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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the year ended December 31, 2021

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____
Commission file number 001-32327

The Mosaic Company
(Exact name of registrant as specified in its charter)

Delaware	**20-1026454**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

101 East Kennedy Blvd
Suite 2500
Tampa, Florida 33602
(800) 918-8270
(Address and zip code of principal executive offices and registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading symbol	Name of each exchange on which registered
Common Stock, par value $0.01 per share	MOS	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports); and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one): Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of June 30, 2021, the aggregate market value of the registrant's voting common stock held by stockholders, other than directors, executive officers, subsidiaries of the Registrant and any other person known by the Registrant as of the date hereof to beneficially own ten percent or more of any class of Registrant's outstanding voting common stock, and consisting of shares of Common Stock, was approximately $12.1 billion based upon the closing price of a share of Common Stock on the New York Stock Exchange on that date.

Indicate the number of shares outstanding of each of the registrant's classes of common stock: 368,309,275 shares of Common Stock as of February 18, 2022.

DOCUMENTS INCORPORATED BY REFERENCE

1. Portions of the registrant's definitive proxy statement to be delivered in conjunction with the 2022 Annual Meeting of Stockholders (Part III)

2021 FORM 10-K CONTENTS

PART I.

Item 1. Business.

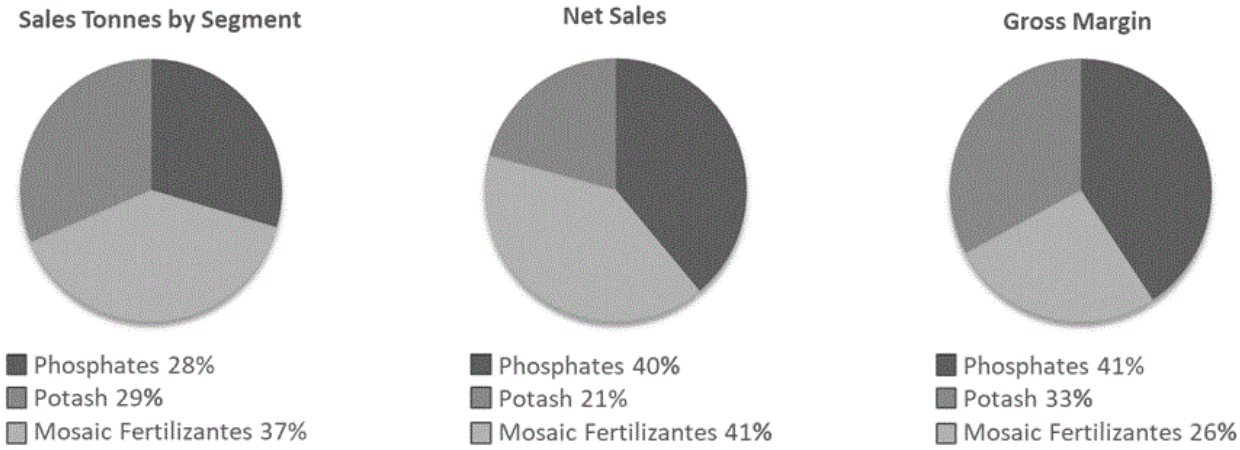
OVERVIEW

The Mosaic Company is the world's leading producer and marketer of concentrated phosphate and potash crop nutrients. Through our broad product offering, we are a single source supplier of phosphate- and potash-based crop nutrients and animal feed ingredients. We serve customers in approximately 40 countries. We are the second largest integrated phosphate producer in the world and one of the largest producers and marketers of phosphate-based animal feed ingredients in North America and Brazil. We are the leading fertilizer production and distribution company in Brazil. We mine phosphate rock in Florida, Brazil and Peru. We process rock into finished phosphate products at facilities in Florida, Louisiana and Brazil. We are one of the four largest potash producers in the world. We mine potash in Saskatchewan, New Mexico and Brazil. We have other production, blending or distribution operations in Brazil, China, India and Paraguay, as well as a strategic equity investment in a joint venture that operates a phosphate rock mine and chemical complexes in the Kingdom of Saudi Arabia. Our distribution operations serve the top four nutrient-consuming countries in the world: China, India, the United States and Brazil.

The Mosaic Company is a Delaware corporation that was incorporated in March 2004 and serves as the parent company of the business that was formed through the October 2004 combination of IMC Global Inc. ("***IMC***") and the fertilizer businesses of Cargill, Incorporated. We are publicly traded on the New York Stock Exchange under the ticker symbol "MOS" and are headquartered in Tampa, Florida.

We conduct our business through wholly and majority-owned subsidiaries as well as businesses in which we own less than a majority or a non-controlling interest. We are organized into three reportable business segments: Phosphates, Potash and Mosaic Fertilizantes. Intersegment eliminations, unrealized mark-to-market gains/losses on derivatives, debt expenses, Streamsong Resort® results of operations, and the results of the China and India distribution businesses are included within Corporate, Eliminations and Other.

The following charts show the respective contributions to 2021 sales volumes, net sales and gross margin for each of our business segments in effect at December 31, 2021:



We account for approximately 12% of estimated global annual phosphate production. We also account for approximately 12% of estimated global annual potash production.

Phosphates Segment–We sell phosphate-based crop nutrients and animal feed ingredients throughout North America and internationally. We account for approximately 70% of estimated North American annual production of concentrated phosphate crop nutrients.

Potash Segment–We sell potash throughout North America and internationally, principally as fertilizer, but also for use in industrial applications and, to a lesser degree, as animal feed ingredients. We account for approximately 33% of estimated North American annual potash production.

Mosaic Fertilizantes Segment–We produce and sell phosphate and potash-based crop nutrients, and animal feed ingredients, in Brazil. In addition to five phosphate rock mines, four chemical plants and a potash mine in Brazil, this segment consists of sales offices, crop nutrient blending and bagging facilities, port terminals and warehouses in Brazil and Paraguay. The Mosaic Fertilizantes segment also serves as a distribution outlet for our Phosphates and Potash segments. We account for approximately 65% of estimated annual production of concentrated phosphate crop nutrients in Brazil and 100% of estimated annual potash production in Brazil.

As used in this report:

- "***Mosaic***" or "***Company***" means The Mosaic Company;
- "***we,***" "***us,***" and "***our***" refer to Mosaic and its direct and indirect subsidiaries, individually or in any combination;
- "***Cargill***" means Cargill, Incorporated and its direct and indirect subsidiaries, individually or in any combination;
- "***Cargill Crop Nutrition***" means the crop nutrient business we acquired from Cargill in the Combination;
- "***Combination***" means the October 22, 2004 combination of IMC and Cargill Crop Nutrition; and
  statements as to our industry position reflect information from the most recent period available.

Business Developments during 2021

- During the second quarter of 2021, due to increased brine inflows, we made the decision to accelerate the timing of the shutdown of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine. Closing the K1 and K2 shafts are key pieces of the transition to the K3 shaft, but the timeline for the closure was accelerated by approximately nine months. We recognized pre-tax costs of $158.1 million related to the permanent closure of these facilities. In the third quarter of 2021, we resumed production at our previously idled Colonsay potash mine to offset a portion of the production lost by the early closure of the K1 and K2 shafts at Esterhazy. In December 2021, the K3 shaft became fully operational and is expected to reach full operating capacity in the first quarter of 2022. The closure of the K1 and K2 shafts will eliminate future brine management expenses at these sites.

- In August 2021 we entered into a new, unsecured five-year credit facility of up to $2.5 billion, with a maturity date of August 19, 2026, which replaces our prior $2.2 billion line of credit. This increase in size provides additional security and flexibility and reflects the growth in our business.

- In August 2021 we prepaid the outstanding balance of $450 million on our 3.75% senior notes, due November 15, 2021, without premium or penalty.

- During the third quarter of 2021, our Board of Directors approved a new $1 billion share repurchase authorization (the "***2021 Repurchase Program***"), replacing our previous $1.5 billion authorization (the "***2015 Repurchase Program***") that had $700 million remaining. This new, expanded authorization reflects our unchanged commitment to a balanced deployment of excess capital that includes returning capital to stockholders. During 2021, we repurchased 11,200,371 shares of Common Stock, including 8,544,144 shares that we purchased in an underwritten secondary offering by Vale S.A., at an average price of $36.69, for a total of approximately $410.9 million.

- In November 2021, Vale S.A. sold its 34,176,574 shares of common stock of Mosaic in an underwritten secondary offering. Vale S.A. no longer holds any shares of Mosaic common stock.

- In the fourth quarter of 2021, our Board of Directors approved a 50% increase in our annual dividend, to $0.45 per share, beginning in 2022.

- In 2020, we filed petitions with the U.S. Department of Commerce *("**DOC**")* and the U.S. International Trade Commission *("**ITC**")* that requested the initiation of countervailing duty investigations into imports of phosphate fertilizers from Morocco and Russia. The purpose of the petitions was to remedy the distortions that we believe foreign subsidies have caused or are causing in the U.S. market for phosphate fertilizers, and thereby restore fair competition. During the first quarter of 2021, the DOC made final affirmative determinations that countervailable subsidies were being provided by those governments and the ITC made final affirmative determinations that the U.S.

phosphate fertilizer industry is materially injured by reason of subsidized phosphate fertilizer imports from Morocco and Russia. As a result of these determinations, the DOC issued countervailing duty orders on phosphate fertilizer imports from Russia and Morocco, which are scheduled to remain in place for at least five years. Currently, the cash deposit rates for such imports are approximately 20 percent for Moroccan producer OCP, 9 percent and 47 percent for Russian producers PhosAgro and Eurochem, respectively, and 17 percent for all other Russian producers. The final determinations in the DOC and ITC investigations are subject to possible challenges before U.S. federal courts and the World Trade Organization, and Mosaic has initiated actions at the U.S. Court of International Trade contesting certain aspects of the DOC's final determinations that, we believe, failed to capture the full extent of Moroccan and Russian phosphate fertilizer subsidies. Moroccan and Russian producers have also initiated U.S. Court of International Trade actions, seeking lower cash deposit rates and revocation of the countervailing duty orders. Further, the cash deposit rates and the amount of countervailing duties owed by importers on such imports could change based on the results of the DOC's annual administrative review proceedings.

- In response to Covid-19, we continued to implement measures in 2021 that were intended to provide for the immediate health and safety of our employees, including working remotely and alternating work schedules, in order to minimize the number of employees at a single location. Businesses have been impacted by short-term labor shortages due to illness, transportation issues such as trucking delays and port congestion which are slowing delivery of inputs to facilities and products to end customers. At this time, we have experienced limited adverse financial or operational impacts related to Covid-19.

Subsequent to December 31, 2021, we expect to enter into an accelerated share repurchase ("***ASR***") of $400 million, which would be initiated in February 2022. Following the completion of the current authorization, our Board of Directors has approved the establishment of a new $1 billion share repurchase authorization, which will go into effect following completion of this ASR. The Board of Directors has also approved a regular dividend increase to $0.60 per share annually from $0.45, beginning with the second quarter 2022 payment.

We have included additional information about these and other developments in our business during 2021 in our Management's Discussion and Analysis of Financial Condition and Results of Operations ("***Management's Analysis***") and in the Notes to Consolidated Financial Statements.

Throughout the discussion below, we measure units of production, sales and raw materials in metric tonnes, which are the equivalent of 2,205 pounds, or 1.102 tons (U.S. standard), unless we specifically state that we mean short or long ton(s), which are the equivalent of 2,000 pounds and 2,240 pounds, respectively. In addition, we measure natural gas, a raw material used in the production of our products, in MM BTU, which stands for one million British Thermal Units ("***BTU***"). One BTU is equivalent to 1.06 Joules.

This report includes market share and industry data and forecasts that we obtained from publicly available information and industry publications, surveys, market research, internal company surveys and consultant surveys. We believe these sources to be reliable, but there can be no assurance as to the accuracy and completeness of such information. We have not independently verified the data from third-party sources, nor have we ascertained the underlying economic assumptions relied upon therein. Similarly, internal company surveys, industry forecasts and market research, which we believe to be reliable based upon management's knowledge of the industry, have not been verified by any independent sources.

Application of SEC's New Mining Rules Under Regulation S-K 1300

On October 31, 2018, The U.S. Securities Exchange Commission (the "***SEC***") adopted Subpart 1300 of Regulation S-K ("***S-K 1300***") to modernize the property disclosure requirements for mining registrants. Information concerning our mining properties in this Form 10-K has been prepared in accordance with these requirements. These requirements differ significantly from the previously applicable disclosure requirements of SEC Industry Guide 7. Among other differences, S-K 1300 requires us to disclose our mineral resources, in addition to our mineral reserves, as of the end of our most recently completed fiscal year both in the aggregate and for each of our individually material mining properties. The calculation of mineral reserves under SEC Industry Guide 7 and under S-K 1300 are significantly different which may lead to differences in reserve reporting. We have four material properties: Belle Plaine, Esterhazy, Florida and Tapira. See Item 2. "Properties," for further information regarding mineral reserves and resource and discussion of our material mining properties.

BUSINESS SEGMENT INFORMATION

The discussion below of our business segment operations should be read in conjunction with the following information that we have included in this report:

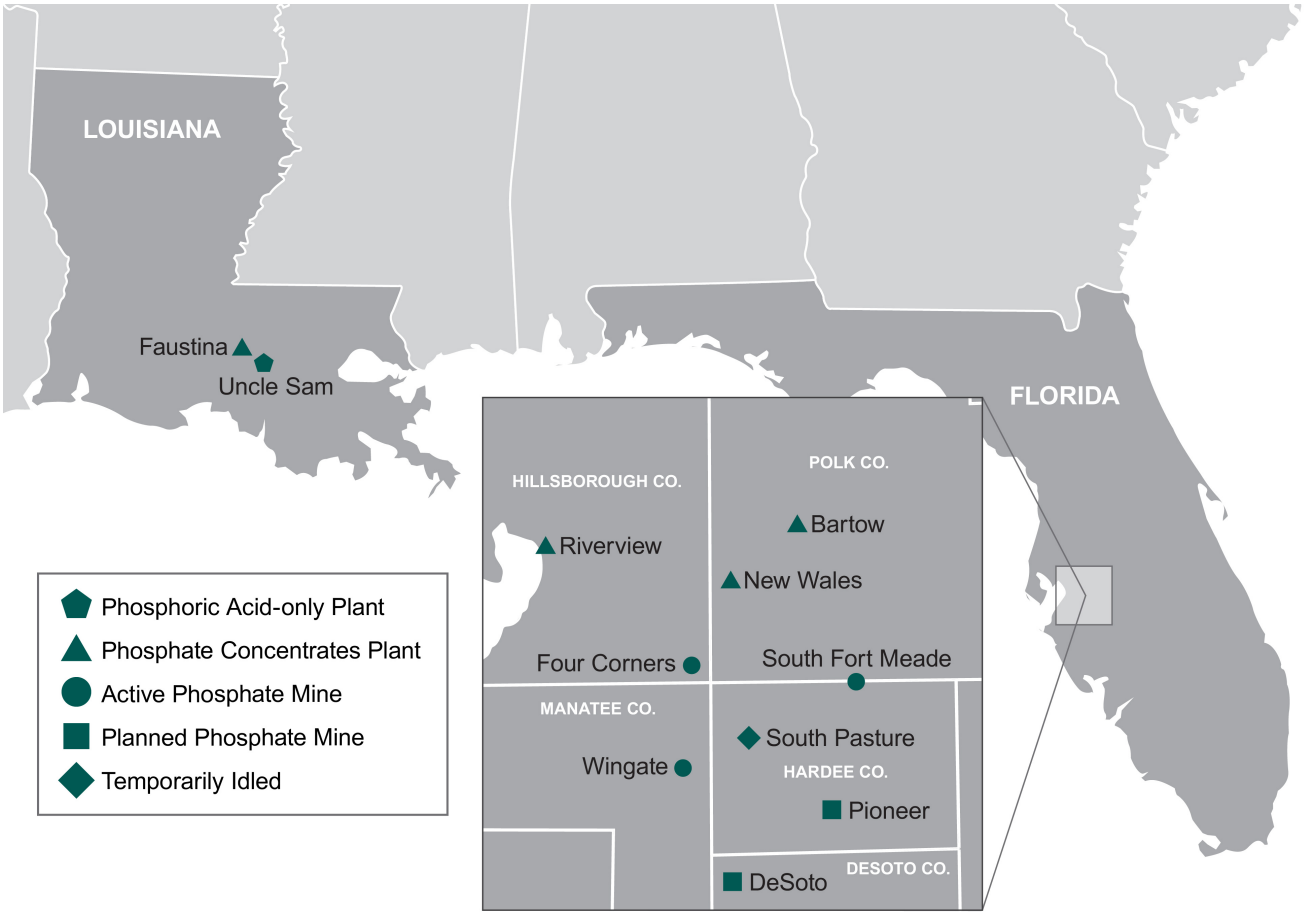
- The risk factors discussed in this report in Part I, Item 1A, "Risk Factors".
- Our Management's Analysis.
- The financial statements and supplementary financial information in our Consolidated Financial Statements ("***Consolidated Financial Statements***").

This information is incorporated by reference into this section from Part II, Item 8, "Financial Statements and Supplementary Data".

