can be developed to maintain compliance.

5.2 RISK FACTORS

Our performance and our future operations are and may be affected by a wide range of risks. The following section describes our key risks and uncertainties. Any or all of these risks, or other risks not presently known to us or that we do not deem material, could have a material adverse effect on our business, financial condition, results of operations, cash flows, value of our debt securities and, in certain cases, our reputation.

1. Significant long-term changes in the agriculture space could adversely impact our business

The agricultural landscape is evolving at an increasingly fast pace as a result of factors including farm and industry consolidation, agricultural productivity and development and climate change.

Farm consolidation in the US and other developed markets has been ongoing for decades and is expected to continue as grower demographics shift and advancements in innovative technology and equipment enables farmers to manage larger operations to create economies of scale in a lower-margin, more capital-intensive environment. Increased consolidation in the crop nutrient industry has resulted in greater resources dedicated to expansion, research and development opportunities, leading to increased competition in advanced product offerings and innovative technologies. Some of these competitors have greater total resources or are state-supported, which make them less vulnerable to industry downturns and better positioned to pursue new expansion and development opportunities.

The advancement and adoption of technology and digital innovations in agriculture and across the value chain has increased and is expected to further accelerate as grower demographics shift and pressures from consumer preference and governments evolve. The development of seeds that require less crop nutrients, development of full or partial substitutes for our products or developments in the application of crop nutrients such as improved nutrient use or efficiency through use of precision agriculture could also emerge, all of which have the potential to adversely affect the demand for our products and results of operations.

The prospective impact of potential climate change on our operations and those of our customers and farmers remains uncertain. Some scientists have suggested that the impacts of climate change could include changing rainfall patterns, water shortages, changing sea levels, changing storm patterns and intensities, and changing temperature levels, and that these changes could be severe. These impacts could vary by geographic location.

These factors as well as other factors affecting long-term demand for our products and services (such as population growth and changes in dietary habits) could adversely impact our strategy, demand for our products and financial performance.

2. Shifting global dynamics may result in a prolonged agriculture downturn

Global macro-economic conditions and shifting dynamics, including trade tariffs and restrictions and increased price competition, or a significant change in agriculture production or consumption trends, could lead to a sustained environment of reduced demand for our products, and/or low commodity prices.

We are subject to intense price competition from both domestic and foreign sources, including state-owned and government-subsidized entities. Crop nutrients, including potash, nitrogen and phosphate, are global commodities with little or no product differentiation, and customers make their purchasing decisions principally on the basis of delivered price and, to a lesser extent, on customer service and product quality. Historically, selling prices for our products have fluctuated in response to periodic changes in supply and demand conditions. Supply is affected by available capacity and operating rates, raw material costs and availability, government policies and global trade.

Periods of high demand, high capacity utilization and increasing operating margins tend to result in investment in production capacity, which may cause supply to exceed demand and capacity utilization and realized selling prices for our products to decline, resulting in possible reduced profit margins. Such conditions could also include write-downs in the value of our inventory and production assets, and

temporary or permanent curtailments of production. Competitors and potential new entrants in the markets for potash, nitrogen and phosphate have in recent years expanded capacity, begun construction of new capacity, or announced plans to expand capacity or build new facilities. The extent to which current global or local economic and financial conditions, changes in such conditions or other factors may cause delays or cancellation of some of these ongoing or planned projects, or result in the acceleration of existing or new projects, is uncertain. Future growth in demand for our products may not be sufficient to absorb excess industry capacity.

We are impacted by global market and economic conditions that could adversely affect demand for crop nutrients or increase prices for, or decrease availability of, raw materials and energy necessary to produce our products. This includes rising incomes in developing countries, the relative value of the US dollar and its impact on the importation of fertilizers, foreign agricultural policies, the existence of, or changes in, import or foreign currency exchange barriers in certain foreign markets and other regulatory policies of foreign governments, as well as the laws and policies affecting foreign trade and investment. Furthermore, some of our customers require access to credit to purchase our products and a lack of available credit to customers in one or more countries, due to this deterioration, could adversely affect demand for crop nutrients as there may a reluctance to replenish inventories in such conditions.

3. Our operations may be affected by political, economic and social instability in the areas in which we operate

We are a global business with significant operations in Canada and the US as well as operations outside of North America, including Australia, South America, European countries and Trinidad with a focus on expanding our international presence in Brazil. We also hold business investments in Egypt and China.

We are subject to numerous risks and uncertainties relating to international sales and operations, including: difficulties and costs associated with complying with a wide variety of complex laws, treaties and regulations; abrupt or unexpected changes in regulatory environments; increased government regulation of the economy and/or state ownership of enterprises; forced divestures or changes to or nullification of existing agreements, mining permits or leases; political and economic instability, including the possibility for civil unrest, inflation and adverse economic conditions resulting from governmental attempts to reduce inflation, such as imposition of higher interest rates and wage and price controls; nationalization of properties or assets by foreign governments; the imposition of tariffs, exchange controls, trade barriers or other restrictions; restrictions on monetary distributions; and currency exchange rate fluctuations between the US dollar and foreign currencies.

The occurrence of any of the above in the countries in which we operate or elsewhere could jeopardize or limit our ability to transact business and could adversely affect our revenue and operating results and the value of our assets located in such countries.

Our governance and compliance processes, which include the review of internal controls over financial reporting and specific internal controls in relation to offers of things of value to government officials and representatives of state-owned enterprises, may not prevent potential violations of law, accounting or governance practice. Our Code, together with our mandatory policies, such as our anti-corruption and anti-fraud policies, may not prevent instances of fraudulent behavior and dishonesty nor guarantee compliance with legal or regulatory requirements. This may lead to regulatory fines, disgorgement of profits, litigation, loss of operating licenses or reputational damage.

4. Our business may be adversely affected by changing regulations

We are subject to numerous federal, state, provincial and local environmental, health and safety laws and regulations, including laws and regulations relating to land, water and raw material use and management; the emission of contaminants to the air or water; land reclamation; the generation, treatment, storage, transportation, disposal and handling of hazardous substances and wastes; the clean-up of hazardous substance releases; and the demolition of existing plant sites upon permanent closure. Specifically, our mining and manufacturing processes release carbon dioxide and other GHGs and consume energy generated by processes that result in GHG emissions.

We incur significant costs and associated liabilities in connection with these laws and regulations. There are substantial uncertainties as to the nature and timing of any future regulations with many of the laws and regulations becoming increasingly stringent, and the cost of compliance can be expected to increase over time. New or revised laws or regulations may result from pressure on law makers and regulators to address climate change, transition to a low-carbon economy or to address concerns related to fertilizer and food prices, accidents, terrorism or transportation of potentially hazardous substances. Increased or more stringent regulations, if enacted, could impact our ability to produce or transport certain products, increase our raw material, energy, transportation, and compliance costs, reduce our efficiency, require us to make capital improvements to our facilities and have a negative effect on our customer satisfaction, reputation and financial performance.

We hold numerous environmental, mining and other governmental permits and approvals authorizing operations at each of our facilities. Continuation and/or expansion of our operations is dependent upon renewing or securing the necessary environmental or other permits or approvals. A decision by a government agency to deny or delay issuing a new or renewed material permit or approval, or to revoke or substantially modify an existing permit or approval, could materially adversely affect our ability to continue operations at the affected facility.

We are subject to antitrust laws in various countries throughout the world. A significant portion of our business activities are conducted in countries under existing trade agreements and regulations. Changes in antitrust laws, trade agreements or regulations may limit our operations or the operations of Canpotex, and could negatively impact opportunities for future acquisitions or organic growth.

5. Our information technology systems, infrastructure and data may become the target of cyber security attacks

Information technology systems are embedded in our business and operational control systems and, as we grow our digital platform, we may become more exposed to cyber-attacks, which continue to become increasingly sophisticated. Cyber security risks include attacks on information technology and infrastructure by hackers, damage or loss of information due to viruses, the unintended disclosure of confidential information, the misuse or loss of control over computer control systems, and breaches (intentional or otherwise). Targeted attacks on our systems (or on systems of third parties that we rely on), failure or non-availability of a key information or operations technology system or a breach in security measures designed to protect our technology systems could result in property damage, theft, misuse, modification and destruction of information, including trade secrets and confidential business information, and cause business disruptions, reputational damage, extensive personal injury and third-party claims, which could negatively impact our operations and our financial performance.

6. We may fail to effectively allocate capital to achieve sustained growth

Challenges may arise in the capital allocation process due to changing market conditions, including the unavailability, due to geopolitical, market or other reasons, of appropriate capital deployment opportunities, and our ability to anticipate and incorporate such changes in our decision-making process. Inefficiencies in the capital allocation process or decisions that are not consistent with strategic priorities or that do not properly assess risk may also lead to inefficient deployment of capital. Failure to allocate capital in an effective manner may lead to reduced returns on capital invested, operational inefficiencies, damage to our reputation or limitations on our access to capital.

When we undertake any strategic initiatives, our ability to achieve the expected returns and other benefits will be affected by our degree of preparedness and ability to execute.

- We have undertaken and continue to undertake various projects including capital and business process improvement /transformation projects. These projects involve risks, including (but not limited to) difficult environmental conditions, poor project prioritization and capital allocation, factors negatively impacting costs (such as escalating costs of labor and materials, unavailability and underperformance of skilled personnel, suppliers of materials or technology and other third parties we retain, design flaws or

operational issues, poor project management oversight) or poor transition through project stages. Any of the foregoing risks could impair our ability to realize the benefits we had anticipated from the projects and negatively impact our financial performance.

- With respect to any completed and future acquisitions, including the Merger, we are dependent upon our ability to successfully consolidate functions and integrate operations, technology, systems, procedures and personnel in a timely and efficient manner. The integration of assets and operations requires the dedication of management effort, time and resources, which may divert management's focus and resources from other strategic opportunities or operational matters during the process. The integration process with respect to any completed or future acquisitions, including the Merger, may result in the disruption of our existing business and customer relationships, which may adversely affect our ability to achieve the anticipated synergies and other benefits and may, in turn, negatively affect our financial performance.
- We also continue to evaluate the potential disposition of assets and operations that may no longer help us meet our objectives. When we decide to sell assets or operations, we may encounter difficulty in finding buyers or executing alternative exit strategies on acceptable terms or in a timely manner, which could delay the accomplishment of our strategic objectives.

7. We may fail to develop the right organizational structure, talent and resources

Our ability to attract and retain qualified top talent and provide the necessary organizational structure, programs and culture to engage and develop our employees is crucial to our growth and achieving our business results.

Although we strive to be an employer of choice, competition for skilled employees in certain geographical areas can be significant and we may not be successful in attracting, developing or retaining such skilled employees. In addition, we invest significant time and expense in training our employees, which increases their value to competitors who may seek to recruit them. Failure to develop the right organizational structure or culture could result in decreased productivity, reliability, efficiency and safety performance, higher costs or reputational harm. It could also negatively impact our ability to take on new projects or acquisitions and sustain operations, which might negatively affect our operations or our ability to grow.

8. New digital technologies or innovations could adversely impact our Retail business model

Digital innovations, increased research and development activities and use of new technology in the agriculture market by new or existing competitors could alter the competitive environment, resulting in existing business models being disrupted, which may adversely impact our Retail operations and financial performance.

9. We may fail to maintain high levels of safety and health or to protect the environment

Our operations are subject to hazardous safety and environmental risks inherent in mining, manufacturing, transportation, storage and distribution of chemical fertilizers, including ammonia, which is highly toxic and corrosive. These risks can include: underground water inflows at our potash mines; explosions; fires; severe weather and natural disasters; train derailments, collisions, vessel groundings and other transportation and maritime incidents; leaks and ruptures involving storage tanks, pipelines and railcars; spills, discharges and releases of toxic or hazardous substances or gases; uncontrolled tailings, gypsum stack or other containment breaches, significant subsidence from mining activities, deliberate sabotage and terrorist incidents. We also have personnel who work or travel in higher risk countries and are subject to increased safety and security risks as a result.

The potash mining process is complex and subject to certain geological conditions and hazards, including the presence of water-bearing strata above and below many underground mines, which pose the risk of water inflows. It is not uncommon for water inflows of varying degrees to occur in potash mines; however, it is difficult to predict if, when, or to what degree, such inflows could occur. At our Saskatchewan potash

mines we have minor water inflows that we actively monitor and manage, as appropriate. Significant inflows at our potash mines could result in increased operational costs, increased risk of personal injury, production delays or stoppages, or the abandonment and closure of a mine. The risk of underground water inflows, as with most other underground risks, is currently not insured.

Failure to prevent or appropriately respond to a safety, health or security incident could result in injuries or fatalities among our employees, contractors or residents in communities near our operations. Such incidents may lead to liabilities arising out of personal injuries or death, operational interruptions and shutdown or abandonment of affected facilities. Preventing or responding to accidents could require us to expend significant managerial time and effort, and financial resources to remediate safety issues, compensate injured parties or repair damaged facilities. Any of the foregoing could have an adverse impact on our ability to produce or distribute product, financial results and our reputation. Failure to prevent a significant environmental incident could be harmful to our employees, contractors, and communities in which we operate and impact the biodiversity, water resources and related ecosystems near our operations. Such incidents could also adversely impact our operations, financial performance or reputation.

10. Our business and operations are subject to general and ongoing risks, most of which are outside our control

We may fail to maintain the support of our stakeholders for our business plans

Our stakeholders may place an increasing importance on the structure of our business, our ability to execute on our strategy and our core sustainability and social responsibilities. Underperformance due to weak market fundamentals or business issues, inadequate communication, engagement and/or collaboration with our stakeholders, or dissatisfaction with our practices or strategic direction may lead to a lack of support for our business plans. Loss of stakeholder confidence impairs our ability to execute on our business plans, negatively impacts our ability to produce or sell our products and may also lead to reputational and financial losses, or shareholder action.

Canpotex may be dissolved or its ability to operate impaired

Canpotex is the offshore marketing, transportation and distribution company we rely on to deliver our potash to customers outside Canada and the US. Unexpected changes in laws or regulations, market or economic conditions, our (or our venture partner's) business, or otherwise could threaten the existence or effectiveness of Canpotex. A trusted potash brand could be lost and our access to key offshore markets negatively impacted resulting in a less efficient logistics system, decreased sales, higher costs or lower net earnings from offshore sales.

We are exposed to various market risks that may impact our operating results

We are exposed to various market factors that may impact our operating results including changes in the price of, or ability to source, raw materials and energy, which could, among other things, impact our gross margins and profitability; commodity price volatility, including the possibility of asset impairment as a result thereof; currency volatility and risk, including as a result of the translation of foreign subsidiary income statements to US dollars for consolidation at the Nutrien level; and fluctuations in interest rates which could negatively impact our financial results given our use of floating rate debt, floating rate credit facilities and commercial paper, as well as the refinancing of long-term debt and anticipated future financing needs. We seek to manage a portion of the risks relating to changes in commodity prices and foreign currency exchange rates by using derivative instruments; however, such instruments may be ineffective in fully mitigating such risks.

Changes in the price of raw materials and energy required to produce our products, including natural gas, which is the principal raw material used to manufacture our nitrogen products and a significant energy source in the potash milling and mining process, could have a material impact on our business. The price of raw materials and energy can fluctuate widely for a variety of reasons, including changes in availability because of additional capacity or limited availability due to curtailments, regulatory changes, including

changes related to production of certain raw materials or energy sources, or other operating problems. Other external factors beyond our control can also cause volatility in raw materials prices, including, without limitation, general economic conditions, the level of business activity in the industries that use our products, weather conditions and forecasts, competitors' actions, international events and circumstances and governmental regulation in the US and abroad. Because most of our products are commodities or derived from commodities, there can be no assurance that we will be able to recover increases in the price of such raw materials through an increase in the price of our related crop nutrient products. Conversely, when the market prices for these raw materials rapidly decrease, the selling prices for related crop nutrients can fall more rapidly than we are able to consume our raw material inventory that we purchased or committed to purchase at higher prices. As a result, our costs may not fall as rapidly as the selling prices of our products. Until we are able to consume the higher priced raw materials, our gross margins and profitability may be adversely affected.

We have benefited from relatively low North American natural gas prices in recent years; however, the price for natural gas in North America can vary significantly compared to the price for natural gas in Europe and Asia. Significantly lower natural gas prices in Europe and/or Asia may give our competitors in Europe and Asia a competitive advantage, which could, in turn, decrease international and domestic product prices and reduce our margins. In addition, higher natural gas prices, particularly in North America, during a period of low crop input selling prices could adversely affect our results of operations.

There is also a risk to production at various of our facilities due to concerns over the availability of natural gas supplies. Nitrogen facilities in Argentina, Egypt and Trinidad have all experienced supply strains or curtailments. Continued or increased natural gas shortages may result in reduced production available for sale and higher production costs per tonne.

We may be unable to access sufficient, cost-effective and timely transportation, distribution and storage of our products

We rely on railroad, trucking, pipeline and other transportation service providers to transport raw materials to our manufacturing facilities, to coordinate and deliver finished products to our storage and distribution system and our Retail centers and to ship finished products to our customers.

Our (or the third parties upon which we rely) ability to provide sufficient, cost-effective and timely transportation and storage of product may be challenged due to a number of factors, including labor disputes, system failures, accidents (such as spills or derailments), delays, adverse weather or other environmental events, adverse operating conditions (including aging transportation infrastructure, railroad capacity constraints, changes to rail or ocean freight systems), swings in demand for our products, increased shipping demand for other products, adverse economic conditions, a change in our export, sales or marketing company relationships, or otherwise. This could result in delays and increased costs, lost revenue and reputational damage with our customers.

Adverse weather conditions may decrease demand for our products or delay grower purchases

Our business and our customers are also impacted by weather patterns and conditions. Adverse conditions that can delay or intermittently disrupt fieldwork during the planting and growing seasons may cause agricultural customers to use different forms of crop nutrients and crop protection products, which may adversely affect demand for the forms that we sell or may impede farmers from applying our crop nutrients and crop protection products until the following growing season, or in some cases not at all, resulting in lower demand for our products and reduced revenues. In addition, we face the significant risk and cost of continuing to carry inventory should our customers' activities be curtailed during their normal seasons. We must manufacture and distribute product throughout the year in order to meet peak season demand, as well as react quickly to unexpected changes in weather patterns that affect demand. Weather can also have an adverse effect on crop yields, which could lower the income of growers and impair their ability to purchase our crop nutrients, crop protection and seed products and services. As a result, our quarterly financial results may vary significantly from one year to the next due to weather-related shifts in planting schedules and purchasing patterns, and losses due to adverse weather conditions in one quarter may not be recovered in the following season.

We may be unable to access capital on a cost-effective or timely basis

We rely on access to debt capital markets to finance our day-to-day and long-term operations. Access to and cost of capital may be affected by factors not specific to our company, such as adverse conditions in the credit markets, general and industry-specific market and economic conditions and interest rate fluctuations. Our access to capital will also be dependent on our credit ratings, which are determined by, among other things, the level and quality of our earnings, our ability to generate cash flows and restrictions on our ability to repatriate cash offshore. A credit rating downgrade could potentially limit our access to private and public credit markets and increase the costs of borrowing under our existing credit facilities. A downgrade could also limit our access to short-term debt markets and increase the cost of borrowing in the short-term and long-term debt markets. Inability to access capital on a cost-effective or timely basis may result in a loss of liquidity, an increase in the cost of capital or inability to execute on value-added transactions requiring significant capital.

Our operations are exposed to counterparty risk

We are exposed to the risks associated with counterparty performance, including credit risk and performance risk. We may experience material financial losses in the event of customer payment default for our products and/or financial derivative transactions.

We are subject to legal proceedings, the outcome of which may affect our business

We are, and may in the future be, involved in legal and regulatory proceedings, including matters arising from our activities or activities of predecessor companies. The outcome of these matters may be difficult to assess or quantify, and such matters may not be resolved in our favor. Such matters could result in unfavorable outcomes, including fines, sanctions and monetary damages against us or our directors, officers or employees. The defense of such matters may also be costly and time consuming, and could divert the attention of management and key personnel from our operations. We may also be subject to adverse publicity associated with such matters, regardless of whether such allegations are valid or whether we are ultimately found liable.

Our insurance coverage may not adequately cover our losses

We maintain property, business interruption, casualty and liability insurance policies, but we are not fully insured against all potential hazards and risks pertaining to our business. As a result, we may incur significant liability for which we are not fully insured. We are subject to various self-retentions, deductibles and limits under these insurance policies. The policies also contain exclusions and conditions that could have a material adverse impact on our ability to receive indemnification thereunder. Our policies are generally renewed annually. As a result of market conditions, our premiums, self-retentions and deductibles for certain insurance policies can increase substantially and, in some instances, certain insurance may become unavailable or available only for reduced amounts of coverage. In addition, significantly increased costs could lead us to decide to reduce, or possibly eliminate, coverage for certain hazards and risks.

We may be subject to labor disruptions or disputes

A significant portion of our workforce is unionized or otherwise governed by collective bargaining or similar agreements. We are therefore subject to the possibility of organized labor disruptions. Adverse labor relations or contract negotiations that do not result in an agreement could result in strikes, slowdowns or impose additional costs to resolve these disputes. These disruptions may negatively impact our ability to produce or sell our products. These disruptions may also impact our ability to recruit and retain personnel and could negatively affect our financial performance.

Our reported mineral reserves and mineral resources are only estimates

Our reported mineral reserves and mineral resources are only estimates. The estimated mineral reserves and mineral resources may not be recovered or may not be recovered at the rates estimated. Mineral reserves and mineral resources estimates are based on limited sampling, and, consequently, are uncertain because the samples may not be representative of the actual resources. Mineral reserves and mineral resources estimates may require revision (either up or down) based on actual production experience. Further, market fluctuations in the price of potash, as well as increased production costs or reduced recovery rates, may render certain mineral reserves and mineral resources uneconomic and may ultimately result in a restatement of estimated resources and/or reserves.

5.3 MINERAL PROJECTS

See "Schedule B – Mineral Projects" for information regarding our Allan, Cory, Lanigan, Rocanville and Vanscoy Potash operations.

ITEM 6 – DIVIDENDS

The declaration, amount and payment date of any dividend by Nutrien is at the discretion of the Board and will depend on numerous factors, including compliance with applicable laws and the financial performance, debt obligations, working capital requirements and future capital requirements of Nutrien and its subsidiaries. See "Item 5 – Description of the Business – 5.2 Risk Factors".

In 2018, Nutrien declared a cash dividend of $0.40 per Common Share in the first, second and third quarters, and two cash dividends of $0.43 per Common Share were declared in the fourth quarter, for a total of $2.06 per Common Share for the year. The first cash dividend of $0.43 per Common Share declared in the fourth quarter was payable on January 17, 2019 to shareholders of record December 31, 2018, and the second cash dividend of $0.43 per Common Share is payable on April 18, 2019 to shareholders of record on March 29, 2019.

In 2017, PotashCorp declared aggregate cash dividends of $0.40 per PotashCorp Share and Agrium declared aggregate cash dividends of $3.50 per Agrium Share.

In 2016, PotashCorp declared aggregate cash dividends of $0.70 per PotashCorp Share and Agrium declared aggregate cash dividends of $3.50 per Agrium Share.

ITEM 7 – DESCRIPTION OF CAPITAL STRUCTURE

7.1 GENERAL DESCRIPTION OF CAPITAL STRUCTURE

Authorized Capital

The authorized share capital of Nutrien consists of an unlimited number of Common Shares and an unlimited number of preferred shares issuable in series.

As of the date hereof, 602,630,027 Common Shares were issued and outstanding and no preferred shares were outstanding. The following is a general description of the material rights, privileges, restrictions and conditions attached to the Common Shares and the preferred shares.

Common Shares

Each Common Share entitles the holder to: (i) vote at all meetings of holders of Common Shares (except meetings at which only holders of a specified class or series of shares of Nutrien are entitled to vote as provided in the CBCA) and to one vote for each Common Share held on all polls taken at such meetings; (ii) receive, subject to the rights of the holders of another class of shares of Nutrien, any dividend declared by the Board from time to time, in their absolute discretion, in accordance with applicable law; and (iii) receive, subject to the rights of holders of another class or series of shares of Nutrien, the remaining property of Nutrien on the liquidation, dissolution or winding up of Nutrien or any other distribution of the assets of Nutrien for the purposes of winding

up its affairs, whether voluntary or involuntary. There are no preemptive or conversion rights attaching to the Common Shares and the Common Shares are not subject to redemption. All Common Shares currently outstanding and to be outstanding upon exercise of outstanding options and other securities, as applicable, are, or will be, fully paid and non-assessable.

Our by-laws provide for certain rights of holders of our Common Shares in accordance with the provisions of the CBCA. Such by-laws may be amended either by a majority vote of the holders of Common Shares or by a majority vote of the Board. Any amendment of the by-laws by action of the Board must be submitted to the next meeting of our shareholders whereupon the by-law amendment must be confirmed, confirmed as amended or rejected by a majority vote of the shareholders voting on such matter. The Common Shares are not redeemable or convertible.

Preferred Shares

The preferred shares may at any time and from time to time be issued in one or more series with the designation, rights, privileges, restrictions and conditions attaching to each series of the preferred shares to be determined by the Board.

The preferred shares of each series rank on a parity with the preferred shares of every other series, and are entitled to preference over the Common Shares and any other shares of the Company ranking junior to the preferred shares, with respect to (i) the payment of dividends; (ii) the distribution of property in the event of the liquidation, dissolution or winding-up of Nutrien; and (iii) such other preferences as may be determined by the Board.

Except as specifically provided in the rights, privileges, restrictions and conditions attaching to any series of preferred shares and except as provided by the CBCA, the holders of preferred shares are not entitled to receive notice of or attend any meeting of the shareholders of the Company or to vote at any such meeting for any purpose.

The provisions attaching to the preferred shares as a class may be added to, changed or removed, and the Board may create shares ranking prior to the preferred shares, only with the approval of the holders of the preferred shares as a class, any such approval to be given by the holders of not less than 66 2/3 percent of the preferred shares in writing by the registered holders of the preferred shares or by resolution at a meeting of such holders.

7.2 CONSTRAINTS

There are no constraints imposed on the ownership of Nutrien's securities to ensure that the Company has a required level of Canadian ownership.

7.3 DEBT RATINGS

The following information relating to Nutrien's credit ratings is provided as it relates to Nutrien's financing costs, liquidity and operations and to satisfy disclosure requirements under applicable Canadian securities rules. Our ability to access reasonably priced debt in the capital markets is dependent, in part, on the quality of our credit ratings. We continue to maintain investment-grade credit ratings for our long-term debt. A downgrade of the credit rating of our long-term debt could increase the interest rates applicable to borrowings under our credit facilities.

Commercial paper markets are normally a source of same-day cash for the Company. Our access to the US commercial paper market primarily depends on maintaining our current short-term credit ratings as well as general conditions in the money markets.

A credit rating is not a recommendation to buy, sell or hold securities. Such ratings may be subject to revision or withdrawal at any time by the respective credit rating agency and each rating should be evaluated independently of any other rating.

The following table sets out ratings the Company has received in respect of its outstanding debt securities from the ratings agencies as at the date of this AIF. The Company has paid each of Standard & Poor's Rating Services

("S&P") and Moody's Investors Service ("Moody's") their customary fees in connection with the provision of the below ratings. The Company has not made any payments to S&P or Moody's in the past two years for services unrelated to the provision of such ratings.

	S&P Rating	Moody's Rating
Nutrien Notes	BBB	Baa2
US$ Commercial Paper	A-2	P-2
Ratings Outlook	Stable	Stable

S&P

On March 7, 2018, S&P assigned a BBB long-term corporate credit rating on Nutrien. The BBB rating assigned by S&P is the fourth highest rating of S&P's eleven rating categories for long-term debt which range from AAA to D. Issues of debt securities rated BBB are judged by S&P to exhibit adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation. The ratings from AA to CCC may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.

On April 4, 2018, S&P assigned an A-2 global short-term rating to Nutrien and A-2 commercial paper rating to the Company's US$4.5 billion commercial paper program. The A-2 rating assigned by S&P is the second highest rating of S&P's rating categories for short-term debt which range from A-1 to D. Short-term debt rated A-2 means the obligor has satisfactory capacity to meet its financial commitments. However, it is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligors in the highest rating category.

S&P's stable outlook on Nutrien's credit ratings means that the ratings are not likely to change.

Moody's

On February 8, 2018, Moody's assigned a Baa2 issuer rating to Nutrien. The Baa2 rating assigned by Moody's is the fourth highest rating of Moody's nine rating categories for long-term debt, which range from Aaa to C. Moody's appends numerical modifiers from one to three on its long-term debt ratings from Aa to Caa to indicate where the obligation ranks within a particular ranking category, with the two modifier indicating a mid-range ranking. Obligations rated Baa are defined by Moody's as being subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics. On April 5, 2018, Moody's also affirmed Nutrien's issuer rating at Baa2.

On April 5, 2018, Moody's also assigned a P-2 commercial paper rating to Nutrien. The P-2 rating assigned by Moody's is the second highest rating of Moody's four rating categories for short-term debt, which range from P-1 to NP. Issuers rated P-2 are defined by Moody's as having a strong ability to repay short-term debt obligations.

Moody's stable outlook on Nutrien's credit ratings indicates a low likelihood of a rating change over the medium term.

ITEM 8 – MARKET FOR SECURITIES

8.1 TRADING PRICE AND VOLUME

During 2018, the Company's common shares traded on the Toronto Stock Exchange ("TSX") and the New York Stock Exchange ("NYSE") under the symbol "NTR".

The following table sets out the high, low and closing prices and trading volume of the common shares on the TSX for 2018 on a monthly basis:

Month (2018)	High Price (CA$)	Low Price (CA$)	Closing Price (CA$)	Volume
January	$70.05	$64.27	$64.35	19,011,611
February	$64.99	$55.27	$63.05	22,111,836
March	$68.93	$59.13	$60.89	25,777,818
April	$61.15	$56.55	$58.45	14,507,687
May	$66.68	$57.86	$65.61	24,629,797
June	$73.43	$64.91	$71.52	27,769,955
July	$71.99	$68.11	$70.65	13,922,334
August	$76.12	$69.91	$73.34	19,940,217
September	$76.17	$70.80	$74.58	20,233,188
October	$75.78	$66.01	$69.69	32,119,502
November	$75.78	$66.51	$68.44	29,136,676
December	$70.52	$59.97	$64.12	34,059,895

The following table sets out the high, low and closing prices and trading volume of the common shares on the NYSE for 2018 on a monthly basis:

Month (2018)	High Price (US$)	Low Price (US$)	Closing Price (US$)	Volume
January	$56.18	$51.51	$52.34	36,163,883
February	$52.24	$40.41	$49.25	47,402,780
March	$53.75	$45.77	$47.26	39,963,990
April	$48.43	$44.04	$45.53	23,189,066
May	$52.73	$44.94	$50.65	33,235,477
June	$55.18	$50.20	$54.38	43,225,420
July	$54.72	$51.50	$54.21	28,643,313
August	$58.70	$53.77	$56.63	36,315,582
September	$58.81	$53.81	$57.70	33,870,094
October	$58.99	$50.49	$52.93	40,059,250
November	$57.97	$49.85	$51.56	32,109,287
December	$52.92	$43.96	$47.00	38,361,313

8.2 PRIOR SALES

During the year ended December 31, 2018, Nutrien issued Common Shares pursuant to the exercise and settlement of outstanding share-based compensation award plans of PotashCorp and Agrium assumed in connection with the Merger. In addition, during the year ended December 31, 2018, Nutrien granted stock options under its stock option plan. See note 29 of the 2018 Financial Statements for additional information.

In addition, in the second quarter of 2018, substantially all of the outstanding senior notes of PotashCorp and debentures of Agrium (other than Agrium's debentures due 2027) were exchanged for Nutrien Notes having interest rates and maturities identical to those of the applicable exchanged series of PotashCorp senior notes and Agrium debentures. See note 23 of the 2018 Financial Statements for additional information.

ITEM 9 – ESCROWED SECURITIES AND SECURITIES SUBJECT TO CONTRACTUAL RESTRICTION ON TRANSFER

To the knowledge of the Company, none of the securities of the Company are subject to escrow or contractual restriction on transfer.

ITEM 10 – DIRECTORS AND OFFICERS

10.1 NAME, OCCUPATION AND SECURITY HOLDING

Information is given below with respect to each of the current directors and executive officers, including names, municipality and country of residence, all current positions held with the Company, present principal occupation and principal occupations held during the last five years. The current directors will hold office until the earlier of their resignation and our next annual meeting of shareholders at which directors are elected or until such directors cease to hold office pursuant to the provisions of the CBCA.

Directors (Name and Municipality of Residence)	**Director Since**	**Present principal occupation or employment**	**Prior principal occupation or employment within the preceding five years**
Derek G. Pannell [(1)(2)] Saint John, New Brunswick, Canada	2018 (Agrium from 2008 – 2017)	Corporate Director Board Chair of Nutrien	Corporate Director Board Chair of Agrium
Charles (Chuck) V. Magro Heritage Pointe, Alberta, Canada	2018 (Agrium from 2013 – 2017)	President & Chief Executive Officer of Nutrien	President & Chief Executive Officer of Agrium
Christopher M. Burley [(1)(3)] Calgary, Alberta, Canada	2018 (PotashCorp from 2009 – 2017)	Corporate Director	Corporate Director
Maura J. Clark [(1)(2)] New York, New York, US	2018 (Agrium from 2016 – 2017)	Corporate Director	President of Direct Energy Business, a subsidiary of Centrica plc, a North American energy and energy-related services provider
John W. Estey [(2)(4)] Glenview, Illinois, US	2018 (PotashCorp from 2003 – 2017)	Corporate Director	Current Chairman and former President & CEO of S&C Electric Company, a global provider of equipment and services for electric power systems Board Chair of PotashCorp
David C. Everitt [(1)(2)] Marco Island, Florida, US	2018 (Agrium from 2013 – 2017)	Corporate Director	Current Board Chair and former Interim President & CEO of Harsco Corporation, a global industrial company
Russell K. Girling [(1)(3)] Calgary, Alberta, Canada	2018 (Agrium from 2006 – 2017)	President & Chief Executive Officer and Director of TransCanada Corporation, a diversified energy and pipeline company	Same as present
Gerald W. Grandey [(2)(4)] Saskatoon, Saskatchewan, Canada	2018 (PotashCorp from 2011 – 2017)	Corporate Director	Corporate Director
Miranda C. Hubbs [(3)(4)] Toronto, Ontario, Canada	2018 (Agrium from 2016 – 2017)	Corporate Director	Corporate Director

Directors (Name and Municipality of Residence)	Director Since	Present principal occupation or employment	Prior principal occupation or employment within the preceding five years
Alice D. Laberge (1)(3) Vancouver, British Columbia, Canada	2018 (PotashCorp from 2003 – 2017)	Corporate Director	Corporate Director
Consuelo E. Madere (3)(4) Destin, Florida, US	2018 (PotashCorp from 2014 – 2017)	President and Founder of Proven Leader Advisory, LLC, a management consulting and executive coaching firm	Same as present
Keith G. Martell (1)(2) Eagle Ridge, Saskatchewan, Canada	2018 (PotashCorp from 2007 – 2017)	President & Chief Executive Officer and Director of First Nations Bank of Canada, a Canadian charted bank independently controlled by Aboriginal shareholders	Same as present
A. Anne McLellan (2)(4) Edmonton, Alberta, Canada	2018 (Agrium from 2006 – 2017)	Senior advisor at Bennett Jones LLP	Corporate Director
Aaron W. Regent (1)(2) Toronto, Ontario, Canada	2018 (PotashCorp from 2015 – 2017)	Founding Partner and Managing Partner of Magris Resources Inc., a private equity investment firm specializing in the mining sector Chairman and Chief Executive Officer of Niobec Inc., a company that owns and operates the Niobec mine which comprises niobium deposit	Same as present
Mayo M. Schmidt (3)(4) Las Vegas, Nevada, US	2018 (Agrium from 2013 – 2017)	Corporate Director	President & Chief Executive Officer and Director of Hydro One Inc., an electricity transmission and distribution company

(1) Member of the Audit Committee of the Board.

(2) Member of the Human Resources & Compensation Committee of the Board.

(3) Member of the Corporate Governance & Nominating Committee of the Board.

(4) Member of the Safety, Health, Environment & Security Committee of the Board.

Executive Officers (Name and Municipality of Residence)	Present position with the Company and Principal Occupation	Prior principal occupation or employment within the preceding five years
Charles (Chuck) V. Magro Heritage Pointe, Alberta, Canada	President & Chief Executive Officer of Nutrien	President & Chief Executive Officer, Agrium
Pedro Farah (1) Calgary, Alberta, Canada	Executive Vice President & Chief Financial Officer of Nutrien	Executive Vice President and Treasurer, Walmart; Executive Vice President and Chief Financial Officer, Walmex (Walmart Mexico)
Fred Thun (1) Calgary, Alberta, Canada	Senior Vice President, Finance	Interim Chief Financial Officer of Nutrien; Vice President Finance & Accounting of Nutrien; Vice President, Finance, Agrium; Vice President & Corporate Controller, Agrium
Steve J. Douglas (2) De Winton, Alberta, Canada	Executive Vice President & Chief Integration Officer of Nutrien	Senior Vice President & Chief Financial Officer, Agrium
Michael J. Frank Timnath, Colorado, US	Executive Vice President & Chief Executive Officer of Retail Nutrien	Executive Vice President and President, Retail, Agrium; Senior Vice President & Chief Commercial Officer, Monsanto Company, an agrochemical and agricultural biotechnology company
Susan C. Jones Saskatoon, Saskatchewan, Canada	Executive Vice President & Chief Executive Officer of Potash Nutrien	Senior Vice President & Chief Legal Officer, Agrium; Former Vice President, Marketing & Distribution, Agrium
Leslie A. O'Donoghue Calgary, Alberta, Canada	Executive Vice President, Chief Strategy & Corporate Development Officer of Nutrien	Executive Vice President, Corporate Development & Strategy & Chief Risk Officer, Agrium
Joseph Podwika Timnath, Colorado, US	Executive Vice President & Chief Legal Officer of Nutrien	Senior Vice President, General Counsel and Secretary, PotashCorp
Brent Poohkay Canmore, Alberta, Canada	Executive Vice President & Chief Information Officer of Nutrien	Senior Vice President, Information Technology, Former PotashCorp; Vice President, Chief Information Officer and Chief Privacy Officer, Enbridge Inc., a multinational energy transportation company
Raef Sully Glenview, Illinois, US	Executive Vice President & Chief Executive Officer of Phosphate & Nitrogen Nutrien	President, Nitrogen and Phosphate, PotashCorp; Vice President, Project Management and Capital, PotashCorp
Michael R. Webb Calgary, Alberta, Canada	Executive Vice President & Chief Human Resources and Administrative Officer of Nutrien	Senior Vice President, Human Resources, Agrium; Senior Vice President, Head of Human Resources, HSBC Bank Canada, a Canadian international bank

(1) Mr. Farah was appointed as the Executive Vice President & Chief Financial Officer of Nutrien effective February 1, 2019. Prior thereto, Mr. Thun served as the Interim Chief Financial Officer of Nutrien from November 6, 2018 to January 31, 2019.

(2) Mr. Douglas' employment with Nutrien as the Executive Vice President & Chief Integration Officer ended effective January 31, 2019.

As at the date hereof, the directors and executive officers of the Company as a group beneficially own, or control or direct, directly or indirectly, Common Shares representing less than 1 percent of the outstanding Common Shares.

10.2 CEASE TRADE ORDERS, BANKRUPTCIES, PENALTIES OR SANCTIONS

Except as set out below, no director or executive officer of the Company was, as at the date hereof, or has been within the ten years prior to the date hereof, a director, chief executive officer or chief financial officer of any company (including the Company), that:

- was subject to an order that was issued while the director or executive officer was acting in the capacity as director, chief executive officer or chief financial officer; or
- was subject to an order that was issued after the director or executive officer ceased to be a director, chief executive officer or chief financial officer and which resulted from an event that occurred while that person was acting in the capacity as director, chief executive officer or chief financial officer.

For the purposes of the above, "order" means any of the following that was in effect for a period of more than 30 consecutive days:

- a cease trade order;
- an order similar to a cease trade order; or
- an order that denied the relevant company access to an exemption under securities legislation.

Except as set out below, no director or executive officer of the Company, or a shareholder holding a sufficient number of securities of the Company to affect materially the control of the Company:

- was, as at the date hereof, or has been within the ten years prior to the date hereof, a director or executive officer of any company (including the Company) that, while that person was acting in that capacity, or within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver manager or trustee appointed to hold its assets; or
- has, within the ten years before the date hereof, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of the director, executive officer or shareholder.

Mr. Burley was a director of Parallel Energy Inc., administrator of Parallel Energy Trust ("Parallel Energy"). On or about November 9, 2015, Parallel Energy and its affiliates filed applications for protection under the *Companies' Creditors Arrangement Act* (Canada) and voluntary petitions for relief under Chapter 11 of the *United States Bankruptcy Code*. Mr. Burley resigned from the board of directors of Parallel Energy Inc. on March 1, 2016. The Canadian entities of Parallel Energy each filed an assignment in bankruptcy under the *Bankruptcy and Insolvency Act* (Canada) on March 3, 2016. In 2015, securities regulators for the Provinces of Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan and New Brunswick issued cease trade orders in relation to the securities of Parallel Energy for the failure by Parallel Energy to timely file financial statements as well as related continuous disclosure documents. Such cease trade orders continue to be in effect. The TSX delisted the trust units and debentures of Parallel Energy at the close of business on December 11, 2015.

In May 2004, Saskatchewan Wheat Pool Inc. ("SWP"), the predecessor of Viterra, disposed of its hog operations, which had been carried on through certain of its subsidiaries, through a court-supervised process under the *Companies' Creditors Arrangement Act* (Canada). On April 12, 2005, the Saskatchewan Financial Services Commission issued a cease trade order against four of these subsidiaries of SWP for failing to file the required annual continuous disclosure documents. The cease trade order was revoked on October 18, 2010 pursuant to Viterra's application to effect a reorganization of the entities in question. Mr. Schmidt served as an officer and/or director of these entities.

10.3 CONFLICTS OF INTEREST

To the knowledge of the Company, no director or officer of the Company has an existing or potential material conflict of interest with the Company or any of its subsidiaries, joint ventures or partnerships.

ITEM 11 – PROMOTERS

During the two most recently completed financial years, no person or company has been a promoter of the Company.

ITEM 12 – LEGAL PROCEEDINGS AND REGULATORY ACTIONS

The information under "Legal and Other Matters" of note 31 to the 2018 Financial Statements is incorporated by reference herein. For further discussion of certain environmental proceedings in which we are involved, see "Environmental Matters" above.

In the normal course of business, we are also, and expect to continue to be, subject to various other legal proceedings being brought against us. While it is not possible to determine the ultimate outcome of such actions at this time, and inherent uncertainties exist in predicting such outcomes, it is the Company's belief that the ultimate resolution of any such known actions is not reasonably likely to have a material adverse effect on its consolidated financial statements.

ITEM 13 – INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS

To the knowledge of the Company, as of the date hereof, there were no directors or executive officers of the Company or any associate or affiliate of a director or executive officer of the Company with any material interest, direct or indirect, in any transaction within the three most recently completed financial years or during the current financial year that has materially affected or is reasonably expected to materially affect the Company.

ITEM 14 – TRANSFER AGENT, REGISTRAR AND TRUSTEES

During the year ended December 31, 2018, the registrar and transfer agent for the Common Shares was AST Trust Company (Canada), at its principal offices in Saskatoon, Saskatchewan; Calgary, Alberta and Toronto, Ontario.

The trustee for the Nutrien Notes is the Bank of New York Mellon at its principal offices in New York, New York.

ITEM 15 – MATERIAL CONTRACTS

To the knowledge of the Company, no material contracts require disclosure under this Item.

ITEM 16 – INTERESTS OF EXPERTS

16.1 NAMES OF EXPERTS

The Company's 2018 Financial Statements have been audited by KPMG LLP. The consolidated financial statements of the Company as at December 31, 2017 and for the period from the date of incorporation (June 2, 2017) to December 31, 2017 have been jointly audited by KPMG LLP and Deloitte LLP.

The PotashCorp 2017 Financial Statements have been audited by Deloitte LLP.

The Agrium 2017 Financial Statements have been audited by KPMG LLP.

Craig Funk, B.Sc., M.Sc., P.Eng., P.Geo., an employee of the Company, prepared the Allan Technical Report, the Cory Technical Report, the Lanigan Technical Report and the Rocanville Technical Report (each, as defined herein). Mr. Funk is a qualified person under NI 43-101 and has reviewed and approved the scientific and technical information in this AIF relating to the Company's Allan, Cory, Lanigan and Rocanville potash operations.

A. Dave Mackintosh, P.Geo., of ADM Consulting Limited, and Michael Ryan Bartsch, P.Eng. and Dennis William Aldo Grimm, P.Eng., both employees of the Company as of the date of the Vanscoy Technical Report (as defined herein), each prepared certain sections of the Vanscoy Technical Report in accordance with NI 43-101 on behalf of the Company. Mr. Mackintosh, of ADM Consulting Limited, Messrs. Bartsch and Grimm are qualified persons under NI 43-101 and have reviewed and approved the scientific and technical information within this AIF relating to the Company's Vanscoy potash operations.

16.2 INTERESTS OF EXPERTS

As of February 20, 2019, KPMG LLP, the auditors of the Company, have confirmed that they are independent with respect to the Company (and its associates or affiliates) within the meaning of the relevant rules and related interpretations prescribed by the relevant professional bodies in Canada and any applicable legislation or regulations. KPMG LLP are independent accountants with respect to the Company under all relevant US professional and regulatory standards.

Deloitte LLP, the former auditors of the Company and PotashCorp, have confirmed that they were, with respect to the Company, throughout the period from the date of incorporation of the Company (June 2, 2017) to December 31, 2017 and as of February 20, 2018, and, with respect to PotashCorp, throughout the period covered by the PotashCorp 2017 Financial Statements and as of February 20, 2018, independent with respect to the Company and PotashCorp (and their associates or affiliates) within the meaning of the United States *Securities Act of 1933*, as amended, and the applicable rules and regulations thereunder adopted by the US Securities and Exchange Commission and the Public Company Accounting Oversight Board (United States) and within the meaning of the rules of professional conduct of the Chartered Professional Accountants of Saskatchewan.

Craig Funk is an employee of the Company and holds beneficially, directly or indirectly, less than one percent of any class of the securities of the Company or of any of the Company's associates or affiliates.

A. Dave Mackintosh, P.Geo., ADM Consulting Limited and the partners, employees and consultants of ADM Consulting Limited, did not hold any registered or beneficial interests, directly or indirectly, in the securities of the Company or its associates or affiliates.

Dennis William Aldo Grimm, P.Eng., is a retired employee of the Company and holds beneficially, directly or indirectly, less than one percent of any class of the Company's securities.

Michael Ryan Bartsch, P.Eng., is an employee of the Company and holds beneficially, directly or indirectly, less than one percent of any class of the Company's securities.

ITEM 17 – AUDIT COMMITTEE

17.1 AUDIT COMMITTEE CHARTER

Attached, as Schedule A, is the charter for the Company's Audit Committee.

17.2 COMPOSITION OF THE AUDIT COMMITTEE

Members of the Audit Committee are Christopher M. Burley, Maura J. Clark, David C. Everitt, Russell K. Girling, Alice D. Laberge, Keith G. Martell, Derek G. Pannell and Aaron W. Regent. Each member of the Audit Committee is independent and financially literate.

17.3 RELEVANT EDUCATION AND EXPERIENCE OF MEMBERS OF THE AUDIT COMMITTEE

Name (Director Since)	Principal Occupation and Full Biography
Ms. Maura J. Clark (2018) (Audit Committee Chair) B.A. (Economics), CPA, CA New York, New York, US **Other Public Directorships** • Fortis Inc., a North American electric and gas utility holding company, (TSX) • Garrett Motion Inc., a turbocharger and electric-boosting technology manufacturer, (NYSE)	Ms. Clark is a Corporate Director and the former President of Direct Energy Business, a subsidiary of Centrica plc, a North American energy and energy-related services provider from 2007 to 2014. Previously, Ms. Clark was Executive Vice President of North American Strategy and Mergers and Acquisitions for Direct Energy. She also served as a managing director at Goldman Sachs & Co., an investment-banking firm, and as Executive Vice President, Corporate Development and Chief Financial Officer of Premcor, Inc. (formerly known as Clark Refining & Marketing, Inc.), a petroleum refiner and marketer. Ms. Clark holds a Bachelor of Arts degree from Queen's University and a Chartered Professional Accountant designation.
Mr. Christopher Burley (2018) B.Sc., M.B.A. Calgary, Alberta, Canada **Other Public Directorships** • WestJet Airlines Ltd., a Canadian airline, (TSX)	Mr. Burley is a Corporate Director and former Managing Director and Vice Chairman of Energy for Merrill Lynch Canada Inc., an investment banking firm. He has over two decades of experience in the investment banking industry. He is the Vice Chairman and a director of WestJet Airlines Ltd. and a former non-executive Chairman of the board of directors of Parallel Energy Inc. Mr. Burley is a graduate of the Institute of Corporate Directors' Education Program and holds the ICD.D designation.
Mr. David C. Everitt (2018) B.Sc. (Engineering) Marco Island, Florida, US **Other Public Directorships** • Harsco Corporation, a worldwide industrial company, (NYSE) • Brunswick Corporation, a worldwide manufacturing company, (NYSE) • Allison Transmission Holdings, Inc., a worldwide manufacturing company, (NYSE)	Mr. Everitt is a Corporate Director and the Chair of the Board and former Interim Chief Executive Officer of Harsco Corporation, a worldwide industrial company. Since joining Deere & Company, an agricultural equipment manufacturer, in 1975, Mr. Everitt held a variety of management positions, including former Co-Leader of the Agriculture and Turf Division of Deere & Company, President – North America, Asia, Australia, and Sub-Saharan and South Africa, and Global Tractor and Turf Products (from 2009 until his retirement in 2012) and as President of Deere's Agricultural Division – North America, Australia, Asia and Global Tractor and Implement Sourcing. During that time, he led significant growth in overseas markets as well as streamlined the North American and European distribution footprint. Mr. Everitt also serves on the Board of the National Business Aviation Association located in Washington, D.C. and the board of directors of the Kansas State University Foundation.

Name (Director Since)	Principal Occupation and Full Biography
Mr. Russell K. Girling (2018) B. Comm., M.B.A. (Finance) Calgary, Alberta, Canada **Other Public Directorships** • TransCanada Corporation, a diversified energy and pipeline company, (TSX, NYSE)	Mr. Girling has been the President and Chief Executive Officer of TransCanada and TransCanada PipeLines Limited since July 1, 2010. Prior to his appointment, he served as Chief Operating Officer from July 17, 2009 to June 30, 2010 and President, Pipelines from June 1, 2006 until June 30, 2010. Previously, Mr. Girling served as Chief Financial Officer and Executive Vice-President, Corporate Development of TransCanada until May 31, 2006, and as Executive Vice-President, Power from 1995 until his appointment as Chief Financial Officer in 1999. Mr. Girling has held various other leadership positions since joining TransCanada in 1994. Prior to his employment with TransCanada, he held several marketing and management positions at Suncor Inc., Northridge Petroleum Marketing and Dome Petroleum. Mr. Girling is a member of the Canadian Council of Chief Executives, US National Petroleum Council, the US Business Roundtable and a member of the board of directors of the American Petroleum Institute and the Business Council of Canada. Mr. Girling also holds the ICD.D designation.
Ms. Alice D. Laberge (2018) B.Sc., M.B.A. Vancouver, British Columbia **Other Public Directorships** • Royal Bank of Canada, a global financial services provider, (TSX, NYSE) • Russell Metals Inc., a North American metal distribution company, (TSX)	Ms. Laberge is a Corporate Director and the former President and Chief Executive Officer of Fincentric Corporation, a global provider of software solutions to financial institutions. She was previously Senior Vice President and Chief Financial Officer of MacMillan Bloedel Ltd. She is a director of the Royal Bank of Canada, Russel Metals Inc, the Canadian Public Accountability Board and the B.C. Cancer Foundation and has served as a director of SilverBirch Holdings Inc., Delta Hotels Ltd. and Catalyst Paper Corporation. She was recognized as a Fellow of the Institute of Corporate Directors in 2015.
Mr. Keith G. Martell (2018) B. Comm, CPA, CA Eagle Ridge, Saskatchewan, Canada **Other Public Directorships** • None	Mr. Martell is President & Chief Executive Officer and a director of First Nations Bank of Canada, a Canadian chartered bank primarily focused on providing financial services to the First Nations marketplace. He is a Chartered Professional Accountant, formerly with KPMG LLP. He is a director of River Cree Enterprises Ltd., is a trustee of the National Indian Brotherhood Trust, serves on the Dean's Advisory Council of the University of Saskatchewan's Edwards School of Business and is a trustee of Primrose Lake Trust. Mr. Martell is a former director of the Canadian Chamber of Commerce, Public Sector Pension Investment Board of Canada and The North West Company Inc., and a former trustee of the North West Company Fund.

Name (Director Since)	Principal Occupation and Full Biography
Mr. Derek G. Pannell (2018) B.Sc. (Engineering) Saint John, New Brunswick, Canada **Other Public Directorships** • Brookfield Infrastructure Partners Limited, the general partner of Brookfield Infrastructure Partners L.P., an infrastructure asset operating company, (TSX, NYSE)	Mr. Pannell is a Corporate Director and the Board Chair of Brookfield Infrastructure Partners Limited (an asset management company). He was President, Chief Executive Officer and Director of Noranda Inc. and Falconbridge Limited from 2001 to 2006 and Vice President, Operations of Compania Minera Antamina from 1998 to 2001. Mr. Pannell is a graduate of Imperial College in London, England and the Royal School of Mines, London, England ("ARSM") and an engineer registered in Québec and Peru. He also serves as a Commissioner on the Board of Commissioners of Saint John Energy in Saint John, New Brunswick.
Mr. Aaron W. Regent (2018) B.A., FCPA, FCA Toronto, Ontario, Canada **Other Public Directorships** • The Bank of Nova Scotia, a global financial services provider, (TSX, NYSE)	Mr. Regent serves on the board of and is a former member of the audit committee of The Bank of Nova Scotia, and is also the Founding Partner of Magris Resources Inc. and Chairman and Chief Executive Officer of Niobec Inc. Mr. Regent has acquired significant financial experience during his time as President and Chief Executive Officer of Barrick Gold Corporation, Senior Managing Partner of Brookfield Asset Management and Co-Chief Executive Officer of the Brookfield Infrastructure Group, and as President and Chief Executive Officer of Falconbridge Limited. Mr. Regent is a member of the Chartered Professional Accountants of Ontario.

17.4 PRE-APPROVAL POLICIES AND PROCEDURES

Subject to applicable law, the Audit Committee is directly responsible for the compensation and oversight of the work of the independent auditors. The Audit Committee has implemented a Pre-Approval Policy for Audit and Non-Audit Services for the pre-approval of services performed by our auditors. The objective of the Policy is to specify the scope of services permitted to be performed by our auditors and to ensure that the independence of our auditors is not compromised through engaging them for other services. Our Audit Committee pre-approves all audit services and all permitted non-audit services provided by our external auditors and reviews on a quarterly basis whether these services affect our external auditors' independence. All services provided by our auditors in 2018 complied with the Pre-Approval Policy for Audit and Non-Audit Services, and professional standards and securities regulations governing auditor independence.

17.5 EXTERNAL AUDITOR SERVICE FEES (BY CATEGORY)

KPMG LLP and Deloitte LLP were appointed by the Board as external auditors of Nutrien in January 2018 in connection with the joint audit of the Company's consolidated financial statements for the period from the date of incorporation (June 2, 2017) to December 31, 2017. In July 2018, KPMG LLP was appointed by the Board as the sole external auditor of Nutrien and Deloitte LLP ceased to be an external auditor of the Company.

The following table sets out the fees billed to us by KPMG LLP and its affiliates for professional services rendered during the year ended December 31, 2018.

Category	Year Ended December 31, 2018
	US$
Audit Fees (1)	5,942,200
Audit-Related Fees (2)	325,900
Tax Fees (3)	362,400
Total	6,630,500

(1) For professional services rendered by KPMG LLP for the audit and review of the Company's financial statements or services that are normally provided by KPMG LLP in connection with statutory and regulatory filings or engagements.
(2) For professional services rendered by KPMG LLP for specified audit procedures regarding financial assurances issued to certain government agencies, and services which are reasonably related to the performance of the audit of the Company's financial statements and are not included in Audit Fees.
(3) For professional services rendered by KPMG LLP for tax compliance, tax advice and tax planning with respect to the Canadian, US and key international jurisdictions; review of tax filings; assistance with the preparation of tax filings; tax advice relating to asset dispositions; and other tax planning, compliance, and transaction services. These amounts include fees paid to KPMG LLP specifically for tax compliance and preparation services rendered in 2018 in the amount of $289,200.

The following table sets out the fees billed to us by Deloitte LLP and its affiliates for professional services rendered while serving as an external auditor of the Company during the year ended December 31, 2018.

Category	Year Ended December 31, 2018
	US$
Audit Fees (1)	958,200
Audit-Related Fees (2)	488,000
Tax Fees (3)	182,000
All Other Fees (4)	24,400
Total	1,652,600

(1) For professional services rendered by Deloitte LLP for the review of the Company's interim financial statements, the provision of consent letters and the provision of comfort letters.
(2) For professional services rendered by Deloitte LLP for employee benefit plan audits, audits of individual statutory financial statements, verification letters issued for certain of the Company's environmental liabilities, and specified procedure engagements.
(3) For professional services rendered by Deloitte LLP for general tax compliance and advice.
(4) For professional services rendered by Deloitte LLP for subscription-based services for human resource related literature.

ITEM 18 – ADDITIONAL INFORMATION

Additional financial information is provided in the 2018 Financial Statements and the 2018 MD&A. Further, additional information, including historical information concerning directors' and officers' remuneration and indebtedness, principal holders of the Company's securities, and securities authorized for issuance under equity compensation plans is contained in the Company's management proxy circular dated June 6, 2018 for the annual meeting of the Company's shareholders that took place on July 19, 2018.

Additional information related to Nutrien may be found on the Company's website at www.nutrien.com, on the Canadian Securities Administrators' website at www.sedar.com and on the EDGAR section of the US SEC's website at www.sec.gov.

SCHEDULE A

NUTRIEN LTD.

AUDIT COMMITTEE CHARTER

Introduction

The Audit Committee (the "**Committee**") is established to assist the Board of Directors (the "**Board**") of Nutrien Ltd. (the "**Corporation**") in fulfilling its oversight responsibilities with respect to the accounting and financial reporting processes and the reviews and audits of the financial statements of the Corporation by monitoring: (i) the quality and integrity of the Corporation's financial statements and related disclosures; (ii) the Corporation's internal control systems, including internal control over financial reporting; (iii) specific elements of risk management (including all financial risk management) delegated to the Committee by the Board; (iv) the qualifications and independence of the external auditors of the Corporation and the recommendation of the Board to shareholders for the appointment thereof; (v) the performance of the Corporation's Internal Audit function and external auditors; and (vi) the Corporation's compliance with legal and regulatory requirements with respect to matters within the Committee's mandate and the Code of Ethics.

Management is responsible for preparing the consolidated financial statements of the Corporation and the external auditors are responsible for auditing those financial statements. Nothing in this Charter is intended, or may be construed, to impose on any member of the Committee a standard of care or diligence that is in any way more onerous or extensive than the standard to which all directors are subject under applicable laws or regulatory requirements.

In this Charter, "**Committee Chair**" means the Chair of the Committee; "**Chair**" means the Board Chair; and "**CEO**" means the Chief Executive Officer of the Corporation.

Composition

The members of the Committee shall be appointed by the Board, on the recommendation of the Corporate Governance & Nominating Committee. Any member of the Committee may be removed or replaced at any time by the Board and shall cease to be a member of the Committee on ceasing to be a director. Subject to the above, each member of the Committee shall serve as a member of the Committee until the next annual meeting of shareholders after his or her appointment.

The Committee shall consist of not less than three and not more than eight members. Each Committee member shall be independent according to the independence standards set out in the Corporate Governance Framework, including applicable independence requirements of stock exchanges on which the Corporation is listed and securities laws, rules and regulations.

Each member of the Committee shall be "financially literate", and at least one member of the Committee shall be designated as the "audit committee financial expert" and shall have "accounting or related financial management expertise", in each case, as such qualification is interpreted by the Board in its business judgment and as defined by applicable requirements of stock exchanges on which the Corporation is listed and securities laws, rules and regulations.

No member of the Committee shall serve on the audit committees of more than two other publicly listed companies, unless the Board determines that such simultaneous service would not impair the ability of such member to effectively serve on the Committee and discloses such determination in the Corporation's annual management proxy circular.

The Board may fill vacancies on the Committee from among its members, on the recommendation of the Corporate Governance & Nominating Committee. If and whenever a vacancy shall exist on the Committee, the remaining members may exercise all its powers so long as a quorum remains in place.

The members of the Committee shall be entitled to receive such remuneration for acting as members of the Committee as the Board may from time to time determine.

The Corporate Secretary or such other person acceptable to the members shall act as Secretary to the Committee.

Committee Chair

The Board, upon recommendation of the Corporate Governance & Nominating Committee, shall appoint a Committee Chair. The Committee Chair may be removed and replaced by the Board.

If the Committee Chair is not present at any meeting of the Committee, one of the other members of the Committee present at the meeting shall be chosen by the Committee to chair the meeting.

The Committee Chair shall have the duties and responsibilities set forth in **Annex 1** which is incorporated by reference herein.

Quorum

Fifty percent of the members of the Committee shall constitute a quorum. All determinations of the Committee shall be made by a majority of its members present at a meeting duly called and held.

Meetings

All Committee members are expected to attend, in person or via teleconference, video conference, or other electronic communications facilities that permits all participants to communicate adequately, all meetings of the Committee, to come prepared for the meeting, and to remain in attendance for the duration of the meeting. The powers of the Committee may be exercised by resolution in writing signed by all members of the Committee who would have been entitled to vote on that resolution at a meeting of the Committee.

The Committee may invite such directors, officers, employees and external advisors of the Corporation as it may see fit from time to time to attend meetings of the Committee and assist in the discussion and consideration of the duties of the Committee.

The time at which and place where the meetings of the Committee shall be held, and the calling of meetings and the procedure at such meetings, shall be determined by the Committee in accordance with the Corporation's articles, by-laws, and applicable laws.

The Committee shall meet at each regularly scheduled Committee meeting alone without Management present, and shall meet separately with applicable senior Management, the external auditors, and the Chief Audit Executive.

Responsibilities

The Committee, to the extent required by applicable laws or rules, or otherwise considered by the Committee to be necessary or appropriate, is responsible for the oversight in respect of the Corporation's financial disclosure and accounting practices, internal control systems (including internal control over financial reporting), specific elements of risk management (including all financial risk management) delegated to the Committee by the Board, the external auditors, the Internal Audit function, and legal and regulatory compliance with respect to matters within the Committee's mandate and the Code of Ethics.

To fulfill its duties and responsibilities, the Committee shall:

Financial Disclosure and Accounting

- meet with Management and the external auditors to review and discuss, and to recommend to the Board for approval prior to public disclosure, the annual audited financial statements and the specific disclosures in "Management's Discussion and Analysis of Financial Condition and Results of Operations" ("**MD&A**");

- meet with Management and the external auditors to review and discuss, and to approve prior to public disclosure, the unaudited quarterly financial statements, including the specific disclosures in the MD&A and quarterly interim reports (including annual guidance);
- review and discuss with Management and the external auditors prior to public disclosure each press release that contains significant financial information respecting the Corporation or contains estimates or information regarding the Corporation's future financial performance or prospects; and the type and presentation of information to be included in such press releases (in particular, the use of "pro forma" or "adjusted" information that is not in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board ("**IFRS**"));
- review and discuss with Management and the external auditors, and recommend to the Board for approval prior to public disclosure:
    - the portions of the Annual Information Form containing significant information within the Committee's mandate;
    - the portions of the Corporation's annual management proxy circular containing significant information within the Committee's mandate;
    - all financial statements included in prospectuses or other offering documents;
    - all prospectuses and all documents which may be incorporated by reference in a prospectus, other than any pricing supplement issued pursuant to a shelf prospectus; and
    - significant financial information, including "pro forma" or "adjusted" non-IFRS information respecting the Corporation contained in a publicly disclosed document (other than routine investor relations or similar communications);
- review and discuss with Management and the external auditors (including those of the following that are contained in any report of the external auditors): (1) any analyses prepared by Management and/or the external auditors setting forth significant financial reporting issues and judgments made in connection with the preparation of the financial statements, including analyses of the effects of alternative accounting principles in accordance with IFRS; (2) all critical accounting policies and practices to be used by the Corporation in preparing its financial statements; (3) all material alternative treatments of financial information within IFRS that have been discussed with Management, ramifications of the use of these alternative treatments, and the treatment preferred by the external auditors; and (4) other material communications between the external auditors and Management, such as any Management Representation Letter or Schedule of Unadjusted Differences;
- review and discuss with Management and the external auditors significant accounting and reporting issues and understand their impact on the financial statements, including complex or unusual transactions and areas involving significant assumptions; major issues regarding accounting principles and financial statement presentation, including any significant changes in the Corporation's selection or application of accounting principles, and the effect of regulatory and accounting initiatives, as well as off balance sheet structures, on the financial statements of the Corporation, any significant issues as to the adequacy of the Corporation's internal controls and any special audit steps adopted in light of significant control deficiencies;
- review and discuss with Management and the external auditors non-IFRS financial measures, as well as financial information and earnings guidance provided externally, including to analysts and rating agencies;
- review with Management and the external auditors the results of the annual audit, including any restrictions on the scope of the external auditors' activities or on access to requested information, and the resolution of any significant disagreements with Management;
- review Management's Internal Control Report and the related attestation by the external auditors of the Corporation's internal controls over financial reporting; and

- review with Management and the external auditors and, if necessary, legal counsel, any litigation, claim or contingency, including tax assessments, or material reports or inquiries from regulators or governmental agencies, that could have a material effect upon the financial position of the Corporation, and the manner in which these matters have been disclosed in the financial statements.

Internal Controls

- assess the effectiveness of the Corporation's internal control systems, including internal control over financial reporting and information technology strategy, risks and, in consultation with the Safety, Health, Environment + Security Committee, cyber security controls and related matters;
- understand the scope of Internal Audit's and the external auditors' review of internal controls over financial reporting, and obtain reports on significant findings and recommendations, together with Management's responses;
- annually review the Corporation's disclosure controls and procedures, including any significant deficiencies in or material non-compliance with such controls and procedures;
- receive and review reports from the Corporation's Disclosure Committee and periodically review the Corporation's Disclosure Policy;
- review and discuss with the CEO and Chief Financial Officer their disclosures made during their annual and quarterly certification processes about significant deficiencies or material weaknesses in the design or operation of internal controls or any fraud that involves Management or other employees who have a significant role in the Corporation's internal controls;
- discuss with Management the Corporation's material financial risk exposures and the steps Management has taken to monitor and control such exposures; and
- review executive officers' expenses and aircraft usage reports and periodically report to the Corporate Governance & Nominating Committee thereon, as appropriate.

Risk Management

- regularly review with Management the Corporation's material risks within the Committee's scope (i.e. the principal financial risks facing the Corporation and any other risks specifically delegated to the Committee by the Board), the assessment of those risks, and how they are being managed or mitigated; and
- monitor and review at least annually Management processes and controls designed to identify, assess, monitor and manage the risks referred to above.

Internal Audit

- review with Management, the external auditors, and Internal Audit (and if appropriate, approve) the Charter, plans, activities, and organizational structure of the Internal Audit function;
- review the significant findings prepared by Internal Audit and recommendations issued by any external party relating to Internal Audit issues, together with Management's response thereto;
- take reasonable steps to ensure there are no unjustified or inappropriate restrictions or limitations on the functioning of the Internal Audit function, or on access to requested information;
- review the adequacy of the resources of Internal Audit to satisfy itself as to the effectiveness, objectivity and independence of the Internal Audit function;
- review and concur on the appointment, replacement, or dismissal of the Chief Audit Executive (or such individual in a similar capacity or position who performs a substantially similar function); and
- review the performance and effectiveness of the Internal Audit function.