Phosphates Segment

Our Phosphates business segment owns and operates mines and production facilities in Florida which produce concentrated phosphate crop nutrients and phosphate-based animal feed ingredients, and processing plants in Louisiana which produce concentrated phosphate crop nutrients. We have a 75% economic interest in the Miski Mayo Phosphate Mine in Peru "***Miski Mayo Mine***"), which is included in the results of our Phosphates segment. On June 18, 2019, we permanently closed our Plant City, Florida production facility. On September 24, 2019, Mosaic entered into a long-term lease agreement with Anuvia Plant Nutrition to lease certain assets at that location.

The following map shows the locations of each of our phosphate concentrates plants in the United States and each of our active, temporarily idled, and planned phosphate mine locations, including beneficiation plants, in Florida. The reserves associated with our Ona location have been allocated to other active mines based on our future mining plans:



U.S. Phosphate Crop Nutrients and Animal Feed Ingredients

Our U.S. phosphates operations have capacity to produce approximately 4.5 million tonnes of phosphoric acid ("***P_2O_5***") per year, or about 7% of world annual capacity and about 60% of North American annual capacity. P_2O_5 is produced by reacting finely ground phosphate rock with sulfuric acid. P_2O_5 is the key building block for the production of high analysis or concentrated phosphate crop nutrients and animal feed products, and is the most comprehensive measure of phosphate capacity and production and a commonly used benchmark in our industry. Our U.S. P_2O_5 production totaled approximately 3.4 million tonnes during 2021. Our U.S. operations account for approximately 7% of estimated global annual production and 51% of estimated North American annual output.

Our phosphate crop nutrient products are marketed worldwide to crop nutrient manufacturers, distributors, retailers and farmers. Our principal phosphate crop nutrient products are:

- **Diammonium Phosphate (18-46-0)** Diammonium Phosphate ("***DAP***") is the most widely used high-analysis phosphate crop nutrient worldwide. DAP is produced by first combining phosphoric acid with anhydrous ammonia in a reaction vessel. This initial reaction creates a slurry that is then pumped into a granulation plant where it is reacted with additional ammonia to produce DAP. DAP is a solid granular product that is applied directly or blended with other solid plant nutrient products, such as urea and potash.
- **Monoammonium Phosphate (11-52-0)** Monoammonium Phosphate ("***MAP***") is the second most widely used high-analysis phosphate crop nutrient and the fastest growing phosphate product worldwide. MAP is also produced by first combining phosphoric acid with anhydrous ammonia in a reaction vessel. The resulting slurry is then pumped into the granulation plant where it is reacted with additional P_2O_5 to produce MAP. MAP is a solid granular product that is applied directly or blended with other solid plant nutrient products.
- **MicroEssentials®** is a value-added ammoniated phosphate product that is enhanced through a patented process that creates very thin platelets of sulfur and other micronutrients, such as zinc, on the granulated product. The patented process incorporates both the sulfate and elemental forms of sulfur, providing season-long availability to crops.

Production of our animal feed ingredients products is located at our New Wales, Florida facility. We market our feed phosphate primarily under the leading brand names of Biofos® and Nexfos®.

Annual capacity by plant as of December 31, 2021 and production volumes by plant for 2021 are listed below:

(tonnes in millions)	Phosphoric Acid		Processed Phosphate[a]/DAP/MAP/ MicroEssentials®/Feed Phosphate	
Facility	Operational Capacity[b]	Production[c]	Operational Capacity[b]	Production[c]
Florida:				
Bartow	1.1	1.0	2.5	2.2
New Wales	1.7	1.2	4.0	2.6
Riverview	0.9	0.8	1.8	1.6
	3.7	3.0	8.3	6.4
Louisiana:				
Faustina[d]	—	—	1.6	0.9
Uncle Sam[d]	0.8	0.4	—	—
	0.8	0.4	1.6	0.9
Total	4.5	3.4	9.9	7.3

(a) Our ability to produce processed phosphates has been less than our annual operational capacity stated in the table above, except to the extent we purchase P_2O_5. Factors affecting actual production are described in note (c) below.

(b) Operational capacity is our estimated long-term capacity based on an average amount of scheduled down time, including maintenance and scheduled turnaround time, and product mix, and no significant modifications to operating conditions, equipment or facilities.

(c) Actual production varies from annual operational capacity shown in the above table due to factors that include, among others, the level of demand for our products, maintenance and turnaround time, accidents, mechanical failure, product mix, and other operating conditions.

(d) Our Louisiana facilities experienced lower production as a result of downtime from sulfur supply constraints and damage from Hurricane Ida.

The P_2O_5 produced at Uncle Sam is shipped to Faustina, where it is used to produce DAP, MAP and MicroEssentials®. Our Faustina plant also manufactures ammonia that is mostly consumed in our concentrate plants.

We produced approximately 6.9 million tonnes of concentrated phosphate crop nutrients during 2021 and accounted for approximately 70% of estimated North American annual production.

Phosphate Rock

Phosphate rock is the key mineral used to produce phosphate crop nutrients and feed phosphate. Our Florida phosphate rock mines produced approximately 12.2 million tonnes in 2021 and accounted for approximately 51% of estimated North American annual production. We are the world's second largest miner of phosphate rock (excluding China) and currently operate four mines in North America with a combined annual capacity of approximately 18.0 million tonnes. Additionally, we own 75% of the Miski Mayo Mine in Peru, which has an annual capacity of 4.0 million tonnes. Production of one tonne of DAP requires between 1.6 and 1.7 tonnes of phosphate rock.

All of our wholly owned phosphate mines and related mining operations in North America are located in central Florida. During 2021, we operated three active mines in Florida: Four Corners, South Fort Meade and Wingate. We plan to explore and develop the DeSoto property and the South Pasture property, which was previously idled, to offset future depletion at our Florida properties. We have a 75% economic interest in the Miski Mayo Mine in Peru, which allows us to supplement our other produced rock to meet our overall fertilizer production needs and is the primary source of rock for our Louisiana operations. We have the right to use or sell to third parties 75% of Miski Mayo's annual production.

See Item 2. "Properties" for a discussion of our phosphate mining properties, including processing methods, facilities, production and summaries of our mineral resources and reserves, both in the aggregate and for our individual material phosphate mining properties.

Investment in Ma'aden Wa'ad Al Shamal Phosphate Company ("MWSPC")

We own a 25% interest in MWSPC and, in connection with our equity share, we are entitled to market approximately 25% of MWSPC's production. MWSPC consists of a mine and two chemical complexes (the "***Project***") that produce phosphate fertilizers and other downstream phosphates products in the Kingdom of Saudi Arabia. The greenfield project was built in the northern region of Saudi Arabia at Wa'ad Al Shamal Minerals Industrial City, and included further expansion of processing plants in Ras Al Khair Minerals Industrial City, which is located on the east coast of Saudi Arabia. Ammonia operations commenced in late 2016 and on December 1, 2018, MWSPC commenced commercial operations of the phosphate plant, thereby bringing the entire project to the commercial production phase. Phosphate production will gradually ramp-up until it reaches an expected 3.0 million tonnes in annual production capacity. Actual phosphate production was 2.4 million tonnes in 2021. The Project benefits from the availability of key raw nutrients from sources within Saudi Arabia.

Our cash investment in the Project was $770 million at December 31, 2021. Our obligation to contribute additional equity was eliminated as part of the Project debt refinancing in 2020.

Sulfur

We use molten sulfur at our phosphates concentrates plants to produce sulfuric acid, primarily for use in our production of P_2O_5. We purchased approximately 3.7 million long tons of sulfur during 2021. We purchase the majority of this sulfur from North American oil and natural gas refiners who are required to remove or recover sulfur during the refining process. Production of one tonne of DAP requires approximately 0.40 long tons of sulfur. We procure our sulfur from multiple sources and receive it by truck, rail, barge and vessel, either directly at our phosphate plants or have it sent for gathering to terminals that are located on the U.S. gulf coast. In addition, we use formed sulfur received through Tampa, Florida ports, which are delivered by truck to our New Wales facility and melted through our sulfur melter.

We own and operate a sulfur terminal in Riverview, Florida. We also lease terminal space in Tampa, Florida and Galveston and Beaumont, Texas. We have long-term time charters on two ocean-going tugs/barges and one ocean-going vessel that transports molten sulfur from the Texas terminals to Tampa. We then further transport by truck to our Florida phosphate plants. In addition, we own a 50% equity interest in Gulf Sulphur Services Ltd., LLLP ("***Gulf Sulphur Services***"), which is operated by our joint venture partner. Gulf Sulphur Services has a sulfur transportation and terminaling business in the Gulf

of Mexico, and handles these functions for a substantial portion of our Florida sulfur volume. Our sulfur logistic assets also include a large fleet of leased railcars that supplement our marine sulfur logistic system. Our Louisiana operations are served by truck from nearby refineries.

Although sulfur is readily available from many different suppliers and can be transported to our phosphate facilities by a variety of means, sulfur is an important raw material used in our business that has in the past been, and may in the future, be the subject of volatile pricing and availability. Alternative transportation and terminaling facilities might not have sufficient capacity to fully serve all of our facilities in the event of a disruption to current transportation or terminaling facilities. Changes in the price of sulfur or disruptions to sulfur transportation or terminaling facilities could have a material impact on our business. We have included a discussion of sulfur prices in our Management's Analysis.

Ammonia

We use ammonia together with P_2O_5 to produce DAP, MAP and MicroEssentials®. We consumed approximately 1.1 million tonnes of ammonia during 2021. Production of one tonne of DAP requires approximately 0.23 tonnes of ammonia. We purchase approximately one-third of our ammonia from various suppliers in the spot market with the remaining two-thirds either purchased through our ammonia supply agreement (the "***CF Ammonia Supply Agreement***") with an affiliate of CF Industries Inc. ("***CF***") or produced internally at our Faustina, Louisiana location.

Our Florida ammonia needs are currently supplied under multi-year contracts with both domestic and offshore producers. Ammonia for our Bartow and Riverview plants is terminaled through owned ammonia facilities at the Port of Tampa and Port Sutton, Florida. Ammonia for our New Wales plant is terminaled through another ammonia facility owned and operated by a third party at Port Sutton, Florida pursuant to an agreement that provides for service through 2022, with automatic renewal for an additional two-year period unless either party terminates, as provided in the agreement. Ammonia is transported by pipeline from the terminals to our production facilities. We have service agreements with the operators of the pipelines for Bartow, New Wales, and Riverview, which provide service through June 30, 2022 with annual auto-renewal provisions unless either party objects.

Under the CF Ammonia Supply Agreement, Mosaic agreed to purchase approximately 523,000 to 725,000 metric tonnes of ammonia per year during a term that commenced in 2017 and may extend until December 31, 2032, at a price tied to the prevailing price of U.S. natural gas. The contract provides for early termination at certain dates. For 2021, our minimum purchase obligation was approximately 523,000 metric tonnes, and actual purchases were 580,000 metric tonnes. A specialized tug and barge unit transports ammonia for Mosaic between a load location at Donaldsonville, Louisiana and a discharge location at Tampa, Florida. Additional information about this chartered unit and its financing is provided in Note 23 of our Consolidated Financial Statements. We expect a majority of the ammonia purchased under the CF Ammonia Supply Agreement to be received by barge at the Port of Tampa and delivered to our Florida facilities as described in the preceding paragraph. While the market prices of natural gas and ammonia have changed since we executed the CF Ammonia Supply Agreement in 2013 and will continue to change, we expect that the agreement will provide us a competitive advantage over its term, including by providing a reliable long-term ammonia supply.

We produce ammonia at Faustina, Louisiana primarily for our own consumption. Our annual capacity is approximately 530,000 tonnes. From time to time, we sell surplus ammonia to unrelated parties and/or may transport surplus ammonia to the Port of Tampa. In addition, under certain circumstances we are permitted to receive ammonia at Faustina under the CF Ammonia Supply Agreement.

Although ammonia is readily available from many different suppliers and can be transported to our phosphates facilities by a variety of means, ammonia is an important raw material used in our business that has in the past been, and may in the future be, the subject of volatile pricing. In addition, alternative transportation and terminaling facilities might not have sufficient capacity to fully serve all of our facilities in the event of a disruption to existing transportation or terminaling facilities. Changes in the price of ammonia or disruptions to ammonia transportation or terminaling could have a material impact on our business. We have included a discussion of ammonia prices in our Management's Analysis.

Natural Gas for Phosphates

Natural gas is the primary raw material used to manufacture ammonia. At our Faustina facility, ammonia is manufactured on site. The majority of natural gas is purchased through firm delivery contracts based on published index-based prices and is sourced from Texas and Louisiana via pipelines interconnected to the Henry Hub. We use over-the-counter swap and/or

option contracts to forward price portions of future natural gas purchases. We typically purchase approximately 11.3 million MM Btu of natural gas per year for use in ammonia production at Faustina.

Our ammonia requirements for our Florida operations are purchased rather than manufactured on site. Therefore, while we typically purchase approximately 2.5 million MM Btu of natural gas per year in Florida, it is only used as a thermal fuel for various phosphate production processes.

Florida Land Holdings

We are a significant landowner in the State of Florida, which has in the past been considered one of the fastest areas of population growth in the United States. We own land comprising over 317,000 acres held in fee simple title in central Florida, and have the right to mine additional properties which contain phosphate rock reserves. Some of our land holdings are needed to operate our Phosphates business, while a portion of our land assets, such as certain reclaimed properties, are no longer required for our ongoing operations. As a general matter, more of our reclaimed property becomes available for uses other than for phosphate operations each year. Our real property assets are generally comprised of concentrates plants, port facilities, phosphate mines and other property which we have acquired through our presence in Florida. Our long-term future land use strategy is to optimize the value of our land assets. For example, we developed Streamsong Resort® (the "***Resort***"), a destination resort and conference center, in an area of previously mined land as part of our long-term business strategy to maximize the value and utility of our extensive land holdings in Florida. In addition to the hotel and conference center, the Resort includes three golf courses, a clubhouse and ancillary facilities.

Potash Segment

We are one of the leading potash producers in the world. We mine and process potash in Canada and the United States and sell potash in North America and internationally. The term "potash" applies generally to the common salts of potassium. Muriate of potash ("***MOP***") is the primary source of potassium for the crop nutrient industry. Red MOP has traces of iron oxide. The granular and standard grade red MOP products are well suited for direct fertilizer application and bulk blending. White MOP has a higher percent potassium oxide ("K_2O"). White MOP, besides being well suited for the agricultural market, is used in many industrial applications. We also produce a double sulfate of potash magnesia product, which we market under our brand name K-Mag®, at our Carlsbad, New Mexico facility.

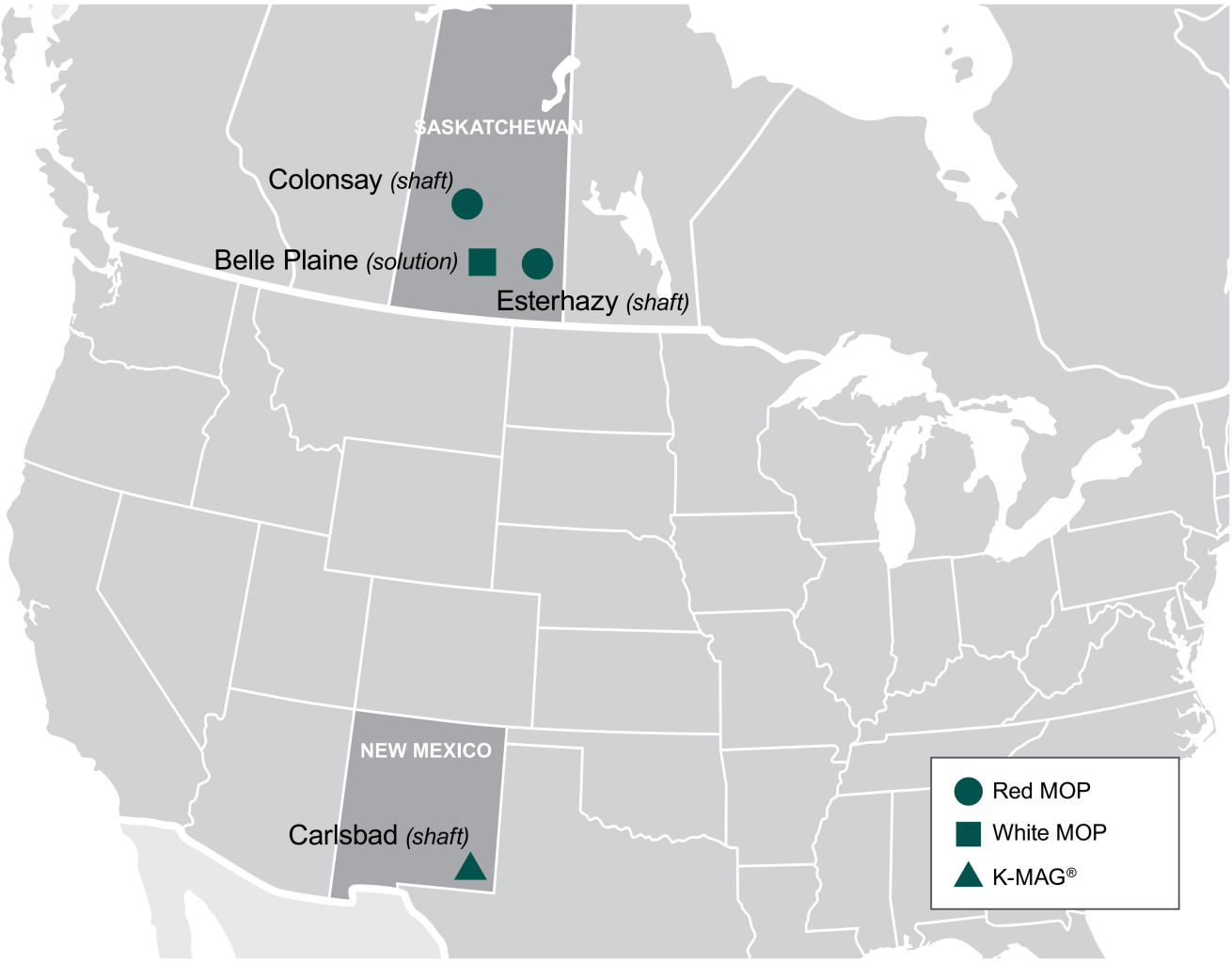
Our potash products are marketed worldwide to crop nutrient manufacturers, distributors and retailers and are also used in the manufacturing of mixed crop nutrients and, to a lesser extent, in animal feed ingredients. We also sell potash to customers for industrial use. In addition, our potash products are used for de-icing and as a water softener regenerant.

In the first half of 2021, we operated two potash mines in Canada, including one shaft mine with a total of three production shafts and one solution mine, as well as one potash shaft mine in the United States. During the second quarter of 2021, due to increased brine inflows, we made the decision to accelerate the timing of the shutdown of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan mine by approximately nine months. In the third quarter, we resumed production at our previously idled Colonsay potash mine to offset a portion of the production lost by the early closure of the K1 and K2 shafts. In December, the K3 shaft became fully operational. Currently, work is underway to decommission the K1 and K2 underground mines. Due to this closure, we have eliminated future brine management costs at these locations. We own related mills or refineries at our mines.

We also own a greenfield potash project in Kronau, Saskatchewan, approximately 27 kilometers southeast of Regina, Saskatchewan. In addition, Mosaic leases approximately 291,500 acres of mineral rights from the government of Saskatchewan, and approximately 99,700 acres of freehold mineral rights in the Kronau/Regina area, which have not been developed.

We pay Canadian resource taxes consisting of the Potash Production Tax and resource surcharge. The Potash Production Tax is a Saskatchewan provincial tax on potash production and consists of a base payment and a profits tax. We also pay a percentage of the value of resource sales from our Saskatchewan mines. In addition to the Canadian resource taxes, royalties are payable to the mineral owners in respect of potash reserves or production of potash. We have included a further discussion of the Canadian resource taxes and royalties in our Management's Analysis.

The map below shows the location of each of our potash properties:



Our North American potash annualized operational capacity totals 11.2 million tonnes of product per year and accounts for approximately 14% of world annual capacity and 32% of North American annual capacity. Production during 2021 totaled 8.2 million tonnes. We account for approximately 12% of estimated world annual production and 33% of estimated North American annual production.

The following table shows, for each of our potash mines, annual capacity as of December 31, 2021 and finished product output for 2021:

(tonnes in millions)

Facility	Annualized Proven Peaking Capacity (a)(c)(d)	Annual Operational Capacity (a)(b)(d)(e)	Finished Product[(b)]
Canada			
Belle Plaine—MOP	3.9	3.0	2.8
Colonsay—MOP [(f)]	2.6	1.5	0.4
Esterhazy—MOP[(g)]	6.3	6.0	4.4
Canadian Total	12.8	10.5	7.6
United States			
Carlsbad—K-Mag®[(h)]	0.9	0.7	0.6
United States Total	0.9	0.7	0.6
Totals	13.7	11.2	8.2

(a) Finished product.
(b) Actual production varies from annual operational capacity shown in the above table due to factors that include, among others, the level of demand for our products, maintenance and turnaround time, the quality of the reserves and the nature of the geologic formations we are mining at any particular time, accidents, mechanical failure, product mix, and other operating conditions.
(c) Represents full capacity assuming no turnaround or maintenance time.
(d) The annualized proven peaking capacity shown above is the capacity currently used to determine our share of Canpotex, Limited ("***Canpotex***") sales. Canpotex members' respective shares of Canpotex sales are based upon the members' respective proven peaking capacities for producing potash. When a Canpotex member expands its production capacity, the new capacity is added to that member's proven peaking capacity based on a proving run at the maximum production level. Alternatively, after January 2017, Canpotex members may elect to rely on an independent engineering firm and approved protocols to calculate their proven peaking capacity. The annual operational capacity reported in the table above can exceed the annualized proven peaking capacity until the proving run has been completed. Our entitlement percentage of Canpotex is 36.2%. In 2021 our realized percentage was 33% due to lower shipments as a result of the early closure of the K1 and K2 mine shafts at Esterhazy.
(e) Annual operational capacity is our estimated long-term potash capacity based on the quality of reserves and the nature of the geologic formations expected to be mined, milled and/or processed over the long term, average amount of scheduled down time, including maintenance and scheduled turnaround time, and product mix, and no significant modifications to operating conditions, equipment or facilities. Operational capacities will continue to be updated to the extent new production results impact ore grades assumptions.
(f) We have the ability to reach an annual operating capacity of 2.1 million tonnes over time by increasing our staffing levels and investment in mine development activities. In August 2019, we indefinitely idled our Colonsay, Saskatchewan mine. In the third quarter of 2021, we restarted operations at Colonsay to offset a portion of the production lost by the early closure of K1 and K2.
(g) In June, 2021, we permanently ceased operations at the K1 and K2 mine shafts. The annual operational capacity of Esterhazy has remained consistent following the K1 and K2 closures based on the accelerated ramp-up in capacity from the K3 mine shafts.
(h) K-Mag® is a specialty product that we produce at our Carlsbad facility.

See Item 2, "Properties" for a discussion of our potash mining properties, including processing methods, facilities, production and summaries of our mineral resources and reserves, both in the aggregate and for our individual material potash mining properties.

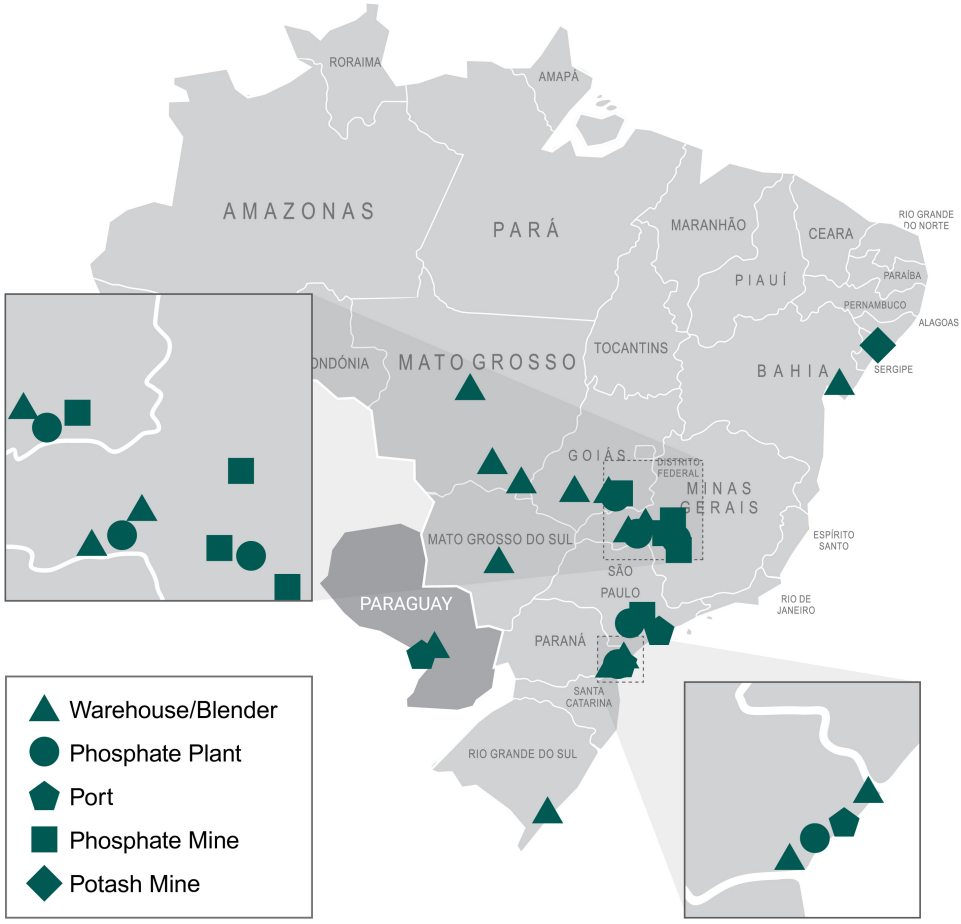
Natural Gas

Natural gas is used at our Belle Plaine solution mine as a fuel to produce steam and to dry potash products. The steam is used to generate electricity and provide thermal energy to the evaporation, crystallization and solution mining processes. The Belle Plaine solution mine typically accounts for approximately 80% of our Potash segment's total natural gas requirements for potash production. At our shaft mines, natural gas is used as a fuel to heat fresh air supplied to the shaft mines and for drying potash products. Combined natural gas usage for both the solution and shaft mines totaled 17 million MM Btu during 2021. We purchase our natural gas requirements on firm delivery index price-based physical contracts and on short-term spot-priced physical contracts. Our Canadian operations purchase physical natural gas from Alberta and Saskatchewan using AECO price indices references and transport the gas to our plants via the TransGas pipeline system. The U.S. potash operation in New Mexico purchases physical gas in the southwest respective regional market using the El Paso San Juan Basin market pricing reference. We use financial derivative contracts to manage the pricing on portions of our natural gas

requirements.

Mosaic Fertilizantes Segment

Our Mosaic Fertilizantes segment owns and operates mines, chemical plants, crop nutrient blending and bagging facilities, port terminals and warehouses in Brazil and Paraguay, which produce and sell concentrated phosphates crop nutrients, phosphate-based animal feed ingredients and potash fertilizer. The following map shows the locations of our operations in Brazil and Paraguay:



We are the largest producer and one of the largest distributors of blended crop nutrients for agricultural use in Brazil. We produce and sell phosphate-and potash-based crop nutrients, and animal feed ingredients through our operations. Our operations in Brazil include five phosphate mines, four chemical plants and a potash mine. We own and operate ten blending plants in Brazil and one blending plant and port in Paraguay. In addition, we lease several other warehouses and blending units depending on sales and production levels. We also have a 62% ownership interest in Fospar, S.A. ("***Fospar***"). Fospar owns and operates an SSP (defined below) granulation plant, which produces approximately 0.5 million tonnes of SSP per year, and a deep-water port and throughput warehouse terminal facility in Paranagua, Brazil. The port facility at Paranagua handles approximately 3.6 million tonnes of imported crop nutrients. In 2021, Mosaic Fertilizantes sold approximately 10.1 million tonnes of crop nutrient products and accounted for approximately 20% of fertilizer shipments in Brazil.

We have the capability to annually produce approximately 4.4 million tonnes of phosphate-and potash-based crop nutrients and animal feed ingredients. Crop nutrient products produced are marketed to crop nutrient manufacturers, distributors, retailers and farmers.

In addition to producing crop nutrients, Mosaic Fertilizantes purchases phosphates, potash and nitrogen products which are either used to produce blended crop nutrients ("***Blends***") or for resale. In 2021, Mosaic Fertilizantes purchased 2.1 million

tonnes of phosphate-based products, primarily MicroEssentials®, from our Phosphates segment, and 2.5 million tonnes of potash products from our Potash segment and Canpotex.

Phosphate Crop Nutrients and Animal Feed Ingredients

Our Brazilian phosphates operations have capacity to produce approximately 1.1 million tonnes of P_2O_5 per year, or about 69% of Brazilian annual capacity. Phosphoric acid is produced by reacting ground phosphate rock with sulfuric acid. P_2O_5 is the key building block for the production of high analysis or concentrated phosphate crop nutrients and animal feed products and is the most comprehensive measure of phosphate capacity and production and a commonly used benchmark in our industry. Our Brazilian P_2O_5 production totaled approximately 1.0 million tonnes in 2021 and accounted for approximately 90% of Brazilian annual output.

Our principal phosphate crop nutrient products are:

- **Monoammonium Phosphate (11-52-0) ("*MAP*")** MAP is a crop nutrient composed of two macronutrients, nitrogen and phosphoric acid. This slurry is added inside a rotary drum type granulator with ammonia to complete the neutralization reaction and produce MAP.
- **Triple superphosphate ("*TSP*")** TSP is a highly concentrated phosphate crop nutrient. TSP is produced from the phosphate rock reaction with phosphoric acid in a kuhlmann type reactor. The process for the production of TSP in Brazil is run of pile where the product undergoes a curing process of approximately seven days for later granulation.
- **Single superphosphate ("*SSP*")** SSP is a crop nutrient with a low concentration of phosphorus that is used in agriculture because of the sulfur content in its formulation. SSP is produced from mixing phosphate rock with sulfuric acid in a kuhlmann or malaxador type reactor. After the reaction, the product goes to the curing process and then feeds the granulation units.
- **Dicalcium phosphate ("*DCP*")** Dicalcium phosphate is produced by the reaction of desulphurized phosphoric acid with limestone. At Uberaba, it is produced from the reaction of concentrated phosphoric acid with limestone slurry. At Cajati the phosphoric acid is diluted with dry limestone. The reaction of the DCP occurs in a kuhlmann or spinden type reactor.

Our primary mines and chemical plants are located in the states of Minas Gerais, São Paulo, and Goias. Production of our animal feed ingredients products is located at our Uberaba, Minas Gerais, and Cajati, São Paulo facilities. We market our feed phosphate primarily under the brand name Foscálcio.

Annual capacity and production volume by plant as of December 31, 2021 are listed below:

(tonnes of ore in millions)	***Phosphoric acid***		***Processed Phosphate[a] (MAP/TSP/SSP/DCP/Feed)***	
Facility	**Capacity[b]**	**Production[c]**	**Capacity[b]**	**Production[c]**
Phosphate				
Uberaba	0.9	0.8	1.8	1.5
Cajati	0.2	0.1	0.5	0.4
Araxá	—	—	1.0	1.0
Catalão	—	—	0.4	0.4
Total	1.1	0.9	3.7	3.3

(a) Our ability to produce processed phosphates has been less than our annual operational capacity as stated in the table above, except to the extent we purchase phosphoric acid. Factors affecting actual production are described in note (c) below.
(b) The annual production capacity was calculated using the hourly capacity, days stopped for annual maintenance and OEE (historical utilization factor and capacity factor).
(c) Actual production varies from annual operational capacity shown in the table above due to factors that include, among others, the level of demand for our products, maintenance and turnaround time, accidents and mechanical failure.

The phosphoric acid produced at Cajati is used to produce DCP. The phosphoric acid produced at Uberaba is used to produce MAP, TSP and DCP.

We produced approximately 2.9 million tonnes of concentrated phosphate crop nutrients during 2021 which accounted for approximately 51% of estimated Brazilian annual production.

Phosphate Rock

Phosphate rock is the key mineral used to produce phosphate crop nutrients and animal feed product. Our phosphate rock production in Brazil totaled approximately 4.0 million tonnes in 2021, which accounted for approximately 73% of estimated Brazilian annual production. We are the largest producer of phosphate rock in Brazil and currently operate five properties with a combined annual capacity of approximately 4.6 million tonnes. Production of one tonne of MAP requires 1.6 to 1.7 tonnes of phosphate rock. Production of one tonne of SSP requires between 0.6 to 0.7 tonnes of phosphate rock. Production of one tonne of TSP requires 1.4 tonnes of phosphate rock.

During 2021, we operated five properties; Araxá, Patrocínio and Tapira, in the state of Minas Gerais; Catalão, in the state of Goiás; and Cajati, in the state of São Paulo.

See Item 2, “Properties” for a discussion of our Brazilian mining properties, including processing methods, facilities, production and summaries of our mineral resources and reserves, both in the aggregate and for our individually material Brazilian properties.

We are required to pay royalties to mineral owners and resource taxes to the Brazilian government for phosphate and potash production. The resource taxes, known as Compensação Financeira pela Exploração de Recursos Minerais or CFEM, are regulated by the National Mining Agency. In 2021, we paid royalties and resource taxes of approximately $9.3 million.

Sulfur

We use molten sulfur at our phosphates concentrates plants to produce sulfuric acid, one of the key components used in the production of phosphoric acid. We consumed approximately 1.2 million long tons of sulfur for our own production during 2021. We purchase approximately 26% of the volume under annual supply agreements from oil and natural gas refiners, who are required to remove or recover sulfur during the refining process. The remaining 74% is purchased in the spot market. Sulfur is imported through the Tiplam port and transported by rail to the Uberaba plant and by truck to the Araxá and Cajati locations.

Although sulfur is readily available from many different suppliers and can be transported to our phosphate facilities by a variety of means, sulfur is an important raw material used in our business that has in the past been, and could in the future be, subject to volatile pricing and availability. Alternative transportation and terminaling facilities might not have sufficient capacity to fully serve all of our facilities in the event of a disruption to current transportation or terminaling facilities. Changes in the price of sulfur or disruptions or sulfur transportation or terminaling facilities could have a material impact on our business.