External Audit

- meet with the external auditors prior to the annual audit to review (and if appropriate, approve) the proposed audit scope, approach and staffing (including coordination of audit efforts with Internal Audit) and budget;
- monitor the progress of the annual audit;
- obtain feedback about the conduct of the external audit from key employees engaged in the process;
- when applicable, review the annual post-audit letter from the external auditors and Management's response thereto and follow-up in respect of any identified weakness;
- at least annually, obtain and review a report by the external auditors describing: (i) the external auditors' internal quality control procedures, and (ii) any material issues raised by the most recent internal quality control review, or peer review, of the external auditors, or by any inquiry or investigation by governmental or professional authorities, within the preceding five years, respecting one or more independent audits carried out by the external auditors, and any steps taken to deal with any such issues;
- annually receive from the external auditors, and review, a report on items required to be communicated to the Committee by applicable rules and regulations;
- annually review the independence of the external auditors, including their formal written statement of independence delineating all relationships between the external auditors and the Corporation, review all such relationships, and consider applicable auditor independence standards and take any decisions and actions that are necessary and appropriate where the Committee becomes aware of the potential for a conflict (or the reasonable perception of a conflict) between the interests of the external auditors and the interests of the Corporation;
- annually evaluate the performance of the external auditors, including the lead audit partner, and report to the Board on its conclusions regarding the external auditors and recommendation to shareholders for appointment of the external auditors;
- investigate and consider whether any action is required if the external auditors resign;
- ensure the rotation of the lead audit partner having primary responsibility for the audit as required by applicable law; and
- set clear hiring policies for partners, employees and former partners and employees of the present and former external auditors.

Oversight in Respect of Audit and Non-Audit Services

- subject to confirmation by the external auditors of their compliance with Canadian and U.S. regulatory requirements, be directly responsible (subject to Board confirmation) for the appointment of the external auditors for the purpose of preparing or issuing any audit report or performing other audit, review or attest services for the Corporation, such appointment to be confirmed by the Corporation's shareholders at each annual meeting;
- be directly responsible (subject to Board confirmation) for the approval of fees to be paid to the external auditors for audit services, and shall pre-approve the retention of the external auditors for any permitted non-audit service to the Corporation;
- be directly responsible for the retention and oversight of the services of the external auditors (including resolution of disagreements between Management and the external auditors regarding financial reporting) for the purpose of preparing or issuing an audit report or performing other audit, review or attest services for the Corporation (with the external auditors reporting directly to, and being accountable to, the Committee);

- have the sole authority to pre-approve all audit services and all permitted non-audit services to the Corporation, provided that the Committee need not approve in advance non-audit services where:
    - the aggregate amount of all such non-audit services provided to the Corporation constitutes not more than 5% of the total amount of fees paid by the Corporation to the external auditors during the fiscal year in which the non-audit services are provided; and
    - such services were not recognized by the Corporation at the time of the engagement to be non-audit services; and
    - such services are promptly brought to the attention of the Committee and approved prior to the completion of the audit by the Committee or by one or more members of the Committee to whom authority to grant such approvals has been delegated by the Committee.
- have the sole authority to delegate to one or more designated members of the Committee the authority to grant pre-approvals required by this section, provided that the decision of any member to whom authority is delegated to pre-approve a service shall be presented to the Committee at its next scheduled meeting. If the Committee approves an audit service within the scope of the engagement of the external auditors, such audit service shall be deemed to have been pre-approved for purposes of this section.

Compliance

- establish procedures for: (i) the receipt, retention and treatment of complaints received by the Corporation regarding accounting, internal accounting controls or auditing matters; and (ii) the confidential, anonymous submission by employees of the Corporation of concerns regarding questionable accounting or auditing matters, and institute and oversee any special investigations as needed;
- review with the Chief Legal Officer (or such individual in a similar capacity or position who performs a substantially similar function) the Corporation's significant compliance policies and any legal matters or reports or inquiries received from regulators or governmental agencies that could have a material effect upon the financial position of the Corporation and that are not subject to the oversight of another committee of the Board;
- review the effectiveness of the system for monitoring compliance with laws and regulations (including those with respect to anti-fraud and anti-bribery) and the results of Management's investigations and follow-up of any instances of non-compliance that could have a material effect upon the financial position of the Corporation and that are not subject to the oversight of another committee of the Board;
- review the process for communicating the Corporation's Code of Ethics to the Corporation's personnel and monitoring compliance therewith; and
- report annually to shareholders describing the Committee's composition, responsibilities and how they were discharged, and any other information required by applicable legislation or regulation, including approval of non-audit services.

The Committee may perform such other functions as the Committee deems necessary or appropriate for the performance of its responsibilities and duties.

Delegation

The Committee may from time to time delegate any of its responsibilities to a subcommittee comprised of one or more members of the Committee and shall also carry out such other duties that may be delegated to it by the Board from time to time.

Other Matters

At the Corporation's expense, the Committee may retain, when it considers it necessary or desirable, outside consultants and advisors to advise the Committee independently on any matter. The Committee shall have the

sole authority to retain and terminate any such consultants or advisors, including sole authority to establish or review a consultant's or advisor's fees and other retention terms, and to direct the payment thereof.

The Corporation will provide appropriate funding, as determined by the Committee, for payment of ordinary administrative expenses of the Committee that are necessary or appropriate in carrying out its duties.

Authority to make minor technical amendments to this Charter is hereby delegated to the Corporate Secretary, who will report any amendments to the Committee at its next meeting.

The Committee's performance and effectiveness shall be evaluated annually, in accordance with a process developed by the Corporate Governance & Nominating Committee and approved by the Board. The results of that evaluation, including progress on adopted recommendations, shall be reported to the Corporate Governance & Nominating Committee and to the Board.

On an annual basis, this Committee Charter shall be reviewed and assessed, and any proposed changes shall be submitted to the Corporate Governance & Nominating Committee for review and recommendation, and then to the Board for approval.

Date of Last Revision: February 19, 2019

ANNEX 1

AUDIT COMMITTEE CHAIR POSITION DESCRIPTION

The Committee Chair shall provide overall leadership to enhance the effectiveness of the Committee and be responsible to:

- set the "tone" for the Committee and its members to foster ethical and responsible decision making, appropriate oversight of Management and appropriate corporate governance practices;
- encourage free and open discussion at meetings of the Committee;
- schedule and set the agenda for Committee meetings with input from other Committee members, the Chair and Management as appropriate;
- facilitate the timely, accurate and proper flow of information to and from the Committee, and arrange sufficient time during Committee meetings to fully discuss agenda items;
- report to the Board following each meeting of the Committee on the activities, findings and any recommendations of the Committee;
- provide advice and counsel to the senior members of Management in the areas covered by the Committee's mandate;
- proactively encourage training and education of the Committee and its members in areas falling within the Committee's mandate;
- take reasonable steps to ensure that Committee members understand the boundaries between the Committee and Management responsibilities;
- organize the Committee to function independently of Management and take reasonable steps to ensure that the Committee has an opportunity to meet in separate regularly scheduled closed sessions without Management present, and with or without internal personnel or external advisors as needed or appropriate;
- lead the Committee in monitoring and evaluating, in consultation with the Corporate Governance & Nominating Committee, the performance and effectiveness of the Committee as a whole and the contributions to the Committee of individual directors; and
- take all other reasonable steps to ensure that the responsibilities and duties of the Committee, as outlined in its Charter, are well understood by the Committee members and executed as effectively as possible.

SCHEDULE B
MINERAL PROJECTS

For the purposes of National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101"), our Allan, Cory, Lanigan, Rocanville and Vanscoy Potash operations are the properties material to Nutrien.

a) Allan Potash Operations

Certain scientific and technical information regarding our Allan potash operations is based on the technical report titled "National Instrument 43-101 Technical Report on Allan Potash Deposit (KL 112R A), Saskatchewan, Canada" dated effective December 31, 2018 ("Allan Technical Report") prepared by Craig Funk, B.Sc., M.Sc., P.Eng., P.Geo., who is a "qualified person" as defined in NI 43-101. The Allan Technical Report has been filed with the securities regulatory authorities in each of the provinces of Canada and furnished to the SEC. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. References should be made to the full text of the Allan Technical Report.

i) Project Description, Location and Access

General

The Allan mine is located in central Saskatchewan, approximately 45 kilometers east of the city of Saskatoon, Saskatchewan. More precisely, the Allan Shaft #2 collar is located at:

- Latitude: 51 degrees 55 minutes 55.56 seconds North
- Longitude: 106 degrees 04 minutes 18.84 seconds West
- Elevation: 524.26 meters above mean sea level ("SL")
- Northing: 5,754,028.978 m
- Easting: 426,303.225 m
- Projection: UTM
- Datum: NAD83
- Zone: 13

The Legal Description (Saskatchewan Township/Range) of the Allan surface plant is Section 22 Township 34 Range 01 West of 3rd Meridian.

The Company owns approximately 3,212 hectares (7,938 acres) of surface rights required for current Allan mine operations, including all areas covered by the existing surface plant and Tailings Management Area ("TMA"), and all surface lands required for anticipated future Allan mine and expanded milling operations.

The Allan mine surface facilities are accessed by an existing paved road that is part of the Saskatchewan Provincial Highway System. All potash product is shipped by rail over existing track.

The Allan mine is served by a number of villages within 50 kilometers of the mine site. The nearest city is Saskatoon (45 km distant).

Mineral Rights

Mineral rights at Allan are mined pursuant to mining leases with the Province of Saskatchewan, Canada ("Crown"), and with non-Crown ("Freehold") mineral rights owners. Crown mineral rights are governed by *The Subsurface Mineral Tenure Regulations, 2015* (Saskatchewan), and Crown leases are approved and issued by Saskatchewan's Ministry of the Economy. The original Allan Crown Subsurface Mineral Lease, numbered KL 112, was signed and executed in September 1962. In the following years, minor amendments were made to the lease, resulting in Crown Subsurface Mineral Lease KL 112R. In October 2017, a large area of land totaling 20,784 hectares (51,359 acres) was added to the lease resulting in Crown Subsurface Mineral Lease KL 112R A ("Allan Crown Lease").

The Allan Crown Lease covers an area of approximately 75,112 hectares (185,605 acres). At Allan, the Company has leased potash mineral rights for 45,484 hectares (112,393 acres) of Crown land and owns or has leased approximately 17,932 hectares (44,311 acres) of Freehold land within the lease boundary. The Allan Crown Lease term is for a period of 21 years from September 2004, with renewals (at the Company's option) for 21-year periods. Freehold lands also remain under lease providing, generally, that production is continuing and that there is a continuation of the Allan Crown Lease.

Within the Allan Crown Lease area, 19,183 hectares (47,403 acres) are mined pursuant to unitization agreements with mineral rights holders (Crown and Freehold) within two unitized areas. Allan Unit Area #1 includes 9,888 hectares (24,343 acres), while Allan Unit Area #2 includes 9,295 hectares (22,969 acres).

When underground workings of a potash mine are designed, there are inevitably regions that are mined with higher mining extraction (e.g., production panels) and other regions where mining extraction is lower (e.g., conveyor-belt development rooms). To treat mineral rights holders in both low extraction and high extraction areas fairly, and to promote good mining practices, a unitization agreement is the preferred method for determining royalty payouts. Under a unitization agreement, each mineral rights holder is paid a royalty based on their proportional share of the entire unit area regardless of whether or not their lands are actually mined. For example, if one mineral rights holder owns rights to 4,000 hectares within a 40,000 hectare unit area, they would be paid 10% of the total monthly royalty payout from that unit area.

ii) History

Ten potash mines were brought into production in Saskatchewan in the period 1962 through 1970. With nearly 50 years of production history, most potash mines have contracted or expanded production in response to the demand for potash. No new mines had been commissioned until 2017, when a solution mine and production facility near Moose Jaw, Saskatchewan began production. At present, eight of the eleven operating mines are conventional underground mines, and three operate using solution mining methods.

Exploration drilling for potash in the Allan area was carried out in the 1950s and 1960s. The Allan mine was built by a consortium of companies (U. S. Borax, Homestake Potash Company, and Swift Canadian Company) in the 1960s. Potash production began at Allan in April 1968 and the mine has run on a continuous basis since then (other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work).

PotashCorp acquired a 60% ownership of the Allan mine in 1978 (through purchase of the U. S. Borax and Swift Canadian interests), and became the operator of the mine in 1981. In 1990, PotashCorp purchased the remaining 40% interest.

Both flotation and crystallization methods are used at Allan to produce granular, standard and suspension-grade potash products. Debottlenecking and compaction expansion projects were completed at Allan during two phases of construction in 2005 and 2007. A major refurbishment and expansion of the Allan mine was completed in 2013, increasing nameplate capacity to 4.0 million tonnes of finished potash products per year.

iii) Geological Setting, Mineralization and Deposit Types

Geological Setting and Mineralization

Much of southern Saskatchewan is underlain by the Prairie Evaporite Formation, a layered sequence of salts and anhydrite which contains the Western world's largest deposits of potash. The potash extracted from the predominantly sylvinite ore has its main use as a fertilizer.

The 100 m–200 m thick Prairie Evaporite Formation is overlain by approximately 500 m of Devonian carbonates, followed by 100 m of Cretaceous sandstone, and 400 m of Cretaceous shales and Pleistocene glacial tills to surface; it is underlain by Devonian carbonates. The Phanerozoic stratigraphy of Saskatchewan is remarkable in that units are flat-lying and relatively undisturbed over very large areas.

Potash mineralization in this region of Saskatchewan is predominantly sylvinite, which is comprised mainly of the minerals sylvite ("KCl") and halite or rock salt ("NaCl"), with trace carnallite ("$KMgCl_3$ $6H_2O$") and minor water insolubles. Potash fertilizer is concentrated, nearly pure KCl (i.e., greater than 95% pure KCl), but ore grade is traditionally reported on a % K_2O equivalent basis. The "% K_2O equivalent" gives a standard measurement of the nutrient value of different potassium-bearing rocks and minerals. To convert from % K_2O equivalent tonnes to actual KCl tonnes, multiply by 1.58.

Over the past three years (2016, 2017, 2018), the average, measured potash ore grade of the mill feed at Allan was 25.3% K_20 equivalent. The average ore grade reported from 18 historic surface drillhole intersections, all within the Allan Crown Lease, is 26.65% K_20 equivalent. The average ore grade observed from 6,738 in-mine samples collected to the end of December 2017 is 24.8% K_20 equivalent.

Deposit Type

There are three mineable potash members within the Prairie Evaporite Formation of Saskatchewan. Stratigraphically highest to lowest, these members are: Patience Lake, Belle Plaine and Esterhazy.

The Allan potash deposit lies within the Patience Lake Member of Prairie Evaporite Formation. There are two potash seams named A Zone and B Zone within this Member; at present, only the A Zone is being mined at Allan. Some test mining has been carried out in the B Zone, but no mining is done in this layer at present. Neither the Esterhazy nor the White Bear Potash Members are present in the Allan area. The Belle Plaine Potash Member is not well-developed, and therefore is not mined.

Allan potash mineralization occurs at about 1000 meters depth below surface. The A Zone is approximately 3.35 meters thick and occurs near the top of the Prairie Evaporite Formation salts. Salt cover from the ore zone to overlying units is approximately 14 m. The Allan mine operates as a conventional, underground potash mine.

iv) Exploration

Before the Allan mine was established in 1968, all exploration consisted of drilling from surface and analysis of core from these drillholes. Since mining began in 1968, there has been just one exploration drillhole; this drillhole was completed in 1969.

In most of southern Saskatchewan, potash mineralization is in place wherever Prairie Evaporite Formation salts exist, are flat-lying and are undisturbed. Since the surface seismic exploration method is an excellent tool for mapping the top and bottom of Prairie Evaporite salts, this has become the main potash exploration tool in any existing Saskatchewan subsurface (potash) mineral lease. Historically, 2D seismic, and now the more accurate 3D seismic methods are used to map continuity and extent of potash beds in flat-lying potash deposits. Seismic data are relied upon to identify collapse structures that must be avoided in the process of mine development since these structures can act as conduits for water. As a result, isolation pillars or mining buffer zones are left around these anomalous features. This practice reduces the overall mining extraction ratio, but the risk of inflow to mine workings is effectively mitigated. A total of 248 linear kilometers of 2D seismic lines have been acquired at Allan. Between 1988 and 2015, 3D seismic has been acquired over an area covering 363 square kilometers. The most recent seismic survey was conducted in 2015 and accounted for 49.5 square kilometers of the total square kilometers stated above.

Surface seismic data are generally collected three to five years in advance of mining. Any area recognized as seismically unusual is identified early, and mine plans are adjusted to avoid these regions.

v) Drilling

For the original Allan potash test holes drilled in the 1950s and 1960s, the primary objective of this drilling was to sample the potash horizons to establish basic mining parameters. Seismic surveys (2D) were done sparingly in those days, so the drillhole information was relied upon heavily to evaluate potash deposits. Test holes would penetrate the evaporite section with a hydrocarbon based drilling mud (oil-based or diesel fuel) to

protect the potash mineralization from dissolution. Basic geophysical well-logs were acquired, and in many cases, drill stem tests were run on the Dawson Bay Formation to help assess mine inflow potential. Core samples from the targeted potash intersections were split or quartered (cut with a masonry saw) crushed and analyzed to establish potash grades.

Relatively thin interbeds or seams, referred to as clay seams in the potash industry, are an ever-present component of the A Zone and B Zone at Allan. These seams, along with the clay or clay-like material disseminated throughout the rock, make up the water insoluble portion of the mineralized horizons. The same sequences of clay seams can be correlated for many kilometers across the central Saskatchewan potash mining district.

At Allan, a particular sequence of three clay seams marks the top of the A Zone. These seams are used to guide the vertical positioning of the mining machine. The uppermost portion of the sequence of three seams is maintained at the top of the mining cut to keep the cutting "on grade". Cutting too high above this upper seam or top marker results in dilution, as halite (rather than sylvinite) immediately overlies the production zone. In practice though, the top marker seam is slightly overcut (between 10 cm to 20 cm) to prevent an unstable condition from being created. Clay seams are often planes of weakness, and if they are undercut, material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

The A Zone mining interval was historically fixed at 3.35 m (11'). Recently acquired mining machines cut at a fixed height of 3.65 m (12'). At present, seven older mining machines cut at a height of 3.35 m (11') and four new mining machines cut at a height of 3.65 m (12'). These mining heights allow for comfortable working headroom and efficient extraction of potash ore. It is difficult to determine at which mining height certain Mineral Resources and Reserves will be cut in the future, so the more conservative mining height of 3.35 m (11') was applied to Mineral Resource and Reserve calculations.

The original exploration area was explored with a number of test holes spaced at intervals of 1.6 km to 6.4 km (1–4 miles). Assays from most of these original test holes were studied by independent consultant David S. Robertson and Associates (1978) and are found in Table A. An additional six historical test holes were studied by Nutrien staff in 2018, which are also listed in Table A below. In each case, the best 3.35 m (11') mining interval intersected in each drillhole was determined from the assay values, using clay marker seams as a guide. Note that one of the above-mentioned test holes was omitted from the assay calculation due to a section of missing core in the ore zone, one was omitted due to erroneous assay data which could not be resolved and another two were omitted due to an ore grade of less than 15% K_2O. With nearly 50 years of mining experience at Allan, it is the opinion of the authors that areas of low grade (i.e., <15% K_2O) are localized with a relatively small lateral extent.

Drillhole assay data for the A Zone at Allan gives an estimated mean grade of 26.65% K_2O with 4.96% water insolubles.

B Zone mineralization is indicated by gamma ray geophysical log response in each of the exploration drillholes listed in Table A indicating a potash Mineral Resource. Some test mining of the B Zone has been done. However, sustained production from that zone has not been established. Assay results for the B Zone are not presented here.

Table A: Assay results for all potash test holes within Allan Crown Lease

Average in 3.35 m (11 feet) mining interval (undiluted)			
Drillhole	**Year Drilled**	**% K_2O**	**% Water Insolubles**
04-10-033-01 W3	1954	*	*
12-32-034-02 W3	1956	28.74	5.76
16-11-033-01W3	1956	*	*
04-29-034-01 W3	1957	25.79	4.74
01-25-034-01 W3	1957	28.05	4.74
16-11-034-02 W3	1957	29.05	3.40
13-11-034-01 W3	1957	28.75	4.54
13-11-034-03 W3	1957	21.97	1.74
16-09-035-01 W3	1957	25.04	5.11
05-26-035-01 W3	1957	16.78	*
09-29-033-02 W3	1957	*	*
09-28-034-01 W3	1961	29.53	5.26
09-27-034-01 W3	1961	30.63	4.52
09-26-034-01 W3	1961	27.71	6.33
09-33-034-01 W3	1961	23.95	5.89
08-34-034-01 W3	1961	26.31	5.76
09-35-034-01 W3	1961	25.89	8.64
05-22A-034-01 W3	1961	26.47	3.19
16-14-034-01 W3	1962	26.78	5.25
01-17-034-01 W3	1962	28.63	5.29
01-12-034-01 W3	1962	*	*
14-23-034-03 W3	1969	29.56	4.18
Average (from 18 usable values):		**26.65**	**4.96**

Due to the remarkably consistent mineralogy and continuity of the resource, as experienced through 50 years of mine production, no potash exploration drilling has been done at Allan since 1969. Instead of exploration drillholes, seismic surveying has been relied upon to explore ahead of mine development. Where normal Prairie Evaporite sequences are mapped in the seismic data, potash beds have unfailingly been present. Localized, relatively small mine anomalies, not mapped in seismic data do occur. When they do, they are dealt with in the normal course of mining and extraction through these anomalous areas and are typically minimized. Anomalies associated with possible water inflow problems, which are mapped in the seismic data, are avoided.

vi) Sampling, Analysis and Data Verification

Basic Approach

Exploration in the Allan area was conducted in the 1950s and 1960s. Sampling and assaying of potash core samples was done using methods considered consistent with standard procedures for potash exploration at these times.

Drillhole sampling methods have remained essentially the same over the years. Potash core samples are acquired as described in earlier sections of this report. Short segments of core usually about 1 foot (0.3 m) in length are labeled based on visible changes in mineralization, and sometimes based on more or less fixed intervals. Each segment of core is then split using some type of rock or masonry saw. The split portion of core is then bagged

and labeled and sent to a laboratory for chemical analysis. Historical potash samples remain stored at the Subsurface Geological Laboratory (Regina, Saskatchewan) of the Saskatchewan Ministry of the Economy. Most of these have deteriorated substantially.

A total of 6,738 in-mine ore grade samples were collected at Allan to the end of December 2017. All in-mine samples were analyzed in the Allan mill laboratory using analysis techniques that were up-to-date for the era in which the sample was collected.

Regarding quality assurance for analytical results of in-mine samples, the Company participates in the Saskatchewan Potash Producers Association ("SPPA") Sample Exchange Program to monitor the accuracy of analytical procedures used in its labs. In the early 1970s, the SPPA initiated a round-robin Sample Exchange Program, the purpose of which was to assist the potash laboratories in developing a high level of confidence in analytical results. This program has continued up to the present, and participants include all major Canadian potash mine site labs, the Nutrien Pilot Plant Lab, and an independent surveyor lab. The Sample Exchange Program provides the participants with three unknown potash samples for analysis four times per year. Results for the unknown sample analysis are correlated by an independent agency that distributes statistical analysis and a summary report to all participants. Completed SPPA samples can be used for control standards as required in QA/QC sections of standard analytical procedures.

The Nutrien Pilot Plant is secured in the same way as modern office buildings are secured. Authorized personnel have access and visitors are accompanied by staff. No special security measures are taken beyond that. Currently, no external laboratory certification is held by the Nutrien Pilot Plant. On occasion, product quality check samples are sent to the Saskatchewan Research Council, a fully certified analytical facility.

In the opinion of the authors of the Allan Technical Report, the sampling methods are acceptable, are consistent with industry-standard practices and are adequate for mineral resource and reserve estimation purposes.

Mean Potash Mineral-Grade In-Mine Samples

At Allan, in-mine grade samples are taken from the floor approximately once per week per active mining face. This is roughly equivalent to a sample taken every 68 m to 74 m in production panels, and a sample taken every 85 m to 128 m in development panels. Since start-up in 1968 through to the end of December 2017, a total of 6,738 in-mine potash mineral grade samples have been collected from the Allan A Zone, the main potash horizon at Allan. In-mine samples collected and analyzed in 2018 contributed no meaningful change to the overall grade. All samples were analyzed in the Allan mill laboratory using analysis techniques that were up-to-date for the era in which the sample was collected.

The median ore grade for this family of in-mine samples is 25.5% K_2O equivalent and the mean ore grade is 24.8%.

For the B Zone at Allan, mineral grade is reported to be 20.3% K_2O equivalent, the grade observed from 20,230 in-mine samples at the Lanigan mine where the B Zone has been extensively mined. Even though Allan mine is some distance from Lanigan, this is considered to be the best estimate of expected mineral grade for this potash layer because the deposit is known to be regionally continuous from west of Cory to east of Lanigan. Although it is possible that once mining proceeds into the B Zone the reported grade could change from what is reported, it is expected that any such change would be minimal.

Potash Ore-Density From In-Mine Mineral-Grade Measurements

An estimate of in-situ rock density is used to calculate potash mineralization volumes in mineral resource and reserve assessments. A common approach is to determine in-place mineral resource and reserve volumes (m^3) to a certain degree of confidence, then multiply this number by in-situ bulk-rock density (kg/m^3) to give in-place mineral resource and reserve tonnes. However, establishing an accurate bulk-rock density value is not an easy or trivial task. Well-log data from drillholes can be used for this if accurate and calibrated well-logs are acquired during exploration drilling. In practical terms, modern well-logs tend to meet these criteria, but historic well-logs (collected before the 1990s) do not. In Saskatchewan, almost all potash exploration drilling took place in the 1950s and 1960s, well before density logs were accurate and reliable.

Another approach is to look up density values for the minerals which constitute potash rock – values determined in a laboratory to a high degree of accuracy and published in reliable scientific journals/textbooks – then apply these densities to the bulk-rock in some way. Given that the density of each pure mineral is quantified and known, the only difficult aspect of this approach is determining what proportion of each mineral makes up the bulk-rock at a particular sample location. This is the methodology that was used to determine an estimate of bulk-rock density for the Allan ore zone. An obvious benefit of this approach is that a mean value computed on the distribution (6,738 sample points) has a much greater confidence interval than a mean value computed from 18 drillhole assays.

The main mineralogical components of the ore zones of Saskatchewan's Prairie Evaporite Formation are:

- Halite – NaCl
- Sylvite – KCl
- Carnallite – $KMgCl_3 \cdot 6(H_2O)$
- Insolubles – dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components

All Nutrien divisions measure and record the in-mine % K_2O grade and insoluble content of the mined rock. The magnesium content is not measured at Allan, since carnallite is not a significant component of the ore here. From this set of measurements, the density of the ore can be calculated. The required composition and mineral density information for each mineral component is given below (sourced from Webmineral Mineralogy Database, 2018):

Halite – NaCl

- Na 39.34%
- Cl 60.66%
- Oxide form Na_2O 53.03%
- Mineral density 2170 kg/m^3

Sylvite – KCl

- K 52.45%
- Cl 47.55%
- Oxide form K_2O 63.18%
- Mineral density 1990 kg/m^3

Insolubles (Allan A Zone)

- Component minerals: dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components
- Average density – 2510 kg/m^3 (Nutrien Pilot Plant, 2018)

The value for insoluble density is based on known densities of the constituent parts of the insoluble components of the mineralization and the average occurrence of these insoluble components, which is known from the nearly 50 years of mining experience at Allan. Assuming the lowest plausible density of insolubles known for Saskatchewan potash deposits of this nature, the effect upon overall bulk-rock ore density and Mineral Resource and Reserve calculations would be negligible.

The mineral composition of potash ore is halite, sylvite and insolubles. From 6,738 Allan A Zone in-mine grade samples, raw ore composition is:

% Sylvite = 39.3 (converted from % K_2O)
% Insolubles = 2.7
% Carnallite = 0.0

The percent of halite is assumed to be:

% Halite = (100 - % Sylvite - % Insol. - % Carnallite)
= (100 - 39.3 - 2.7 - 0.0)
= 58.1

Applying this methodology, and using these mean grade data gives a mean bulk-rock density for Allan A Zone potash of:

$\mathbf{RHO_{bulk\text{-}rock}}$ = (Halite density * % Halite) +
(Sylvite density * % Sylvite) +
(Insol. density * % Insol.)
= (2170 * % Halite) +
(1990 * % Sylvite) +
(2510 * % Insol.)
= 2110

$RHO_{bulk\text{-}rock}$ (Allan Zone) = 2110 kg/m^3

This method is as accurate as the ore grade measurements and mineral density estimates.

To date, not enough B Zone mining has been carried out at Allan to permit a bulk density calculation based on Allan in-mine grade samples. The mining of 3.537 million tonnes of the B Zone represents a relatively small amount of material for a potash mine. The historic mining that was conducted in the B Zone at Allan was localized in only one geographic area, so data from this mining are not considered representative of what will be seen once mining proceeds in this layer. Although it is possible that once enough mining has occurred in the B Zone to give enough samples with all constituent minerals measured, the reported proportions of the various mineral constituents could change from what is reported. It is expected that any such change would have only a minimal effect on bulk-rock density used in tonnage calculations.

Instead, we use the potash bulk-rock density calculated using 20,230 in-mine grade samples from Lanigan B Zone:

$RHO_{bulk\text{-}rock}$ (Allan B Zone) = $RHO_{bulk\text{-}rock}$ (Lanigan B Zone) = 2120 kg/m^3

This estimate is considered acceptable since both Allan B Zone and Lanigan B Zone are the same potash seam.

Assay Data Verification

Most of the original drillhole assays were studied by independent consultant David S. Robertson and Associates (1978). In 2018, six historical drillhole assay results were studied by Nutrien technical staff, Jodi Derkach (GIS Cert., P.Geo.) and Tanner Soroka (P.Geo.).

The original assay results for core samples from historical drillholes were taken as accurate in these studies, as there is no way to reliably reanalyze these samples. Most of the remaining samples in storage have long since deteriorated to the point where they are not usable.

Ore grades of in-mine samples are measured in-house at the Allan mine laboratory by Company staff using modern, standard chemical analysis tools and procedures; an independent agency does not verify these results. However, check sampling through the SPPA program does occur.

It should be noted that assay results from historical drillholes match mine sample results closely – within approximately 0.9% – even though sample spacing is obviously much greater in the case of wells. This fact is a validation of the methodology. Based on 50 years of in-mine experience at Allan, historical assay results are

considered to be acceptable and provide a good basis for estimating ore grade in areas of future mining at Allan. However, the mean mineral grade of 24.8% K_2O equivalent determined from 6,738 in-mine grade samples is thought to provide the most accurate measurement of potash grade for the Allan mine.

Exploration Data Verification

The purpose of any mineral exploration program is to determine extent, continuity, and grade of mineralization to a certain level of confidence and accuracy. For potash exploration, it is important to minimize the amount of cross-formational drilling, since each drillhole is a potential conduit for subsurface groundwater from overlying (or underlying) water-bearing formations into future mine workings. Every potash test drillhole from surface sterilizes potash mineralization; a safety pillar is required around every surface drillhole once underground mining commences. This is the main reason that exploration drilling has not been carried out at Allan in recent years.

Initial sampling and assaying of cores was done during potash exploration at Allan in the 1950s and 1960s. Methods were consistent with standard procedures for that era. The mine began production in 1968 and, with the exception of a single potash test hole in 1969, no further core drilling has been carried out since then. This approach to potash sampling is in accordance with widely accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

Assay of physical samples (drillhole cores and/or in-mine samples) is the only way to gain information about mineral grade, but extent and continuity of mineralization are correctly determined using data collected from geophysical surveys correlated with historic drilling information. To date surface seismic data at Allan have been collected, analyzed, and verified by Company staff, at times in cooperation with an independent consultant. Ultimate responsibility for final analyses including depth conversion (seismic depth migration), as well as the accuracy of these data, rests with Nutrien qualified persons.

Data for the mineral resource and reserve estimates for Allan mine were verified by Company staff as follows:

- Annual review of potash assay sample information (drillholes and in-mine grade samples);
- Annual review of surface geophysical exploration results (3D and 2D seismic data);
- Annual crosscheck of mined tonnages reported by mine site technical staff with tonnages estimated from mine survey information; and
- Annual crosscheck of mineral resource and reserve calculations carried out by corporate technical staff.

This approach to data verification of potash mineral grade and surface seismic information is in accordance with generally accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

vii) Mineral Processing and Metallurgical Testing

At Allan, potash ore has been mined and concentrated using flotation and crystallization methods to produce saleable quantities of high-grade finished potash products since 1968.

Over the 50-year mine life, 150.239 million tonnes of potash ore have been mined and hoisted at Allan to produce 52.949 million tonnes of finished potash product (from startup in 1968 to December 31, 2018). Given this level of sustained production over 50 years, basic mineralogical processing and prospective metallurgical testing of Allan potash is not considered relevant.

viii) Mineral Resource and Mineral Reserve Estimates

Definitions of Mineral Resource

The Canadian Institute of Mining and Metallurgy and Petroleum ("CIM") has defined mineral resource in *The CIM Definition Standards for Mineral Resources and Reserves* (2014) as:

> **Inferred Mineral Resource**: That part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

Indicated Mineral Resource: That part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade quality continuity between points of observation.

Measured Mineral Resource: That part of a mineral resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.

CIM defines modifying factors as "considerations used to convert mineral resources into mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors."

In south-central Saskatchewan, where geological correlations are straightforward, and within a (potash) subsurface mineral lease with an operating potash mine, mineral resource categories are generally characterized by the Company as follows:

Inferred Mineral Resource: Areas of limited exploration, such as areas that have been investigated through regional geological studies, or areas with 2D regional surface seismic coverage, little or no drilling, at some distance from underground workings, and within the applicable Crown lease.

Indicated Mineral Resource: Areas of adequate exploration, such as areas with 3D surface seismic coverage, little or no drilling, at some distance from underground workings, and within the applicable Crown lease.

Measured Mineral Resource: Areas of detailed, physical exploration through actual drilling or mine sampling, near existing underground workings, and within the applicable Crown lease.

The Allan mine began production in 1968 and, with the exception of a single test hole in 1969, no further core drilling has been carried out since then. Instead, exploration involved collecting surface seismic data, which became better in quality over the years. Exploration drilling has demonstrated the presence of the potash horizon, and seismic coverage shows the continuity of the Prairie Evaporite Formation within which the potash horizon occurs.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Allan that is far superior to the level of understanding provided by any surface drilling based exploration program. We believe that our approach provides a body of information that guides and constrains our exploration inferences in a much better way than could be achieved from any conventional exploration investigation in areas immediately surrounding, and contiguous to, the Allan potash mine.

Potash Resource Estimate

Exploration information used to calculate reported Mineral Resource tonnages at Allan consist of both physical sampling (drillhole and in-mine) and surface seismic (2D and 3D). Based on the definitions and guidelines above, all mineral rights leased or owned by the Company, and within Allan Crown Lease, are assigned to one of the three mineral resource categories.

Mineral resources are reported as mineralization in-place and are exclusive of Mineral reserves. In-place tonnes were calculated for each of the mineral resource categories using the following parameters:

Mining Height: 3.353 meters (11 feet)
Ore Density: 2.110 tonnes/cubic meter (A Zone)
Ore Density: 2.120 tonnes/cubic meter (B Zone)

The mineral resources for Allan, as of December 31, 2018 are as follows:

Allan A Zone:		
Inferred Resource	2,678	millions of tonnes
Indicated Resource	366	millions of tonnes
Measured Resource	1,006	millions of tonnes
Total A Zone Resource	4,050	millions of tonnes
Allan B Zone:		
Inferred Resource	2,691	millions of tonnes
Indicated Resource	367	millions of tonnes
Measured Resource	1,506	millions of tonnes
Total B Zone Resource	4,564	millions of tonnes
Total for Allan (A Zone + B Zone):		
Inferred Resource	5,369	millions of tonnes
Indicated Resource	733	millions of tonnes
Measured Resource	2,512	millions of tonnes
Total A Zone + B Zone Resource	8,614	millions of tonnes

The average mineral grade of the Allan A Zone Mineral Resource is 24.8% K_20 equivalent, and was determined from 6,738 in-mine samples at Allan collected over the life of the mine. The average mineral grade of the Allan B Zone Mineral Resource is 20.3% K_20 equivalent, and was determined from 20,230 in-mine samples at Lanigan mine where the B Zone has been extensively mined.

The tonnage reported in the Allan A Zone Measured Resource is comprised of the potash that is within 1.6 km (1 mile) of physically sampled location (i.e., drillholes or mine workings). Also included as Measured Resource is the potash that is left behind as pillars in mined-out areas of the Allan mine. In a potash mine, it is common practice to consider mining remnant pillar mineralization using solution methods after conventional mining is complete, or after a mine is lost to flooding. The Patience Lake mine was successfully converted from a conventional mine to a solution mine after being lost to flooding in 1989. Since conversion to a solution mine is not anticipated in the near future at Allan, in-place pillar mineralization remains as a mineral resource rather than a mineral reserve at this time.

Definitions of Mineral Reserve

CIM defined mineral reserve in *The CIM Definition Standards for Mineral Resources and Reserves* (2014) as:

> **Probable Mineral Reserve**: The economically mineable part of an indicated, and in some circumstance, a measured, mineral resource. The confidence in the modifying factors applying to a probable mineral reserve is lower than that applying to a proven mineral reserve.
>
> **Proven Mineral Reserve**: The economically mineable part of a measured mineral resource. A proven mineral reserve implies a high degree of confidence in the modifying factors.

For Saskatchewan, in regions adjacent and contiguous to an operating potash mine, mineral reserve categories are characterized by the Company as follows:

> **Probable Mineral Reserve**: Identified recoverable potash mineralization classified as a measured resource, within a 1.6 km (1 mile) radius of a sampled mine entry or exploration drillhole, and within the applicable Crown lease.
>
> **Proven Mineral Reserve**: identified recoverable potash mineralization classified as a measured resource, delineated on at least two sides by sampled mined entries or exploration drillholes to a maximum of 3.2 km (2 miles) apart, and within the applicable Crown lease.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Allan that is far superior to the level of understanding provided by any surface drilling based exploration program. An understanding of the amount of ore that can be conventionally mined from the measured resource category using current mining practices comes from 50 years of potash mining experience at Allan.

Mineral Reserve Estimates

Using the definitions outlined above, part of the Allan A Zone measured resource has been converted to mineral reserve. The assigned mineral reserve category is dependent on proximity to sampled mined entries also described above.

The overall extraction rate at the Allan mine is 33%. It was derived by dividing the total tonnes mined to date by the tonnage equivalent of the total area of the mine workings (i.e., the perimeter around the mine workings) less future mining blocks. Since an extraction rate has been applied, mineral reserves are considered recoverable ore, and are reported as such.

The mineral reserves for Allan as of December 31, 2018 are as follows:

Allan A Zone:		
Probable Reserve	250	millions of tonnes
Proven Reserve	99	millions of tonnes
Total A Zone Reserve =	349	millions of tonnes
Allan B Zone:		
Probable Reserve	nil	
Proven Reserve	nil	
Total B Zone Reserve =	nil	
Total for Allan (A Zone + B Zone):		
Probable Reserve	250	millions of tonnes
Proven Reserve	99	millions of tonnes
Total A Zone and B Zone Reserve =	349	millions of tonnes

The average mineral grade of the Allan A Zone mineral reserve is 24.8% K_20 equivalent, and was determined from 6,738 in-mine samples at Allan over the life of the mine.

ix) Mining Operations

All conventional potash mines in Saskatchewan operate at 900 m to 1200 m below surface within 9 m to 30 m of the top of the Prairie Evaporite Formation. Over the scale of any typical Saskatchewan potash mine, potash beds are tabular and regionally flat-lying, with only moderate local variations in dip. At Allan, potash ore is mined using conventional mining methods, whereby:

- Shafts are sunk to the potash ore body;
- Continuous mining machines cut out the ore, which is hoisted to surface through the Production shaft;
- Raw-potash is processed and concentrated in a mill on surface; and
- Concentrated finished potash products (near-pure KCl) are sold and shipped to markets in North America and offshore.

Sinking of the two original shafts (Shaft #1 and Shaft #2) from surface to the potash zone was completed in early 1968, and the first potash ore was hoisted by Allan in April of that year. The Allan mine has run on a continuous basis since the first ore was hoisted in 1968, other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work.

In recent years, the Allan mine underwent a major expansion which brought the nameplate capacity up to 4.0 million tonnes of finished potash products per year. As of December 31, 2018, the operational capability of the Allan facility is 2.6 million tonnes per year.

Virtually all Allan underground mining rooms are in one potash mineralized zone, the upper layer (or A Zone) of the Patience Lake Member of the Prairie Evaporite Formation (the host evaporite salt). In contrast, some potash mines further east in Saskatchewan mine in a different potash layer, the Esterhazy Member of the Prairie Evaporite Formation. At Allan, mine elevations range from approximately 980 m to 1120 m, averaging approximately 1010 m. These depths to A Zone potash mineralization are anticipated over most of the Allan lease area. Mine workings are protected from aquifers in overlying formations by approximately 14 m of overlying salt and potash beds, along with salt plugged porosity in the Dawson Bay Formation, a carbonate layer lying immediately above potash hosting salt beds.

The Allan mine is a conventional underground mining operation whereby continuous mining machines are used to excavate the potash ore by the stress-relief mining method. Continuous conveyor belts transport ore from the mining face to the bottom of the production shaft. The highest mineral grade section of the Allan potash seam is approximately 3.35 m (11 feet) thick, with gradations to lower grade salts immediately above and below the mining horizon. The actual mining thickness at Allan is dictated by the height of continuous boring machines used to cut the ore. Seven older borers are designed to cut at a thickness of 3.35 m (11 feet) and four new borers are designed to cut 3.65 m (12 feet).

Allan cuts to a marker (clay) seam that is slightly above the high-grade mineralized zone to establish a safe and stable mine roof. The top marker seam is slightly overcut by 10 to 20 cm. Clay seams are often planes of weakness, and if they are undercut, material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

Conservative local extraction rates (never exceeding 45% in any mining block) are employed at all Saskatchewan mines, including Allan, in order to minimize potential detrimental effects of mining on overlying strata; this is common practice in flat-lying, tabular ore bodies overlain by water-bearing layers.

From the shaft-bottom, potash ore is hoisted approximately 1000 m from the potash level through the vertical shafts to a surface mill. In addition to hoisting potash ore to surface, the production shaft also provides fresh air ventilation to the mine and serves as a secondary egress. The Service Shaft is used for service access, and exhaust ventilation from the mine.

Over the 50-year mine life, 150.239 million tonnes of potash ore have been mined and hoisted at Allan to produce 52.949 million tonnes of finished potash products (from startup in 1968 to December 31, 2018). The life-of-mine average concentration ratio (raw-ore/finished potash products) is 2.84 and the overall extraction rate over this time period is 33%.

x) Processing and Recovery Operations

At Allan, potash ore has been mined and concentrated to produce saleable quantities of high grade finished potash products since 1968. Products include granular, standard, and industrial grade potash used for agricultural applications and industrial purposes.

Both flotation methods and crystallization methods are used to concentrate potash ore into finished potash products at the Allan mill. Raw potash ore is processed on surface and concentrated finished potash products (near-pure KCl) are sold and shipped to markets in North America and offshore.

Over the past three years, production of finished potash products at Allan was:

- 2016: 2.380 million tonnes finished potash products at 61.16% K_2O (average grade)
- 2017: 1.832 million tonnes finished potash products at 61.39% K_2O (average grade)
- 2018: 2.410 million tonnes finished potash products at 61.17% K_2O (average grade)

Over the past decade actual mill recovery rates have been between 81.5% and 87.0%, averaging 84.6%. Given the long-term experience with potash geology and actual mill recovery at Allan no fundamental potash milling problems are anticipated in the foreseeable future.

Quality control testing and monitoring geared towards fine-tuning and optimizing potash milling and concentrating processes are conducted on a continual basis at all Nutrien mine sites and at Nutrien research facilities. At Allan, this is no exception; test work to optimize circuit performance and ensure product quality is carried out on an ongoing basis.

xi) Infrastructure, Permitting and Compliance Activities

Project Infrastructure

Infrastructure is in place to meet current and projected requirements for transportation, energy (electricity and natural gas), water and process materials at Allan.

The Allan mine is served by a number of villages within 50 kilometers of the mine site. The nearest city is Saskatoon (approximately 45 km distant).

The Allan surface facilities are accessed by existing paved roads and highways that are part of the Saskatchewan Provincial Highway System. All potash product is shipped by rail over existing track.

At present, high-voltage power capacity at Allan is 32 MVA. The ten-year projection of power utilization indicates that the utility can meet all foreseeable future demand.

The Allan operation requires a sustained fresh water supply for the milling process which is provided from a local reservoir called the Bradwell Reservoir operated by SaskWater (approximately 6 km distant). This water supply provides a sustainable source of process water for Allan milling operations without having any impact on other users of water in the area.

Environmental Studies, Permitting and Compliance Activities

The tailings management strategy at all Nutrien potash mines in Saskatchewan, including Allan, is one of sequestering solid mine tailings in an engineered and provincially licensed TMA near the surface plant site. The Allan TMA currently covers an area of approximately 600 hectares (1,483 acres) of land owned by the Company. Solid potash mine tailings typically consist of 85% to 95% rock salt (NaCl) and 5% to 15% insoluble (carbonate mud = $CaCO_3$, anhydrite mud = $CaSO_4$, and clays like chlorite, illite and so on). An engineered slurry-wall (in some portions, a compacted earth trench barrier) has been constructed where required around approximately half of the Allan TMA. In future years this wall can be expanded if required for operational needs. The slurry-wall provides secondary containment for any saline mine waters, minimizing brine impacts from the TMA to surrounding surface water bodies and near-surface aquifers. Areas surrounding the TMA are closely monitored: this includes everything from daily visual perimeter inspections to annual investigations and inspections of surrounding groundwater and aquifers.

Allan currently operates two brine disposal wells near the surface plant of the Allan mine where clear salt brine (i.e., no silt, clay slimes, or other waste) is borehole injected into the Winnipeg/Deadwood Formations, deep subsurface aquifers approximately 1500 m to 1700 m below the surface. The groundwater in these extensive deep aquifers is naturally saline.

Emissions to air (mostly salt dust and potash dust) are kept below regulatory limits through various modern air pollution abatement systems (e.g., dust collection systems built into mill processes) that are provincially licensed. This same procedure is followed at all Nutrien mines in Saskatchewan.

The Allan operation requires a sustained fresh water supply for the milling process which is provided by a waterline from the Bradwell Reservoir (approximately 6 km distant). This water supply is provincially licensed and provides a sustainable source of process water for Allan milling operations without having any impact on other users of water in the area.

In Saskatchewan, all potash tailings management activities are carried out under an "Approval to Operate" granted by the Saskatchewan Ministry of Environment ("MOE"), the provincial regulator. The Allan mine is in compliance in all material respects with all regulations stipulated by the Environmental Protection Branch of the MOE. The current Allan Approval to Operate has been granted to July 1, 2028.

In terms of long-term decommissioning, environmental regulations of the Province of Saskatchewan require that all operating potash mines in Saskatchewan create a long-term decommissioning and reclamation plan that will ensure all surface facilities are removed, and the site is left in a chemically and physically stable condition once mine operations are complete. The Company has conducted numerous studies of this topic, and the most recent decommissioning and reclamation plan for Allan was approved by MOE technical staff in October 2016. Because the current expected mine life for Allan is many decades into the future, it is not meaningful to come up with detailed engineering designs for decommissioning at present. Instead, decommissioning plans are reviewed every five years and updated to accommodate new ideas, technological change, incorporation of new data and adjustments of production forecasts and cost estimates. Any updated decommissioning and reclamation reports generated by this process are submitted to provincial regulatory agencies. For Allan, a revised decommissioning and reclamation plan is required in July 2021.

In addition to the long-term decommissioning plan, provincial regulations require that every potash producing company in Saskatchewan set up an Environmental Financial Assurance Fund, which is to be held in trust for the decommissioning, restoration and rehabilitation of the plant site after mining is complete. This fund is for all mines operated by Nutrien in the province of Saskatchewan (i.e., Allan, Cory, Lanigan, Patience Lake, Rocanville and Vanscoy).

xii) Capital and Operating Costs

The Allan mine has been in operation since 1968; in the years immediately preceding this, major capital investment was made to bring this mine into production. Since then, capital expenditures were made on a regular and ongoing basis to sustain production and to expand production from time to time.

A major refurbishment and expansion of the Allan mine was completed in 2013, increasing nameplate capacity to 4.0 million tonnes of finished potash products per year. This work involved enhancement of hoists and shaft conveyances, major expansions of both mine and mill, improvements to loadout facilities and some infrastructure improvements. All construction was carried out without significant disruption to existing potash production from the site.

xiii) Exploration, Development and Production

Potash production in any given year at the Allan potash mine is a function of many variables, so actual production in any given year can vary dramatically from tonnages produced in previous years. The mineral reserve tonnage and historic average production are used to estimate remaining mine life. If the average mining rate seen over the past three years (6.198 million tonnes of potash ore mined and hoisted per year) is sustained, and if mineral reserves remain unchanged, then the Allan mine life is 56 years from December 31, 2018.

b) Cory Potash Operations

Certain scientific and technical information regarding our Cory potash operations is based on the technical report titled "National Instrument 43-101 Technical Report on Cory Potash Deposit (KL 103 B), Saskatchewan, Canada" dated effective December 31, 2018 ("Cory Technical Report") prepared by Craig Funk, B.Sc., M.Sc., P.Eng., P.Geo., who is a "qualified person" as defined in NI 43-101. The Cory Technical Report has been filed with the securities regulatory authorities in each of the provinces of Canada and furnished to the SEC. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. References should be made to the full text of the Cory Technical Report.

i) Project Description, Location and Access

General

The Cory mine is located in central Saskatchewan, approximately 7 kilometers west of the city of Saskatoon, Saskatchewan. The Legal Description (Saskatchewan Township/Range) of the Cory surface operation is Section 18 Township 36 Range 06 West of 3rd Meridian. More precisely, the Cory Shaft #2 collar is located at:

- Latitude: 52 degrees 05 minutes 30.15 seconds North
- Longitude: 106 degrees 51 minutes 16.32 seconds West
- Elevation: 502.92 meters above mean SL
- Northing: 5772861 m
- Easting: 372951 m
- Projection: UTM
- Datum: NAD83
- Zone: 13

The Company owns approximately 2,109 hectares (5,212 acres) of surface rights required for current Cory mine operations, including all areas covered by the existing surface plant and tailings management area, and all surface lands required for anticipated future Cory mine and expanded milling operations.

The Cory mine surface facilities are accessed by an existing paved road that is part of the Saskatchewan Provincial Highway System. All potash product is shipped by rail over existing track.

The Cory mine is served by a number of villages within 50 kilometers of the mine site. The nearest city is Saskatoon (7 km distant). Cory is situated near the northern extent of the Great Plains of North America. Topography is relatively flat, with gently rolling hills and occasional valleys. The Cory surface plant lies approximately 10 km northwest of the South Saskatchewan River, a major continental drainage channel.

Mineral Rights

Mineral rights at Cory are mined pursuant to mining leases with the Crown, and with Freehold mineral rights owners. Crown mineral rights are governed by *The Subsurface Mineral Tenure Regulations, 2015* (Saskatchewan) and Crown Leases are approved and issued by the Ministry of the Economy. The original Cory Crown Subsurface Mineral Lease, numbered KL 103, was entered into in September 1962. In the following years, various minor amendments were made to this Crown lease, resulting in Crown Subsurface Mineral Lease KL 103 B ("Cory Crown Lease").

The Cory Crown Lease covers an area of approximately 46,902 hectares (115,897 acres). At Cory, the Company has leased potash mineral rights for 25,918 hectares (64,045 acres) of Crown land and owns or has leased approximately 18,368 hectares (45,389 acres) of Freehold land within the lease boundary. The Cory Crown Lease term is for a period of 21 years from September 2004, with renewals (at the Company's option) for 21-year periods. Freehold lands also remain under lease providing, generally, that production is continuing and that there is a continuation of the Cory Crown Lease.

Within the Cory Crown Lease area, 29,772 hectares (73,569 acres) are mined pursuant to a Unitization Agreement, with mineral rights holders (Freehold and Crown) within one Unitized Area.

ii) History

See "Mineral Projects – a) Allan Potash Operations – ii) History" above for a general overview of the history of potash mines in Saskatchewan.

Exploration drilling for potash in the Cory area was carried out in the 1950s and 1960s. The Cory mine was built by a company called Duval Sulphur and Potash Company in the 1960s. Potash production began at Cory in 1968 and the mine has run on a continuous basis since then (other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work). PotashCorp acquired the Cory mine in 1976.

In 1988, production was curtailed at the Cory mine. This downsizing included shutdown of the flotation plant. Since 1989, only crystallization methods have been used at Cory to produce a variety of specialized white potash products. In 2008 through 2011 the Cory mine underwent a major expansion which involved the re-commissioning of refurbished flotation circuits. Products include soluble, granular and standard grade potash used for agricultural applications and high grade white soluble potash and chicklets used for industrial applications.

In recent years, the Cory mine underwent a major expansion which brought the nameplate capacity up to 3.0 million tonnes of finished potash products per year. In December 2013, operational changes were announced that reduced the operational capability of the Cory facility to 1.4 million tonnes per year. This was in response to market conditions and to optimize the Company's lowest cost operations.

In October 2017, Cory reverted to a pure crystallization plant producing only white potash products and further curtailing production to 0.8 million tonnes per year.

iii) Geological Setting, Mineralization and Deposit Types

Geological Setting and Mineralization

See "Mineral Projects – a) Allan Potash Operations – iii) Geological Setting, Mineralization and Deposit Types – Geological Setting and Mineralization" above for a general overview of geological setting and mineralization for potash mines in Saskatchewan.

Over the past three years (2016, 2017, 2018), the average, measured potash ore grade of the mill feed at Cory was 23.9% K_20 equivalent. The average ore grade reported from 10 historic surface drillhole intersections, all within Cory Subsurface Mineral Lease KL 103 B, is 25.6% K_20 equivalent. The average ore grade observed from 4,590 in-mine samples taken over 50 years of mining (to the end of December 2017) at Cory is 22.5% K_20 equivalent.

Deposit Type

There are three mineable potash members within the Prairie Evaporite Formation of Saskatchewan. Stratigraphically highest to lowest these members are: Patience Lake, Belle Plaine and Esterhazy.

The Cory potash deposit lies within the Patience Lake Member of Prairie Evaporite Formation. There are two potash seams named A Zone and B Zone within this Member; at present, only the A Zone is being mined at Cory. Some test mining has been carried out in the B Zone, but no mining is done in this layer at present. Neither the Esterhazy nor the White Bear Potash Members are present in the Cory area. The Belle Plaine potash member is present at Cory but it is too thin to be mined. Cory A Zone potash mineralization occurs at an average of about 1010 m depth below surface. The A Zone is approximately 3.35 meters thick and occurs near the top of the Prairie Evaporite Formation salts. Salt cover from the ore zone to overlying units is approximately 14 meters. The Cory mine operates as a conventional, underground potash mine.

iv) Exploration

Before the Cory mine was established in 1968, all exploration consisted of drilling from surface and analysis of core from these drillholes. Since mining began in 1968, there have been just two exploration drillholes; these two drillholes did not intersect the ore zone of the Prairie Evaporite Formation, but rather targeted overlying formations.

In most of southern Saskatchewan, potash mineralization is in place wherever Prairie Evaporite Formation salts exist, are flat-lying and are undisturbed. Since the surface seismic exploration method is an excellent tool for mapping the top and bottom of Prairie Evaporite salts, this has become the main potash exploration tool in any existing Saskatchewan subsurface (potash) mineral lease. Historically, 2D seismic and now the more accurate 3D seismic methods are used to map continuity and extent of potash beds in flat-lying potash deposits. Seismic data are relied upon to identify collapse structures that must be avoided in the process of mine development since these structures can act as conduits for water. As a result, isolation pillars or mining buffer zones are left around these anomalous features. This practice reduces the overall mining extraction ratio, but the risk of inflow to mine workings is effectively mitigated.

A total of 99 linear kilometers of 2D seismic lines have been acquired at Cory. A total of 222 square kilometers of 3D seismic have been acquired at Cory between 1988 and 2013. The most recent seismic surveys were conducted in 2013 and accounted for 49 square kilometers of the total square kilometers stated above.

v) Drilling

For the original Cory potash test holes drilled in the 1950s and 1960s, the primary objective of this drilling was to sample the potash horizons to establish basic mining parameters. Seismic surveys (2D) were done sparingly in those days, so the drillhole information was relied upon heavily to evaluate potash deposits. Test holes would penetrate the evaporite section with a hydrocarbon based drilling mud (oil-based or diesel fuel) to protect the potash mineralization from dissolution. Basic geophysical well logs were acquired and in many cases drill stem tests were run on the Dawson Bay Formation to help assess mine inflow potential. Core samples from the targeted potash intersections were split or quartered (cut with a masonry saw) crushed and analyzed to establish potash grades.

Relatively thin interbeds or seams, referred to as clay seams in the potash industry, are an ever-present component of the A Zone and B Zone at Cory. These seams, along with the clay or clay-like material disseminated throughout the rock make up the water insoluble portion of the mineralized horizons. The same sequences of clay seams can be correlated for many kilometers across the central Saskatchewan potash mining district.

At Cory, a particular sequence of three clay seams marks the top of the A Zone. These seams are used to guide the vertical positioning of the mining machine. The uppermost portion of the sequence of three seams is maintained at the top of the mining cut to keep the cutting “on grade”. Cutting too high above this upper seam or top marker results in dilution, as halite (rather than sylvinite) immediately overlies the production zone. In practice though, the top marker seam is slightly overcut (between 10 cm to 20 cm) to prevent an unstable condition from being created. Clay seams are often planes of weakness and if they are undercut, material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

It is difficult to determine at which mining height certain mineral resources and reserves will be cut in the future so the more conservative mining height of 3.35 m (11 feet) was applied to mineral resource and reserve calculations.

Original drill core assays were studied by independent consultant David S. Robertson and Associates (1976), and are found in Table B below. The best 3.35 m (11 feet) mining interval intersected in each hole was determined from the assay values, using clay marker seams as a guide.

Zone mineralization is indicated by gamma ray geophysical log response in each of the exploration holes listed in Table B below indicating a potash mineral resource. Some test mining of the B Zone has been done. However, sustained production from that zone has not been established. Assay results for the B Zone are not presented here.

Table B: Assay results for all potash test holes within Cory Lease KL 103 B.

Average in 3.35 m (11') mining interval (undiluted)			
Drillhole	**Year Drilled**	**% K_2O**	**% Water Insolubles**
14-28-036-06 W3	1954	*	*
04-28-037-07 W3	1955	24.93	4.59
01-11-037-07 W3	1955	25.96	4.78
08-22-036-07 W3	1956	29.1	4.55
04-16-036-07 W3	1965	27.04	6.18
16-34-035-07 W3	1965	27.98	4.87
01-25-035-07 W3	1965	17.27	6.78
01-32-036-07 W3	1965	26.41	5.17
06-18-036-06 W3	1965	23.75	3.92
05-07-036-06 W3	1965	26.45	4.71
04-04-036-06 W3	1965	29.44 (anomalous)	4.59 (anomalous)
05-30-036-06 W3	1965	27.34	4.91
01-16-036-06 W3	1965	25.61 (anomalous)	5.71 (anomalous)
13-01-038-08 W3	1968	*	*
Average of 10 usable values:		**25.62**	**5.05**

Due to the remarkably consistent mineralogy and continuity of the resource, as experienced through 50 years of mine production, no potash exploration drilling has been done at Cory since 1965. Instead of exploration drillholes, seismic surveying has been relied upon to explore ahead of mine development. Where normal Prairie Evaporite sequences are mapped in the seismic data, potash beds have unfailingly been present. Localized, relatively small mine anomalies not mapped in seismic data do occur. When they do, they are dealt with in the normal course of mining and extraction through these anomalous areas is typically minimized. Anomalies associated with possible water inflow problems, which are mapped in the seismic data, are avoided.

vi) Sampling, Analysis and Data Verification

Basic Approach

Exploration in the Cory area was conducted in the 1950s and 1960s. Sampling and assaying of potash core samples was done using methods considered consistent with standard procedures for potash exploration at these times.

Drillhole sampling methods have remained essentially the same over the years. Potash core samples are acquired. Short segments of core usually about 0.3 m (1 foot) in length are labeled based on visible changes in mineralization, and sometimes based on more or less fixed intervals. Each segment of core is then split using some type of rock or masonry saw. The split portion of core is then bagged and labeled and sent to a laboratory for chemical analysis. Historical potash samples remain stored at the Subsurface Geological Laboratory (Regina, Saskatchewan) of the Saskatchewan Ministry of the Economy. Most of these have deteriorated substantially.

Regarding quality assurance for analytical results of in-mine samples, the Company participates in the SPPA Sample Exchange Program to monitor the accuracy of analytical procedures used in its labs. In the early 1970s, the SPPA initiated a round-robin Sample Exchange Program, the purpose of which was to assist the potash laboratories in developing a high level of confidence in analytical results. This program has continued up to the present, and participants include all major Canadian potash mine site labs, the Nutrien Pilot Plant Lab and an independent surveyor lab. The Sample Exchange Program provides the participants with three unknown potash samples for analysis four times per year. Results for the unknown sample analysis are correlated by an independent agency that distributes statistical analysis and a summary report to all participants. Completed SPPA samples can be used for control standards as required in QA/QC sections of standard analytical procedures.

The Nutrien Pilot Plant is secured in the same way as modern office buildings are secured. Authorized personnel have access and visitors are accompanied by staff. No special security measures are taken beyond that. Currently, no external laboratory certification is held by the Nutrien Pilot Plant. On occasion, product quality check samples are sent to the Saskatchewan Research Council, a fully certified analytical facility.

In the opinion of the authors of the Cory Technical Report, the sampling methods are acceptable, are consistent with industry-standard practices, and are adequate for Mineral Resource and Reserve estimation purposes.

Mean Potash Mineral Grade From In-Mine Samples

It has been the practice at Cory for the past several years to collect two in-mine grade samples (one in the left break-through and one in the right break-through) from the floor at the start of every cutting sequence. This is equivalent to two samples taken every approximately 25 m in production panels, and two samples taken every approximately 50 m in development panels. In-mine grade sampling practices at Cory have varied over the years resulting in a less than ideal distribution graph. However, it is the belief of the authors that the average grade reported from these in-mine samples is representative of A Zone potash mineralization in the Cory area. In-mine sample data can be roughly confirmed by mill feed grade data collected over the years.

Since start-up in 1968 through to the end of December 2017, 4,590 in-mine potash mineral grade samples have been collected from the Cory A Zone, the main potash horizon at Cory. In-mine samples collected and analyzed in 2018 contributed no meaningful change to the overall grade. All samples were analyzed in the Cory mill laboratory using analysis techniques that were up-to-date for the era in which the sample was collected. The median ore grade for this family of in-mine samples is 22.5% K_2O equivalent and the mean ore grade is 23.5%.

For the B Zone at Cory, mineral grade is reported to be 20.3% K_2O equivalent, which is the grade observed from 20,230 in-mine samples at the Lanigan mine where the B Zone has been extensively mined. Even though Cory mine is some distance from Lanigan, this is considered to be the best estimate of expected mineral grade for this potash layer because the deposit is known to be regionally continuous from west of Cory to east of Lanigan. Although it is possible that once mining proceeds into the B Zone the reported grade could change from what is reported, it is expected that any such change would be minimal.

Potash Ore Density From In-Mine Mineral-Grade Measurements

An estimate of in-situ rock density is used to calculate potash mineralization volumes in mineral resource and reserve assessments. A common approach is to determine in-place mineral resource and reserve volumes (m^3) to a certain degree of confidence, then multiply this number by in-situ bulk-rock density (kg/m^3) to give in-place mineral resource and reserve tonnes. However, establishing an accurate bulk-rock density value is not an easy or trivial task. Well-log data from drillholes can be used for this if accurate and calibrated well-logs are acquired during exploration drilling. In practical terms, modern well-logs tend to meet these criteria, but historic well-logs (collected before the 1990s) do not. In Saskatchewan, almost all potash exploration drilling took place in the 1950s and 1960s, well before density logs were accurate and reliable.

Another approach is to look up density values for the minerals which constitute potash rock – values determined in a laboratory to a high degree of accuracy and published in reliable scientific journals/textbooks – then apply these densities to the bulk-rock in some way. Given that the density of each pure mineral is quantified and known, the only difficult aspect of this approach is determining what proportion of each mineral makes up the bulk-rock at a particular sample location. Because historical Cory in-mine mineral grade analyses did not include measurements of the insoluble content, this approach cannot be used at Cory. Instead, we use the potash bulk-rock density calculated using 6,738 in-mine samples from Allan A Zone:

$$\mathbf{RHO_{bulk\text{-}rock}\,(Cory) = RHO_{bulk\text{-}rock}\,(Allan) = 2110\ kg/m^3}$$

This estimate is considered acceptable since Cory and Allan are mining the same potash seam, both mines use boring machines that are the same height and both mines use the same basic mineral grade sampling methodology.

Not enough B Zone mining has been carried out at Cory to permit a bulk density calculation based on in-mine grade samples. Instead, we use the potash bulk rock density calculated using 20,230 in-mine samples from Lanigan B Zone:

$RHO_{bulk\text{-}rock}$ (Cory B) = $RHO_{bulk\text{-}rock}$ (Lanigan) = 2120 kg/m^3

This estimate is considered acceptable since the Cory B Zone and Lanigan B Zone are the same potash seam.

Assay Data Verification

The majority of original drill core assays were studied by independent consultant David S. Robertson and Associates (1976). The original assay results for core samples from historical wells were taken as accurate in these studies, as there is no way to reliably reanalyze these samples. Most of the remaining samples in storage have long since deteriorated to the point where they are not usable.

Ore grades of in-mine samples are measured in-house at the Cory mine laboratory by Company staff using modern, standard chemical analysis tools and procedures; an independent agency does not verify these results. However, check sampling through the SPPA program does occur.

It should be noted that assay results from historical wells match mine sample results closely – within approximately 0.9% – even though sample spacing is obviously much greater in the case of drillholes. This fact is a validation of the methodology. Based on 50 years of in-mine experience at Cory, we consider these historical assay results to be acceptable and to provide a good basis for estimating ore grade in areas of future mining at Cory. However, the mean mineral grade of 22.5% K_2O equivalent determined from 4,590 in-mine grade samples is thought to provide the most accurate measurement of potash grade for the Cory mine site.

Exploration Data Verification

The purpose of any mineral exploration program is to determine extent, continuity and grade of mineralization to a certain level of confidence and accuracy. For potash exploration it is important to minimize the amount of cross-formational drilling, since each drillhole is a potential conduit for subsurface groundwater overlying (or underlying) water-bearing formations into future mine workings. Every potash test hole from surface sterilizes potash mineralization; a safety pillar is required around every surface drillhole once underground mining commences. This is the main reason that exploration drilling has not been carried out at Cory in recent years. Initial sampling and assaying of cores was done during potash exploration at Cory in the 1950s and 1960s. Methods were consistent with standard procedures for that era. The mine began production in 1968 and no further core drilling has been carried out since then. Due to small number of drillholes, mineral grade information from in-mine grab samples provided better sampling of potash grade at Cory. This approach to potash sampling is in accordance with generally accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

Assay of physical samples (drillhole cores and/or in-mine samples) is the only way to gain information about mineral grade, but extent and continuity of mineralization are correctly determined using data collected from geophysical surveys correlated with historic drilling information. To date, surface seismic data at Cory have been collected, analyzed, and verified by Company staff, at times in cooperation with an independent consultant. Ultimate responsibility for final analyses including depth conversion (seismic depth migration), as well as the accuracy of these data, rests with Nutrien qualified persons.

Data for the mineral resource and reserve estimates for Cory mine were verified by Company staff as follows:

- Annual review of potash assay sample information (drillholes and in-mine grade samples);
- Annual review of surface geophysical exploration results (3D and 2D seismic data);
- Annual crosscheck of mined tonnages reported by mine site technical staff with tonnages estimated from mine survey information; and
- Annual crosscheck of mineral resource and reserve calculations carried out by corporate technical staff.

This approach to data verification of potash mineral grade and surface seismic information is in accordance with generally accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

vii) Mineral Processing and Metallurgical Testing

At Cory, potash ore has been mined and concentrated to produce saleable quantities of high-grade finished potash products since 1968. In 1988, production was curtailed at the Cory mine. This downsizing included shutdown of the flotation plant, leaving only the crystallization plant which produced a variety of specialized white potash products. From 2008 through 2011, the Cory mine underwent a major expansion which again allowed for the production of red product through floatation circuits. This expansion brought the nameplate capacity up to 3.0 million tonnes of finished potash products per year.