Ammonia

We use ammonia, together with phosphoric acid, to produce MAP, and to a lesser extent for SSP production. We consumed approximately 133,507 tonnes of ammonia during 2021. Production of one tonne of MAP requires approximately 0.137 tonnes of ammonia. We purchase all of our ammonia under a long-term supply agreement with two suppliers. Ammonia is imported through the Tiplam port and transported by truck to Uberaba, Araxá and Catalão.

We own approximately 1% of the Tiplam terminal in Santos, São Paulo. Our ownership percentage, along with a contractual agreement, guarantee us unloading priority for ammonia and also provide us unloading capacity for rock, sulfur and crop nutrients.

Although ammonia is readily available from many different suppliers and can be transported to our phosphates facilities by a variety of means, ammonia is an important raw material used in our business that has in the past been, and in the future could be, subject to volatile pricing. Alternative transportation and terminaling facilities might not have sufficient capacity to fully serve all of our facilities in the event of a disruption to existing transportation or terminaling facilities. Changes in the price of ammonia or disruptions to ammonia transportation of terminaling could have a material impact on our business.

Brazilian Potash

We conduct potash operations through the leased Taquari-Vassouras shaft mine, which is the only potash mine in Brazil, located in Rosário do Catete in the Brazilian state of Sergipe. We also own a related refinery at the site. We produce and sell potash product domestically. MOP is the primary source of potassium for the crop nutrient industry in Brazil. Red MOP has traces of iron oxide. The granular and standard grade red MOP products are well-suited for direct fertilizer application and bulk blending. Our potash product is marketed in Brazil to crop nutrient manufacturers, distributors and retailers and is also used in the manufacturing of crop nutrients.

In 2021, we paid royalties of approximately $7 million related to the leasing of potash assets and mining rights for Taquari.

Land Holdings

Mosaic Fertilizantes owns properties and the surface rights of certain additional rural lands comprising over 35,000 hectares (86,500 acres) in the States of São Paulo, Minas Gerais, Goiás, Paraná, Mato Grosso, Santa Catarina, Bahia and Sergipe, and has the right to mine additional properties which contain phosphate rock or potash reserves. Most of our land holdings are needed to operate our phosphate and potash production and fertilizer distribution businesses. A portion of our land assets may no longer be required for our current operations and may be leased to third parties, for agricultural or other purposes, or may be set aside for mineral or environmental conservation. Our real property assets are generally comprised of concentrates plants, port facilities and phosphate and potash mines, crop nutrient blending and bagging facilities and other properties which we have acquired through our presence in Brazil.

India and China Distribution Businesses

Our China and India distribution businesses market phosphate-, potash- and nitrogen-based crop nutrients and provide other ancillary services to wholesalers, cooperatives, independent retailers, and farmers in the Asia-Pacific regions. These operations provide our Phosphates and Potash segments access to key markets outside of North and South America and serve as a marketing agent for our Phosphates segment. In 2021, the India and China operations purchased 294,729 tonnes of phosphate-based products from our Phosphates segment and MWSPC, and 1,105,257 tonnes of potash products from our Potash segment and Canpotex. They also purchase phosphates, potash and nitrogen products from unrelated third parties, which we either use to produce blended crop nutrients or for resale.

In China, we own two 300,000-tonne per year capacity blending plants. In 2021, we sold approximately 175,000 tonnes of Blends and distributed another 815,000 tonnes of phosphate and potash crop nutrients in China.

In India, we have distribution facilities to import and sell crop nutrients. In 2021, we distributed approximately 635,000 tonnes of phosphate and potash crop nutrient products in India.

SALES AND DISTRIBUTION ACTIVITIES

United States and Canada

We have a United States and Canada sales and marketing team that serves our business segments. We sell to wholesale distributors, retail chains, cooperatives, independent retailers and national accounts.

Customer service and the ability to effectively minimize the overall supply chain costs are key competitive factors in the crop nutrient and animal feed ingredients businesses. In addition to our production facilities, to service the needs of our customers, we own or have contractual throughput or other arrangements at strategically located distribution warehouses along or near the Mississippi and Ohio Rivers as well as in other key agricultural regions of the United States and Canada. From these facilities, we distribute Mosaic-produced phosphate and potash products for customers who in turn resell the product into the distribution channel or directly to farmers in the United States and Canada.

We own port facilities in Tampa, Florida, which have deep water berth capabilities providing access to the Gulf of Mexico. We also own warehouse distribution facilities in Savage, Minnesota; Rosemount, Minnesota; Pekin, Illinois; and Henderson, Kentucky. The Savage, Minnesota facility has been idled awaiting decisions on future use or sale.

In addition to the facilities that we own, our U.S. distribution operations also include leased distribution space or contractual throughput agreements in other key geographical areas including California, Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, Texas and Wisconsin.

Our Canadian customers include independent dealers and national accounts. We also lease or own warehouse facilities in Saskatchewan, Ontario, Quebec and Manitoba in Canada.

International

Outside of the United States and Canada, we market our Phosphates segment's products through our Mosaic Fertilizantes segment and our China and India distribution businesses, as well as a salesforce focused on geographies outside of North America. The countries that account for the largest amount of our phosphates sales outside the United States, by volume, are Brazil, Canada, Colombia and Mexico.

Our sales outside of the United States and Canada of potash products are made through Canpotex. Canpotex sales are allocated between its members based on peaking capacity. In 2021, our entitlement percentage of Canpotex is 36.2%.

Our potash exports from Carlsbad are sold through our own sales force. We also market our Potash segment's products through our Mosaic Fertilizantes segment and our China and India distribution businesses, which acquire potash primarily through Canpotex. The countries that account for the largest amount of international potash sales, by volume, are Brazil, China, Indonesia, India and Malaysia.

To service the needs of our customers, our Mosaic Fertilizantes segment includes a network of strategically located sales offices, crop nutrient blending and bagging facilities, port terminals and warehouse distribution facilities that we own and operate. The blending and bagging facilities primarily produce Blends from phosphate, potash and nitrogen. The average product mix in our Blends (by volume) contains approximately 18% nitrogen, 50% phosphate, and 32% potash, although this mix differs based on seasonal and other factors. All of our production in Brazil is consumed within the country.

Our India and China distribution businesses also includes a network of strategically located sales offices, crop nutrient blending and bagging facilities, port terminals and warehouse distribution facilities. These businesses serve primarily as a sales outlet for our North American phosphates production, as well as additional phosphate production we market from our MWSPC joint venture, both for resale and as an input for Blends. Our Potash segment also has historically furnished the majority of the raw materials needs for the production of Blends, primarily via Canpotex, and is expected to continue to do so in the future.

Other Products

With a strong brand position in a multi-billion dollar animal feed ingredients global market, our Phosphates segment supplies animal feed ingredients for poultry and livestock to customers in North America, Latin America and Asia. Our potash sales to non-agricultural users are primarily to large industrial accounts and the animal feed industry. Additionally, in North America, we sell potash for de-icing and as a water softener regenerant. In Brazil, we also sell phosphogypsum.

COMPETITION

Because crop nutrients are global commodities available from numerous sources, crop nutrition companies compete primarily on the basis of delivered price. Other competitive factors include product quality, cost and availability of raw materials, customer service, plant efficiency and availability of product. As a result, markets for our products are highly competitive. We compete with a broad range of domestic and international producers, including farmer cooperatives, subsidiaries of larger companies, and independent crop nutrient companies. Foreign competitors may have access to cheaper raw materials, may not have to comply with as stringent regulatory requirements or are owned or subsidized by governments and, as a result, may have cost advantages over North American companies. We believe that our extensive North American and international production and distribution system provides us with a competitive advantage by allowing us to achieve economies of scale, transportation and storage efficiencies, and obtain market intelligence. Also, we believe our performance products, such as MicroEssentials®, provide us a competitive advantage with customers in North and South America.

Unlike many of our competitors, we have our own distribution system to sell phosphate- and potash-based crop nutrients and animal feed ingredients, whether produced by us or by other third parties, around the globe. In North America, we have one of the largest and most strategically located distribution systems for crop nutrients, including warehouse facilities in key agricultural regions. We also have an extensive network of distribution facilities internationally, including in the key growth regions of South America and Asia, with port terminals, warehouses, and blending plants in Brazil, Paraguay, China, and India. Our global presence allows us to efficiently serve customers in approximately 40 countries.

Phosphates Segment

Our Phosphates segment operates in a highly competitive global market. Among the competitors in the global phosphate industry are domestic and foreign companies, as well as foreign government-supported producers in Asia and North Africa. Phosphate producers compete primarily based on price, as well as product quality, service and innovation. Major integrated producers of feed phosphates are located in the United States, Europe and China. Many smaller producers are located in emerging markets around the world. Many of these smaller producers are not miners of phosphate rock or manufacturers of phosphoric acid and are required to purchase this material on the open market.

We believe that we are a low-cost integrated producer of phosphate-based crop nutrients, due in part to our scale, vertical integration and strategic network of production and distribution facilities. As the world's second largest producer of concentrated phosphates, as well as the second largest miner of phosphate rock in the world and the largest in the United States, we maintain an advantage over some competitors as the scale of operations effectively reduces production costs per unit. We are also vertically integrated to captively supply one of our key inputs, phosphate rock, to our phosphate production facilities. We believe that our position as an integrated producer of phosphate rock provides us with a significant cost advantage over competitors that are non-integrated phosphate producers. In addition, our ownership in the Miski Mayo Mine allows us to supplement our overall phosphate rock needs. We also sell approximately 25% of Miski Mayo production to third parties. MWSPC enables us to not only further diversify our sources of phosphates but also improve our access to key agricultural countries in Asia and the Middle East.

We produce ammonia at our Faustina, Louisiana concentrates plant in quantities sufficient to meet approximately one third of our total ammonia needs in North America. We do not have ammonia production capacity within Florida to serve our Florida operations, but we have capacity to supply a portion of our requirements by transporting produced ammonia from Louisiana to Florida. We purchase additional ammonia from world markets and thus are subject to significant volatility in our purchase price of ammonia. The CF Ammonia Supply Agreement provides us with a long-term supply of a substantial volume of ammonia at prices based on the price of natural gas.

With our dedicated sulfur transportation barges and tugs, and our 50% ownership interest in Gulf Sulphur Services, we are also well-positioned to source an adequate, flexible and cost-effective supply of sulfur, our third key input, to our Florida and Louisiana phosphate production facilities. We believe that our investments in sulfur logistical and melting assets continue to afford us a competitive advantage compared to other producers in cost and access to sulfur.

With facilities in both central Florida and Louisiana, we are logistically well positioned to fulfill our material needs at very competitive prices. Those multiple production points also afford us the flexibility to optimally balance supply and demand.

Potash Segment

Potash is a commodity available from several geographical regions around the world and, consequently, the market is highly competitive. Through our participation in Canpotex, we compete outside of North America against various independent and state-owned potash producers. Canpotex has substantial expertise and logistical resources for the international distribution of potash, including strategically located export assets in Portland, Oregon, St. John, New Brunswick, and Vancouver, British Columbia. Our principal methods of competition with respect to the sale of potash include product pricing, and offering consistent, high-quality products and superior service. We believe that our potash cost structure is competitive in the industry and should improve as we continue to complete our potash expansion projects.

Mosaic Fertilizantes

The Mosaic Fertilizantes segment operates in a highly competitive market in Brazil. We compete with a broad range of domestic and international producers, including farmer cooperatives, subsidiaries of larger companies, and independent crop nutrient companies. We believe that having a vertically integrated business, internationally but also in Brazil, provides us with a competitive advantage by allowing us to achieve economies of scale, transportation and storage efficiencies, and obtain market intelligence.

Mosaic Fertilizantes has a wide variety of customers including farmers, blenders, and other local distributors. We compete with local businesses that offer a wide variety of products that are available from many sources. We believe the strategic location of our mines and chemical plants, in close proximity to our customers, and the benefit of our own distribution network, gives us an advantage over most of our competitors. The vertical integration of our wholly-owned production, along with our distribution network, as well as our focus on product innovation and customer solutions, position us with an

advantage over many of our competitors. We have a strong brand in Brazil. In addition to having access to our own production, our distribution activities have the capability to supply a wide variety of crop nutrients to our dealer/farmer customer base.

FACTORS AFFECTING DEMAND

Our results of operations historically have reflected the effects of several external factors which are beyond our control and have in the past produced significant downward and upward swings in operating results. Revenues are highly dependent upon conditions in the agriculture industry and can be affected by, among other factors: crop conditions; changes in agricultural production practices; worldwide economic conditions, including the increasing world population, household incomes, and demand for more protein-rich food, particularly in developing regions such as China, India and Latin America; changing demand for biofuels; variability in commodity pricing; governmental policies; the level of inventories in the crop nutrient distribution channels; customer expectations about farmer economics, future crop nutrient prices and availability, and transportation costs, among other matters; market trends in raw material costs; market prices for crop nutrients; and weather. Furthermore, our crop nutrients business is seasonal to the extent farmers and agricultural enterprises in the markets in which we compete purchase more crop nutrient products during the spring and fall. The international scope of our business, spanning the northern and southern hemispheres, reduces to some extent the seasonal impact on our business. The degree of seasonality of our business can change significantly from year to year due to conditions in the agricultural industry and other factors. The seasonal nature of our businesses requires significant working capital for inventory in advance of the planting seasons.

We sell products throughout the world. Unfavorable changes in trade protection laws, policies and measures, government policies and other regulatory requirements affecting trade; unexpected changes in tax and trade treaties; and strengthening or weakening of foreign economies as well as political relations with the United States may cause sales trends to customers in one or more foreign countries to differ from sales trends in the United States.

Our international operations are subject to risks from changes in foreign currencies, or government policy, which can affect local farmer economics.

OTHER MATTERS

Employees

We had 12,525 employees as of December 31, 2021, consisting of approximately 9,300 salaried and 3,200 hourly employees. There are also approximately 200 salaried and 500 hourly employees at the Miski Mayo Mine, of which we own 75% and its results are consolidated within our results of operations.

Labor Relations

As of December 31, 2021:

- We had twenty collective bargaining agreements with unions covering certain hourly employees in the U.S. and Canada. Of these employees, approximately 49% are covered under collective bargaining agreements which expire in 2022. All are expected to collectively bargain for new contracts in 2022.
- We had agreements with 34 unions covering all employees in Brazil. More than one agreement may govern our relations with each of these unions. In general, the agreements are renewable on an annual basis.

Failure to renew any of our union agreements could result in a strike or labor stoppage that could have a material adverse effect on our operations. However, we have not experienced a significant work stoppage in many years and historically have had good labor relations.

Information Available on our Website

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments thereto, filed with the SEC pursuant to Section 13(a) of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder are made available free of charge on our website (www.mosaicco.com) as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. These reports are also available on the SEC's website (www.sec.gov). The information contained on our website and the SEC's website is not being incorporated in

this report.

HUMAN CAPITAL

Our employees are the foundation of our Company. Our 12,525 colleagues embody Mosaic's core values of innovation, collaboration, drive and responsibility, and are the key to enabling us to execute our mission to help the world grow the food it needs.

As of December 31, 2021, our regular employee base was made up of the following:

Country	Male	Female	Total
Brazil	5,621	1,008	6,629
Canada	1,612	277	1,889
China	105	51	156
India	56	9	65
Paraguay	41	13	54
United States	3,146	585	3,731
Saudi Arabia	1	—	1
Total	10,582	1,943	12,525

Mosaic is committed to the well-being and development of our employees by creating and cultivating an innovative and collaborative workplace that welcomes, values and respects diversity of people, thoughts, and perspectives; a workplace free of discrimination and intolerant of bias. As part of Mosaic's strategic priorities, we are committed to prioritizing our internal culture and external partnerships to meet our commitments to our employees and stakeholders and to be an employer of choice for generations to come.

Employee Health and Safety–safety is non-negotiable. We strive for zero harm to people and zero environmental incidents. Through the implementation of the Mosaic Management System, we have established a structured approach to effectively manage and control risk for the safety and well-being of our colleagues, the environment and our stockholders. The management system defines processes that help support a safe work environment and establishes a continuous improvement cycle to adjust for changing conditions and identified risks.

Global Worker Wellness–extending beyond safety, our wellness programs seek to improve the well-being of our employees – and their families – in the areas of physical and psychological health, and financial security. These programs include health screenings, insurance plans and mental health resources, as well as our Environmental, Health and Safety (*"**EHS**"*) Risk Reduction Program, various trainings and flexible schedules.

- In 2021, we continued to build more flexibility into our pay and leave policies and medical plans to help our employees with any potential or confirmed exposure to Covid-19. We limited the number of employees to those who critically needed to be on site and allowed others to work remotely. We also put a significant amount of preventative measures in place globally to reduce the exposure risk to employees and contractors, including mask requirements, social distancing policies, travel limitations, virtual audits, ultraviolet (UV) light installation, filter upgrades, increased sanitization, ongoing incentives to encourage vaccination and much more.

Development–Mosaic believes in continually investing in people and their lifelong learning. Mosaic holds training events throughout the year across all of our locations, and hosts an online education platform, GrowingU, which all employees are encouraged to access. Mosaic offers companywide educational reimbursement programs to help employees in each of our operating companies acquire new skills and capabilities to better meet their job responsibilities and provide for future career opportunities within the Company. Mosaic supports membership in numerous professional associations and encourages participation in work-related external networking groups.

- In 2021, Mosaic continued its pilot programs to help employees gain the knowledge and skills that we believe will be necessary for the next evolution of our business. Like any company, Mosaic experiences turnover and the need to replace talent related to retirement and succession. Mosaic seeks to minimize unwanted turnover through its talent review, succession management, performance management, and compensation processes. For certain roles critical to

our operations, such as engineering, operations, and employee health and safety professionals, we maintain specific talent programs, internal development strategies, and recruitment pipelines.

Community–Mosaic is an active contributor to the communities in which we operate. In addition to philanthropic grants and sponsorships of local programs, we also support and facilitate volunteerism by our employees. We also participate on local committees and associations focused on contributing to the vitality of the people and communities around us.

- In 2021, we initiated the Mosaic Employee Giving Program that provides employees with greater flexibility in leveraging matching funds from The Mosaic Company Foundation and aligns to Mosaic's strategic priorities and our 2025 Environmental, Social and Governance performance targets. Employees can take advantage of matching funds through financial contributions, volunteering, or both - up to $2,000 annually. The opportunity to offer volunteering incentives is an exciting addition we hope provides employees equal opportunity to participate in helping our communities prosper. We also participate on local committees and associations focused on contributing to the vitality of the people and the communities around us.

Diversity, Inclusion and Equal Opportunities–In 2021, Mosaic's Diversity and Inclusion Task Force engaged in several initiatives to advance Mosaic's commitments to our employees and stakeholders to do more to ensure a diverse and inclusive environment. Initiatives included conducting a global listening strategy to ascertain the current culture as well as conducting Conscious Inclusion training for all salaried and graded employees globally.

- Pay equity is fundamental to our compensation philosophy and our commitment to diversity and inclusion. Mosaic annually evaluates pay equity and compensation practices to ensure fair and equitable treatment of employees based on our pay-for-performance framework. In 2020, Mosaic retained an independent consultant to assist with our pay equity analysis on the basis of both gender and ethnicity across our global operations. The results revealed fewer than .05% outliers without adequate business justifications. Mosaic addressed each of the instances during our 2021 compensation cycle. We expect to conduct external independent reviews every three years.

Looking ahead to 2022, Mosaic will continue to evolve and build upon current initiatives to ensure inclusion and diversity across our global operations, including driving diversity and inclusion education deeper into the organization, concentrating on attracting a more diverse pipeline of talent and introduction of Employee Inclusion Networks to facilitate increased awareness, engagement and inclusion within our employee populations. Additional information about our human capital, including our recently announced diversity and inclusion goals for 2030, will be available in the sustainability report posted on our website. The information contained on our website is not being incorporated in this report.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Information regarding our executive officers as of February 23, 2022 is set forth below:

Name	Age	Position
Bruce M. Bodine Jr.	50	Senior Vice President - North America
Clint C. Freeland	53	Senior Vice President and Chief Financial Officer
Mark J. Isaacson	59	Senior Vice President, General Counsel and Corporate Secretary
Christopher A. Lewis	59	Senior Vice President - Human Resources
James "Joc" C. O'Rourke	61	Chief Executive Officer, President and Director
Benjamin J. Pratt	55	Senior Vice President - Government and Public Affairs
Walter F. Precourt III	57	Senior Vice President - Strategy and Growth
Corrine D. Ricard	58	Senior Vice President - Mosaic Fertilizantes
Karen A. Swager	51	Senior Vice President - Supply Chain
Yijun ("Jenny") Wang	54	Senior Vice President - Global Strategic Marketing, Head of China and India

Bruce M. Bodine Jr. Mr. Bodine was named Senior Vice President - North America effective April 1, 2020. From January 1, 2019 until his appointment as Senior Vice President - North America, Mr. Bodine served as our Senior Vice President - Phosphates and, also provided executive oversight for the corporate procurement organization. Prior to that, he served as our Senior Vice President - Potash (from June 2016 to December 31, 2018); as our Vice President - Potash (from April to May 2016); as our Vice President - Supply Chain (from August 2015 to March 2016); as our Vice President - Operations Business

Development (from October 2014 to August 2015); as Vice President - Operations for our Esterhazy and Colonsay potash production facilities (from July 2013 to October 2014); as the General Manager, Esterhazy (from September 2012 to June 2013); and as the General Manager, Four Corners (from March 2010 to August 2012). Before that, Mr. Bodine held various plant and mine development management positions in the Phosphates segment beginning with Mosaic's formation in 2004. Mr. Bodine serves as a director of MVM Resources International, B.V., the general partner of Compañia Minera Miski Mayo S.R.L., the joint venture that operates the mines in Peru.

Clint C. Freeland. Mr. Freeland was named Senior Vice President and Chief Financial Officer in June 2018. Prior to joining Mosaic, Mr. Freeland served as Executive Vice President and Chief Financial Officer of Dynegy Inc. from July 2011 until Dynegy's merger with Vistra Energy Corp. in April 2018. Mr. Freeland was responsible for Dynegy's financial affairs, including finance and accounting, treasury, tax and banking and credit agency relationships. In November 2011, as part of a reorganization of its subsidiaries, certain of Dynegy's affiliates filed voluntary petitions for reorganization under Chapter 11 of the U.S. Bankruptcy Code (the "***Code***") and, in July 2012, Dynegy filed a voluntary petition for reorganization under Chapter 11 of the Code. Dynegy emerged from Bankruptcy in October 2012. Prior to joining Dynegy, Mr. Freeland served as Senior Vice President, Strategy & Financial Structure of NRG Energy, Inc. from February 2009 to July 2011. Mr. Freeland served as NRG's Senior Vice President and Chief Financial Officer from February 2008 to February 2009 and its Vice President and Treasurer from April 2006 to February 2008. Prior to joining NRG, Mr. Freeland held various key financial roles within the energy sector.

Mark J. Isaacson. Mr. Isaacson was named Senior Vice President, General Counsel and Corporate Secretary in August 2015 and previously served as our Vice President, General Counsel and Corporate Secretary since August 2014. Mr. Isaacson joined Mosaic upon its formation in 2004 as its Chief Phosphates Counsel before being promoted to Vice President, Associate General Counsel and Chief Compliance Officer in 2011 and to Vice President, Acting General Counsel and Corporate Secretary in June 2014. Prior to joining Mosaic, Mr. Isaacson worked for 15 years at Cargill, Inc., where he served as Senior Attorney for a number of its business units.

Christopher A. Lewis. Mr. Lewis was named Senior Vice President - Human Resources in June 2019. Prior to joining Mosaic, Mr. Lewis held the role of Vice President, Project Execution for Spectra Energy Corporation's merger into Calgary, Alberta, Canada-based Enbridge, Inc. where he led construction of the companies' energy assets throughout North America, as well as a synergy capture program post acquisition. Prior to that role, Lewis held roles at DCP Midstream, LLC, a natural gas company based in Denver, where he started as the head of Human Resources while the company was formed as a spin-off from Duke Energy in 2007. From 2010 to 2016, he was DCP's Chief Corporate Officer, a multi-functional role that included leadership of the human resources function. Earlier in his career, Lewis held regional and global senior human resources positions at Thomson Multimedia (formerly RCA, GE consumer electronics) and DHL, Inc.

James "Joc" C. O'Rourke. Mr. O'Rourke was promoted to President and Chief Executive Officer effective in August 2015. Previously, he served as Executive Vice President - Operations and Chief Operating Officer since August 2012 and before that as Executive Vice President - Operations since January 2009. Prior to joining Mosaic, Mr. O'Rourke was President, Australia Pacific for Barrick Gold Corporation, the largest gold producer in Australia, since May 2006, where he was responsible for the Australia Pacific Business Unit, consisting of ten gold and copper mines in Australia and Papua New Guinea. Before that, Mr. O'Rourke was Executive General Manager in Australia and Managing Director of Placer Dome Asia Pacific Ltd., the second largest gold producer in Australia, from December 2004, where he was responsible for the Australia Business Unit, consisting of five gold and copper mines; and General Manager of Western Australia Operations for Iluka Resources Ltd., the world's largest zircon and second largest titanium producer, from September 2003, where he was responsible for six mining and concentrating operations and two mineral separation/synthetic rutile refineries. Mr. O'Rourke had previously held various management, engineering and other roles in the mining industry in Canada and Australia since 1984. Mr. O'Rourke has served on our Board of Directors since May 2015 and is also a director of The Toro Company.

Benjamin J. Pratt. Ben Pratt was named Senior Vice President - Government and Public Affairs in April 2020. Previously, Mr. Pratt held the position of Vice President - Corporate Public Affairs, leading corporate communications and U.S. Federal Government relations, as well as Mosaic's corporate social responsibility activities. In addition, Mr. Pratt serves as Owner's Representative to Streamsong Resort. Prior to joining Mosaic in February 2012, Mr. Pratt was Senior Vice President, Corporate Communications at Ameriprise Financial, Inc., in Minneapolis. Earlier in his career, he worked in a variety of communications and investor relations capacities at The PNC Financial Services Group in Pittsburgh, and at Lehman Brothers and Bear Stearns, both in New York.

Walter F. Precourt III. Mr. Precourt was named Senior Vice President - Strategy and Growth effective January 1, 2019. From June 2016 through March 2020 he also provided executive oversight for the EHS organization. He previously served as Senior Vice President - Phosphates and provided executive oversight for the corporate procurement organization from June 2016 until January 1, 2019, as our Senior Vice President - Potash Operations from May 2012 to June 2016, and before that he led our Environment, Health and Safety organization since joining Mosaic in 2009. Prior to joining Mosaic, Mr. Precourt was employed by cement and mineral component producer Holcim (U.S.) where he initially led its safety transformation and later became Vice President of Environment and Government Affairs. Mr. Precourt started his career at The Dow Chemical Company where he served in a variety of roles in Operations, Technology, Capital Project Management, and Environmental, Health and Safety. Mr. Precourt served as a director and was the past Chairman of the Board of the Saskatchewan Potash Producers Association and was a director of Fertilizer Canada.

Corrine D. Ricard. Ms. Ricard was appointed Senior Vice President - Mosaic Fertilizantes effective November 15, 2019. Prior to that she served as Senior Vice President - Commercial since February 2017, Senior Vice President - Human Resources from April 2012 to February 2017, and before that she held a number of other leadership positions at Mosaic, including Vice President - International Distribution, Vice President - Business Development and Vice President - Supply Chain. Prior to Mosaic's formation, Ms. Ricard worked for Cargill in various roles, including risk management, supply chain and commodity trading.

Karen A. Swager. Ms. Swager was named Senior Vice President - Supply Chain effective April 1, 2020, and also provides executive oversite for the Procurement and corporate EHS teams. From January 1, 2019 until her appointment as Senior Vice President - Supply Chain, she served as Senior Vice President - Potash. Previously, Ms. Swager held leadership positions at Mosaic, including Vice President - Minerals, Vice President - Mining Operations and General Manager in our Phosphates business. She also led the mine planning and strategy group for the Phosphates business.

Yijun ("Jenny") Wang. Ms. Wang was named Senior Vice President - Global Strategic Marketing, Head of China and India effective January 1, 2022. From October 15, 2020 until her appointment as Senior Vice President - Global Strategic Marketing, Head of China and India, Ms. Wang served as Vice President - Global Strategic Marketing. Prior to October 2020, Ms. Wang served as Vice President - Global Product Management and International Distribution and before May 2019, Ms. Wang served as Country Head for China. Ms. Wang has served on the Board of Directors at Canpotex.

Our executive officers are generally elected to serve until their respective successors are elected and qualified or until their earlier death, resignation or removal. No "family relationships," as that term is defined in Item 401(d) of Regulation S-K, exist among any of the listed officers or between any such officer and any member of our board of directors.

Item 1A. Risk Factors.

Our business, financial condition or results of operations could be materially adversely affected by any of the risks and uncertainties described below.

Operational Risks

The Covid-19 pandemic may materially adversely affect our business operations and financial condition.

The Covid-19 pandemic continues to impact the global economy and could significantly disrupt our operations, key suppliers or third-party logistics providers, customers and ultimate end-users due to the spread of the virus, shelter in place orders, quarantines or other measures implemented to prevent the spread of the virus. In some instances, the pandemic has impacted our business. As part of government mandates, our Patrocinio operations in Brazil and Miski Mayo operations in Peru were temporarily suspended at the onset of the pandemic, but have since resumed operations. Businesses have been impacted by short-term labor shortages due to illness, transportation issues such as trucking delays and port congestion which are slowing delivery of inputs to facilities and products to end customers. At this time, the Company has only experienced limited adverse financial and operational Covid-19 related conditions.

An increase in severity to our employees, customers, vendors or supply chain or governmental mandates, could have a material adverse effect on our business, financial condition and/or results of operations. The extent to which the Covid-19 pandemic impacts our operations and financial results will depend on future developments that are highly uncertain, including new information concerning the severity of the virus and variants and the cost, time and actions taken to contain its impact.

Other cascading effects of the Covid-19 pandemic that are not currently foreseeable could materially increase our costs, negatively impact our revenue and/or adversely impact our results of operations and liquidity, possibly to a significant degree. We cannot predict the severity or duration of any such impacts. The Covid-19 pandemic could also have the effect of heightening many of the other risks described in this Item 1A of this 10-K Report.

Our operating results are highly dependent upon and fluctuate based upon business and economic conditions and governmental policies affecting the agricultural industry in which we or our customers operate. These factors are outside of our control and may significantly affect our profitability.

The most important of these factors are:

- weather and field conditions (particularly during periods of traditionally high crop nutrients consumption);
- quantities of crop nutrients imported and exported;
- current and projected inventories and prices, which are heavily influenced by U.S. exports and world-wide markets; and
- governmental policies, including farm and biofuel policies, which may directly or indirectly influence the number of acres planted, the level of inventories, the mix of crops planted or crop prices or otherwise negatively affect our operating results.

International market conditions, which are also outside of our control, may also significantly influence our operating results. The international market for crop nutrients is influenced by such factors as the relative value of the U.S. dollar and its impact upon the cost of importing crop nutrients, foreign agricultural policies, including subsidy policies, the existence of, or changes in, import or foreign currency exchange barriers in certain foreign markets, changes in the hard currency demands of certain countries and other regulatory policies of foreign governments, as well as the laws and policies of the United States affecting foreign trade and investment, including use of tariffs. In 2020, we filed petitions with the DOC and ITC that requested the initiation of countervailing duty investigations into imports of phosphate fertilizers from Morocco and Russia. The purpose of the petitions was to remedy the distortions that we believe foreign subsidies have caused or are causing in the U.S. market for phosphate fertilizers, and thereby restore fair competition. During the first quarter of 2021, the DOC made final affirmative determinations that countervailable subsidies were being provided by those governments and the ITC made final affirmative determinations that the U.S. phosphate fertilizer industry is materially injured by reason of subsidized phosphate fertilizer imports from Morocco and Russia. As a result of these determinations, the DOC issued countervailing duty orders on phosphate fertilizer imports from Russia and Morocco, which are scheduled to remain in place for at least five years. Currently, the cash deposit rates for such imports are approximately 20 percent for Moroccan producer OCP, 9 percent and 47 percent for Russian producers PhosAgro and Eurochem, respectively, and 17 percent for all other Russian producers. The final determinations in the DOC and ITC investigations are subject to possible challenges before U.S. federal courts and the World Trade Organization, and Mosaic has initiated actions at the U.S. Court of International Trade contesting certain aspects of the DOC's final determinations that, we believe, failed to capture the full extent of Moroccan and Russian phosphate fertilizer subsidies. Moroccan and Russian producers have also initiated U.S. Court of International Trade actions, seeking lower cash deposit rates and revocation of the countervailing duty orders. Further, the cash deposit rates and the amount of countervailing duties owed by importers on such imports could change based on the results of the DOC's annual administrative review proceedings. If the final determinations are challenged and subsequently reversed, the results could have an adverse effect on our business, and/or our financial condition or operating results.

Our crop nutrient business is seasonal and varies based on application rates, which may result in carrying significant amounts of inventory and seasonal variations in working capital, and our inability to predict future seasonal crop nutrient demand accurately may result in excess inventory or product shortages.

The use of crop nutrients is seasonal and varies based on application rates. Farmers tend to apply crop nutrients during two short application periods, the strongest one in the spring, before planting, and the other in the fall, after harvest. As a result, the strongest demand for our products typically occurs during the spring planting season, with a second period of strong demand following the fall harvest. In contrast, we and other crop nutrient producers generally produce our products throughout the year. As a result, we and/or our customers generally build inventories during the low demand periods of the year in order to ensure timely product availability during the peak sales seasons. The seasonality of crop nutrient demand results in our sales volumes and net sales typically being the highest during the North American spring season and our working capital requirements typically being the highest just prior to the start of the spring season. Our quarterly financial results can vary significantly from one year to the next due to weather-related shifts in planting schedules and purchasing patterns.

If seasonal demand exceeds our projections, we will not have enough product and our customers may acquire products from our competitors, which would negatively impact our profitability. If seasonal demand is less than we expect, we will be left with excess inventory and higher working capital and liquidity requirements. The degree of seasonality of our business can change significantly from year to year due to conditions in the agricultural industry and other factors.

Changes in transportation costs can affect our sales volumes and selling prices.

The cost of delivery is a significant factor in the total cost to customers and farmers of crop nutrients. As a result, changes in transportation costs, or in customer expectations about them, can affect our sales volumes and prices.