In recent years, the Cory mine underwent a major expansion which brought the nameplate capacity up to 3.0 million tonnes of finished potash products per year. In December 2013, operational changes were announced that reduced the operational capability of the Cory facility to 1.4 million tonnes per year. This was in response to market conditions and to optimize the Company's lowest cost operations. In October 2017, Cory reverted to a pure crystallization plant producing only white potash products, and further curtailing production to 0.8 million tonnes per year. At present, only concentrated white potash products (near-pure KCl) are produced at Cory; these include high-grade specialized white soluble potash, white granular, chicklets and prills. These products have industrial, agricultural and feed applications.

Over the 50-year mine life, 115.455 million tonnes of potash ore have been mined and hoisted to produce 36.296 million tonnes of finished potash product (from startup in 1968 to December 31, 2018). Given this level of sustained production over 50 years, basic mineralogical processing and prospective metallurgical testing of Cory potash is not considered relevant**.**

viii) Mineral Resource and Mineral Reserve Estimates

Definitions of Mineral Resource

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Resource" for an overview of CIM's mineral resource categories and the Company's general characterization of mineral resources categories for its potash mines.

The Cory mine began production in 1968 and no further core drilling has been carried out since then. Instead, exploration involved collecting surface seismic data, which became better in quality over the years. Exploration drilling has demonstrated the presence of the potash horizon, and seismic coverage shows the continuity of the Prairie Evaporite Formation within which the potash horizon occurs.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Cory that is far superior to the level of understanding provided by any surface drilling based exploration program. We believe that our approach provides a body of information that guides and constrains our exploration inferences in a much better way than could be achieved from any conventional exploration investigation in areas immediately surrounding, and contiguous to, the Cory potash mine.

Mineral Resource Estimates

Based on the definitions and guidelines described above, all mineral rights leased or owned by the Company, and within the Cory Crown lease, are assigned to one of the three mineral resource categories.

The potash resources for Cory division, as of December 31, 2018 are as follows:

Cory A Zone:		
Inferred Resource	1,310	millions of tonnes
Indicated Resource	437	millions of tonnes
Measured Resource	983	millions of tonnes
Total A Zone Resource	2,730	millions of tonnes
Cory B Zone:		
Inferred Resource	1,316	millions of tonnes
Indicated Resource	439	millions of tonnes
Measured Resource	1,353	millions of tonnes
Total B Zone Resource	3,108	millions of tonnes
Total for Cory (A Zone + B Zone):		
Inferred Resource	2,626	millions of tonnes
Indicated Resource	876	millions of tonnes
Measured Resource	2,336	millions of tonnes
Total A Zone + B Zone Resource	5,838	millions of tonnes

The average mineral grade of the Cory A Zone mineral resource is 22.5% K_20 equivalent, and was determined from 4,590 in-mine samples at Cory. The average mineral grade of the Cory B Zone mineral resource is 20.3% K_20 equivalent, and was determined from 20,230 in-mine samples at Lanigan mine where the B Zone has been extensively mined.

The tonnage reported in the Cory A Zone measured resource is comprised of the potash that is within 1.6 km (1 mile) of a physically sampled location (i.e., drillholes or mine workings). Also included as measured resource is the potash that is left behind as pillars in mined-out areas of the Cory mine. In a potash mine, it is common practice to consider mining remnant pillar mineralization using solution methods after conventional mining is complete, or after a mine is lost to flooding. The Patience Lake mine was successfully converted from a conventional mine to a solution mine after being lost to flooding in 1989. Since conversion to a solution mine is not anticipated in the near future at Cory, in-place pillar mineralization remains as a mineral resource rather than a mineral reserve at this time.

Definitions of Mineral Reserve

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Reserve" for an overview of CIM's mineral reserve categories and the Company's general characterization of mineral reserve categories for its potash mines.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Cory that is far superior to the level of understanding provided by any surface drilling based exploration program. An understanding of the amount of ore that can be conventionally mined from the Measured Resource category using current mining practices comes from nearly 50 years of potash mining experience at Cory.

Mineral Reserve Estimates

Using the definitions outlined above, part of the Cory A Zone measured resource has been converted to mineral reserve. The assigned mineral reserve category is dependent on proximity to sampled mined entries also described above. An overall extraction rate for the Cory mine has been applied to the area outlined as measured resource.

The overall extraction rate at the Cory mine is 27%. It was derived by dividing the total tonnes mined to date by the tonnage equivalent of the total area of the mine workings (i.e., the perimeter around the mine workings) less future mining blocks. Since an extraction rate has been applied, mineral reserves are considered recoverable ore and are reported as such.

Note that only drillholes whose 1.6 km radii are contiguous to mine workings or the 1.6 km radius placed around mine workings are used to compute probable mineral reserve. The remaining non-contiguous drillholes remain in the measured resource category.

The potash reserves for Cory as of December 31, 2018 are as follows:

Cory A Zone:		
Probable Reserve	171	millions of tonnes
Proven Reserve	77	millions of tonnes
Total A Zone Reserve =	248	millions of tonnes
Cory B Zone:		
Probable Reserve	nil	
Proven Reserve	nil	
Total B Zone Reserve =	nil	
Total for Cory (A Zone + B Zone):		
Probable Reserve	171	millions of tonnes
Proven Reserve	77	millions of tonnes
Total A Zone and B Zone Reserve =	248	millions of tonnes

The average mineral grade of the Cory A Zone Mineral Reserve is 22.5% K_20 equivalent and was determined from 4,590 in-mine samples at Cory.

ix) Mining Operations

All conventional potash mines in Saskatchewan operate at 900 m to 1200 m below surface within 9 m to 30 m of the top of the Prairie Evaporite Formation. Over the scale of any typical Saskatchewan potash mine, potash beds are tabular and regionally flat-lying, with only moderate local variations in dip. At Cory, potash ore is mined using conventional mining methods, whereby:

- Shafts are sunk to the potash ore body;
- Continuous mining machines cut out the ore, which is hoisted to surface through the production shaft;
- Raw potash is processed and concentrated in a mill on surface; and
- Concentrated finished potash products (near-pure KCI) are sold and shipped to markets in North America and offshore.

Sinking of the two original shafts (Shaft #1 and Shaft #2) from surface to the potash zone was completed in 1968, and the first potash ore was hoisted in the fall of that year. The Cory mine has run on a continuous basis since the first ore was hoisted in 1968, other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work.

In recent years, the Cory mine underwent a major expansion which brought the nameplate capacity up to 3.0 million tonnes of finished potash products per year. However, in 2014 the operational capability of the Cory facility was reduced to 1.4 million tonnes per year due to market conditions. In October 2017, Cory reverted to a pure crystallization plant producing only white potash products, and further curtailing production to 0.8 million tonnes per year.

Virtually all Cory underground mining rooms are in one potash mineralized zone, the upper layer (or A Zone) of the Patience Lake Member of the Prairie Evaporite Formation (the host evaporite salt). In contrast, some potash mines further east in Saskatchewan mine in a different potash layer, the Esterhazy Member of the Prairie Evaporite Formation. At Cory, mine elevations range from approximately 980 m to 1045 m, averaging approximately 1010 m. These depths to A Zone potash mineralization are anticipated over most of the Cory lease area. Mine workings are protected from aquifers in overlying formations by approximately 14 m of overlying salt and potash beds, along with salt plugged porosity in the Dawson Bay Formation, a carbonate layer lying immediately above potash hosting salt beds.

The Cory mine is a conventional underground mining operation whereby continuous mining machines are used to excavate the potash ore by the stress-relief mining method. Continuous conveyor belts transport ore from the mining face to the bottom of the production shaft. The highest mineral grade section of the Cory potash seam is approximately 3.35 m (11 feet) thick, with gradations to lower grade salts immediately above and below the mining horizon. The actual mining thickness at Cory is dictated by the height of continuous boring machines used to cut the ore. Five older borers are designed to cut at a thickness of 3.35 m (11 feet) and five new borers are designed to cut 3.65 m (12 feet).

Cory cuts to a marker (clay) seam that is slightly above the high-grade mineralized zone to establish a safe and stable mine roof. The top marker seam is slightly overcut by 10 to 20 cm. Clay seams are often planes of weakness, and if they are undercut, material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

Conservative local extraction rates (never exceeding 45% in any mining block) are employed at all Saskatchewan mines, including Cory, in order to minimize potential detrimental effects of mining on overlying strata; this is common practice in flat-lying, tabular ore bodies overlain by water-bearing layers.

From the shaft bottom, potash ore is hoisted approximately 1000 m from the potash level through the vertical shafts to a surface mill. In addition to hoisting potash ore to surface, the production shaft provides fresh air ventilation to the mine and serves as a secondary egress. The Service Shaft is used for service access and exhausting ventilation from the mine.

Over the 50-year mine life, 115.455 million tonnes of potash ore have been mined and hoisted at Cory to produce 36.296 million tonnes of finished potash products (from startup in 1968 to December 31, 2018). The life-of-mine average concentration ratio (raw-ore/MOP-product) is 3.18 and the overall extraction rate over this time period is 27%.

x) Processing and Recovery Operations

At Cory, potash ore has been mined and concentrated to produce saleable quantities of high-grade finished potash products since 1968. At present, only concentrated white potash products (near-pure KCl) are produced at Cory; these include high-grade specialized white soluble potash, white granular, chicklets and prills. These products have industrial, agricultural, and feed applications.

The crystallization method is used to concentrate potash ore into finished potash products at the Cory mill. Raw potash ore is processed on surface and concentrated white potash products are sold and shipped to markets in North America and offshore.

Over the past three years, production of finished potash products at Cory was:

- 2016: 1.241 million tonnes finished potash products at 61.56% K_2O (average grade)
- 2017: 0.988 million tonnes finished potash products at 61.96% K_2O (average grade)
- 2018: 0.810 million tonnes finished potash products at 62.63% K_2O (average grade)

Over the past decade, actual mill recovery rates have been between 66.4% and 75.6%, averaging 72.5%. Mill recoveries at Cory are lower than at other Nutrien plants because a larger portion (now all) of Cory's total production is made through the crystallization process.

Given the long-term experience with potash geology and actual mill recovery at Cory, no fundamental potash milling problems are anticipated in the foreseeable future.

Quality control testing and monitoring geared towards fine-tuning and optimizing potash milling and concentrating processes are conducted on a continual basis at all Nutrien mine sites and at Nutrien research facilities. At Cory, this is no exception; test work to optimize circuit performance and ensure product quality is carried out on an ongoing basis.

xi) Infrastructure, Permitting and Compliance Activities

Project Infrastructure

Infrastructure is in place to meet current and projected requirements for transportation, energy (electricity and natural gas), water and process materials at Cory.

The Cory mine is served by a number of villages within 50 kilometers of the mine site. The nearest city is Saskatoon (approximately 7 km distant).

The Cory surface facilities are accessed by existing paved roads and highways that are part of the Saskatchewan Provincial Highway System. All potash product is shipped by rail over existing track.

At present, high-voltage power capacity at Cory is 52 MVA. The ten-year projection of power utilization indicates that the utility can meet all foreseeable future demand.

The Cory operation requires a sustained fresh water supply for the milling process which is provided by a waterline from the South Saskatchewan River (approximately 10 km distant). This water supply provides a sustainable source of process water for Cory milling operations without having any impact on other users of water in the area.

Environmental Studies, Permitting and Compliance Activities

The tailings management strategy at all Nutrien potash mines in Saskatchewan, including Cory, is one of sequestering solid mine tailings in an engineered and provincially licensed TMA near the surface plant site. The Cory TMA currently covers an area of approximately 416 hectares (1,027 acres) of land owned by the Company. Solid potash mine tailings typically consist of 85% to 95% rock-salt (NaCl) and 5% to 15% insolubles (carbonate mud = $CaCO_3$, anhydrite mud = $CaSO_4$ and clays like chlorite, illite, and so on). An engineered slurry-wall has been constructed on the north, west, and south sides of the Cory TMA in the areas where near-surface aquifers could be impacted by mine waters. Near-surface geology to the east of the TMA limits the possibility of brine migration into these areas. The slurry-wall provides secondary containment of any saline mine waters, stopping these brines from reaching surrounding near-surface aquifers. Areas surrounding the Cory TMA are closely monitored; this includes everything from daily visual perimeter inspections to annual investigations and inspections of surrounding groundwater and aquifers.

Cory currently operates four brine disposal wells near the surface plant of the Cory mine where clear salt brine (i.e., no silt, clay-slimes, or other waste) is borehole-injected into the Winnipeg/Deadwood Formations, deep subsurface aquifers approximately 1500 m to 1700 m below surface. The groundwater in these extensive deep aquifers is naturally saline**.**

Emissions to air (mostly salt dust and potash dust) are kept below regulatory limits through various modern air-pollution abatement systems (e.g., dust collection systems built into mill processes) that are provincially licensed. This same procedure is followed at all Nutrien mines in Saskatchewan.

The Cory operation requires a sustained fresh water supply for the milling process which is provided by a waterline from the South Saskatchewan River (approximately 10 km distant). This water supply is provincially licensed and provides a sustainable source of process water for Cory milling operations without having any impact on other users of water in the area. In Saskatchewan, all potash tailings management activities are carried out under an "Approval to Operate" granted by the MOE, the provincial regulator. The Cory mine is in compliance with all regulations stipulated by the Environmental Protection Branch of the MOE. The current Cory Approval to Operate has been granted to July 1, 2028, the renewal date.

In terms of long-term decommissioning, environmental regulations in the Province of Saskatchewan require that all operating potash mines in Saskatchewan create a long-term decommissioning and reclamation plan that will ensure all surface facilities are removed, and the site is left in a chemically and physically stable condition once mine operations are complete. The Company has conducted numerous studies of this topic, and the most recent decommissioning and reclamation plan for Cory was approved by MOE technical staff in October 2016. Because the current expected mine life for Cory is many decades into the future, it is not meaningful to come up with

detailed engineering designs for decommissioning at present. Instead, decommissioning plans are reviewed every five years, and updated to accommodate new ideas, technological change, incorporation of new data and adjustments of production forecasts and cost estimates. Any updated decommissioning and reclamation reports generated by this process are submitted to provincial regulatory agencies. For Cory, a revised decommissioning and reclamation plan is required in July 2021.

In addition to the long-term decommissioning plan, provincial regulations require that every potash producing company in Saskatchewan set up an Environmental Financial Assurance Fund, which is to be held in trust for the decommissioning, restoration and rehabilitation of the plant site after mining is complete. This fund is for all mines operated by Nutrien in the province of Saskatchewan (i.e., Allan, Cory, Lanigan, Patience Lake, Rocanville, and Vanscoy).

xii) Capital and Operating Costs

The Cory mine has been in operation since 1968; in the years immediately preceding this, major capital investment was made to bring this mine into production. Since then, capital expenditures were made on a regular and ongoing basis to sustain production and to expand production from time to time.

A major refurbishment and expansion of the Cory mine was completed in 2012, increasing nameplate capacity to 3.0 million tonnes of finished potash products per year. This work involved enhancement of hoists and shaft conveyances, major expansions of both mine and mill, improvements to loadout facilities and some infrastructure improvements. All construction was carried out without significant disruption to existing potash production from the site.

In December 2013, operational changes were announced that reduced the operational capability of the Cory facility to 1.4 million tonnes per year. This was in response to market conditions and to optimize the Company's lowest cost operations. In October 2017, Cory reverted to a pure crystallization plant producing only white potash products and further curtailing production to 0.8 million tonnes per year.

xiii) Exploration, Development and Production

In recent years the Cory mine underwent a major expansion which brought the nameplate capacity up to 3.0 million tonnes of finished potash products per year. In December 2013, operational changes were announced that reduced the operational capability of the Cory facility to 1.4 million tonnes per year. This was in response to market conditions and to optimize the Company's lowest cost operations. In October 2017, Cory reverted to a pure crystallization plant producing only white potash products and further curtailing production to 0.8 million tonnes per year.

Potash production in any given year at the Cory mine is a function of many variables, so actual production in any given year can vary dramatically from tonnages produced in previous years. The Mineral Reserve tonnage and historic average production are used to estimate remaining mine life. If the average mining rate seen over the past three years (3.548 million tonnes of potash ore mined and hoisted per year is sustained), and if Mineral Reserves remain unchanged, then the Cory mine life is 70 years from December 31, 2018.

c) Lanigan Potash Operations

Certain scientific and technical information regarding our Lanigan potash operations is based on the technical report titled "National Instrument 43-101 Technical Report on Lanigan Potash Deposit (KLSA 001 C), Saskatchewan, Canada" dated effective December 31, 2018 ("Lanigan Technical Report") prepared by Craig Funk, B.Sc., M.Sc., P.Eng., P.Geo., who is a "qualified person" as defined in NI 43-101. The Lanigan Technical Report has been filed with the securities regulatory authorities in each of the provinces of Canada and furnished to the SEC. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. References should be made to the full text of the Lanigan Technical Report.

i) Project Description, Location and Access

The Lanigan mine is located in central Saskatchewan, approximately 100 kilometers east of the city of Saskatoon, Saskatchewan. The Legal Description (Saskatchewan Township/Range) of the Lanigan surface operation is Section 28 Township 33 Range 23 West of 2nd Meridian. More precisely, the Lanigan Shaft #2 collar is located at:

- Latitude: 51 degrees 51 minutes 20.48 seconds North
- Longitude: 105 degrees 12 minutes 34.79 seconds West
- Elevation: 535.34 meters above mean SL
- Easting: 485560.306 m
- Northing: 5745008.726 m
- Projection: UTM
- Datum: NAD83
- Zone: 13

The Company owns approximately 3,700 hectares (9,140 acres) of surface rights required for current Lanigan mine operations, including all areas covered by the existing surface plant and tailings management area, and all surface lands required for anticipated future Lanigan mine and expanded milling operations.

Mineral rights at Lanigan are mined pursuant to mining leases with the Crown, and with Freehold mineral rights owners. Crown mineral rights are governed by *The Subsurface Mineral Tenure Regulations, 2015,* and Crown leases are approved and issued by the Saskatchewan Ministry of the Economy.

The original Lanigan Crown subsurface mineral lease, numbered KL 100, was entered into in March 1964. A minor amendment to this lease in September 1989 resulted in KL 100R. In November 2009, a large area of land was added to the lease resulting in KLSA 001. Shortly after that, in June 2011, a minor amendment to the lease resulted in KLSA 001 A. KLSA 001 B was issued in September 2014 when portions of the adjacent exploration permits, granted in September 2011, were added to the lease. Finally, in November 2015, a minor change to the lease resulted in KLSA 001 C.

KLSA 001 C covers an area of approximately 56,328 hectares (139,190 acres), At Lanigan, the Company has leased potash mineral rights for 38,188 hectares (94,365 acres) of Crown land and owns or has leased approximately 17,913 hectares (44,265 acres) of Freehold land within the lease boundary. The Lanigan Crown lease term is for a period of 21 years from March 2006, with renewals (at the Company's option) for 21-year periods. Freehold lands also remain under lease providing, generally, that production is continuing and that there is a continuation of the Crown lease.

Within the Lanigan Crown lease area, 55,950 hectares (138,256 acres) are mined pursuant to unitization agreements with mineral rights holders (Crown and Freehold) within two unitized areas. Lanigan Unit Area #1 includes 19,990 hectares (49,395 acres) while Lanigan Unit Area #2 includes 35,961 hectares (88,861 acres).

The Lanigan mine surface facilities are accessed by an existing paved road that is part of the Saskatchewan Provincial Highway System. All potash product is shipped by rail over existing track.

The Lanigan mine is served by a number of villages within 50 kilometers of the mine site. The nearest cities are Humboldt (approximately 45 km north of Lanigan) and Saskatoon (approximately 100 km west of Lanigan). The topography is relatively flat, with gently rolling hills and occasional valleys. There are no rivers or other major watercourse channels near the Lanigan mine site.

ii) History

See "Mineral Projects – a) Allan Potash Operations – iii) Geological Setting, Mineralization and Deposit Types – Geological Setting and Mineralization" above for a general overview of geological setting and mineralization for potash mines in Saskatchewan.

Exploration drilling for potash in the Lanigan area was carried out in the 1950s and 1960s. The Lanigan mine was built by a company named Alwinsal Potash of Canada Ltd., a consortium of German and French mining and fertilizer companies. Potash production began at Lanigan in 1968 and the mine has run on a continuous basis since then (other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work). PotashCorp acquired the Lanigan mine in 1976.

Mill rehabilitation, mine expansion and hoist improvement projects were completed at Lanigan between 2005 and 2010. The expansion construction was carried out without significant disruption to existing potash production from the site.

Both flotation and crystallization methods are used at Lanigan to produce granular, standard and suspension grade potash for agricultural use. As of December 31, 2018, the annual nameplate capacity at Lanigan is 3.8 million tonnes and the annual operational capability is 2.0 million tonnes of concentrated finished potash products.

iii) Geological Setting, Mineralization and Deposit Types

Geological Setting and Mineralization

See "Mineral Projects – a) Allan Potash Operations – iii) Geological Setting, Mineralization and Deposit Types – Geological Setting and Mineralization" above for a general overview of geological setting and mineralization for potash mines in Saskatchewan.

Deposit Type

There are three mineable potash members within the Prairie Evaporite Formation of Saskatchewan. Stratigraphically highest to lowest, these members are: Patience Lake, Belle Plaine and Esterhazy.

The Lanigan potash deposit lies within the Patience Lake Member of Prairie Evaporite Formation. There are two potash seams named A Zone and B Zone within this Member; both the A Zone and B Zone are being mined at Lanigan. The Belle Plaine potash member is present at Lanigan but is not economically mineable, while the Esterhazy Member is poorly developed and not economically mineable.

Lanigan potash mineralization occurs at an average of about 990 m below surface. Salt cover from the top of the A Zone mining horizon to overlying units is approximately 7 m thick and salt cover from the top of the B Zone mining horizon to overlying units is approximately 14 m thick. The Lanigan mine operates as a conventional, underground potash mine.

iv) Exploration

Before the Lanigan mine was established in 1968, all exploration consisted of drilling from surface and analysis of core from these drillholes. Since mining began in 1968, there have been just six potash test holes; two of which targeted seismic (geological) anomalies as part of a seismic data verification process. A map showing potash exploration coverage at Lanigan Potash (drillholes, 2D and 3D seismic coverage) can be found in the Lanigan Technical Report.

In most of southern Saskatchewan, potash mineralization is in place wherever Prairie Evaporite Formation salts exist, are flat-lying and are undisturbed. Since the surface seismic exploration method is an excellent tool for mapping the top and bottom of Prairie Evaporite salts, this has become the main potash exploration tool in any existing Saskatchewan subsurface (potash) mineral lease. Historically, 2D seismic, and now the more accurate 3D seismic methods are used to map continuity and extent of potash beds in flat-lying potash deposits. Seismic data are relied upon to identify collapse structures that must be avoided in mine development since these structures can act as conduits for water. As a result, isolation pillars or mining buffer zones are left around these anomalous features. This practice reduces the overall mining extraction ratio, but the risk of inflow to mine workings is effectively mitigated.

A total of 621 linear kilometers of 2D seismic lines have been acquired at Lanigan. A total of 520 square kilometers of 3D seismic have been acquired at Lanigan between 1988 and 2018. The most recent seismic survey was conducted in 2017 and accounted for 10 square kilometers of the total square kilometers stated above.

Experience has shown that the potash mining zone is continuous when seismic data are undisturbed and flat-lying. Surface seismic data are generally collected three to five years in advance of mining. Any area recognized as seismically unusual is identified early, and mine plans are adjusted to avoid these regions.

v) Drilling

For the original Lanigan potash test holes drilled in the 1950s and 1960s, the primary objective of this drilling was to sample the potash horizons to establish basic mining parameters. Seismic surveys (2D) were done sparingly in those days, so the drillhole information was relied upon heavily to evaluate potash deposits. Test holes would penetrate the evaporite section with a hydrocarbon based drilling mud (oil-based or diesel fuel) to protect the potash mineralization from dissolution. Basic geophysical well-logs were acquired, and in many cases, drill stem tests were run on the Dawson Bay Formation to help assess mine inflow potential. Core samples from the targeted potash intersections were split or quartered (cut with a masonry saw), crushed and analyzed to establish potash grades.

Drilling activity was limited at Lanigan during the 1970s. In 1973, a single exploration drillhole was completed, although assay results proved to be unusable. Subsequently, in 1975, a second salt water disposal well, from which assay data were taken, was constructed.

In 1981, further exploration drilling was carried out at Lanigan as part of a mine expansion project. Five additional drillholes were completed, following similar drilling and sampling methodologies as the original 1950s and 1960s drillholes. Geophysical well-logging technology had improved and therefore the log suites collected in the 1981 drill program were of better quality than those collected previously. A 2D seismic survey had been carried out prior to the 1981 drilling program. Two of the five drillholes completed in 1981 targeted seismic (geological) anomalies as part of a seismic data verification process. The anomalies were confirmed and areas around these drillholes were excluded from mine development.

Relatively thin interbeds or seams, referred to as clay seams in the potash industry, are an ever-present component of the A Zone and B Zone at Lanigan. These seams, along with the clay or clay-like material disseminated throughout the rock, make up the water insoluble portion of the mineralized horizons. The same sequences of clay seams can be correlated for many kilometers across the central Saskatchewan potash mining district.

At Lanigan, a particular sequence of two clay seams marks the top of the A Zone. A distinct clay seam marks the top of the B Zone; this clay seam is immediately overlain by a much less consistent clay seam referred to as Shadowband at Lanigan. In 2013, Lanigan modified its cutting practices in the B Zone to improve mine roof stability. This modification involved cutting a slightly higher horizon, just above Shadowband, thus removing the risk associated with the seam. The goal of improved mine roof stability was achieved; however, less potash and more salt is now being mined resulting in a slightly lower reported ore grade for B Zone.

The clay seams are used to guide the vertical positioning of the mining machine. The uppermost portion of the sequence of three seams is maintained at the top of the mining cut to keep the cutting “on grade”. Cutting too high above this upper seam or top marker results in dilution, as lower grade material immediately overlies the production zone. In practice though, the top marker seam is slightly overcut (between 10 cm to 20 cm) to prevent an unstable condition from being created. Clay seams are often planes of weakness, and if they are undercut, material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

The A Zone mining interval is fixed at 3.66 m (12 feet). B Zone mining machines have a fixed mining height of 2.74 m (9 feet). In a normal B Zone production room, ore is extracted in two lifts resulting in a mining height of approximately 4.88 m (16 feet). These mining heights allow for comfortable working headroom and efficient extraction of potash ore.

Drill core assay results were studied by independent consultant David S. Robertson and Associates (1976) and by Nutrien technical staff. Results are found in Table C below. The best 3.66 m (12 feet) mining interval in A Zone, and the best approximately 4.88 m (16 feet) mining interval in B Zone was determined from the assay values in each potash test well, using clay marker seams as a guide. Note that while B Zone drillhole assays were derived using intervals of between 4.07 m and 7.30 m averaging 5.08 m, a more conservative mining height of 4.88 m is used for mineral resource and reserve estimates.

The original Lanigan exploration area was explored with 12 test holes spaced at intervals of 1.6 km to 3.4 km (1–3 miles). In total, 27 potash test holes have been drilled within Lanigan lease KLSA 001 C, but only 19 are used in the average ore grade calculation for A Zone in Table C, and only 19 are used in the average ore grade calculation for B Zone in Table C. Certain drillholes within KLSA 001 C were not assayed, while others intersected abnormal geology whereby a normal potash zone could not be picked given the limited data available and, therefore, the resulting % K_2O and % water insoluble content could not be evaluated with confidence.

Drillhole assay data for the A Zone at Lanigan give an estimated mean grade of 25.29% K_2O with 5.78% water insolubles. Drillhole assay data for B Zone at Lanigan give an estimated mean grade of 23.21% K_2O with 5.59% water insolubles.

Table C: Assay results for all potash test holes within Lanigan Lease KLSA 001 C.

Location	Year Drilled	A Zone			B Zone		
		Interval (m)	% K_2O Equiv.	% Water Insol.	Interval (m)	% K_2O Equiv.	% Water Insol.
01-29-033-22 W2	1955	3.66	27.68	6	*5.49*	*	*
13-34-033-23 W2	1956	–	*	*	–	*	*
16-12-034-24 W2	1956	–	*	*	*4.51*	*25.77*	*
12-24-034-23 W2	1957	3.66	25.61	2.78	*5.12*	*18.51*	*2.37*
04-28-033-23 W2	1958	3.66	25.87	2.13	*4.85*	*25.75*	*6.3*
04-29-032-22 W2	1959	–	*	*	–	*	*
13-11-033-23 W2	1959	3.66	21.17	9.65	*4.16*	*26.85*	*5.5*
09-26-033-23 W2	1959	3.66	27.33	2.24	*4.51*	*25.18*	*6.6*
03-10-034-23 W2	1959	3.66	22.06	*	*4.07*	*23.97*	*5.7*
01-10-033-24 W2	1959	3.66	27.32	*	*4.92*	*24.58*	*4.2*
04-24-033-24 W2	1959	3.66	25.68	1.91	*5.19*	*24.02*	*5*
13-18-033-22 W2	1960	3.66	26.29	7.1	*4.72*	*22.84*	*8.15*
08-02-033-23 W2	1960	3.66	26.93	7.1	*7.59*	*15.73*	*5.25*
12-04-033-23 W2	1960	3.66	26.53	6.54	*4.76*	*24.61*	*5.8*
12-16-033-23 W2	1960	3.66	23.87	8.4	*4.31*	*25.89*	*4.2*
09-22-033-23 W2	1960	3.66	29.45	5.69	*5.04*	*25.15*	*6.8*
02-30-033-23 W2	1960	–	*	*	–	*	*
13A-30-033-23 W2	1960	3.66	25.36	8.88	*7.3*	*14.79*	*3.51*
01-12-033-24 W2	1960	3.66	24.72	7.33	*5.02*	*26.62*	*4.8*
12-04-033-23 W2	1961	–	*	*	–	*	*
08-03-033-23 W2	1973	–	*	*	–	*	*
01-20-033-23 W2	1975	–	*	*	*5.96*	*22.4*	*5.6*
04-07-033-22 W2	1981	3.66	22.8	4.15	–	*	*
03-26-032-23 W2	1981	3.66	20.59	6.21	4.57	18.8	7.17
04-28-032-23 W2	1981	3.66	25.67	*	4.94	25.59	6.88
16-25-033-23 W2	1981	–	*	*	–	*	*
13-25-032-24 W2	1981	3.66	25.57	6.4	4.88	24.01	6.8
Average (of usable values):		**3.66**	**25.29**	**5.78**	**5.10**	**23.21**	**5.59**

Italicized numbers from Robertson Associates 1976

* Assay sampling incomplete. In drillholes that intersected abnormal potash geology, a normal potash zone could not be picked given the limited data available and, therefore, the resulting % K_2O and % water insoluble content could not be evaluated with confidence.

Due to the remarkably consistent mineralogy and continuity of the resource, as experienced through 50 years of mine production, very little potash exploration drilling has been done at Lanigan since 1961. Instead of exploration drillholes, seismic surveying has been relied upon more and more to explore ahead of mine development. Where normal Prairie Evaporite sequences are mapped in the seismic data, potash beds have unfailingly been present. Localized, relatively small mine anomalies, not mapped in seismic data, do occur. When they do, they are dealt with in the normal course of mining and extraction through these anomalous areas is typically minimized. Anomalies associated with possible water inflow problems, which are mapped in the seismic data, are avoided.

vi) Sampling, Analysis and Data Verification

Analysis of Exploration Data

Exploration in the Lanigan area was conducted in the 1950s and 1960s. A second phase of drilling associated with a mine expansion project occurred in 1981. Sampling and assaying of potash core samples was done using methods considered consistent with standard procedures for potash exploration at these times.

Drillhole sampling methods have remained essentially the same over the years. Potash core samples are acquired as described in earlier sections of this report. Short segments of core usually about 0.3 m (1 foot) in length are labeled based on visible changes in mineralization and sometimes based on more or less fixed intervals. Each segment of core is then split using some type of rock or masonry saw. The split portion of core is then bagged and labeled and sent to a laboratory for chemical analysis. Historical potash samples remain stored at the Subsurface Geological Laboratory (Regina, Saskatchewan) of the Saskatchewan Ministry of the Economy. Most of these have deteriorated substantially.

Regarding quality assurance for analytical results of in-mine samples, the Company participates in the SPPA Sample Exchange Program to monitor the accuracy of analytical procedures used in its labs. In the early 1970s, the SPPA initiated a round-robin Sample Exchange Program, the purpose of which was to assist the potash laboratories in developing a high level of confidence in analytical results. This program has continued up to the present, and participants include all major Canadian potash mine site labs, the Nutrien Pilot Plant Lab, and an independent surveyor lab. The Sample Exchange Program provides the participants with three unknown potash samples for analysis four times per year. Results for the unknown sample analysis are correlated by an independent agency that distributes statistical analysis and a summary report to all participants. Completed SPPA samples can be used for control standards as required in QA/QC sections of standard analytical procedures.

The Nutrien Pilot Plant is secured in the same way as modern office buildings are secured. Authorized personnel have access and visitors are accompanied by staff. No special security measures are taken beyond that. Currently, no external laboratory certification is held by the Nutrien Pilot Plant. On occasion, product quality check samples are sent to the Saskatchewan Research Council, a fully certified analytical facility.

Mean Potash Mineral-Grade From In-Mine Samples

In the Lanigan A Zone, in-mine grade samples are taken from the floor at the start of every cutting sequence. This is equivalent to a sample taken every approximately 23 m (76 feet) in production panels, and a sample taken every approximately 47 m (155 feet) in development panels. Since mining began in the A Zone in 2007 through to the end of December 2017, a total of 1,485 in-mine potash mineral grade samples have been collected from the Lanigan A Zone. In-mine samples collected and analyzed in 2018 contributed no meaningful change to the overall grade. All samples were analyzed in the Lanigan mill laboratory using up-to-date analysis techniques. The median ore grade for this family of in-mine samples is 24.5% K_2O equivalent and the mean ore grade is 23.5%.