A disruption to our production, distribution or terminaling facilities could have a material adverse impact on our business. The risk of material disruption increases when demand for our products results in high operating rates at our facilities.

We conduct our operations through a limited number of key production, distribution and terminaling facilities. These facilities include our phosphate mines and concentrates plants; our potash mines; and the ports and other distribution facilities through which we, Canpotex and the other joint ventures in which we participate, conduct our respective businesses, as well as other commercial arrangements with unrelated third parties. Any disruption of operations at any one of these facilities has the possibility of significantly negatively affecting our production or our ability to distribute our products.

Examples of the types of events that could result in a disruption at one of these facilities include: adverse weather; strikes or other work stoppages; civil unrest; deliberate, malicious acts, including acts of terrorism and armed conflict; political or economic instability; cyberattacks; changes in permitting, financial assurance or certain environmental, health and safety laws or other changes in the regulatory environment in which we operate; legal and regulatory proceedings; our relationships with the other member of Canpotex and the other joint ventures in which we participate and their or our exit from participation in such joint ventures; other changes in our commercial arrangements with unrelated third parties; brine inflows at our Esterhazy, Saskatchewan mine or our other shaft mines; mechanical failure and accidents or other failures occurring in the course of operating activities, including at our gypstacks, clay settling areas and tailing dams; accidents occurring in the course of operating activities; lack of truck, rail, barge or ship transportation; and other factors.

Reduced oil refinery operating rates in the United States could have a material adverse impact on our business, financial condition or operating results.

Reduced oil refinery operating rates in the U.S. and Canada could result in decreased availability of molten sulfur, which could increase costs of sulfur procurement or decrease availability of sulfur needed in our phosphate fertilizer production operations. We have not yet become subject to such results in the sulfur procurement markets, if it becomes necessary to procure sulfur at higher costs, and if we are unable to pass those costs on in our product prices, or if we are unable to procure sulfur at volumes necessary for our operations, such events could have a material adverse effect on our phosphate business, and/or our financial condition or operating results.

Important raw materials and energy used in our businesses in the past have been and may in the future be the subject of volatile pricing. Changes in the price of our raw materials have had, and could again have, a material adverse impact on our businesses.

Natural gas, ammonia and sulfur are key raw materials used in the manufacture of phosphate crop nutrient products. Natural gas is used as both a chemical feedstock and a fuel to produce anhydrous ammonia, which is a raw material used in the production of concentrated phosphate products. Natural gas is also a significant energy source used in the potash solution mining process. From time to time, our profitability has been and may in the future be adversely impacted by the price and availability of these raw materials and other energy costs. Because most of our products are commodities, there can be no assurance that we will be able to pass through increased costs to our customers. A significant increase in the price of natural gas, ammonia, sulfur or energy costs that is not recovered through an increase in the price of our related crop nutrients products could have a material adverse impact on our business. In addition, under our long-term CF Ammonia Supply Agreement, we have agreed to purchase approximately 545,000 to 725,000 tonnes of ammonia per year during a term that may extend until December 31, 2032, and at a price to be determined by a formula based on the prevailing price of U.S. natural gas. If the price of natural gas rises or the market price for ammonia falls outside of the range anticipated at execution of this agreement, we may not realize a cost benefit from the natural gas-based pricing over the term of the agreement, or the

cost of our ammonia under the agreement could become a competitive disadvantage. At times, we have paid considerably more for ammonia under the agreement than what we would have paid had we purchased it in the spot market.

We are subject to risks associated with our international sales and operations, which could negatively affect our sales to customers in foreign countries as well as our operations and assets in foreign countries. Some of these factors may also make it less attractive to distribute cash generated by our operations outside the United States to our stockholders, or to utilize cash generated by our operations in one country to fund our operations or repayments of indebtedness in another country or to support other corporate purposes.

For 2021, we derived approximately 68% of our net sales from customers located outside of the United States. As a result, 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;
- unexpected changes in regulatory environments;
- increased government ownership and regulation of the economy in the countries we serve;
- political and economic instability, including the possibility for terrorism, armed conflict, 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;
- unpredictable tax audit practices of various governments;
- nationalization of properties by foreign governments;
- the imposition of tariffs, exchange controls, trade barriers or other restrictions, or government-imposed increases in the cost of resources and materials necessary for the conduct of our operations or the completion of strategic initiatives, including with respect to our joint ventures; and
- currency exchange rate fluctuations between the U.S. dollar and foreign currencies, particularly the Brazilian real and the Canadian dollar.

The occurrence of any of the above in the countries in which we operate or elsewhere could jeopardize or affect our ability to transact business there and could adversely affect our revenues and operating results and the value of our assets located outside of the United States.

In addition, tax regulations and tax audit practices, currency exchange controls and other restrictions may also make it economically unattractive to:

- distribute cash generated by our operations outside the United States to our stockholders; or
- utilize cash generated by our operations in one country to fund our operations or repayments of indebtedness in another country or to support other corporate purposes.

Our assets outside of North America are located in countries with volatile conditions, which could subject us and our assets to significant risks.

We are a global business with substantial assets located outside of the United States and Canada. Our operations in Brazil, China, India and Paraguay are a fundamental part of our business. We have a majority interest in the joint venture entity operating the Miski Mayo Mine in Peru that supplies phosphate rock to us. We also have a minority joint venture investment in MWSPC, which operates a mine and chemical complexes that produce phosphate fertilizers and other downstream products in the Kingdom of Saudi Arabia. Volatile economic, market and political conditions may have a negative impact on our operations, operating results and financial condition. In addition, unfavorable changes in trade protection laws, policies and measures, or governmental actions and policies and other regulatory requirements affecting trade and the pricing and sourcing of our raw materials, may also have a negative impact on our operations, operating results and financial condition.

Natural resource extraction is an important part of the economy in Peru, and, in the past, there have been protests against other natural resource operations in Peru. There remain numerous social conflicts that exist within the natural resource sector in Peru. As a result, there is potential for active protests against natural resource companies. If the Government of Peru's proactive efforts to address the social and environmental issues surrounding natural resource activities are not successful, protests could extend to or impact the Miski Mayo Mine and adversely affect our interest in the Miski Mayo joint venture or the supply of phosphate rock to us from the mine.

Adverse weather conditions, including the impact of hurricanes, and excess heat, cold, snow, rainfall and drought, have in the past, and may in the future, adversely affect our operations, and result in increased costs, decreased sales or production and potential liabilities.

Adverse weather conditions, including the impact of hurricanes and excess heat, cold, snow, rainfall and drought, have in the past and may in the future adversely affect our operations, particularly our Phosphates business. In the past, hurricanes have resulted in physical damage to our facilities in Florida and Louisiana.

Additionally, water treatment costs due to high water balances, tend to increase significantly following excess rainfall from hurricanes or other adverse weather. Some of our Florida and Louisiana facilities have had, and others could have, high water levels that have required, or may require, treatment. High water balances in the past at phosphate facilities in Florida also led the Florida Department of Environmental Protection ("***FDEP***") to adopt rules requiring phosphate production facilities to meet more stringent process water management objectives for phosphogypsum stack systems. In addition to the FDEP, the USEPA and the LDEQ also have similar requirements for water management objectives as outlined in our RCRC CD's.

If excess rainfall or hurricanes occur in coming years, our facilities may be required to take additional measures to manage process water to comply with existing or future requirements and these measures could potentially have a material effect on our business and financial condition.

Adverse weather may also cause a loss of production and may disrupt our supply chain or adversely affect delivery of our products to our customers. For example, oil refineries that supply sulfur to us may suspend operations as a result of a hurricane, and incoming shipments of ammonia can be delayed, disrupting production at our Florida or Louisiana facilities and delivery of our products. In the second half of 2021, we experienced production impacts related to Hurricane Ida.

Excess rainfall and drought have in the past, and may in the future, adversely affect us. For example, in 2019 we experienced the wettest year in North America in nearly 50 years which reduced fertilizer applications by farmers. Excess rainfall also resulted in higher river levels which adversely affected delivery of our products. Drought can reduce farmers' crop yields and the uptake of phosphates and potash, reducing the need for application of additional phosphates and potash for the next planting season. Drought can also lower river levels, adversely affecting delivery of our products to our customers.

We do not own a controlling equity interest in our non-consolidated companies, some of which are foreign companies, and therefore our operating results and cash flow may be materially affected by how the governing boards and majority owners operate such businesses. There may also be limitations on monetary distributions from these companies that are outside of our control. Together, these factors may lower our equity earnings or cash flow from such businesses and negatively impact our results of operations.

In 2013, we entered into an agreement to form MWSPC, a joint venture in which we hold a 25% interest, to develop a mine and chemical complexes for an estimated $8.0 billion that produces phosphate fertilizers and other downstream products in the Kingdom of Saudi Arabia. The success of MWSPC will depend on, among other matters, the completion of development and full commencement of operations of production facilities in the Kingdom of Saudi Arabia, the future success of current plans for completion of the development and for the operation of MWSPC, including the availability and affordability of necessary resources and materials and access to appropriate infrastructure, and any future changes in those plans, as well as the general economic and political stability of the region.

We also hold minority ownership interests in other companies that are not controlled by us. We expect that the operations and results of MWSPC will be, and the operations or results of some of the other companies are, significant to us, and their operations can affect our earnings. Because we do not control these companies either at the board or stockholder levels and because local laws in foreign jurisdictions and contractual obligations may place restrictions on monetary distributions by these companies, we cannot ensure that these companies will operate efficiently, pay dividends, or generally follow the desires of our management by virtue of our board or stockholder representation. As a result, these companies may contribute less than anticipated to our earnings and cash flow, negatively impacting our results of operations and liquidity.

Strikes or other forms of work stoppage or slowdown could disrupt our business and lead to increased costs.

Our financial performance is dependent on a reliable and productive work force. A significant portion of our workforce, and that of the joint ventures in which we participate, is covered by collective bargaining agreements with unions. Unsuccessful contract negotiations or adverse labor relations could result in strikes or slowdowns. Any disruption may decrease our

production and sales or impose additional costs to resolve disputes. The risk of adverse labor relations may increase as our profitability increases because labor unions' expectations and demands generally rise at those times.

Our underground potash shaft mines are subject to risks of water inflows.

Over the past century, several potash mines experiencing water inflow problems have flooded. Since December 1985, we have had inflows of salt saturated brine water into our Esterhazy, Saskatchewan K1 and K2 potash mines. Due to an acceleration of brine inflows, on June 4, 2021 the Company announced a closure of our K1 and K2 potash mine shafts eliminating the risk of brine inflows. Our potash mines at Colonsay, Saskatchewan, Carlsbad, New Mexico and our Esterhazy, Saskatchewan K3 mine (though not contiguous with the K1/K2 underground inflow region) are also subject to risks from the inflow of water as a result of our underground shaft mining operations. Though minor inflows are regularly managed, it is possible that significant water inflows could occur which may present risks to our employees and our operations, and which may require us to incur brine management costs, change our mining processes, or abandon our operating mines.

See the "Key Factors that can Affect Results of Operations and Financial Condition" and "Potash Net Sales and Gross Margin" sections of our Management's Analysis in this Form 10-K report and the Esterhazy closure costs in Note **25** of this report, which sections are incorporated herein by reference, for a discussion of costs, risks and other information relating to the brine inflows.

Accidents or equipment failures occurring in the course of our operating activities could result in significant liabilities, interruptions or shutdowns of facilities or the need for significant safety or other expenditures.

We engage in mining and industrial activities that can result in serious accidents or experience equipment failures. If our procedures are not effective, or if an accident or equipment failure were to occur, we could be subject to liabilities arising out of property damage, personal injuries or death, our operations could be interrupted and we might have to shut down or abandon affected facilities. Accidents could cause us to expend significant amounts to remediate safety issues or to repair damaged facilities and could result in significant liabilities and/or impact on the financial performance of the Company, including material adverse effects on our results of operations, liquidity or financial condition. For example:

- **Some of our facilities are subject to potential damage from seismic activity.**

  The excavation of mines in some parts of the world can result in potential seismic events or can increase the likelihood or potential severity of a seismic event. Our Esterhazy mine and southern Louisiana facilities have experienced minor seismic events from time to time. A significant seismic event at one our facilities or mines could result in serious injuries or death, or damage to or flooding of operations, or damage to adjoining properties or facilities of unrelated third parties.

- **Our underground potash shaft mines are subject to risk from fire. In addition, fire at one of our underground shaft mines could halt our operations at the affected mine while we investigate the origin of the fire or for longer periods for remedial work or otherwise.**

  Our underground potash shaft mines at Esterhazy and Colonsay, Saskatchewan, Carlsbad, New Mexico and Taquari-Vassouras, Brazil are subject to risk from fire. In the event of a fire, if our emergency procedures are not successful, we could have significant injuries or deaths, or shutdowns of our facilities, or could cause us to expend significant amounts to remediate safety issues or repair damaged facilities.

- **We handle significant quantities of ammonia at several of our facilities. If our safety procedures are not effective, an accident involving our ammonia operations could result in serious injuries or death, or result in the shutdown of our facilities.**

  We produce ammonia at our Faustina, Louisiana phosphate concentrates plant, use ammonia in significant quantities at all of our Florida and Louisiana phosphates concentrates plants and store ammonia at some of our distribution facilities. In Florida, ammonia is received at terminals in Tampa and transported by pipelines and trucks to our facilities. We also use ammonia in our Brazil phosphate operations. Our ammonia is generally stored and transported at high pressures or cryogenically.

- **We also use or produce other hazardous or volatile chemicals at some of our facilities. If our safety procedures are not effective, an accident involving these other hazardous or volatile chemicals could result in serious injuries or death, or result in the shutdown of our facilities.**

  We use sulfuric acid in the production of concentrated phosphates in our Florida and Louisiana U.S. operations and our Brazil operations. We also use or produce other hazardous or volatile chemicals at some of our facilities. An accident involving any of these chemicals could result in serious injuries or death, or evacuation of areas near an accident. An accident could also result in property damage or shutdown of our facilities, or cause us to expend significant amounts to remediate safety issues or to repair damaged facilities.

Regulatory Risks

The environmental, health and safety regulations and permitting requirements to which we are subject may have a material adverse effect on our business, financial condition and results of operations.

We are subject to numerous environmental, health and safety laws and regulations in the U.S., Canada, China, Brazil and other countries in which we operate. These laws and regulations govern a wide range of matters, including environmental controls, land reclamation, discharges to air and water, remediation of hazardous substance releases permitting requirements and in some cases, demonstration of financial assurance. They significantly affect our operating activities as well as the level of our operating costs and capital expenditures. In some jurisdictions, environmental laws change frequently and it may be difficult for us to determine if we are in compliance with all material environmental laws at any given time. If we are not in compliance, we may be subject to enforcement or third-party claims, and may require new investment in our business. In those circumstances, our financial condition and results of operations may be materially adversely affected.

The U.S. Comprehensive Environmental Response, Compensation, and Liability Act ("***CERCLA***") imposes liability, including for cleanup costs, without regard to fault or to the legality of a party's conduct, on certain categories of persons, including current and former owners and operators of a site and parties who are considered to have contributed to the release of "hazardous substances" into the environment. Under CERCLA, or various U.S. state analogues, a party may, under certain circumstances, be required to bear more than its proportional share of cleanup costs at a site where it has liability if payments cannot be obtained from other responsible parties. As a crop nutrient company producing and managing chemicals, we periodically have incurred and may incur liabilities and cleanup costs, under CERCLA and other environmental laws, with regard to our current or former facilities, adjacent or nearby third-party facilities or offsite disposal locations.

Our operations, including our mines, are dependent on having the required permits and approvals from governmental authorities. Denial or delay by a government agency in issuing, modifying or renewing any of our permits and approvals or imposition of restrictive or cost prohibitive conditions on us with respect to these permits and approvals may impair our business and operations and could have a material adverse effect on our business, financial condition or results of operations.

We have included additional discussion about permitting for our phosphate mines in Florida under "Environmental, Health, Safety and Security Matters–Operating Requirements and Impacts–Permitting" in our Management's Analysis.

We are, and may in the future be, involved in legal and regulatory proceedings that could be material to us.

We have in the past been, are currently and, in the future may be, subject to legal and regulatory proceedings that could be material to our business, results of operations, liquidity or financial condition. Joint ventures in which we participate could also become subject to these sorts of proceedings. These proceedings may be brought by the government or private parties and may arise out of a variety of matters, including:

- Allegations that we have violated environmental, health and safety laws and regulations or that we are responsible for nuisance or other conditions on nearby properties. We are currently involved in proceedings alleging that, or to review whether, we have violated environmental laws in the United States and Brazil.
- Allegations by private parties that our operations have resulted in personal injury, property damage or damage to business operations.
- Antitrust, commercial, tax (including tax audits) and other disputes.

The legal and regulatory proceedings to which we are currently or may in the future be subject may, depending on the circumstances, result in monetary damage awards, fines, penalties, other liabilities, injunctions or other court or

administrative rulings that interrupt, impede or otherwise materially affect our business operations or criminal sanctions.

We have included additional information with respect to pending legal and regulatory proceedings in Note 22 of our Notes to Consolidated Financial Statements and in this Form 10-K Report in Part I, Item 3, “Legal Proceedings”.

Environmental, health and safety and food and crop laws and regulations to which we are subject may become more stringent over time. This could increase the effects on us of these laws and regulations, and the increased effects could be materially adverse to our business, operations, liquidity and/or results of operations.