In the Lanigan B Zone, in-mine grade samples are taken from the floor every 60 m (200 feet) in newly mined rooms. In-mine grade data is available from 1999 through to the end of December 2017. A total of 20,230 in-mine potash mineral grade samples have been collected from the Lanigan B Zone. In-mine samples collected and analyzed in 2018 contributed no meaningful change to the overall grade. All samples were analyzed in the Lanigan mill laboratory using analysis techniques that were up-to-date for the era in which the sample was collected. The median ore grade for this family of in-mine samples is 20.8% K_2O equivalent and the mean ore grade is 20.3%.

In 2013, Lanigan modified its cutting practices in the B Zone to improve mine roof stability. This modification involved cutting in a slightly higher, but more stable horizon. The goal of improved mine roof stability was achieved, however, less potash and more salt is now being mined resulting in a slightly lower reported ore grade for B Zone.

Potash Ore-Density From In-Mine Mineral-Grade Measurements

An estimate of in-situ rock density is used to calculate potash mineralization volumes in mineral resource and reserve assessments. A common approach is to determine in-place mineral resource and reserve volumes (m^3) to a certain degree of confidence, then multiply this number by in-situ bulk-rock density (kg/m^3) to give in-place mineral resource and reserve tonnes. However, establishing an accurate bulk-rock density value is not an easy or trivial task. Well-log data from drillholes can be used for this if accurate and calibrated well-logs are acquired during exploration drilling. In practical terms, modern well-logs tend to meet these criteria, but historic well-logs (collected before the 1990s) do not. In Saskatchewan, almost all potash exploration drilling took place in the 1950s and 1960s, well before density logs were accurate and reliable.

Another approach is to look up density values for the minerals which constitute potash rock – values determined in a laboratory to a high degree of accuracy and published in reliable scientific journals/textbooks – then apply these densities to the bulk-rock in some way. Given that the density of each pure mineral is quantified and known, the only difficult aspect of this approach is determining what proportion of each mineral makes up the bulk-rock at a particular sample location. This is the methodology that was used to determine an estimate of bulk-rock density for the Lanigan B Zone. An obvious benefit of this approach is that a mean value computed on the distribution (20,230 sample points) has a much greater confidence interval than a mean value computed from 19 drillhole assays.

The main mineralogical components of the ore zones of Saskatchewan's Prairie Evaporite Formation are:

- Halite – NaCl
- Sylvite – KCl
- Carnallite – $KMgCl_3\ 6(H_2O)$
- Insolubles – dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components

All Nutrien potash facilities measure and record the in-mine % K_2O grade and insoluble content of the mined rock. In addition, carnallite content is also measured at Lanigan since it can be a component of the lower portion of the B Zone. Selective mining is generally employed when carnallite is encountered in B Zone production mining. This is performed by taking only a single lift with the mining machine through the upper portion of the B Zone mining horizon, leaving much of the carnallite mineralization in the floor unmined. The B Zone carnallite that does remain in the ore stream is accounted for during analysis. From this set of measurements, the density of the ore can be estimated. The required composition and mineral density information for each mineral component is given below (sourced from Webmineral Mineralogy Database, 2018):

Halite – NaCl

- Na 39.34%
- CL 60.66%
- Oxide form Na_2O 53.03%
- Mineral density 2170 kg/m^3

Sylvite – KCl

- K 52.45%
- CL 47.55%
- Oxide form K_2O 63.18%
- Mineral density 1990 kg/m^3

Carnallite – $KMgCl_3 \cdot 6H_2O$

- K 14.07%
- Mg 8.75%
- H 4.35%
- Cl 38.28%
- O 34.55%
- Oxide form K_2O 16.95%
- Oxide form MgO 14.51%
- Oxide form H_2O 38.90%
- Mineral density 1600 kg/m^3

Insolubles (Lanigan B Zone)

- Component minerals: dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components
- Average density 2870 kg/m^3 (Nutrien Pilot Plant, 2018)

Note that the estimate of the value for insoluble density is based on known densities of the constituent parts of the insoluble components of B Zone mineralization and the average occurrence of these insoluble components, which is known from the nearly 50 years of mining experience at Lanigan. Assuming the lowest plausible density of insolubles known for Saskatchewan potash deposits of this nature, the effect upon overall bulk-rock ore density and reserve calculations would be negligible.

The mineral composition of B Zone potash ore is halite, sylvite, carnallite and insolubles. The effect of % K_2O as carnallite is removed from the total % K_2O measurements leaving % K_2O values that are only due to sylvite. From 20,230 Lanigan B Zone in-mine grade samples, raw ore composition is:

% Sylvite = 30.8 (converted from % K_2O)
% Insolubles = 4.8
% Carnallite = 4.9

The percent of halite is assumed to be:

% Halite = (100-% Sylvite-% Insol.-% Carnallite)
= (100–30.8-4.8–4.9)
= 59.5

Applying this methodology and using these mean grade data give a mean bulk-rock density for Lanigan B Zone potash of:

$\mathbf{RHO_{bulk\text{-}rock}}$ = (Halite density * % Halite) +
(Sylvite density * % Sylvite) +
(Carnallite density * % Carnallite) +
(Insol. density * % Insol.)
= (2170 * % Halite) +
(1990 * % Sylvite) +
(1600 * % Carnallite) +
(2870 * % Insol.)
= 2120

$\mathbf{RHO_{bulk\text{-}rock}}$ (Lanigan B Zone) = 2120 kg/m^3

This method is as accurate as the B Zone ore grade measurements and mineral density estimates are.

To date, not enough A Zone mining has been carried out at Lanigan to permit the calculation of a proper in-situ bulk-rock potash density based solely on in-mine grade samples. A Zone mining has proven successful at Lanigan and takes place in several different geographic locations within the Mineral Lease. Therefore, it is likely that, in the future, enough in-mine samples will be available to support the calculation of an accurate in-situ bulk-rock density for A Zone potash ore. However, in the interim, Allan Potash's in-situ bulk-rock density for A Zone potash is used; this has been calculated using 6,738 in-mine samples from the Allan A Zone:

$$\mathbf{RHO_{bulk\text{-}rock}\ (Lanigan\ A\ Zone) = RHO_{bulk\text{-}rock}\ (Allan\ A\ Zone) = 2110\ kg/m^3}$$

This estimate is considered acceptable since both Allan A Zone and Lanigan A Zone are the same potash seam.

Assay Data Verification

Original drill core assays were studied by independent consultant David S. Robertson and Associates (1976). The original assay results for core samples from historical drillholes were taken as accurate in these studies, as there is no way to reliably reanalyze these samples. Most of the remaining samples in storage have long since deteriorated to the point where they are not usable. Nutrien technical staff Jennifer Scott (P.Geo) and Tanner Soroka (P.Geo) reanalyzed assay results from the A Zone using a 3.66 m (12') mining interval, the mining height currently used in the Lanigan A Zone. Former Company staff evaluated assay results from potash test holes drilled in 1981.

Ore grades of in-mine samples are measured in-house at the Lanigan mine laboratory by Company staff using modern, standard chemical analysis tools and procedures; an independent agency does not verify these results. However, check sampling through the SPPA program does occur.

It should be noted that assay results from historical drillholes match mine sample results closely – within approximately 0.9% for A Zone and 1.4% for B Zone – even though sample spacing is obviously much greater in the case of drillholes. This fact is a validation of the methodology. Based on 50 years of in-mine experience at Lanigan, we consider these historical assay results to be acceptable and to provide a good basis for estimating ore grade in areas of future mining at Lanigan. However, the A Zone mean mineral grade of 23.5% K_2O equivalent determined from 1,485 in-mine grade samples, and the B Zone mean mineral grade of 20.3% K_2O equivalent determined from 20,230 in-mine grade samples is thought to provide the most accurate measurement of potash grade for the Lanigan mine.

Exploration Data Verification

The purpose of any mineral exploration program is to determine extent, continuity and grade of mineralization to a certain level of confidence and accuracy. For potash exploration, it is important to minimize the amount of cross-formational drilling, since each drillhole is a potential conduit for subsurface groundwater from overlying (or underlying) water-bearing formations into future mine workings. Every potash test hole from surface sterilizes potash mineralization; a safety pillar is required around every surface drillhole once underground mining commences. This is the main reason that minimal exploration drilling has been carried out at Lanigan in recent years.

Initial sampling and assaying of cores was done during potash exploration at Lanigan in the 1950s and 1960s. Methods were consistent with standard procedures for that era. The mine began production in 1968 and, with the exception of a potash test hole in 1975 and four potash test holes in 1981 no further core drilling has been carried out since then. This approach to potash sampling is in accordance with widely accepted industry practice for areas adjacent and contiguous to an existing operating potash mine**.**

Assay of physical samples (drillhole cores and/or in-mine samples) is the only way to gain information about mineral grade, but extent and continuity of mineralization are correctly determined using data collected from geophysical surveys correlated with historic drilling information. To date, surface seismic data at Lanigan have been collected, analyzed and verified by Company staff, at times, in cooperation with an independent consultant. Ultimate responsibility for final analyses including depth conversion (seismic depth migration), as well as the accuracy of these data, rests with Nutrien qualified persons.

Data for the mineral reserve and mineral resource estimates for Lanigan mine were verified by Company staff as follows:

- Annual review of potash assay sample information (drillholes and in-mine grade samples);
- Annual review of surface geophysical exploration results (3D and 2D seismic data);
- Annual crosscheck of mined tonnages reported by mine site technical staff with tonnages estimated from mine survey information; and
- Annual crosscheck of mineral resource and reserve calculations carried out by corporate technical staff.

This approach to data verification of potash mineral grade and surface seismic information is in accordance with generally accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

vii) Mineral Processing and Metallurgical Testing

At Lanigan, potash ore has been mined and concentrated to produce saleable quantities of high-grade finished potash products since 1968. Products include granular, standard and suspension grade potash for agricultural use.

Over the 50-year mine life, 207.762 million tonnes of potash ore have been mined and hoisted to produce 60.276 million tonnes of finished potash product (from startup in 1968 to December 31, 2018). Given this level of sustained production over 50 years, basic mineralogical processing and prospective metallurgical testing of Lanigan potash is not considered relevant.

viii) Mineral Resource and Mineral Reserve Estimates

Definitions of Mineral Resources

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Resource" for an overview of CIM's mineral resource categories and the Company's general characterization of mineral resource categories for its potash mines.

The Lanigan mine began production in 1968, and since then just seven potash exploration drillholes have been drilled in the Lanigan lease area; three of which are unusable for assay analysis. Instead, exploration involved collecting surface seismic data, which became better in quality over the years. Exploration drilling has demonstrated the presence of the potash horizon, and seismic coverage shows the continuity of the Prairie Evaporite Formation within which the potash horizon occurs.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zones at Lanigan that is far superior to the level of understanding provided by any surface drilling based exploration program. We believe that our approach provides a body of information that guides and constrains our exploration inferences in a much better way than could be achieved from any conventional exploration investigation in areas immediately surrounding, and contiguous to, the Lanigan potash mine.

Mineral Resource Estimates

Exploration information used to calculate reported mineral resource tonnages at Lanigan consist of both physical sampling (drillhole and in-mine) and surface seismic (2D and 3D) as discussed in earlier sections. Based on the definitions and guidelines described above, all mineral rights leased or owned by the Company, and within Crown Subsurface Mineral Lease KLSA 001 C, are assigned to one of the three mineral resource categories.

Mineral resources are reported as mineralization in-place and are exclusive of mineral reserves. In-place tonnes were calculated for each of the mineral resource categories using the following parameters:

Mining Height (A Zone):	3.66 meters (12')
Mining Height (B Zone):	4.88 meters (16')
Ore Density (A Zone):	2.110 tonnes/cubic meter
Ore Density (B Zone):	2.120 tonnes/cubic meter

The mineral resources for Lanigan as of December 31, 2018 are as follows:

Lanigan A Zone Resource:		
Inferred Resource	671	million tonnes
Indicated Resource	1,325	million tonnes
Measured Resource	2,142	million tonnes
Total A Zone Resource	4,138	million tonnes
Lanigan B Zone Resource:		
Inferred Resource	899	million tonnes
Indicated Resource	1,775	million tonnes
Measured Resource	2,578	million tonnes
Total B Zone Resource	5,252	million tonnes
Total Resource for Lanigan (A Zone + B Zone):		
Inferred Resource	1,570	million tonnes
Indicated Resource	3,100	million tonnes
Measured Resource	4,720	million tonnes
Total A Zone + B Zone Resource	9,390	million tonnes

The average mineral grade of the Lanigan A Zone Mineral Resource is 23.5% K_20 equivalent, and was determined from 1,485 in-mine samples at Lanigan. The average mineral grade of the Lanigan B Zone Mineral Resource is 20.3% K_20 equivalent, and was determined from 20,230 in-mine samples at Lanigan.

The tonnage reported as Lanigan A Zone Measured Resource is comprised of both potash ore that is within 1.6 km (1 mile) of A Zone mine workings, and potash ore that is left behind as pillars in mined-out areas of the A Zone at Lanigan. Also included as Lanigan A Zone Measured Resource is the potash ore within 1.6 km (1 mile) of drillholes for which A Zone assay results are available.

Similarly, the tonnage reported as Lanigan B Zone Measured Resource is comprised of both potash ore that is within 1.6 km (1 mile) of B Zone mine workings, and potash ore that is left behind as pillars in mined-out areas of the B Zone at Lanigan. Also included as Lanigan B Zone Measured Resource is the potash ore within 1.6 km (1 mile) of drillholes for which B Zone assay results are available.

In a potash mine, it is common practice to consider mining remnant pillar mineralization using solution methods after conventional mining is complete, or after a mine is lost to flooding. The Patience Lake mine was successfully converted from a conventional mine to a solution mine after being lost to flooding in 1989. Since conversion to a solution mine is not anticipated in the near future at Lanigan, in-place pillar mineralization remains as a mineral resource rather than a mineral reserve at this time.

Definitions of Mineral Reserve

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Reserve" for an overview of CIM's mineral reserve categories and the Company's general characterization of mineral reserve categories for its potash mines.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Lanigan that is far superior to the level of understanding provided by any surface drilling based exploration program. An understanding of the amount of ore that can be conventionally mined from the measured resource category using current mining practices comes from nearly 50 years of potash mining experience at Lanigan.

Mineral Reserve Estimates

Using the definitions outlined above, part of the Lanigan A Zone and B Zone Measured Resource has been converted to Mineral Reserve. The assigned mineral reserve category is dependent on proximity to sampled mined entries also described above. An overall extraction rate for the Lanigan mine has been applied to the qualifying area outlined as measured resource.

The overall extraction rate at the Lanigan mine is 26%. It was derived by dividing the total tonnes mined to date by the tonnage equivalent of the total area of the mine workings (i.e., the perimeter around the mine workings). Since an extraction rate has been applied, mineral reserves are considered recoverable ore and are reported as such.

Currently, in any specific mining block at Lanigan, only one zone is mined (i.e., bi-level mining is not in practice). As such, mineral reserve has been split by ore zone that will be mined in the future; A Zone Mineral Reserve and B Zone Mineral Reserve do not overlap. Unmined B Zone potash mineralization directly underlying the defined A Zone Mineral Reserve is classified as B Zone Measured Resource. In the same way, unmined A Zone potash mineralization directly overlying the defined B Zone Mineral Reserve is classified as A Zone Measured Resource.

The mineral reserves for Lanigan as of December 31, 2018 are as follows:

Lanigan A Zone:		
Probable Reserve	142	million tonnes
Proven Reserve	19	million tonnes
Total A Zone Reserve =	161	million tonnes
Lanigan B Zone:		
Probable Reserve	287	million tonnes
Proven Reserve	92	million tonnes
Total B Zone Reserve =	379	million tonnes
Total for Lanigan (A Zone + B Zone):		
Probable Reserve	429	million tonnes
Proven Reserve	111	million tonnes
Total A Zone and B Zone Reserve =	540	million tonnes

The average mineral grade of the Lanigan A Zone Mineral Resource is 23.5% K_20 equivalent, and was determined from 1,485 in-mine samples at Lanigan. The average mineral grade of the Lanigan B Zone Mineral Resource is 20.3% K_20 equivalent, and was determined from 20,230 in-mine samples at Lanigan.

ix) Mining Operations

All conventional potash mines in Saskatchewan operate at 900 m to 1200 m below surface within 9 m to 30 m of the top of the Prairie Evaporite Formation. Over the scale of any typical Saskatchewan potash mine, potash beds are tabular and regionally flat-lying, with only moderate local variations in dip. At Lanigan, potash ore is mined using conventional mining methods, whereby:

- Shafts are sunk to the potash ore body;
- Continuous mining machines cut out the ore, which is hoisted to surface through the production shaft;
- Raw potash is processed and concentrated in a mill on surface; and
- Concentrated finished potash products (near-pure KCl) are sold and shipped to markets in North America and offshore.

Potash ore was first hoisted at Lanigan in the fall of 1968. The Lanigan mine has run on a continuous basis since then, other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work.

Most recently, mill rehabilitation, mine expansion and hoist improvement projects were completed at Lanigan between 2005 and 2010. The expansion construction was carried out without significant disruption to existing potash production from the site. As of December 31, 2018, annual nameplate capacity for Lanigan was 3.8 million tonnes and annual operational capability is 2.0 million tonnes of finished potash products (concentrated KCl).

Virtually all Lanigan underground mining rooms are in one of two potash mineralized zones within the Patience Lake Member of the Prairie Evaporite Formation (the host evaporite salt). In this Member, there are two potash seams named A Zone (the upper seam) and B Zone (the lower seam); at present, both the A Zone and B Zone are being mined at Lanigan. The A Zone and B Zone are separated by approximately 4 m to 6 m of tabular salt. In contrast, some potash mines further east in Saskatchewan mine in a different potash layer, the Esterhazy Member of the Prairie Evaporite Formation. At Lanigan, mine elevations range from approximately 940 m to 1030 m, averaging approximately 990 m. These depths to potash mineralization are anticipated over most of the Lanigan lease area. Mine workings are protected from aquifers in overlying formations by approximately 7 m (A Zone) to 14 m (B Zone) of overlying salt and potash beds, along with salt plugged porosity in the Dawson Bay Formation, a carbonate layer lying immediately above potash hosting salt beds.

The Lanigan mine is a conventional underground mining operation where continuous mining machines are used to excavate potash ore by the stress-relief method in the A Zone and the long-room and pillar mining method in the B Zone. Currently, in any specific mining block, only one zone is mined (i.e., bi-level mining is not in practice). Continuous conveyor belts transport ore from the mining face to the bottom of the production shaft. Mining methods employed in Saskatchewan are discussed in Jones and Prugger (1982) and in Gebhardt (1993).

The actual mining thickness at Lanigan is dictated by the height of continuous boring machines used to cut the ore. The A Zone mining interval is fixed at 3.66 m (12’). The 3.66 m (12’) mining height also allows for comfortable working headroom and efficient extraction of potash ore. The thickness of the B Zone mining horizon varies somewhat and there is some flexibility in the thickness of the potash ore that is extracted there. Production mining machines have a fixed mining height of 2.74 m (9’). In a normal production room ore is extracted in two lifts resulting in a mining height of approximately 4.88 m (16’).

Carnallite sometimes occurs in minor amounts in the basal part of the B Zone. Carnallite is an undesirable mill feed material. If more than minor amounts of carnallite are detected in the floor after the first lift of a production room in the B Zone, it is left in the floor (i.e., a second lift is not cut). In these instances the B Zone mining height is just 2.74 m (9’). Carnallite is found in trace amounts in the A Zone; however, due to its low occurrence, mining practices remain unchanged when it is encountered.

Mining systems used in both A Zone and B Zone cut to a marker (clay) seam that is slightly above the high-grade mineralized zone to establish a safe and stable mine roof. In both zones, the top marker seam is slightly overcut by 10 to 20 cm. Clay seams are often planes of weakness, and if they are undercut material immediately below the clay seam becomes a hazard as it may separate and fall. Since the hazard must be remediated prior to proceeding, thus slowing production, the moderately diluted mineral grade that results from the overcutting is preferable from a safety point of view.

In 2013, Lanigan modified its cutting practices in the B Zone to improve mine roof stability. This modification involved cutting in a slightly higher, but more stable horizon. The goal of improved mine roof stability was achieved; however, less potash and more salt is now being mined resulting in a slightly lower reported ore grade for B Zone.

Conservative local extraction rates (never exceeding 45% in any mining block) are employed at all Saskatchewan mines, including Lanigan, in order to minimize potential detrimental effects of mining on overlying strata; this is common practice in flat-lying, tabular ore bodies overlain by water-bearing layers.

From the shaft-bottom potash ore is hoisted approximately 1000 m from the potash level through the vertical shafts to a surface mill. In addition to hoisting potash ore to surface, the production shaft provides fresh air ventilation to the mine and serves as secondary egress. The Service Shaft is used for service access, and exhausting ventilation from the mine.

Over the 50-year mine life, 207.762 million tonnes of potash ore have been mined and hoisted at Lanigan to produce 60.276 million tonnes of finished potash products (from startup in 1968 to December 31, 2018). The life-of-mine average concentration ratio (raw ore/finished potash products) is 3.45 and the overall extraction rate over this time period is 26%.

x) Processing and Recovery Operations

At Lanigan, potash ore has been mined and concentrated to produce saleable quantities of high-grade finished potash products since 1968. Products include granular, standard and suspension grade potash for agricultural use.

Both floatation methods and crystallization methods are used to concentrate potash ore into finished potash products at the Lanigan mill. Raw potash ore is processed on surface and concentrated red potash products are sold and shipped to markets in North America and offshore.

Over the past three years, production of finished potash products at Lanigan was:

- 2016: 2.030 million tonnes finished potash products at 60.72% K_2O (average grade)
- 2017: 1.817 million tonnes finished potash products at 60.92% K_2O (average grade)
- 2018: 1.962 million tonnes finished potash products at 60.97% K_2O (average grade)

Over the past decade, actual mill recovery rates have been between 75.6% and 85.9%, averaging 82.7%.

Given the long-term experience with potash geology and actual mill recovery at Lanigan, no fundamental potash milling problems are anticipated in the foreseeable future.

Quality control testing and monitoring geared towards fine-tuning and optimizing potash milling and concentrating processes are conducted on a continual basis at all Nutrien mine sites and at Nutrien research facilities. At Lanigan, this is no exception; test work to optimize circuit performance and ensure product quality is carried out on an ongoing basis.

Infrastructure is in place to meet current and projected requirements for transportation, energy (electricity and natural gas), water and process materials at Lanigan.

At present, high voltage power capacity at Lanigan is 52 MVA. The ten-year projection of power utilization indicates that the utility can meet all foreseeable future demand. The Lanigan operation requires a sustained fresh water supply for the milling process which is provided by a waterline from the Bradwell Reservoir (approximately 10 km distant) and from a regional aquifer called the Hatfield Valley Aquifer. This water supply provides a sustainable source of process water for Lanigan milling operations without having any impact on other users of water in the area.

xi) Infrastructure, Permitting and Compliance Activities

The tailings management strategy at all Nutrien potash mines in Saskatchewan, including Lanigan, is one of sequestering solid mine tailings in an engineered and provincially licensed TMA near the surface plant site. The Lanigan TMA currently covers an area of approximately 708 hectares (1,750 acres) of land owned by the Company. Solid potash mine tailings typically consist of 85% to 95% rock-salt (NaCl) and 5% to 15% insolubles (carbonate mud = $CaCO_3$, anhydrite mud = $CaSO_4$, and clays like chlorite, illite, and so on). An engineered slurry-wall has been constructed on the south and south-west sides of the Lanigan TMA in the areas where near-surface aquifers could be impacted by mine waters. Near-surface geology on all other sides of the TMA limits the possibility of brine migration into these areas. The slurry-wall provides secondary containment of any saline mine waters, stopping these brines from reaching surrounding near-surface aquifers. Areas surrounding the TMA are closely monitored; this includes everything from daily visual perimeter inspections to annual investigations and inspections of surrounding groundwater and aquifers.

In Saskatchewan, all potash tailings management activities are carried out under an “Approval to Operate” granted by the MOE. The Lanigan mine is in compliance in all material respects with all regulations stipulated by the Environmental Protection Branch of the MOE. The current Lanigan Approval to Operate has been granted to July 1, 2028, the renewal date.

In terms of long-term decommissioning, environmental regulations in the Province of Saskatchewan require that all operating potash mines in Saskatchewan create a long-term decommissioning and reclamation plan that will ensure all surface facilities are removed and the site is left in a chemically and physically stable condition once mine operations are complete. The Company has conducted numerous studies of this topic, and the most recent decommissioning and reclamation plan for Lanigan was approved by MOE technical staff in October 2016. Because the current expected mine life for Lanigan is many decades into the future, it is not meaningful to come up with detailed engineering designs for decommissioning at present. Instead, decommissioning plans are reviewed every five years, and updated to accommodate new ideas, technological change, incorporation of new data and adjustments of production forecasts and cost estimates. Any updated decommissioning and reclamation reports generated by this process are submitted to provincial regulatory agencies. For Lanigan, a revised decommissioning and reclamation plan is required in July 2021.

In addition to the long-term decommissioning plan, provincial regulations require that every potash producing company in Saskatchewan set up an Environmental Financial Assurance Fund, which is to be held in trust for the decommissioning, restoration and rehabilitation of the plant site after mining is complete. This fund is for all mines operated by Nutrien in the province of Saskatchewan (i.e., Allan, Cory, Lanigan, Patience Lake, Rocanville and Vanscoy).

xii) Capital and Operating Costs

The Lanigan mine has been in operation since 1968; in the years immediately preceding this, major capital investment was made to bring this mine into production. Since then, capital expenditures were made on a regular and ongoing basis to sustain production, and to expand production from time to time.

Most recently, mill rehabilitation, mine expansion and hoist improvement projects were completed at Lanigan between 2005 and 2010. The expansion construction was carried out without significant disruption to existing potash production from the site.

xiii) Exploration, Development and Production

Potash production in any given year at the Lanigan mine is a function of many variables, so actual production in any given year can vary dramatically from tonnages produced in previous years. The mineral reserve tonnage and historic average production are used to estimate remaining mine life. If the average mining rate seen over the past three years (6.795 million tonnes of potash ore mined and hoisted per year) is sustained, and if mineral reserves remain unchanged, then Lanigan A Zone mine life is 24 years from December 31, 2018 and Lanigan B Zone mine life is 56 years from December 31, 2018.

d) Rocanville Potash Operations

Certain scientific and technical information regarding our Rocanville potash operations is based on the technical report titled “National Instrument 43-101 Technical Report on Rocanville Potash Deposit (KL 305) Saskatchewan, Canada” dated effective December 31, 2018 (the “Rocanville Technical Report”) prepared by Craig Funk, B.Sc., M.Sc., P.Eng., P.Geo., who is a “qualified person” as defined in NI 43-101. The Rocanville Technical Report has been filed with the securities regulatory authorities in each of the provinces of Canada and furnished to the SEC. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. References should be made to the full text of the Rocanville Technical Report.

i) Project Description, Location and Access

General

The Rocanville mine is located in southeastern Saskatchewan near the Saskatchewan-Manitoba Provincial Boundary, approximately 15 kilometers northeast of the town of Rocanville, Saskatchewan.

The legal description (Saskatchewan Township/Range) of the Rocanville surface plant is Section 22 Township 17 Range 30 West of the 1st Meridian. More precisely, the Rocanville #2 Shaft collar is located at:

- Latitude: 50 degrees 28 minutes 19.54 seconds North
- Longitude: 101 degrees 32 minutes 42.58 seconds West
- Elevation: 480.36 meters above mean SL
- Northing: 5,596,826.122 m
- Easting: 745,137.307 m
- Projection: UTM
- Datum: NAD83
- Zone: 13

The Company owns approximately 3,061 hectares (7,564 acres) of surface rights required for current Rocanville mine operations, including all areas covered by the existing surface plant and TMA, and all surface lands required for anticipated future Rocanville mine and expanded milling operations.

The Rocanville mine surface facilities are accessed by an existing paved road that is part of the Saskatchewan Provincial Highway System. Most finished potash products are shipped by rail over existing track, with some product shipped by truck over the North American highway system.

The Rocanville mine is served by a number of towns and villages within 50 kilometers of the mine site. The nearest towns are Rocanville (15 km distant), Moosomin and Esterhazy (both 50 km distant). The nearest city is Yorkton (100 km distant). Rocanville is situated near the north extent of the Great Plains of North America. Topography is relatively flat, with gently rolling hills and occasional valleys.

Mineral Rights

Mineral rights at Rocanville are mined pursuant to subsurface mineral leases with the Crown and with Freehold mineral rights owners.

The original Rocanville Crown subsurface mineral lease KL 111 was entered into in June 1966. In the following years various minor amendments were made to this Crown lease, resulting in Crown subsurface mineral lease KL 111R. KL 111R covered approximately 24,146 hectares (59,668 acres) of Crown mineral rights.

In May 2007, application was made for a Permit to Prospect for Subsurface Minerals (Potash Exploration Permit) covering approximately 26,184 hectares (64,702 acres) of Crown mineral rights in the area just west of and adjoining the existing Rocanville Crown Lease KL 111R. In late 2007, a major expansion of the Rocanville mine was announced. Shortly after this, in May 2008, Potash Exploration Permit KP 338A was issued. A potash exploration program was initiated in 2007 and completed in 2008 to determine the extent of potash mineralization to the west of the mine workings.

A new Crown Subsurface Mineral Lease numbered KLSA 002 was issued in February 2010 incorporating all Crown mineral rights within the existing Crown Lease KL 111R and approximately two-thirds of Crown mineral rights covered in KP 338A. The portion of the lands that were not part of the Lease amalgamation remained as Crown Exploration Permit KP 338B until December 2016 when they were converted to a Crown Subsurface Mineral Lease numbered KL 249.

In October 2017, KL 305 was formed by the amalgamation of Crown Subsurface Leases KLSA 002 (KLSA 002 B, following minor amendments) and KL 249. KL 305 covers an area of approximately 113,975 hectares (281,639 acres). At Rocanville, the Company has leased potash mineral rights for 54,184 hectares (133,892 acres) of Crown land and owns or has leased approximately 45,612 hectares (112,710 acres) of Freehold land within the lease boundary. The Rocanville Crown lease term is for a period of 21 years from October 2017, with renewals at the Company’s option for 21-year periods. Freehold lands also remain under lease providing, generally, that production is continuing and that there is a continuation of the Crown lease.

Within the current Rocanville Crown lease area, 80,181 hectares (198,132 acres) are mined pursuant to Unitization Agreements with mineral rights holders (Crown and Freehold) within two Unitized Areas. Rocanville Unit Area #1 has been in place since 1970 when mining began, was amended in 2006 and includes 35,234 hectares (87,065 acres) of mineral rights. Rocanville Unit Area #2 has been in place since 2011 and includes 44,947 hectares (111,067 acres) of mineral rights.

ii) History

See "Mineral Projects – a) Allan Potash Operations – ii) History" above for a general overview of the history of potash mines in Saskatchewan.

Exploration drilling for potash in the Rocanville, Saskatchewan area was carried out in the 1960s. Thirty-four potash test holes were drilled during this early exploration phase: 25 in Saskatchewan and nine in Manitoba. The Rocanville mine was built by a company called Sylvite of Canada Ltd. (a division of Hudson's Bay Mining and Smelting Ltd.) in the late 1960s, and potash production began at Rocanville in 1970. The mine has run on a continuous basis since then (other than during short-term shutdowns taken for inventory management purposes). Potash Corporation of Saskatchewan Inc. acquired the Rocanville mine in 1977.

A major expansion to increase the nameplate capacity of Rocanville from 3.0 million tonnes to approximately 6.0 million tonnes of finished potash products per year was announced in 2007. Expansion work was substantially completed by the end of 2016 and production was ramped up through 2017 when a nameplate capacity of 6.5 million tonnes of finished potash product was announced. The operational capability at Rocanville to December 31, 2018 is 5.2 million tonnes of finished potash product.

iii) Geological Setting, Mineralization and Deposit Types

See "Mineral Projects – a) Allan Potash Operations – iii) Geological Setting, Mineralization and Deposit Types – Geological Setting and Mineralization" above for a general overview of geological setting and mineralization for potash mines in Saskatchewan.

Over the past three years (2016, 2017, 2018), the average, measured potash ore grade of the mill feed at Rocanville was 23.2% K_20 equivalent. The average ore grade reported from 31 surface drillhole intersections, all within Rocanville Lease KL 305, is 22.4% K_20 equivalent. The average ore grade observed from 39,245 in-mine chip samples taken over 48 years of mining is 23.4% K_20 equivalent.

There are three mineable potash members within the Prairie Evaporite Formation of Saskatchewan. Stratigraphically highest to lowest these members are: Patience Lake, Belle Plaine and Esterhazy.

The Rocanville potash deposit lies within the Esterhazy Member of the Prairie Evaporite Formation. The Patience Lake Member potash beds are not present in the Rocanville Area. The Belle Plaine and White Bear Members are present, but not conventionally mineable in the Rocanville area. The potash zone at Rocanville is approximately 2.4 meters thick and occurs near the top of the Prairie Evaporite Formation. Potash mineralization in this area is flat-lying and continuous. Mine elevations range from approximately 895 m to 1040 m, averaging approximately 955 m. Within the Rocanville Lease, depths to the top of the ore zone can reach up 1250 m (the deepest potash exploration drillhole), but are expected to be shallower than 1200 m over most of the lease area. Salt cover from the ore zone to overlying units is approximately 30 m. The Rocanville mine operates as a conventional underground potash mine.

iv) Exploration

Before the Rocanville mine was established in 1970, all exploration consisted of drilling test holes from surface and analysis of core from these drillholes. The Company did not conduct any exploration drilling after start-up until 2008 when a potash exploration program was initiated under the direction of Company staff to determine the extent of potash mineralization in the western portion of the current Lease. Between 2007 and 2008 exploration work consisted of:

- Analysis of data from five existing exploration drillholes (well-logs from surface casing to total depth within or below the Prairie Evaporite Formation)
- Analysis of 377 km of existing 2D surface seismic data
- Acquisition and analysis of 124 km^2 (48 $miles^2$) of 3D surface seismic data,
- Drilling of four potash exploration drillholes from surface to the base of the Prairie Evaporite Formation (all with a complete suite of modern well-logs plus coring of the potash mineralized zone)
- Drilling of one shaft pilot drillhole (with a complete suite of modern well-logs plus coring of the entire rock column from surface to below the potash mineralized zone)

In most of southern Saskatchewan, potash mineralization is in place wherever Prairie Evaporite Formation salts exist; they are flat-lying and are undisturbed. Since the surface seismic exploration method is an excellent tool for mapping the top and bottom of Prairie Evaporite salts this has become the main potash exploration tool in any existing Saskatchewan Subsurface (potash) Mineral Lease. Historically, 2D seismic, and now the more accurate 3D seismic methods are used to map continuity and extent of potash beds in flat-lying potash deposits. Seismic data are relied upon to identify collapse structures that must be avoided in the process of mine development since these structures can act as conduits for water. As a result, isolation pillars or mining buffer zones are left around these anomalous features. This practice reduces the overall mining extraction ratio, but the risk of inflow to mine workings is effectively mitigated.