Heightened regulation on food and crop inputs (including crop nutrients) and environmental, health and safety issues in the United States, Canada, China, Brazil, Paraguay and other countries where we operate can be expected to result in requirements that apply to us and our operations that may be more stringent than those described elsewhere in this report. These requirements may include:

- Increased levels of future investments and expenditures for environmental controls at ongoing operations, which will be charged against income from future operations; increased levels of the financial assurance requirements to which we are subject, and increased efforts or costs to obtain permits or denial of permits.
- New or interpretations of existing statutes or regulations that impose new or more stringent standards, restrictions or liabilities related to elevated levels of naturally-occurring radiation that arise on formerly mined land; and other matters that could increase our expenses, capital requirements or liabilities or adversely affect our business, liquidity or financial condition.

In addition, to the extent restrictions imposed in countries where our competitors operate, such as China, India, former Soviet Union countries or Morocco, are less stringent than in the countries where we operate, our competitors could gain cost or other competitive advantages over us. These effects could be material.

We are subject to financial assurance requirements as part of our routine business operations. If we were unable to satisfy financial assurance requirements, we might not be able to obtain or maintain permits we need to operate our business as we have in the past. In addition, our compliance with these requirements could materially affect our business, results of operations or financial condition.

In many cases, as a condition to obtaining or maintaining permits and approvals or otherwise, we are required to comply with financial assurance requirements of governmental authorities. The purpose of these requirements is to provide comfort to the government that sufficient funds will be available for the ultimate closure, post-closure care or reclamation of our facilities.

In some cases, we are able to comply through the satisfaction of applicable state financial strength tests. But, if we are unable to do so, we must utilize alternative methods of complying with these requirements; if we do not, we would be prevented from continuing our operations and also could be subject to enforcement proceedings brought by relevant government agencies. Potential alternative methods of compliance include providing credit support in the form of cash escrows or trusts, surety bonds from surety or insurance companies, letters of credit from banks, or other forms of financial instruments or collateral to satisfy the financial assurance requirements. In addition, we could negotiate a consent agreement that establishes a different form of financial assurance. Use of alternative means of financial assurance imposes additional expense on us. Some of them, such as letters of credit, also use a portion of our available liquidity. Other alternative means of financial assurance, such as surety bonds, generally require us to obtain a discharge of the bonds or to post additional collateral (typically in the form of cash or letters of credit) at the request of the issuer of the bonds. Collateral that is required may be in forms that utilize a portion of our available liquidity, or in the form of assets such as real estate, which reduces our flexibility to manage or sell assets.

We have included additional discussion about financial assurance requirements under “Off-Balance Sheet Arrangements and Obligations–Other Commercial Commitments” in our Management’s Analysis.

Regulatory restrictions on greenhouse gas emissions and climate change regulations in the United States, Canada or elsewhere could adversely affect us, and these effects could be material.

Various governmental initiatives to limit greenhouse gas emissions are under way or under consideration around the world. These initiatives could restrict our operating activities, require us to make changes in our operating activities that would increase our operating costs, reduce our efficiency or limit our output, require us to make capital improvements to our

facilities, increase our energy, raw material and transportation costs or limit their availability, or otherwise adversely affect our results of operations, liquidity or capital resources, and these effects could be material to us.

Governmental greenhouse gas emission initiatives include, among others, the December 2015 agreement (the "***Paris Agreement***") which was the outcome of the 21st session of the Conference of the Parties under the United Nations Framework Convention on Climate Change ("***UNFCCC***"). The Paris Agreement, which was signed by nearly 200 nations, including the United States and Canada, entered into force in late 2016 and sets out a goal of limiting the average rise in temperatures for this century to below 2 degrees Celsius. Each signatory is expected to develop its own plan (referred to as a Nationally Determined Contribution, or "***NDC***") for reaching that goal.

In May 2017, the United States President announced that the United States would withdraw from the Paris Agreement. On January 20, 2021 the United States rejoined the Paris Agreement, which was effective February 19, 2021. Previously, the U.S. had submitted an NDC aiming to achieve, by 2025, an economy-wide target of reducing greenhouse gas emissions by 26-28% below its 2005 level. The NDC also aims to use best efforts to reduce emissions by 28%. The U.S. target covers all greenhouse gases that were a part of the 2014 Inventory of Greenhouse Gas Emissions and Sinks. While the extent of the U.S.'s involvement in the Paris Agreement and the status of this NDC is unclear, various legislative or regulatory initiatives relating to greenhouse gases have been adopted or considered by the U.S. Congress, the Environmental Protection Agency ("***EPA***") or various states and those initiatives already adopted may be used to implement a U.S. NDC. Additionally, more stringent laws and regulations may be enacted to accomplish the goals set out in the NDC.

Brazil ratified the Paris Agreement on September 21, 2016, committing to an NDC that includes an economy-wide target of 1.3 GtCO2e by 2025 and 1.2 GtCO2e by 2030. In 2020, Brazil submitted a new NDC, which reaffirms the country's commitment to reducing total net greenhouse gas emissions by 37% in 2025 and by 43% in 2030. The NDC further commits to achieving climate neutrality in 2060. Complete details surrounding Brazil's plan for achieving the greenhouse gas emissions reductions and climate neutrality are uncertain. The government of Brazil may intervene with new or different policy instruments to meet the goals set out in the 2020 NDC.

Canada's intended NDC aims to achieve, by 2030, an economy-wide target of reducing greenhouse gas emissions by 40-45% below 2005 levels. The Canadian federal government has also introduced legislation establishing a long-term target of "net-zero" greenhouse gas emissions by 2050. More stringent laws and regulations may be enacted to accomplish the goals set out in Canada's NDC and Canada's own long-term emissions reduction targets.

It is possible that future legislation or regulation addressing climate change, including in response to the Paris Agreement or any new international agreements, could adversely affect our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources, and these effects could be material or adversely impact our competitive advantage. In addition, to the extent climate change restrictions imposed in countries where our competitors operate, such as India, former Soviet Union countries or Morocco, are less stringent than in the United States, Canada or Brazil our competitors could gain cost or other competitive advantages over us.

Future climate change could adversely affect us.

The prospective impact of climate change on our operations and those of our customers and farmers remains uncertain. Scientists have hypothesized that the impacts of climate change could include changes in 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. Severe climate change could impact our costs and operating activities, the location and cost of global grain and oilseed production, and the supply and demand for grains and oilseeds. At the present time, we cannot predict the prospective impact of climate change on our results of operations, liquidity or capital resources, or whether any such effects could be material to us.

We use tailings, sediments and water dams to manage residual materials generated by our Brazilian mining operations. If our safety procedures are not effective, an accident involving these impoundments could result in serious injuries or death, damage to property or the environment, or result in the shutdown of our facilities, any of which could materially adversely affect our results of operations in Brazil.

Mining and processing of potash and phosphate generate residual materials that must be managed both during the operation of the facility and upon facility closure. Potash tailings, consisting primarily of salt and clay, are stored in surface disposal sites. Phosphate residuals from mining are deposited in large tailing dams in Brazil and in clay settling areas and

phosphogypsum stacks in the United States. They are regularly monitored to evaluate structural stability and for leaks. The failure of or a breach at any of our tailings dams and other impoundments at any of our operations could cause severe property and environmental damage and loss of life, could result in the shut down or idling of our facilities and could have a material adverse effect on our results of operations.

Legislation at both Brazilian federal and state levels has introduced new rules regarding tailings dam safety, construction, licensing and operations. We cannot predict the full impact of these legislative or potentially related judicial actions, or future actions, or whether or how it would affect our Brazilian operations or customers.

Any accident involving our tailings or other dams, or any shut down or idling of our related mines, could have a material adverse effect on our results of operations.

Competitive Risks

Our competitive position could be adversely affected if we are unable to participate in continuing industry consolidation.

Most of our products are readily available from a number of competitors, and price and other competition in the crop nutrient industry is intense. In addition, crop nutrient production facilities and distribution activities frequently benefit from economies of scale. As a result, particularly during pronounced cyclical troughs, the crop nutrient industry has a long history of consolidation. Mosaic itself is the result of a number of industry consolidations. We expect consolidation among crop nutrient producers could continue. Our competitive position could suffer to the extent we are not able to expand our own resources either through consolidations, acquisitions, joint ventures or partnerships. In the future, we may not be able to find suitable companies to combine with, assets to purchase or joint venture or partnership opportunities to pursue. Even if we are able to locate desirable opportunities, we may not be able to enter into transactions on economically acceptable terms. If we do not successfully participate in continuing industry consolidation, our ability to compete successfully could be adversely affected and result in the loss of customers or an uncompetitive cost structure, which could adversely affect our sales and profitability.

Our strategy for managing market and interest rate risk may not be effective.

Our businesses are affected by fluctuations in market prices for our products, the purchase price of natural gas, ammonia and sulfur consumed in operations, freight and shipping costs, foreign currency exchange rates and interest rates. We periodically enter into derivatives and forward purchase contracts to mitigate some of these risks. However, our strategy may not be successful in minimizing our exposure to these fluctuations. See “Market Risk” in our Management’s Analysis and Note 14 of our Notes to Consolidated Financial Statements that is incorporated by reference in this report in Part II, Item 8.

A shortage or unavailability of railcars, tugs, barges and ships for carrying our products and the raw materials we use in our business could result in customer dissatisfaction, loss of production or sales and higher transportation or equipment costs.

We rely heavily upon truck, rail, tug, barge and ocean freight transportation to obtain the raw materials we need to distribute raw materials between our mines and concentrates facilities and to deliver our products to our customers. In addition, the cost of transportation is an important part of the final sale price of our products. Finding affordable and dependable transportation is important in obtaining our raw materials and to supply our customers. Higher costs for these transportation services or an interruption or slowdown due to factors including high demand, high fuel prices, labor disputes, layoffs or other factors affecting the availability of qualified transportation workers, adverse weather or other environmental events, or changes to rail, barge or ocean freight systems, could negatively affect our ability to produce our products or deliver them to our customers, which could affect our performance and results of operations.

Strong demand for grain and other products and a strong world economy increase the demand for and reduce the availability of transportation, both domestically and internationally. Shortages of railcars, barges and ocean transport for carrying product and increased transit time may result in customer dissatisfaction, loss of sales and higher equipment and transportation costs. In addition, during periods when the shipping industry has a shortage of ships, the substantial time needed to build new ships prevents rapid market response. Delays and missed shipments due to transportation shortages, including vessels, barges, railcars and trucks, could result in customer dissatisfaction or loss of sales potential, which could negatively affect our performance and results of operations.

Our success will continue to depend on our ability to attract and retain highly qualified and motivated employees.

We believe our continued success depends on the collective abilities and efforts of our employees. Like many businesses, a significant number of our employees, including some of our most highly skilled employees with specialized expertise in general corporate matters, potash and phosphates operations, will be approaching retirement age throughout the next decade and beyond. In addition, we compete for a talented workforce with other businesses, particularly within the mining and chemicals industries, in general, and the crop nutrients industry, in particular. Our expansion plans are highly dependent on our ability to attract, retain and train highly qualified and motivated employees who are essential to the success of our ongoing operations as well as to our expansion plans. If we were to be unsuccessful in attracting, retaining and training the employees we require, our ongoing operations and expansion plans could be materially and adversely affected.

Our most important products are global commodities, and we face intense global competition from other crop nutrient producers that can affect our prices and volumes.

Our most important products are concentrated phosphate crop nutrients, including diammonium phosphate, or DAP, monoammonium phosphate, or MAP, MicroEssentials® and muriate of potash, or MOP. We sell most of our DAP, MAP and MOP in the form of global commodities. Our sales of these products face intense global competition from other crop nutrient producers.

Changes in competitors' production or shifts in their marketing focus have in the past significantly affected both the prices at which we sell our products and the volumes that we sell, and are likely to continue to do so in the future. Increases in the global supply of DAP, MAP and MOP or competitors' increased sales into regions in which we have significant sales could adversely affect our prices and volumes.

Competitors and new entrants in the markets for both concentrated phosphate crop nutrients and potash have in recent years expanded capacity, or begun, or announced plans, to expand capacity or build new facilities. The extent to which current global or local economic and financial conditions, changes in global or local economic and financial 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 unclear. In addition, certain of our products sold to China may be subject to additional tariffs due to ongoing trade tensions between China and the United States. The level of exports by Chinese producers of concentrated phosphate crop nutrients depends to a significant extent on Chinese government actions to curb exports through, among other measures, prohibitive export taxes at times when the government believes it desirable to assure ample domestic supplies of concentrated phosphate crop nutrients to stimulate grain and oilseed production.

In addition, the other member of Canpotex is among our competitors who may, in the future, independently expand its potash production capacity at a time when each Canpotex member's respective shares of Canpotex sales is based upon that member's respective proven peaking capacity for producing potash. When a Canpotex member expands its production capacity, the new capacity is added to that member's proven peaking capacity based on a proving run at the maximum production level. Alternatively, Canpotex members may elect to rely on an independent engineering firm and approved protocols to calculate their proven peaking capacity. Antitrust and competition laws prohibit the members of Canpotex from coordinating their production decisions, including the timing of their respective proving runs. Worldwide potash production levels could exceed then-current market demand, resulting in an oversupply of potash and lower potash prices.

All of the foregoing events are beyond our control. The effects of any of these events occurring could be materially adverse to our results of operations.

Some of our competitors and potential competitors have greater resources than we do, which may place us at a competitive disadvantage and adversely affect our sales and profitability. These competitors include state-owned and government-subsidized entities in other countries.

We compete with a number of producers throughout the world, including state-owned and government-subsidized entities. Some of these entities have greater total resources than we do, and may be less dependent on earnings from crop nutrients sales than we are. In addition, some of these entities have access to lower cost or government-subsidized natural gas supplies, mining rights and reserves, financing, transportation and tax incentives, placing us at a competitive disadvantage. Furthermore, certain governments as owners of some of our competitors may be willing to accept lower prices and profitability on their products in order to support domestic employment or other political or social goals. To the extent other

producers of crop nutrients enjoy competitive advantages or are willing to accept lower profit levels, the price of our products, our sales volumes and our profits may be adversely affected.

Industry Risks

Future product or technological innovation could affect our business.

Future product or technological innovations by third parties, such as the development of seeds that require less crop nutrients, the development of substitutes for our products or developments in the application of crop nutrients, if they occur, could have the potential to adversely affect the demand for our products and our results of operations, liquidity and capital resources.

The success of our strategic initiatives depends on our ability to effectively manage these initiatives, and to successfully integrate and grow acquired businesses.

We have significant ongoing strategic initiatives, including our plans to expand the annual production capacity of our potash business and MWSPC. These strategic initiatives involve capital and other expenditures and require effective project management and, in the case of potential strategic acquisitions, successful integration. To the extent the processes we (or, for our joint venture, we together with our joint venture partners) put in place to manage these initiatives or integrate and grow acquired businesses are not effective, our capital expenditure and other costs may exceed our expectations or the benefits we expect from these initiatives might not be fully realized, or both, thereby resulting in adverse effects on our operating results and financial condition.

Cyberattacks could disrupt our operations and have a material adverse impact on our business.

As a global company, we utilize and rely upon information technology systems in many aspects of our business, including internal and external communications and the management of our accounting, financial, production and supply chain functions. As we become more dependent on information technologies to conduct our operations, and as the number and sophistication of cyberattacks increase, the risks associated with cyber security increase. These risks apply to us, our employees, and to third parties on whose systems we rely for the conduct of our business. We have experienced cyberattacks but to our knowledge, we have not experienced any material breaches of our technology systems. Failure to effectively anticipate, prevent, detect and recover from the increasing number and sophistication of cyberattacks could result in theft, loss or misuse of, or damage or modification of our information, and cause disruptions or delays in our business, reputational damage and third-party claims, which could have a material adverse effect on our results of operations or financial condition.

Our crop nutrients and other products are subject to price and demand volatility resulting from periodic imbalances of supply and demand, which may cause our results of operations to fluctuate.

Historically, the market for crop nutrients has been cyclical, and prices and demand for our products have fluctuated significantly. Periods of high demand, increasing profits and high capacity utilization tend to lead to new plant investment and increased production in the industry. This growth increases supply until the market is over-saturated, leading to declining prices and declining capacity utilization until the cycle repeats.

As a result, crop nutrient prices and volumes have been, and are expected to continue to be, volatile. This price and volume volatility may cause our results of operations to fluctuate and potentially deteriorate. The price at which we sell our crop nutrient products and our sales volumes could fall in the event of industry oversupply conditions, which could have a material adverse effect on our business, financial condition and results of operations. In contrast, high prices may lead our customers and farmers to delay purchasing decisions in anticipation of future lower prices, thus impacting our sales volumes.

Due to reduced market demand, depressed agricultural economic conditions and other factors, we and our predecessors have at various times suspended or curtailed production at some of our facilities. The extent to which we utilize available capacity at our facilities will cause fluctuations in our results of operations, as we will incur costs for any temporary or indefinite shutdowns of our facilities. In addition, lower sales tend to lead to higher fixed costs as a percentage of sales.

Financial Risks

During periods when the prices for our products are falling because of falling raw material prices, we could be required to write-down the value of our inventories. Any such write-down could adversely affect our results of operations and the value of our assets.