A total of 1,111 linear kilometers of 2D seismic lines have now been acquired at Rocanville. Between 1988 and 2017, 3D seismic has been acquired over an area covering 627 square kilometers. The most recent seismic survey was conducted in 2017 and accounted for 96 square kilometers of the total square kilometers stated above.

Experience has shown that the potash mining zone is continuous when seismic data are undisturbed and flat-lying. Surface seismic data are generally collected three to five years in advance of mining. Any area recognized as seismically unusual is identified early, and mine plans are adjusted to avoid these regions.

v) Drilling

For the original Rocanville potash test holes drilled in 1960s, the primary objective of this drilling was to sample the potash horizon to establish basic mining parameters. Seismic surveys (2D) were done sparingly in those days, so the drillhole information was relied upon heavily to evaluate potash deposits. Test holes would penetrate the evaporite section with a hydrocarbon based drilling mud (oil-based or diesel fuel) to protect the potash mineralization from dissolution. Basic geophysical well-logs were acquired and in many cases drill stem tests were run on the Dawson Bay Formation, a carbonate immediately overlying the Prairie Evaporite Formation, to help assess mine inflow potential. Core samples from the targeted potash intersections were split or quartered (cut with a masonry saw) crushed and analyzed to establish potash grades.

Original Rocanville drillhole assay data are taken from Robertson et al. (1977), where the best 2.44 m (8') mining interval – the original mining height at Rocanville – is reported. As explained in the Robertson Associates report, the Rocanville prospect was originally explored by 34 drillholes in Saskatchewan and Manitoba. Of these original drillholes, 26 are located within the current Rocanville Lease KL 305 and are shown in Table D below.

Potash intersections for one drillhole in Table D revealed anomalously low grades. With nearly 50 years of mining experience at Rocanville, it is the opinion of the authors that areas of low grade (i.e., <15% K_2O) are localized with a relatively small lateral extent. Therefore, the average grade calculation does not include these drillholes.

No further exploration drilling was done by the Company at Rocanville until 2008 when four potash exploration drillholes and one shaft pilot hole were completed. The basic drilling program was specified by Company technical staff.

Each of the 2008 exploration drillholes and the shaft pilot hole were drilled in such a way as to protect the potash minerals from dissolution while core sampling through the targeted mining zone (the Esterhazy Member of the Prairie Evaporite Formation). To accomplish this, the aquifers above the top of salt (top of the Prairie Evaporite) were isolated behind a casing before the drilling mud was changed over to an oil based system. Each drillhole penetrated approximately 10 m into the Winnipegosis Formation, which lies immediately below Prairie Evaporite salts, before drilling was terminated (i.e., through the Prairie Evaporite Formation and far enough into the underlying formation to permit proper geophysical logging of the base of salt).

Hydrogeology in the formations immediately overlying the Prairie Evaporite Formation was evaluated in part by core sampling through the Dawson Bay Formation (for examination of porosity and permeability). As well, drill stem tests were run in the Dawson Bay and Lower Souris River Formations. In the shaft pilot hole, core sampling and drill stem testing were done more extensively as part of a comprehensive investigation for a shaft liner design. In every drillhole, coring and testing of formations above the Prairie Evaporite was completed prior to setting the casing and changing the drilling mud to an oil based system.

A standard suite of geophysical logs was run in each drillhole. These logs included: Gamma Ray, Neutron, Density, Electrical Resistivity (or Induction), Sonic (full-waveform P & S) and Caliper. In certain drillholes, additional specialized logs were run for fracture mapping and/or porosity investigation over certain geological intervals. A deviation survey was run in each drillhole; the results of which were found to be minimal (i.e., all holes are vertical). Stages of open-hole logging had to be completed before casing was put in place. The stages depended on formational permeability (such as the Mannville Formation, which is a major regional aquifer and needs to be isolated) and formational composition (it is necessary to change drilling mud when drilling through salts to not dissolve the rock).

Potash core samples from the four 2008 exploration drillholes and the Scissors Creek shaft pilot hole were assayed. The assay results for these drillholes are listed in Table D. Note that 2008 assay results are for the best 2.59 m (8.5') mining interval, since an operational decision was made to develop parts of the western portion of Rocanville Lease KL 305 at a height of 2.59 m (8.5'). This mining height allows for more headroom with minimal negative impact on ore grade. Mining machines at Rocanville use potassium sensing technology to ensure that rooms are always cut in the best available potash ore. It is difficult to determine at which mining height certain Mineral Resources and Reserves will be cut in the future, so the more conservative mining height of 2.51 m (8.25') was applied to mineral resource and reserve calculations.

Drillhole assay data for the Rocanville mining interval gives an estimated mean grade of 22.4% K_2O, with 1.2% water insolubles and 3.6% carnallite (Table D).

Due to the remarkably consistent mineralogy and continuity of the potash, as experienced through 48 years of mine production, very little potash exploration drilling has been done at Rocanville since start-up. Instead of exploration drillholes, seismic surveying has been relied upon to explore ahead of mine development. Where normal Prairie Evaporite sequences are mapped in the seismic data, potash beds have unfailingly been present. Localized, relatively small mine anomalies, not mapped in seismic data, do occur. When they do, they are dealt with in the normal course of mining and extraction through these anomalous areas is typically minimized. Anomalies associated with possible water inflow problems, which are mapped in the seismic data, are avoided.

Table D: Assay results for all potash test holes within Rocanville Lease KL 305.

Weighted Average for 2.44 m (8') Mining Interval				
Drillhole	**Year Drilled**	**% K_2O**	**% Water Insolubles**	**% Carnallite**
01-04-17-30 W1	1957	23.84	1.15	4.34
16-14-017-01W2	1957	Excluded	N/A	N/A
04-20-17-32 W1	1958	22.74	0.95	1.77
08-32-17-30 W1	1959	20.74	1.06	5.18
10-12-17-30 W1	1959	16.35	1.06	7.62
13-16-18-30 W1	1959	20.32	0.75	0.74
05-07-18-30 W1	1961	19.95	1.07	4.92
16-04-18-30 W1	1961	21.89	1.26	5.71
02-11-18-30 W1	1961	24.87	0.97	0.2
01-16-17-30 W1	1964	27.05	1.31	4.29
04-20-17-30 W1	1964	23.86	1.22	0.19
16-22-17-30 W1	1964	29.06	1.38	0.11
14-36-17-30 W1	1964	17.06	0.93	6.8
14-36-17-30 W1*	1964	26.26	1.42	4.76
03-28-17-30 W1	1966	26.32	1.26	6.48
13-14-17-30 W1	1966	23.73	1.4	7.02
04-24-17-30 W1	1966	17.88	0.81	0.19
10-34-17-30 W1	1966	24.85	1.48	0.18
11-25-17-30 W1	1966	19.6	1.15	2.13
11-14-18-30 W1	1966	26.53	1.09	0.22
13-22-17-30 W1	1967	35.1	1.3	5.4
01-14-17-33 W1	1967	25.62	2.72	2.52
13-22-17-33 W1	1967	21.75	2.61	7.24
16-26-17-33 W1	1967	24.01	0.92	0.16
14-05-17-30 W1	1969	15.56	0.96	10.27
01-14-17-30 W1	1971	15.67	1.15	N/A
04-01-019-31W1	1989	22.48	0.64	0.00
06-13-17-32 W1**	2008	23.6	0.41	0.25
08-02-18-32 W1**	2008	20.7	1.06	0.76
13-09-16-33 W1**	2008	23.44	1.42	8.32
04-34-16-33 W1**	2008	15.7	0.67	8.84
09-11-18-33 W1**	2008	18.03	0.36	0.25
Average of 31 useable values:		**22.41**	**1.16**	**3.56**

*Refers to a deflection, or whipstock, off original drillhole
**Refers to drillhole from the 2008 exploration program where the best 2.59 m (8.5') mining interval is reported

vi) Sampling, Analysis and Data Verification

Analysis of Exploration Data

Exploration in the Rocanville area was conducted in two very different time periods: the 1960s, then in 2008. Sampling and assaying of potash cores samples was done using methods considered consistent with standard procedures for potash exploration at these times.

Drillhole sampling methods have remained essentially the same over the years. Short segments of core usually about 0.3 m (1') in length are labeled based on visible changes in mineralization and sometimes based on more or less fixed intervals. Each segment of core is then split in half using some type of rock or masonry saw. The split portion of core is then bagged and labeled and sent to a laboratory for chemical analysis. Samples from historical drillholes were sometimes quartered; most historical samples have deteriorated substantially. Exploration drillhole samples from 2008 were halved. Potash samples remain stored at the Subsurface Geological Laboratory of the Saskatchewan Ministry of the Economy (Regina, Saskatchewan).

For the exploration holes drilled in 2008, samples were chemically analyzed at the Nutrien Pilot Plant (under the supervision of the Company's Chief Chemist at the time, D. Matthews, MCIC) using the most accurate methods available for the required elements:

- Potassium ("K") content was analyzed by titration using the STPB (sodium tetraphenylboron) method.
- Sodium ("Na") was analyzed by Atomic Absorption.
- Calcium ("Ca") and Magnesium ("Mg") were analyzed by EDTA (ethylenediaminetetracetate) titration.
- Water Insoluble ("WI") was analyzed gravimetrically.

All wet chemical methods are based upon either American Society of Testing Materials (ASTM) or Association of Official Analytical Chemists (AOAC) methods of analysis. The same samples were also analyzed for process (milling) related properties, namely flotation performance, liberation characteristics, and mineralogical content.

Mineralogical (x-ray diffraction) testing was conducted by the Saskatchewan Research Council Mining and Minerals Division, in Saskatoon, Saskatchewan. The Saskatchewan Research Council geoanalytical laboratories are Standards Council of Canada Accredited, with the laboratory management system operated in accordance with ISO/IEC 17025:2005 (Can-P-4E), General Requirements of the Competence of Mineral Testing and Calibration Laboratories.

Detailed sample preparation was as follows:

1. Place core samples in large flat metal pan. Break with hammer into approximately 2.54 cm (1") pieces.
2. Clean out jaw crusher, and place a clean 18.93 L (5 gallon) pail under crusher. Start up crusher, check 0 setting, and then set gap to 10 mm. (Note: jaw crusher should be running when adjusting gap).
3. Put approximately half of the broken core through the jaw crusher. Shake pan under the jaw crusher occasionally to spread out material. Remove crushed material and place on a full height 5 mesh screen with a full height pan underneath. Shake and tap screen by hand. Place +5 mesh in pan to be re-crushed. Place -5 mesh in a separate pan for crushed material.
4. Repeat step #3 with the other half of the original broken sample.
5. Re-crush the +5 mesh from step #3 & #4 with 10 mm opening on jaw crusher. Screen out +5 and -5.
6. Adjust jaw crusher to 5 mm opening and crush +5. Screen out +5 and -5. Repeat crushing +5 mesh at 5 mm opening.
7. Adjust crusher to 2.5 mm opening and crush +5 mesh. Screen out +5 and -5. Repeat crushing +5 mesh at 2.5 mm opening.
8. Combine all crushed fractions and mix well. Place in a well-labeled bag. Seal tightly.
9. Split out ¼ from each crushed sample and pulverize for chemical analysis. The remaining ¾ of the sample is bagged and sealed for future test work.

After chemical analysis was completed, the Company's technical staff identified the ore zone (2.59 m) section of the cores. A composite sample of the ore zone was prepared for each core location. Flotation, liberation and metallurgical analysis were conducted on the composite samples to confirm milling assumptions for the ore in the western portion of Rocanville Lease KL 305.

Regarding quality assurance for analytical results of in-mine samples, the Company participates in the SPPA Sample Exchange Program to monitor the accuracy of analytical procedures used in its labs. In the early 1970s, the SPPA initiated a round-robin Sample Exchange Program, the purpose of which was to assist the potash laboratories in developing a high level of confidence in analytical results. This program has continued up to the present and participants include all major Canadian potash mine site labs, the Nutrien Pilot Plant Lab and an independent surveyor lab. The Sample Exchange Program provides the participants with three unknown potash samples for analysis four times per year. Results for the unknown sample analysis are correlated by an independent agency that distributes statistical analysis and a summary report to all participants. Completed SPPA samples can be used for control standards as required in QA/QC sections of standard analytical procedures.

The Nutrien Pilot Plant is secured in the same way as modern office buildings are secured. Authorized personnel have access and visitors are accompanied by staff. No special security measures are taken beyond that. Currently, no external laboratory certification is held by the Nutrien Pilot Plant. On occasion, product quality check samples are sent to the Saskatchewan Research Council, a fully certified analytical facility.

In the opinion of the authors, the sampling methods are acceptable, are consistent with industry standard practices and are adequate for mineral resource and reserve estimation purposes.

Mean Potash Mineral-Grade In-Mine Samples

In-mine grade samples are taken at 60 m intervals in every underground mine room at Rocanville. Traditionally, Rocanville in-mine grade samples were collected as chips along a sidewall from back (roof) to floor; this methodology is referred to as channel sampling. In 2015, in-mine grade samples were taken from the floor (i.e., grab sampling) at the same 60 m sampling interval. Nutrien technical staff believe that collecting samples from the floor is as representative of ore grade in the mining interval as channel sampling, and far less labor- intensive. Grab sample results are currently being compared to channel sample results to thoroughly assess the best practice.

To the end of December 2017, 39,245 in-mine ore grade samples were collected and analyzed in the Rocanville mill laboratory using analysis techniques that were up-to-date for the era in which the sample was collected. In-mine samples collected and analyzed in 2018 contributed no meaningful change to the overall grade. The mean ore grade for this family of in-mine samples is 23.4% K_2O equivalent, while the median ore grade for this family of in-mine samples is 23.6% K_2O.

Potash Ore-Density From In-Mine Mineral-Grade Measurements

An estimate of in-situ rock density is used to calculate potash mineralization volumes in mineral resource and reserve assessments. A common approach is to determine in-place mineral resource and reserve volumes (m^3) to a certain degree of confidence, then multiply this number by in-situ bulk-rock density (kg/m^3) to give in-place mineral resource and reserve tonnes. However, establishing an accurate bulk-rock density value is not an easy or trivial task. Well-log data from drillholes can be used for this if accurate and calibrated well-logs are acquired during exploration drilling. In practical terms, modern well-logs tend to meet these criteria, but historic well-logs (collected before the 1990s) do not. In Saskatchewan, almost all potash exploration drilling took place in the 1950s and 1960s, well before density logs were accurate and reliable.

Another approach is to look up density values for the minerals which constitute potash rock – values determined in a laboratory to a high degree of accuracy and published in reliable scientific journals/textbooks – then apply these densities to the bulk-rock in some way. Given that the density of each pure mineral is quantified and known, the only difficult aspect of this approach is determining what proportion of each mineral makes up the bulk-rock at a particular sample location. This is the methodology that was used to determine an estimate of bulk-rock density for the Rocanville ore zone.

The main mineralogical components of the ore zones of Saskatchewan's Prairie Evaporite Formation are:

- Halite – NaCl
- Sylvite – KCl
- Carnallite – $KMgCl_3$ 6(H_2O)
- Insolubles – dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components

All Nutrien potash facilities measure and record the in-mine % K_2O grade and insoluble content of the mined rock. In addition, the Mg content is also measured at Rocanville, since this is proportional to the carnallite content of the ore. From this set of measurements, the density of the ore can be estimated. The required composition and mineral density information for each mineral component is given below (sourced from Webmineral Mineralogy Database, 2018):

Halite – NaCl

- Na 39.34%
- CL 60.66%
- Oxide form Na_2O 53.03%
- Mineral density 2160 kg/m^3

Sylvite – KCl

- K 52.45%
- CL 47.55%
- Oxide form K_2O 63.18%
- Mineral density 1990 kg/m^3

Carnallite – $KMgCl_3 \cdot 6H_2O$

- K 14.07%
- Mg 8.75%
- H 4.35%
- Cl 38.28%
- O 34.55%
- Oxide form K_2O 16.95%
- Oxide form MgO 14.51%
- Oxide form H_2O 38.90%
- Mineral density 1600 kg/m^3

Insolubles

- Component minerals: dolomite, muscovite, clinochlore, potassium feldspar, illite, quartz, anhydrite and other minor mineral components
- Average density 2790 kg/m^3 (Nutrien Pilot Plant, 2018)

The value for insoluble density is based on known densities of the constituent parts of the insoluble components of the mineralization and the average occurrence of these insoluble components, which is known from the nearly 50 years of mining experience at Rocanville. Assuming the lowest plausible density of insolubles known for Saskatchewan potash deposits of this nature, the effect upon overall bulk-rock ore density and mineral resource and reserve calculations would be negligible.

The mineral composition of potash ore at Rocanville is halite, sylvite, carnallite and insolubles. To compute bulk-rock density, the carnallite content must be estimated from the Mg measurements. This is followed by

removing the effect of the carnallite from the % K_2O measurements, leaving % K_2O values that are only due to sylvite; the sylvite percentage is estimated from this adjusted % K_2O. From 39,245 Rocanville in-mine grade samples, raw ore composition is:

% Sylvite = 35.4 (converted from % K_2O)
% Insolubles = 1.0
% Carnallite = 6.1

The percent of halite is assumed to be:

% Halite = (100-% Sylvite-% Insol.-% Carnallite)
= (100-35.4-1.0–6.1)
= 57.5

Applying this methodology, and using these mean grade data gives a mean bulk-rock density for Lanigan B Zone potash of:

$\mathbf{RHO_{bulk\text{-}rock}}$ = (Halite density * % Halite) +
(Sylvite density * % Sylvite) +
(Carnallite density * % Carnallite) +
(Insol. density * % Insol.)
= (2170 * % Halite) +
(1990 * % Sylvite) +
(1600 * % Carnallite)
+ (2790 * % Insol.)
= 2080

$\mathbf{RHO_{bulk\text{-}rock}}$ (Rocanville) = 2080 kg/m^3

This method is as accurate as the ore grade measurements and mineral density estimates are.

Assay Data Verification

Original drillhole ore grade assays were studied by independent consultant David S. Robertson and Associates (1977). The original assay results for core samples from historical drillholes were taken as accurate in these studies, as there is no way to reliably reanalyze these samples. Most of the remaining core samples in storage have long since deteriorated to the point where they are no longer usable.

Assay data for the 2008 core samples were supervised and verified by the Company's former Chief Geologist, T. Danyluk (P.Geo.)**.**

Ore grades of in-mine samples are measured in-house at the Rocanville mine laboratory by Company staff using modern, standard chemical analysis tools and procedures. These results are not verified by an independent agency; however, check sampling through the SPPA program does occur.

It should be noted that assay results from historical drillholes match mine sample results closely – within approximately 1.0% – even though sample spacing is obviously much greater in the case of drillholes. This fact is a validation of the methodology. Based on 48 years of in-mine experience at Rocanville, we consider these historical assay results to be accurate and to provide an excellent basis for estimating potash grade in areas of future mining at Rocanville. The mean mineral grade of 23.4% K_2O equivalent determined from 39,245 in-mine grade samples is thought to provide the most accurate measurement of potash grade for the Rocanville mine.

Exploration Data Verification

The purpose of any mineral exploration program is to determine extent, continuity and grade of mineralization to a certain level of confidence and accuracy. For potash exploration, it is important to minimize the amount of cross-formational drilling, since each drillhole is a potential conduit for subsurface groundwater from overlying (or underlying) water-bearing formations into future mine workings. Every potash test drillhole from surface sterilizes

potash mineralization; a safety pillar is required around every surface drillhole once underground mining commences. This is the main reason that minimal exploration drilling has been carried out at Rocanville in recent years.

Initial sampling and assaying of cores was done during potash exploration at Rocanville in the 1960s. Methods were consistent with standard procedures for that era. The mine began production in 1970 and no further core drilling was carried out by the Company at Rocanville until 2008 when the decision was made to expand the mine westward.

Assay of physical samples (drillhole cores and/or in-mine samples) is the only way to gain information about mineral grade, but extent and continuity of mineralization are correctly determined using data collected from geophysical surveys correlated with historic drilling information. To date, surface seismic data at Rocanville have been collected, analyzed and verified by Company staff, at times, in cooperation with an independent consultant. Ultimate responsibility for final analyses including depth conversion (seismic depth migration), as well as the accuracy of these data, rests with Nutrien qualified persons.

Data for the mineral reserve and mineral resource estimates for Rocanville mine were verified by Company staff as follows:

- Annual review of potash assay sample information (drillholes and in-mine grade samples);
- Annual review of surface geophysical exploration results (3D and 2D seismic data);
- Annual crosscheck of mined tonnages reported by mine site technical staff with tonnages estimated from mine survey information; and
- Annual crosscheck of mineral resource and reserve calculations carried out by corporate technical staff.

This approach to data verification of potash mineral grade and surface seismic information is in accordance with generally accepted industry practice for areas adjacent and contiguous to an existing operating potash mine.

vii) Mineral Processing and Metallurgical Testing

At Rocanville, potash ore has been mined and concentrated using flotation and crystallization methods to produce saleable quantities of high-grade finished potash products since 1970. Products include granular and standard grade potash used for agriculture applications.

Over the 48-year mine life, 248.193 million tonnes of potash ore have been mined and hoisted at to produce 80.967 million tonnes of finished potash product (from startup in 1970 to December 31, 2018). Given this level of sustained production over 48 years, basic mineralogical processing and prospective metallurgical testing of Rocanville potash is not considered relevant.

viii) Mineral Resource and Mineral Reserve Estimates

Definitions of Mineral Resource

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Resource" for an overview of CIM's mineral resource categories and the Company's general characterization of mineral resource categories for its potash mines.

The Rocanville mine began production in 1970 and, with the exception of five holes drilled during the 2008 exploration program, no further core drilling has been carried out by the Company since then. Instead, exploration involved collecting surface seismic data, which became better in quality over the years. Exploration drilling has demonstrated the presence of the potash horizon and seismic coverage shows the continuity of the Prairie Evaporite Formation within which the potash horizon occurs.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Rocanville that is far superior to the level of understanding provided by any surface drilling based exploration program. We believe that our approach provides a body of information that guides and constrains our exploration inferences in a much better way than could be achieved from any conventional exploration investigation in areas immediately surrounding, and contiguous to, the Rocanville potash mine.

Mineral Resource Estimate

Exploration information used to calculate reported mineral resource tonnages at Rocanville consist of both physical sampling (drillhole and in-mine) and surface seismic (2D and 3D) as discussed in earlier sections. All mineral rights leased or owned by the Company and within Crown Subsurface Mineral Lease KL 305 are assigned to one of the three mineral resource categories.

Mineral resources are reported as mineralization in-place and are exclusive of mineral reserves. In-place tonnes were calculated for each of the mineral resource categories using the following parameters.

Mining Height:	2.51	meters (8.25 feet)
Ore Density:	2.080	tonnes/cubic meter

The potash resources for Rocanville division, as of December 31, 2018 are as follows:

Inferred Resource	1,376	million tonnes
Indicated Resource	1,342	million tonnes
Measured Resource	1,761	million tonnes
Total Resource =	4,479	million tonnes

The average mineral grade of the Rocanville Mineral Resource is 23.4% K_20 equivalent, and was determined from 39,245 in-mine samples at Rocanville.

The tonnage reported in the Rocanville Measured Resource is comprised of the potash that is within 1.6 km (1 mile) of physically sampled location (i.e., drillhole or mine working). Also included as Measured Resource is the potash that is left behind as pillars in mined-out areas of the Rocanville mine. In a potash mine it is common practice to consider mining remnant pillar mineralization using solution methods after conventional mining is complete, or after a mine is lost to flooding. The Patience Lake mine was successfully converted from a conventional mine to a solution mine after being lost to flooding in 1989. Since conversion to a solution mine is not anticipated in the near future at Rocanville, in-place pillar mineralization remains as a Mineral Resource rather than a Mineral Reserve at this time.

Definitions of Mineral Reserve

See "Mineral Projects – a) Allan Potash Operations – viii) Mineral Resource and Mineral Reserve Estimates – Definitions of Mineral Reserve" for an overview of CIM's mineral reserve categories and the Company's general characterization of mineral reserve categories for its potash mines.

Along with this approach, analysis of in-mine samples for potash grade has provided us with an observation-based understanding of the potash mineralized zone at Rocanville that is far superior to the level of understanding provided by any surface drilling based exploration program. An understanding of the amount of ore that can be conventionally mined from the measured resource category using current mining practices comes from nearly 50 years of potash mining experience at Rocanville.

Mineral Reserve Estimate

Using the definitions outlined above part of the Rocanville Measured Resource has been converted to Mineral Reserve. The assigned Mineral Reserve category is dependent on proximity to sampled mined entries also described above.

The overall extraction rate at the Rocanville mine is 31%. It was derived by dividing the total tonnes mined to date by the tonnage equivalent of the total area of the mine workings (i.e., the perimeter around the mine workings) less future mining blocks. Since an extraction rate has been applied Mineral Reserves are considered recoverable ore and are reported as such.

The Mineral Reserves for Rocanville Potash as of December 31, 2018 are as follows:

Probable Reserve	348	million tonnes
Proven Reserve	195	million tonnes
Total Reserve (Proven + Probable) =	543	million tonnes

The average mineral grade of the Rocanville Mineral Reserve is 23.4% K_20 equivalent, and was determined from 39,245 in-mine samples at Rocanville.

ix) Mining Operations

All conventional potash mines in Saskatchewan operate at 900 m to 1200 m below surface within 9 m to 30 m of the top of the Prairie Evaporite Formation. Over the scale of any typical Saskatchewan potash mine, potash beds are tabular and regionally flat-lying, with only moderate local variations in dip. At Rocanville potash ore is mined using conventional mining methods, whereby:

- Shafts are sunk to the potash ore body;
- Continuous mining machines cut out the ore, which is hoisted to surface through the shafts;
- Raw-potash is processed and concentrated in a mill on surface; and
- Concentrated finished potash products (near-pure KCI) are sold and shipped to markets in North America and offshore.

Sinking of the two original shafts (Shaft #1 and Shaft #2) from surface to the potash zone was completed in early 1970, and the first potash ore was hoisted by the fall of that year. The Rocanville mine has run on a continuous basis since the first ore was hoisted in 1970, other than short-term shutdowns taken for inventory management purposes or occasional plant maintenance and construction work.

In recent years the Rocanville mine has undergone a major expansion which brought the nameplate capacity of the Rocanville facility to 6.5 million tonnes of finished potash products per year. This work involved sinking a third shaft, enhancement of hoists, major expansions of both mine and mill, major improvements to loadout facilities, and other infrastructure improvements. The recent Rocanville expansion, which was announced in 2007, was substantially complete in 2016 and production was ramped up through 2017. The operational capability at Rocanville to December 31, 2018 is 5.2 million tonnes of finished potash product.

Virtually all Rocanville underground mining rooms are in one potash mineralized zone within the Esterhazy Member the Prairie Evaporite Formation (the host evaporite salt). In contrast, Nutrien potash mines further west in Saskatchewan mine in a different potash layer, the Patience Lake Member of the Prairie Evaporite. Rocanville mine elevations range from approximately 895 m to 1040 m, averaging approximately 955 m. Within the Rocanville Lease, depths to the top of the ore zone can reach up 1250 m (the deepest potash exploration drillhole), but are expected to be shallower than 1200 m over most of the lease area. Mine workings are protected from aquifers in overlying formations by approximately 30 m of overlying salt and potash beds, along with salt plugged porosity in the Lower Dawson Bay Formation, a carbonate layer lying immediately above potash hosting salt beds.

The Rocanville mine is a conventional underground mining operation whereby continuous mining machines are used to excavate the potash ore by the long-room and pillar mining method. Continuous conveyor belts transport ore from the mining face to the bottom of the production shaft. Mining methods employed in Saskatchewan are discussed in Jones and Prugger (1982) and in Gebhardt (1993).

The highest mineral grade section of the Rocanville potash seam is approximately 2.3 m (7.5') thick, with gradations to lower grade sylvinite salts immediately above and below the mining horizon. The actual mining thickness at Rocanville is dictated by the height of continuous boring machines used to cut the ore, which are designed to cut slightly thicker than the high-grade mineralized zone. Historically, Rocanville borers cut at a thickness of 2.44 m (8'). These five older machines were recently adjusted to cut a thicker 2.51 m (8.25') mining height. Six newly acquired boring machines cut a slightly thicker 2.59 m (8.5') mining height. This mining

height allows for more headroom with minimal negative impact on ore grade. Mining machines at Rocanville use potassium sensing technology to ensure that rooms are always cut in the best available potash ore. It is difficult to determine at which mining height certain mineral resources and reserves will be cut in the future, so the more conservative mining height of 2.51 m (8.25') was applied to mineral resource and reserve calculations.

Conservative local extraction rates (never exceeding 45% in any mining block) are employed at all Saskatchewan mines, including Rocanville, in order to minimize potential detrimental effects of mining on overlying strata; this is common practice in flat-lying, tabular ore bodies overlain by water-bearing layers.

From the shaft-bottom, potash ore is hoisted approximately 960 m from the potash level through the vertical shafts to a surface mill. Both production shafts also provide exhaust ventilation from underground workings; the third shaft from surface at Scissors Creek is used for service access, fresh air ventilation and second egress.

Over the 48-year mine life, 248.193 million tonnes of potash ore have been mined and hoisted at Rocanville to produce 80.967 million tonnes of finished potash products (from startup in 1970 to December 31, 2018). The life-of-mine average concentration ratio (raw ore/finished potash products) is 3.07 and the overall extraction rate over this time period is 31%.

x) Processing and Recovery Operations

At Rocanville, potash ore has been mined and concentrated to produce saleable quantities of high-grade finished potash products since 1970. Products include granular and standard grade potash used for agriculture applications.

Both flotation methods and crystallization methods are used to concentrate potash ore into finished potash products at the Rocanville mill. Raw potash ore is processed on surface, and concentrated finished potash products (near-pure KCl) are sold and shipped to markets in North America and offshore.

Over the past three years, production of finished potash products at Rocanville was:

- 2016: 2.720 million tonnes finished potash products at 60.60% K_2O (average grade)
- 2017: 4.587 million tonnes finished potash products at 60.62% K_2O (average grade)
- 2018: 5.222 million tonnes finished potash products at 60.46% K_2O (average grade)

Over the past decade actual mill recovery rates have been between 81.5% and 85.7%, averaging 83.5%. Given the long-term experience with potash geology and actual mill recovery at Rocanville no fundamental potash milling problems are anticipated in the foreseeable future.

Quality control testing and monitoring geared towards fine-tuning and optimizing potash milling and concentrating processes are conducted on a continual basis at all Nutrien mine sites and at Nutrien research facilities. At Rocanville, this is no exception; test work to optimize circuit performance and ensure product quality is carried out on an ongoing basis.

xi) Infrastructure, Permitting and Compliance Activities

Project Infrastructure

Infrastructure is in place to meet current and projected requirements for transportation, energy (electricity and natural gas), water and process materials at Rocanville.

The Rocanville mine is served by a number of towns and villages within 50 kilometers of the mine site. The nearest towns are Rocanville (15 km distant), Moosomin and Esterhazy (both 50 km distant). The nearest city is Yorkton (100 km distant).

The Rocanville mine surface facilities are accessed by an existing paved road that is part of the Saskatchewan Provincial Highway System. Most finished potash products are shipped by rail over existing track, with some product shipped by truck over the North American highway system.

At present, high voltage power utilization at the Rocanville Potash is 84 MVA (i.e., 72 MVA to the Rocanville Plant site plus 12 MVA to the Scissors Creek site). The ten-year projection of power utilization indicates that the utility can meet foreseeable future demand.

The Rocanville operation requires a sustained fresh water supply for the milling process which is sourced from two subsurface reservoirs called the Welby Plains Surficial Aquifer and the Welby Plains Middle Aquifer. These aquifers provide a sustainable source of process water for Rocanville milling operations, without having any perceptible impact on other users of water drawn from these aquifers.

Environmental Studies, Permitting and Compliance Activities

The tailings management strategy at all Nutrien potash mines in Saskatchewan, including Rocanville, is one of sequestering solid mine tailings in an engineered and provincially licensed TMA near the surface plant site. The Rocanville TMA currently covers an area of approximately 567 hectares (1400 acres) of land owned by the Company. Solid potash mine tailings typically consist of 85% to 95% rock salt (NaCl) and 5% to 15% insolubles (carbonate mud = $CaCO_3$, anhydrite mud = $CaSO_4$, and clays like chlorite, illite, and so on). An engineered slurry-wall has been constructed around the entire Rocanville TMA. The slurry-wall provides secondary containment for any saline mine waters, minimizing brine impacts from the TMA to surrounding surface water bodies and near-surface aquifers. Areas surrounding the TMA are closely monitored: this includes everything from daily visual perimeter inspections to annual investigations and inspections of surrounding subsurface aquifers.

Rocanville currently operates five brine disposal wells near the surface plant of the Rocanville mine where clear salt brine (i.e., no silt, clay slimes or other waste) is borehole-injected into the Interlake Carbonates, at a depth of approximately 1200 m to 1400 m below surface. The groundwater in these extensive deep aquifers is naturally saline.

Emissions to air (mostly salt dust and potash dust) are kept below regulatory limits through various modern air pollution abatement systems (e.g., dust collection systems built into mill processes) that are provincially licensed. This same procedure is followed at all Nutrien mines in Saskatchewan.

The Rocanville operation requires a sustained fresh water supply for the milling process which is sourced from two subsurface reservoirs called the Welby Plains Surficial Aquifer and the Welby Plains Middle Aquifer. This water supply is provincially licensed and provides a sustainable source of process water for Rocanville milling operations, without having any perceptible impact on other users of water drawn from these aquifers.

In Saskatchewan, all potash tailings management activities are carried out under an "Approval to Operate" granted by the MOE. The Rocanville mine is in compliance with all regulations stipulated by the Environmental Protection Branch of the MOE. The current Rocanville Approval to Operate has been granted to July 1, 2028, the renewal date.

In terms of long-term decommissioning, environmental regulations in the Province of Saskatchewan require that all operating potash mines in Saskatchewan create a long-term decommissioning and reclamation plan that will ensure all surface facilities are removed, and the site is left in a chemically and physically stable condition once mine operations are complete. The Company has conducted numerous studies of this topic, and the most recent decommissioning and reclamation plan for Rocanville was approved by MOE technical staff in October 2016. Because the current expected mine life for Rocanville is many decades into the future, it is not meaningful to come up with detailed engineering designs for decommissioning at present. Instead, decommissioning plans are reviewed every five years, and updated to accommodate new ideas, technological change, incorporation of new data and adjustments of production forecasts and cost estimates. Any updated decommissioning and reclamation reports generated by this process are submitted to provincial regulatory agencies. For Rocanville, a revised decommissioning and reclamation plan is required in July 2021.

In addition to the long-term decommissioning plan, provincial regulations require that every potash producing company in Saskatchewan set up an Environmental Financial Assurance Fund, which is to be held in trust for the decommissioning, restoration and rehabilitation of the plant site after mining is complete. This fund is for all mines operated by Nutrien in the province of Saskatchewan (i.e., Allan, Cory, Lanigan, Patience Lake, Rocanville, and Vanscoy).

xii) Capital and Operating Costs

The Rocanville mine has been in operation since 1970; in the years immediately preceding this, major capital investment was made to bring this mine into production. Since then, capital expenditures were made on a regular and ongoing basis to sustain production and to expand production from time to time.

A major refurbishment and expansion of the Rocanville mine was completed in 2013, increasing nameplate capacity to 6.5 million tonnes of finished potash products per year. This work involved construction of a third shaft, enhancement of hoists and shaft conveyances, major expansions of both mine and mill, improvements to loadout facilities and some infrastructure improvements. All construction was carried out without significant disruption to existing potash production from the site.

xiii) Exploration, Development and Production

A major expansion to increase the nameplate capacity of Rocanville from 3.0 million tonnes to approximately 6.0 million tonnes of finished potash products per year was announced in 2007. Expansion work was substantially completed by the end of 2016 and production was ramped up through 2017 when a nameplate capacity of 6.5 million tonnes of finished potash product was announced. The operational capability at Rocanville to December 31, 2018 is 5.2 million tonnes of finished potash product.

Potash production in any given year at the Rocanville mine is a function of many variables, so actual production in any given year can vary dramatically from tonnages produced in previous years. The mineral reserve tonnage and historic average production are used to estimate remaining mine life. If the average mining rate seen over the past three years (13.489 million tonnes of potash ore mined and hoisted per year) is sustained, and if mineral reserves remain unchanged then the Rocanville mine life is 40 years from December 31, 2018.

e) Vanscoy Potash Operations

Certain scientific and technical information regarding Vanscoy Potash Operations ("VPO") is based on the technical report titled "National Instrument 43-101 Technical Report on Vanscoy Potash Operations" dated effective October 31, 2014 ("Vanscoy Technical Report") prepared by Michael Ryan Bartsch, P.Eng., and Dennis Grimm, P.Eng., both employees of the Company as of the date of the Vanscoy Technical Report, and A. Dave Mackintosh, P.Geo., of ADM Consulting Limited, who are each a Qualified Person (collectively, the "Authors") as defined in NI 43-101. The economic analysis set out under the heading "– Exploration and Development – Economic Analysis" below refers to the incremental one million metric tonne Vanscoy Project and not for VPO in its entirety. The Vanscoy Technical Report has been filed with the securities regulatory authorities in each of the provinces of Canada and furnished to the SEC. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. References should be made to the full text of the Vanscoy Technical Report.

i) Project Description and Location

The Company owns and operates VPO, a potash mining and milling facility located in Vanscoy, Saskatchewan (southwest of Saskatoon). The operation has been in existence for 50 years and has produced approximately 57.8 million tonnes of muriate of potash.

The Saskatchewan Ministry of Economy ("SME") has granted the Company the exclusive right to mine potash on approximately 148,332 acres (600.3 km^2) of crown land pursuant to Subsurface Mineral Leases KL 114-A and KL 204, last revised August 2013. The lands subject to KL 114-A and KL 204, and that are the subject of the Vanscoy Technical Report, form a contiguous area in excess of 189,333 acres (766.2 km^2) containing the lands subject to the Subsurface Mineral Leases KL 114-A and KL 204, lands owned by Agrium and freehold mineral rights owned by others and leased by the Company ("VPO Lands"). Freehold mineral rights not leased by the Company are not included in the Vanscoy Technical Report. For reporting purposes, the VPO Lands have been divided into three areas: (1) the Unitized Area containing most of the mining to date; (2) the South Block to the south and east of the shafts (currently under development); and (3) the North Expansion Block north of the Unitized Area.

The VPO Lands are located in the Province of Saskatchewan, Canada, in the rural municipalities and National Topographic System of Canada ("NTS") blocks indicated in the following table:

Municipal and NTS Block Locations

R.M. Name	R.M. Number	NTS Block
Corman Park	344	073B03/02
Vanscoy	345	072O14/15
Montrose	315	072O14/15

The lands subject to KL 114-A are located within townships 34 to 37 of ranges 7 to 9, west of the 3rd meridian. The lands subject to KL 204 are located within townships 33 and 35 of ranges 6 to 8 west of the 3rd meridian.

The Company owns the surface rights to approximately 7,200 acres (2,914 hectares) of land to accommodate the processing facility, TMA and provide a surrounding buffer. Useable farm land is rented to local farmers.

All operating licenses required by the provincial government, and permits to operate a tailings area or waste management facility have been obtained. Required permits for VPO include the Subsurface Mineral Lease Agreement, Potash Unitization Agreement, Mine Hoist Operating Certificate, Approval to Operate a Pollutant Control Facility, Approval to Dispose of Waste Brine and the Approved Decommissioning and Reclamation Report.

As a result of the Merger, the timing of the ramp-up to full capacity will be considered as part of the optimization of the combined potash production base of Nutrien. Increased hoisting capacity, an increase to the underground mining fleet, a second parallel milling facility, additional compaction capacity and other enhancements to the site, support the increase.

ii) Accessibility, Climate, Local Resources, Infrastructure and Physiography

The VPO Lands are accessible by the Saskatchewan highway and municipal grid road system. Although grid roads may not have been built in all areas, a one chain (20 meters ("m")) road allowance is provided every one mile (1.6 kilometers ("km")) in an east-west direction and every two miles (3.2 km) in the north-south direction. The mine site is serviced by both national railways through one common spur line from the north of the VPO Lands.

VPO is located in the Saskatchewan Plains Region, which has elevations between 300 m and 600 m above sea level. Land use is almost totally agricultural, largely in cropland with some unimproved pasture and southern woodland. Prairie winters are long and cold with short, warm summers. Average daily mean temperatures range between -16°C in January to +20 °C in July. Mean annual precipitation averages 430 millimeters ("mm") with the majority occurring in the summer months. Winds are predominantly from the northwest throughout the year with mean annual wind speeds of 20 km per hour.

Mining and milling operations continue year-round, utilizing a work force that commutes from nearby cities and towns or comes from the local farming community. The closest major population center is Saskatoon, approximately 25 km northeast of the mine site.

Services are provided by Saskatchewan public utilities with a dedicated 138 KVA electrical power transmission service and natural gas pipelines. Fresh water, provided by SaskWater, is delivered via pipeline from the South Saskatchewan River.

iii) History

Imperial Oil first discovered potash in southeastern Saskatchewan in 1942 during oil exploration activity. In 1950, when oil exploration companies started routinely running gamma logs, the existence of potash rich beds over a vast area in southern Saskatchewan was indicated.

Consolidated Mining and Smelting Company of Canada Limited, subsequently Cominco Ltd. ("CM&S"), carried out an exploration program in 1964, drilling 23 holes in the vicinity of Vanscoy, Delisle and Asquith, Saskatchewan. Of the 23 drill holes, one hole penetrated a major solution collapse feature where, although the

Prairie Evaporite Formation is present, the potash beds are not. The drilling identified a prospect averaging just over 25 percent K_2O that was large enough to support a mining operation, and Stearns-Roger Canada Ltd. along with J.T. Boyd and Associates carried out an engineering study in 1965 and a similar capital and operating cost estimate was also completed by Kilborn Engineering Ltd. in December 1965. The mine went into production under CM&S ownership in early 1969.

In 1993, Cominco Fertilizers Ltd. was formed as a separate entity from Cominco Ltd. In 1995, all Cominco involvement in Cominco Fertilizers Ltd. ceased and shares were transferred to the new entity, Agrium Inc. In the site history, lease expansions occurred in 1993 and 2005 to enlarge the total area available for extraction. This brought three additional drill holes into the lease area. The three exploration wells were completed in 1955 and 1957.

In the past 50 years of operating life, 15 additional drill holes and numerous two-dimensional (2D) and three-dimensional (3D) seismic programs have contributed to the understanding of the Prairie Evaporite Formation. Production from the VPO Lands to December 31, 2018 was 57.8 million tonnes of muriate of potash from 172.1 million tonnes of ore hoisted.

iv) Geological Setting

Canadian potash deposits are estimated to be among the largest in the world, stretching some 720 km (450 miles) across Saskatchewan. The deposits lie diagonally across the southern plains of Saskatchewan gently dipping from approximately 1,000 m depth along a northwest line through Rocanville, Esterhazy and Saskatoon to more than 1,600 m depth at Belle Plaine and up to 3,000 m depth in North Dakota. The deposit is unique in the world in that the mineralization covers such a vast area. The same beds mined on the west side of Saskatoon are mined over 100 km to the east and can be traced into Manitoba, North Dakota and Montana.

The Prairie Evaporite Formation forms part of the Elk Point Basin, a sub-basin of the Williston Basin centered on the northwest corner of North Dakota. The Prairie Evaporite Formation, deposited on the Winnipegosis Formation (limestone), varies in thickness from 120 m (400 feet ("ft")) to over 210 m (700 ft) and is overlain by the 2nd Red Bed unit, the lower shale member of the Dawson Bay Formation (limestone).

There are four main potash layers in Saskatchewan. The first to be deposited was the Esterhazy Member, which is the bed mined at Mosaic Esterhazy and Rocanville. Above this is the White Bear Marker which is not thick enough or of sufficient grade, to be of commercial value. This is followed by the Belle Plaine and finally the Lower and Upper Patience Lake. The Lower Patience Lake is mined by Lanigan and the Upper Patience Lake is mined by all other Saskatoon area mines. The Esterhazy Member, being the first potash bearing bed to be deposited, is stratigraphically the deepest. However, the Rocanville/Esterhazy area mines are shallower than the younger Patience Lake Member mines (Saskatoon area) because of their proximity to the basin edge.

The salt cover between the ore zone and the overlying 2nd Red Beds and Dawson Bay Formation varies from no cover near the evaporite edge in Manitoba to over 45 m (150 ft) in south-central Saskatchewan. Salt cover is relied upon to isolate the mining level from potential water-bearing limestone formations above the 2nd Red Beds. Similarly, the depth increases to the southwest from just over 800 m (2,600 ft) in Manitoba to over 1,200 m (4,000 ft) in south-central Saskatchewan.

The local geology of VPO characteristically mirrors the regional geology. The Upper and Lower Patience Lake and Belle Plaine Members exist throughout the VPO Lands. The Esterhazy Member does not exist in the area but is evidenced by a thin (5 centimeters ("cm") thick) seam containing minor potash values. The mining zone dips gently (less than 0.5°) to the southwest from approximately 500 m to 600 m below sea level. The depth below surface ranges from approximately 1,000 m (3,300 ft) in the northeast to over 1,130 m (3,700 ft) in the southwest. The salt cover ranges from 12 m (40 ft) to just under 20 m (65 ft) across the lease area.

v) Mineralization

The potash deposit is generally a flat-lying, bedded deposit dipping slightly to the southwest. It is amenable to mining using track mounted boring machines, floor or roof mounted conveyor systems and ancillary wheel mounted mining and transport equipment.

The potash beds at the VPO site are entirely composed of sylvinite, a mixture of KCl and NaCl, and are within a stratigraphic sequence of halite beds. The same beds mined on the west side of Saskatoon are mined over 100 km to the east. These same beds can be traced into Manitoba, Montana and North Dakota. Despite this remarkable continuity, potash deposits are not without interruption. Solution activity over geological time has resulted in barren or collapse features that have the potential to introduce water from formations above to the mining level.

vi) Exploration

Exploration work other than drilling has consisted of numerous 2D and 3D seismic programs and underground channel sampling. Seismic exploration has been used to try and delineate solution collapse features to be avoided when mine planning. Initial 2D acquisition programs, on relatively sporadic time intervals, have been replaced by 3D programs that have recently been expanded to shoot the entire areas of interest. The most recent 3D seismic shoot was shot in 2016 with results expected in 2019 and was shot over the northwestern edge of KL 114-R. Programs have confirmed the continuity of the Prairie Evaporite Formation and identified features to be avoided, greatly improving the successful completion of mine development entries. In the opinion of the Authors, in order to be categorized as a Measured Mineral Resource, both 3D seismic coverage and adequately spaced drillhole or assay data points are required. Despite the completed 3D program, given that access to the northwest requires considerable entry development time, and there is no drilling program currently planned for the area, the northwest region will remain categorized as an Inferred Mineral Resource.

In addition to drill holes and seismic programs, Nutrien utilizes an underground sampling program to confirm thickness, grade and insolubles. Samples are acquired by geologists employed by Nutrien and delivered to the Saskatchewan Research Council's (SRC) Geoanalytical Laboratory. The SRC issues a "Sample Shipment Receipt Notification" followed soon after by a "Sample Receipt Report" indicating a complete sample listing, including total numbers and sample labels.

vii) Drilling

Original CM&S Drill Holes

All drilling was carried out following SME regulations. Drilling was originally carried out by Canamerican Drilling Corporation. The initial CM&S program set a 10.75" (273 mm) diameter surface casing in a 15" (381 mm) diameter hole to a depth of 450 ft (137 m). From there, a 9" (228 mm) diameter hole was drilled to a core point just above the Prairie Evaporite Formation. Then, a 7" (177.8 mm) diameter intermediate casing was pinned into the Dawson Bay Formation. Coring was completed in a 6.125" (155 mm) diameter hole. Once complete, abandonment consisted of cementing the hole from the total depth to 150 ft (45 m) into the intermediate casing. The casing was cut off 40 ft (12 m) above the cement top and retrieved. Subsequent plugs were run from the cement top to approximately 65 ft (20 m) into the surface casing. The surface casing was then cut off 3 ft (1 m) below the surface, a cap was welded on, and the area was backfilled. A full suite of geophysical logs was run on each hole from surface to total depth.

Recent VPO Drill Holes

In 1989, hole 2-16-36-8-W3 in the Unitized Area was drilled by Sebco Drilling on behalf of Agrium. A 244.5 mm diameter surface casing was cemented in at 146 m depth in a 349 mm diameter drill hole. From there, a long string 177.8 mm diameter casing was cemented the full length to 979 m depth in a 222 mm diameter hole. The hole confirmed the VPO mining zone was present at a depth of 1,021 m. In 1999, hole 1-24-34-8-W3 in the South Block was completed by Ensign Drilling Services Inc. on behalf of Agrium. A 244.5 mm diameter surface casing was installed to 150 m depth in a 349 mm diameter hole. From there, a 222.3 mm diameter well was then completed "open hole" (without casings) to 1,229 m depth with inverted oil emulsion drilling mud. Hole 1-24-34-8-W3 confirmed the potash beds mined at VPO existed at a depth of 1,110 m.

In 2007, hole 4-3-35-7-W3 in the South Block was drilled by Akita Drilling Ltd. on behalf of Agrium. A 244.5 mm diameter surface casing in a 349 mm diameter hole was cemented to 145 m depth. A 177.8 mm diameter intermediate casing in a 222 mm diameter hole was pinned into the Dawson Bay Formation at 1,092 m depth. The well confirmed the presence of the mining zone at a depth of 1,112 m.

In 2010 and 2011, 14 drill holes were completed on the VPO Lands in the South Block. A 349.0 mm hole was drilled to 165 m where a 244.5 mm surface casing was set and cemented. The main hole was drilled with a 222.0 mm diameter bit to the top of the Dawson Bay Formation at depths ranging from 1,045 m to 1,075 m. The Dawson Bay was cored to the middle of the 2nd Red Beds, providing a 101 mm diameter core from a 199 mm diameter hole. A drill stem test was then carried over the complete Dawson Bay. The mud system was changed from brine water to invert mud in order to core the Prairie Evaporite. A 200 mm diameter hole was then drilled to final depth, approximately 15 m into the underlying Winnipegosis Formation. The hole was geophysically logged from total depth to surface casing. Holes were plugged back to surface with a total of 5 cement plugs. After required gas checks, the surface casing was cut off approximately 1.5 m below ground level, a cap welded on, and the site restored to pre-drilling condition.

Drilling cutting samples were collected on 5 m intervals from approximately 350 m depth to total depth with one set retained by Agrium and two sets delivered to the SME. The evaporite core was logged and sampled on site by ADM Consulting Limited. A quarter core was delivered by ADM Consulting Limited to the SRC Geoanalytical Laboratory in Saskatoon for assay, and the remaining three quarters core delivered to the SME subsurface laboratory in Regina by Blackie's Coring.

Additional drill holes are planned to be drilled in the South Block, with one of the drill holes being drilled in 2018.

Composite grades of all the drill holes over the 3.35 m mining interval are shown in the table below. These intervals represent true thickness.

Drill Hole ID	Composite From (ft)	Composite To (ft)	Comp. % NaCl	Comp. % KCl (1)	Comp. % Insolubles	Comp. % K_2O
D15-32-34-8	1,121.0	1,124.4	82.2	10.3	5.9	6.5
D16-28-34-8	1,114.0	1,117.3	48.4	46.5	4.3	29.4
E04-11-35-9	1,140.0	1,143.4	52.1	38.8	7.1	24.5
E04-12-35-9	1,132.3	1,135.7	48.2	43.4	6.7	27.4
E04-24-35-9	1,096.9	1,100.3	45.5	46.2	7.0	29.2
E04-36-35-9	1,083.6	1,087.0	43.6	46.0	7.8	29.1
E16-22-35-9	1,115.4	1,118.8	46.4	47.4	5.0	29.9
V04-10-35-8	1,076.9	1,080.2	50.4	41.6	6.4	26.3
V04-18-35-8	1,090.7	1,094.0	52.1	40.8	5.6	25.8
V04-20-35-8	1,076.8	1,080.1	50.6	41.6	4.8	26.3
V04-22-35-8	1,081.6	1,085.0	48.8	47.0	3.5	29.7
V04-24-35-8	1,079.8	1,083.2	94.4	2.5	5.2	1.6
V04-28-35-8	1,043.7	1,047.0	51.9	44.5	2.7	28.1
V04-34-35-8	1,052.8	1,056.2	51.7	42.4	4.4	26.8
V11-16-35-8	1,077.9	1,081.3	51.5	41.3	5.6	26.1
V13-01-35-8	1,096.0	1,099.4	47.3	45.7	5.8	28.9
V13-11-35-8	1,069.9	1,073.3	47.7	45.3	5.5	28.6
V13-16-35-8	1,074.7	1,078.0	50.6	42.0	6.0	26.5
V13-23-35-8	1,050.1	1,053.4	49.5	45.8	3.9	28.9
V14-29-35-8	1,048.0	1,051.3	53.4	41.0	4.3	25.9
V16-06-35-8	1,095.4	1,098.8	50.8	43.4	4.3	27.4
V16-08-35-8	1,083.8	1,087.2	47.6	44.3	6.3	28.0
2-16-36-8	1,022.48	1,025.81	52.3	42.2	5.4	26.7
1-24-34-8	1,110.57	1,114.13	55.1	40.6	4.3	25.7
4-3-35-7	1,119.06	1,122.41	49.6	44.2	6.2	27.9

Drill Hole ID	Composite From (ft)	Composite To (ft)	Comp. % NaCl	Comp. % KCl (1)	Comp. % Insolubles	Comp. % K_2O
1-21-34-7	1,106.61	1,109.96	50.7	43.8	5.5	27.7
1-11-35-7	1,100.38	1,103.73	49.5	46.5	4	29.4
1-15-35-7	1,075.48	1,078.83	64.4	28.8	6.8	18.2
1-29-34-7	1,110.55	1,113.9	81.4	14.4	4.2	9.1
8-7-34-7	1,124.55	1,127.9	66.4	30.2	3.4	19.1
8-11-35-7	n/a	n/a	n/a	n/a	n/a	n/a
13-9-34-7	n/a	n/a	n/a	n/a	n/a	n/a
13-23-34-7	1,105.44	1,108.79	50.8	42.4	6.8	26.8
15-28-34-8	1,116.69	1,120.04	51.6	43.4	5	27.4
16-26-34-7	1,098.31	1,101.66	47.4	46.4	6.2	29.3
4-5-34-7	1,122.66	1,126.01	50.9	43.1	6	27.2
6-3-34-7	1,110.85	1,114.2	55.2	39.6	5.2	25
12-31-34-7	1,093.65	1,097.00	57.6	38.8	3.6	24.5
13-35-33-8	1,138.22	1,141.57	51.8	42.3	5.9	26.7
16-6-37-8	1,023.27	1,026.62	58	38.8	3.2	24.5
13-22-36-8	1,020.69	1,024.04	53.9	43.7	2.4	27.6

(1) KCl grade is the % K_2O equivalent divided by 0.63177.

North Expansion Wildcat Drill Holes

North Expansion Wildcat Drill Holes were drilled between 1955 and 1957. Canamerican Drilling Company completed two of the holes and Rio Palmer drilled one. Typically, a 10.75" diameter surface casing was installed in a 13.75" or 15" diameter hole to between 360 and 400 ft depth. From there, a 5.5" or 7" diameter intermediate casing was installed in either a 7" or 9" diameter hole into the 2nd Red Beds near 3,300 ft depth with either cement or an anchor packer. These three holes confirmed the presence of the mining zone within the Prairie Evaporite Formation.

viii) Sampling and Analysis

The 2010 and 2011 holes were all logged and sampled at the well site by ADM Consulting Limited in a lab trailer provided by Blackie's Coring of Estevan, Saskatchewan. In general, the core was logged, depth corrected using geophysical logs, convenient sample lengths of 0.25 m to 0.5 m were chosen based on geological changes and existing core breaks, and the intervals measured. Sample intervals were chosen by ADM Consulting Limited and a quarter core was removed either by cutting the core in half along the length of the sample, and one half cut into quarters, or a quarter cut out using a diamond bladed cut-off saw. The quarter core was numbered, bagged and tagged for assay purposes by an employee of Agrium and checked by ADM Consulting Limited. The remaining three quarters were returned to the core box.

Before transport, a packing slip was filled out identifying the drill hole and sample numbers being transported. Samples were transported to SRC's Geoanalytical Laboratories in Saskatoon, Saskatchewan. SRC is accredited by the Standards Council of Canada. Transport was carried out by ADM Consulting Limited on behalf of Agrium.

Upon receiving the samples, SRC acknowledged that the samples had been received and issued a "Sample Shipment Receipt Notification" followed soon after by a "Sample Receipt Report" indicating a complete sample listing, including total numbers and sample labels. The samples were at all times in the possession of a responsible person.

Underground Samples

Underground channel sampling programs are carried out by employees of Nutrien. Samples are obtained by cutting two slots in the mine wall, approximately five centimeters apart and three centimeters deep, from approximately 15 cm above the normal mining zone down to below the normal mining height of 3.35 m.

Horizontal slots are then cut across the verticals to isolate mud seams and noticeable changes in mineralogy to create blocks that are typically 7.5 to 10 cm long. The blocks are removed from the wall with a hammer and chisel. Often, a number of blocks (typically up to three) are combined into one sample interval. The mass of material obtained for assay is very similar to that obtained from a quarter core. Samples are transported to the SRC Geoanalytical Laboratory by an employee of Nutrien and subject to the same documentation procedures as described above.

All VPO drilled hole and underground samples received by the SRC are then crushed, split and a portion pulverized in a grinding mill. The remainder of the split is returned to Nutrien. As part of their Quality Assurance and Quality Control procedures, one in every 20 samples is repeated. A prepared standard sample is also submitted with each batch of client samples. This is done to ensure repeatability of the analyses. The range in results is within the acceptable tolerance.

ix) Data Verification Procedures

The grade forecasts derived from the underground sampling program are reconciled with mill feed grades obtained from belt mounted K40 analyzers and daily feed samples assayed in the on-site laboratory and reported on a daily, monthly, and year to date basis. The mineral reserve tonnage is reconciled monthly to compare the hoisted tonnages, surveyed tonnages and milled tonnages and is approved if agreement is within a 3 percent difference, while the milled grade is reconciled to the block model grade.

x) Mineral Resource and Mineral Reserve Estimates

The table below summarizes the mineral resource estimates regarding VPO as of August 8, 2014:

Area	Grade % Est. % K_2O	% Insolubles	Measured Mineral Resources (million tonnes)	Indicated Mineral Resources (million tonnes)	Inferred Mineral Resources (million tonnes)
South Block	23.4	5.0	687.0	–	–
South Block	25.4	5.2	–	214.9	–
South Block	24.9	5.2	–	–	962.1
North Expansion Block	26.8	3.9	–	–	79.2

(1) Grades are based on the block model estimate.

(2) Insolubles are a deleterious material affecting mineral processing.

(3) Mineral resources that are not mineral reserves do not have demonstrated economic viability.

(4) Mineral reserves are not included in mineral resource estimates.

(5) KCl grade is the % K_2O equivalent divided by 0.63177.

The table below summarizes the mineral reserves estimates regarding VPO as of August 31, 2014:

Area	Grade Est. % K_2O	% Insolubles	Mineral Reserves – Proven (million tonnes)	Mineral Reserves – Probable (million tonnes)
South Block	25.8	4.8	122.9	–
South Block	24.3	4.8	–	56.4
Unitized Area	25.2	4.9	52.8	–

(1) Grades determined using Vulcan block model.

(2) KCl grade is the % K_2O equivalent divided by 0.63177.

To estimate the potential extent, grade and tonnage of the VPO mineral resource and reserves, the Authors made certain assumptions and implemented certain parameters, including assumptions and parameters relating to the property area used in the estimates, the mining height used at VPO, in-situ densities, certain seismic features,

exploration and drilling data, the calculation of tonnages and extraction rates. For a complete description of key assumptions and parameters associated with the information above, reference should be made to the full text of the Vanscoy Technical Report.

xi) Mining Operations

In the mine, borer style miners are used to mechanically excavate the rock and load it directly onto a series of interconnected conveyor belts. The broken ore is then transported to a shaft where it is hoisted from underground to surface at a capacity of 1,800 tonnes per hour and fed to the mill. The mine is accessed using a fleet of 4x4 trucks and a network of roads that stretches 11 km north, 11 km south and 14 km east of the shaft. The borer miners are 3.35 m high, 5.5 m wide and use two, three armed rotors to cut the rock. The miners can advance at about 30 cm (1 ft) per minute and will mine tunnels up to 2,200 m long and 10.2m wide. The potash ore being mined contains about 40 percent potassium chloride (potash), 55 percent sodium chloride (common salt) and 5 percent insolubles.

Production Forecast

Significant changes to the processing facility have been introduced by the Vanscoy Project. As per the Vanscoy Technical Report, the annual production rate will be increased to 2.8 million tonnes from the existing 1.8 million tonnes of product. The circuit is designed to process a range of ore grades between 22.0 percent K_2O to 25.5 percent K_2O, with an average expected grade of 24.6 percent K_2O. The nominal milling rate will be 1,084 tonnes per hour (operating 24 hours per day). VPO produces an agricultural grade muriate of potash with an average product grade of 60.6 percent K_2O (the product grade must exceed 60.0 percent K_2O to achieve the product specification). The design product split will be 75 percent premium (2,100,000 tonnes per annum) and 25 percent non-premium (700,000 tonnes per annum). The amenability of the VPO ore body to recover and concentrate potash has been well established by the long processing history of the plant. Given the remarkable continuity of the Prairie Evaporite Formation potash beds the relative ease of concentration is not expected to change. The process improvements introduced by the Vanscoy Project are supported by bench and pilot scale test work. Furthermore, industry proven technology with a minimum of one year of successful use within the potash industry has been used in the design to improve the target recovery to 87 percent. In 2018, the mill recovery rate was 81.2 percent. The 2019 target recovery is 83.5 percent.

The increased production and recovery will be accomplished through modifications to the existing circuits by installation of new crushing, attrition scrubbing, slimes separation, scavenger flotation and brine handling circuits and the installation of additional flotation and compaction circuit capacity. There have also been enhancements to the existing ore storage, crystallization and loadout circuits.

Infrastructure

The infrastructure at the mine site includes the following key items: mine site location access infrastructure, site power supply, the TMA, rail access and nearby towns and villages. Electrical energy is provided from the SaskPower distribution grid via a 138 KVA power line sized to accommodate current needs. Process water is provided by a dedicated water line from the South Saskatchewan River.

Environmental Considerations

The byproducts of potash extraction are insoluble fine tailings (clay) and salt tailings. The TMA is the destination for these tailings. With an increase in potash production, there will be a corresponding increase in tailings deposition rates. Nutrien has conducted a review of its TMA and developed a plan to extend the current tailings operations through 2077 in the currently approved footprint. As part of the Vanscoy Project, the following scope was completed: relocated and increased the size of its brine pond, relocated and increased the size of the fine TMA (FTMA), installation of a settling pond for both salt and FTMA areas, development of west side deposition cell number 3 (WS3), and planned for significantly higher salt pile heights. In addition, Nutrien will continue to expand the FTMA deposition areas as planned to develop the cell 3B commencing in 2019.

A slope stability study has been completed to understand the sensitivities of containment dyke geometries, deposition rates and duration, and brine mound effect on pore water pressures both in the tailings and underlying soils. Slope inclinometers and pressure transducers are monitored on a continuous basis as tailings are deposited. Additional slope inclinometers and pore water pressure transducers will be installed in key areas of the pile to monitor pile stability as the tailings pile develops. FTMA monitoring equipment is scheduled to be installed in 2019.

Salt deposition is partly offset by excess brine injection into the Deadwood Formation and a road salt operation actively removing tailings from the pile.

Nutrien is in material compliance with all environmental permitting requirements. The site is currently permitted by the Saskatchewan Ministry of the Environment pursuant to *The Environmental Management and Protection Act, 2010*.

The operating potash mines have agreed to provide the Province of Saskatchewan with financial assurances in the form of an irrevocable trust, whereby each producer has agreed to contribute a total of CA$25 million to their respective trusts for the purpose of decommissioning, restoring and rehabilitating their mines site(s). Payments to this trust were initiated on July 1, 2014 and will continue with annual payments through July 1, 2025. This trust agreement provides for possible adjustment of the trust amount at each five-year decommissioning plan review period based upon the most recent closure cost estimate.

Mine Life

Per the Vanscoy Technical Report, after 45 years of production, VPO has a Mineral Reserve remaining of 232.1 million tonnes (Proven Mineral Reserve of 175.7 million tonnes grading 25.6 percent K_2O and Probable Mineral Reserve of 56.4 million tonnes grading 24.3 percent K_2O). The Proven and Probable Reserve estimation is sufficient for approximately 29 years of mining life at the expanded rate of 2.8 million tonnes of product per year.

Measured Mineral Resources of 687.0 million tonnes grading 23.4 percent K_2O and Indicated Mineral Resource of 214.9 million tonnes grading 25.4 percent K_2O has the potential to add a further 32 years.

xii) Exploration and Development

It is reasonable to expect that a significant portion of the Inferred Mineral Resources will be upgraded to Indicated Mineral Resources and Measured Mineral Resources as exploration programs are undertaken in the North Expansion Block and South Block. This has the potential to significantly increase mine life.

Capital and Operating Cost Estimates

As described in the Vanscoy Technical Report, the VPO site has been in operation since 1969. In the years immediately preceding this, major capital investment was made to bring the mine into production. Since then, capital expenditures have been made on a regular and ongoing basis to sustain and expand production. The Vanscoy Project was announced in 2011 whereby VPO would be expanded to increase operational capacity to a total of 2.8 million tonnes muriate of potash product per year. The Vanscoy Project cost is approximately US$2.33 billion. Engineering commenced in 2010 and initial early work construction started in 2011. As a result of the Merger, the timing of the ramp-up to full capacity will be considered as part of the optimization of the combined potash production base of Nutrien.

A summary of the expansion costs is outlined in the table below:

Capital Costs	(billions US$)
Shaft headframe and above ground mining buildings	0.19
Surface ore handing	0.23
Ancillary buildings (offices/shops etc.)	0.02
Underground equipment and development	0.14
Process plants	1.05
Compaction	0.40
Infrastructure	0.23
Product loadout	0.07
Total:	**2.33**[(1)]

(1) Excludes investigation costs and engineering studies completed prior to Agrium's board of directors' approval of the Vanscoy Project.

Operating costs for the facility are largely driven by labor requirements. As we expand production, more equipment and manpower resources are required in both the mine and mill facilities to cover production, maintenance and administrative requirements. Additionally, as the mine transitions into deeper sections of the ore body in the South Block and eventually into KL 204 mine rehabilitation costs are expected to increase to deal with the impact of increased ground pressure. These costs are expected to manifest themselves in both equipment and manpower and have been included in forecast projections. These and other adjustments, such as reagent usage, have been reflected in operating cost estimates that are updated annually for a forward looking period of 20 years. These projections result in cost per tonne projections that are expected to peak during the period of intense ramp-up before decreasing and levelling off at a more normalized level once full production rates are attained.

f) Taxes Relating to Potash Operations

Royalties are paid to the Province of Saskatchewan in connection with the Company's Potash operations, which holds most of the mineral rights in the lease areas, and royalties from non-Crown lands are paid to various freeholders of mineral rights in the area. The Crown royalty rate is 3% and is governed by *The Subsurface Mineral Royalty Regulations, 2017*. The actual amount paid is dependent on selling price and production tonnes.

Municipal taxes are paid based on site property values to the applicable municipality in Saskatchewan. Saskatchewan potash production is taxed at the provincial level under *The Mineral Taxation Act, 1983*. This tax, governed by *The Potash Production Tax Regulations*, consists of a base payment and a profit tax, collectively known as the potash production tax. As a resource corporation in the Province of Saskatchewan, the Company is also subject to a resource surcharge equal to a percentage of the value of its resource sales (as defined in *The Corporation Capital Tax Act of Saskatchewan*). In addition to this, the Company pays federal and provincial income taxes based on corporate profits from all of its operations in Canada.