We carry our inventories at the lower of cost or market. In periods when the market prices for our products are falling rapidly, including in response to falling market prices for raw materials, it is possible that we could be required to write-down the value of our inventories if market prices fall below our costs. Any such write-down could adversely affect our results of operations and the value of our assets. Any such effect could be material.

Our estimates of future selling prices reflect in part the purchase commitments we have from our customers. As a result, defaults on these existing purchase commitments because of the global or local economic and financial conditions or for other reasons could adversely affect our estimates of future selling prices and require additional inventory write-downs.

We may incur significant non-cash charges if our goodwill or long-lived assets become impaired in the future.

Under accounting principles generally accepted in the U.S. ("***GAAP***"), we review goodwill for impairment on an annual basis or more frequently if events or circumstances indicate that their carrying value may not be recoverable. Other long-lived assets, including property, plant and equipment, are reviewed if events or circumstances indicate that their carrying value may not be recoverable. The process of impairment testing involves a number of judgments and estimates made by management, including the fair values of assets and liabilities, future cash flows, our interpretation of current economic indicators and market conditions, overall economic conditions and our strategic operational plans with regard to our business units. If the judgments and estimates used in our analysis are not realized or change due to external factors, then actual results may not be consistent with these judgments and estimates, and our goodwill and intangible assets may become impaired in future periods. If our goodwill or long-lived assets are determined to be impaired in the future, we may be required to record non-cash charges to earnings during the period in which the impairment is determined, which could be significant and have an adverse effect on our financial condition and results of operations. We have, in the past, and may in the future, be required to write down the value of our goodwill or other long-lived assets, and such future write downs could be material. See Note 9, Goodwill and Note 25, Mine Closure Costs, in the accompanying consolidated financial statements for further information related to charges incurred in 2019.

Changes in tax laws or regulations or their interpretation, or exposure to additional tax liabilities, could materially adversely affect our operating results and financial condition.

We are subject to taxes, including income taxes, resource taxes and royalties, and non-income based taxes in the United States, Canada, China, Brazil and other countries where we operate. Changes in tax laws or regulations or their interpretation could result in higher taxes, which could materially adversely affect our operating results and financial condition.

In 2018, U.S. federal tax law changes took effect. This was a significant change to the U.S. system of taxation resulting in numerous areas open to interpretation given the newness and breadth of changes to the rules. As a result, risk exists related to developing interpretation and application of the rules that could result in higher taxes which could materially adversely affect our operating results and financial condition.

We are subject to periodic audits by various levels of tax authorities in all countries where we have meaningful operations. The due process, audit and appeal practices and procedures of such authorities may vary significantly by jurisdiction, may be unpredictable (and unreliable) in nature and may result in significant risk to us. For various reasons, some governments may issue significant reassessments on audit based positions not fully grounded in law or fact, even though, upon disputing the reassessments, a great many are overturned on administrative appeal and through the court system. Certain systems involve tax litigation as a common practice. In certain countries, there are requirements to pay a reassessment (even though the matter has not been finally decided by the tax administration or a court of law) while the taxpayer has a well-supported objection and appeals administratively or in court. This may result in tying up significant funds and/or creating adverse treasury and credit risks that may interrupt, impede or otherwise materially affect our business operations.

We extend trade credit to our customers and guarantee the financing that some of our customers use to purchase our products. Our results of operations may be adversely affected if these customers are unable to repay the trade credit from us or financing from their banks. Increases in prices for crop nutrient, other agricultural inputs and grain may increase this risk.

We extend trade credit to our customers in the United States and throughout the world, in some cases for extended periods of time. In Brazil, where there are fewer third-party financing sources available to farmers, we also have several programs under which we guarantee customers' financing from financial institutions that they use to purchase our products. As our exposure to longer trade credit extends throughout the world and use of guarantees in Brazil increases, we are increasingly exposed to

the risk that some of our customers will not pay us or the amounts we have guaranteed. Additionally, we become increasingly exposed to risk due to weather and crop growing conditions, fluctuations in crop nutrient prices, commodity prices or foreign currencies, and other factors that influence the price, supply and demand for agricultural commodities. Significant defaults by our customers could adversely affect our financial condition and results of operations.

Due to the global nature of our operations, we are exposed to currency exchange rate changes, which may cause fluctuations in earnings and cash flows.

Our primary foreign currency exposures are the Canadian dollar and Brazilian real. The functional currency for our Brazilian subsidiaries is the Brazilian real. However, we finance our Brazilian inventory purchases with U.S. dollar-denominated liabilities. The functional currency of several of our Canadian entities is the Canadian dollar. For those entities, sales are primarily denominated in U.S. dollars, but the costs are paid principally in Canadian dollars. Canadian entities have significant U.S. dollar denominated intercompany loans and U.S. entities, with the U.S. dollar as functional currency, have Brazilian real denominated loans. During periods of local or global economic crises, local currencies may be devalued significantly against the U.S. dollar. During times of a strengthening dollar, our net earnings can be reduced due to transaction currency losses arising from these exposures of U.S. Dollar denominated liabilities held in the Brazilian and Canadian entities and Brazilian Real denominated assets held in US entities. To reduce economic risk and volatility on expected cash flows that are denominated in the Canadian dollar and Brazilian real, we use financial instruments that may include forward contracts, options or collars when unable to naturally offset the exposures.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

SUMMARY OVERVIEW OF MINING

As used in this Form 10-K Report, the terms “mineral resource,” “measured mineral resource,” “indicated mineral resource,” “inferred mineral resource,” “mineral reserve,” “proven mineral reserve” and “probable mineral reserve” are defined and used in accordance with S-K 1300. All mineral resources and mineral reserves have been prepared by qualified persons. Under S-K 1300, mineral resources may not be classified as “mineral reserves” unless the determination has been made by a qualified person that the mineral resources can be the basis of an economically viable project. Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.

Except for that portion of mineral resources classified as mineral reserves, mineral resources have not demonstrated economic value. Inferred mineral resources are estimates based on limited geological evidence and sampling and have too high of a degree of uncertainty to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Estimates of inferred mineral resources may not be converted to a mineral reserve. It cannot be assumed that all or any part of an inferred mineral resource will be upgraded to a higher category. A significant amount of exploration must be completed to determine whether an inferred mineral resource may be upgraded to a higher category. Therefore, you are cautioned not to assume that all or any part of an inferred mineral resource exists, that it can be the basis of an economically viable project, or that it will be upgraded to a higher category.

Properties

The subsections below describe the property locations, overviews and mineral resource and mineral reserve estimates. Our material properties, as determined pursuant to S-K 1300, are Florida Phosphates, Esterhazy, Belle Plaine and Tapira. Further information about these properties can be found in the technical report summaries (“***TRSs***” or “***TRS***”) filed as exhibits to this Form 10-K Report.

Property Locations

Figure 2.1 and 2.2 show the locations of each resource and reserve property:

Figure 2.1: North America Resource and Reserve Location Map

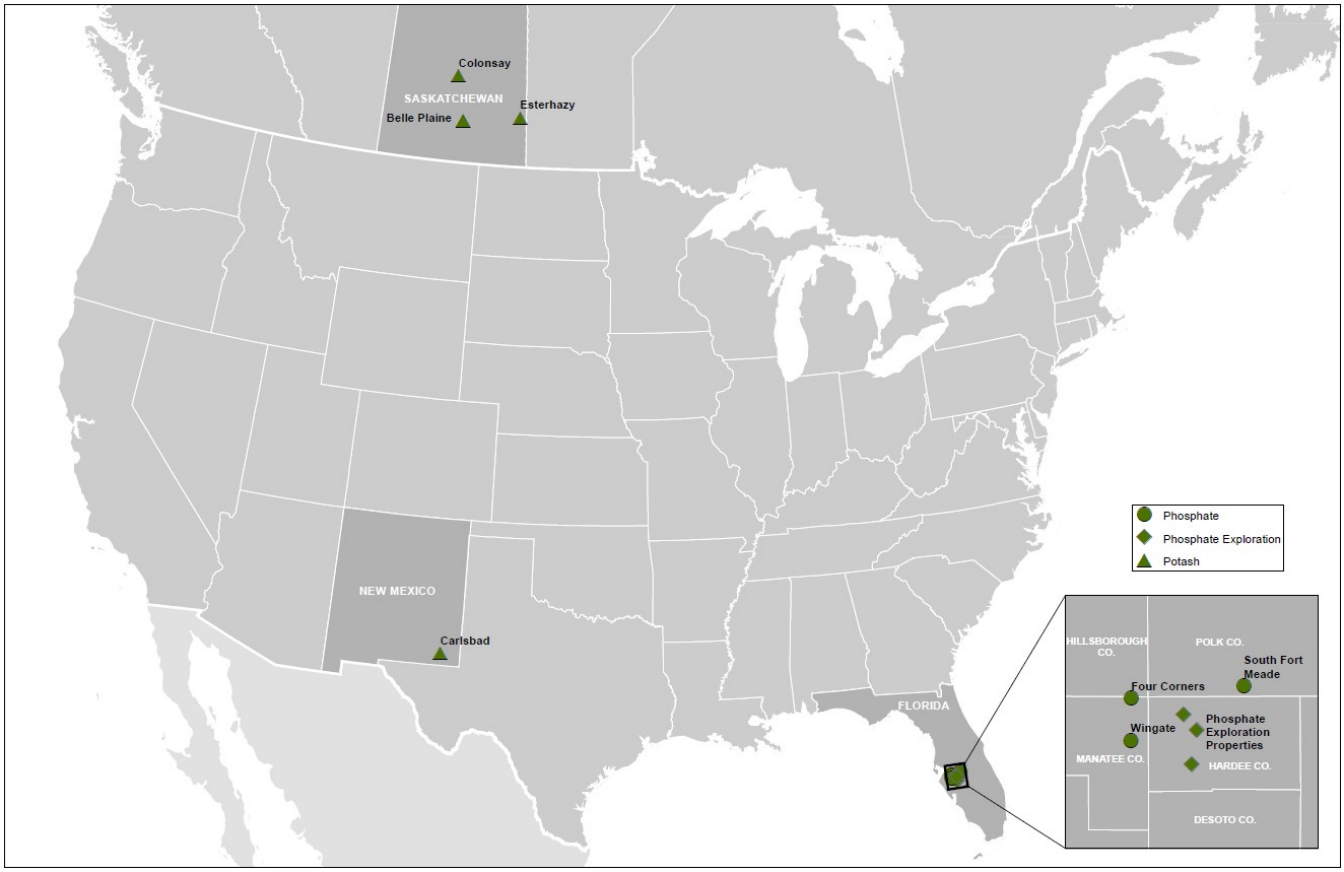
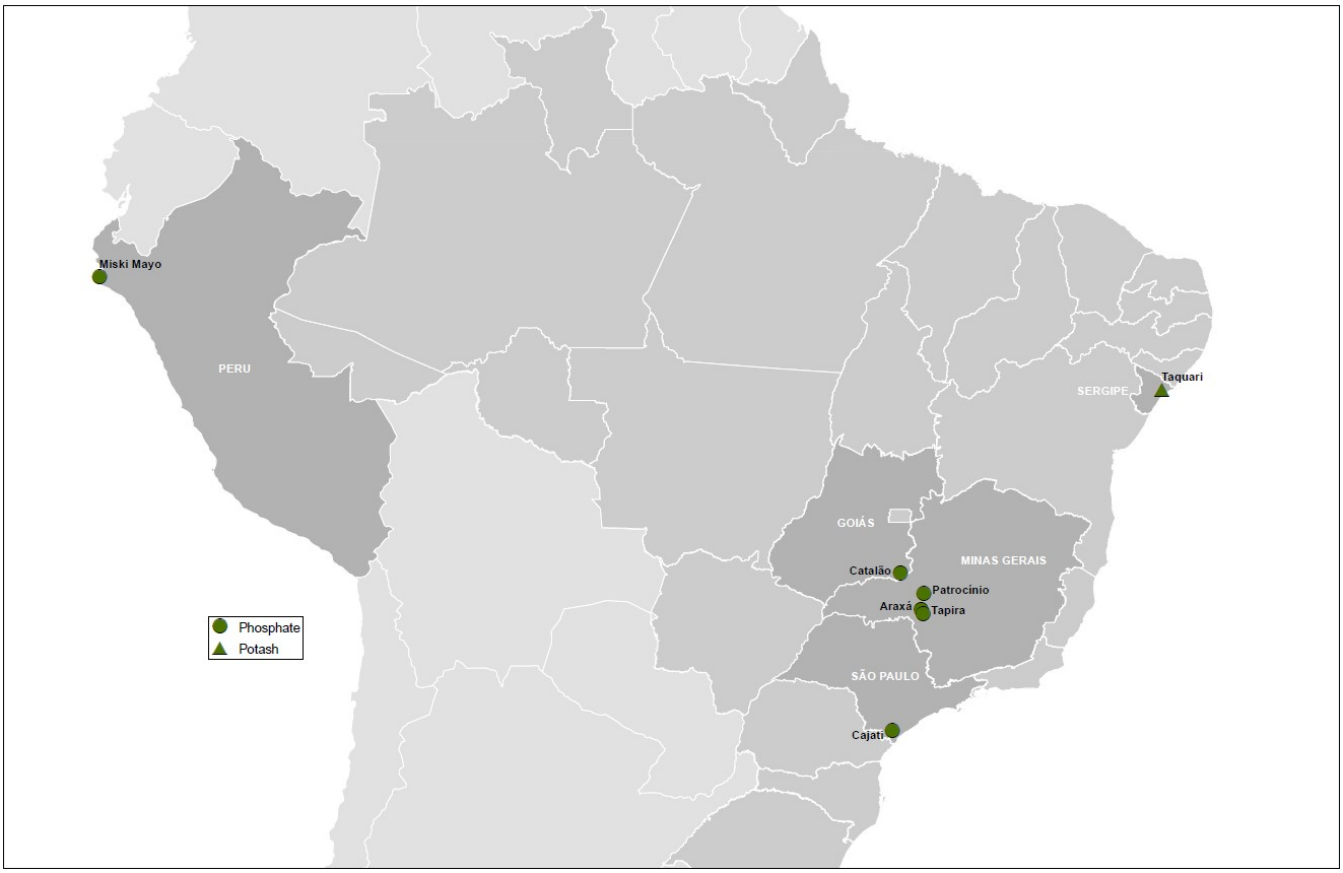


Figure 2.2: South America Resource and Reserve Location Map



Property Overview

Annual Production

Table 2.1 shows the production tonnage and grade for all phosphate properties for 2021, 2020 and 2019.

Table 2.1 Summary of Production - Phosphate Properties

(in millions of tonnes)

		December 31,					
		2021		2020		2019	
Mine Property	**Annual Operational Capacity (tonnes)[a][b]**	**Production (tonnes)**	**%P_2O_5[c]**	**Production (tonnes)**	**%P_2O_5[c]**	**Production (tonnes)**	**%P_2O_5[c]**
Phosphate (Grade: P_2O_5)[c]							
Florida	14.0	11.1	28.0	12.8	28.4	12.2	28.6
Total United States	14.0	11.1	28.0	12.8	28.4	12.2	28.6
Miski Mayo [d]	4.0	4.2	29.8	3.3	29.6	4.0	29.6
Total Peru	4.0	4.2	29.8	3.3	29.6	4.0	29.6
Araxá / Patrocinio	1.3	0.8	34.9	0.9	35.0	0.4	35.0
Cajati	0.6	0.3	34.1	0.4	33.8	0.3	34.6
Catalão	1.0	1.1	34.9	1.1	34.5	0.9	34.2
Tapira	2.1	1.8	35.1	1.9	35.3	1.3	35.4
Total Brazil	5.0	4.0	34.9	4.3	34.7	2.9	35.0
Total Phosphate	**23.0**	**19.3**	**29.8**	**20.4**	**29.9**	**19.1**	**29.8**

(a) Annual operational capacity is the expected average long-term annual capacity for finished goods considering constraints represented by the grade, quality and quantity of the reserves being mined as well as equipment performance and other operational factors.

(b) Actual production varies from annual operational capacity shown in the above table due to factors that include, among others, the level of demand for our products, the quality of the reserves, the nature of the geologic formations we are mining at any particular time, maintenance and turnaround time, accidents, mechanical failure, weather conditions, and other operating conditions.

(c) The percent of P_2O_5 represents a measure of the phosphate content in phosphate rock or a phosphate ore body. A higher percentage corresponds to a higher percentage of phosphate content in phosphate rock or a phosphate ore body.

(d) We have a 75% economic interest in the Miski Mayo Mine in Peru and consolidate their results, therefore, annual operational capacity and production tonnes are presented at 100% economic interest. These amounts are presented on a wet tonne basis based on average moisture levels of 3.5% to 4.5% as it exits the drying process and is prepared for shipping. Operational capacity and production on a dry tonne basis would be 3.8 million tonnes and 4.1 million tonnes, respectively.

Table 2.2 shows the production tonnage and grade for the potash properties for 2021, 2020 and 2019.

Table 2.2 Summary of Production - Potash Properties

(in millions of tonnes)

			December 31,					
			2021		2020		2019	
Facility	**Annualized Proven Peaking Capacity (tonnes)[(a)(b)]**	**Annual Operational Capacity (tonnes) [(b)(c)(d)]**	**Ore Mined (tonnes)**	**Grade % K2O[(e)]**	**Ore Mined (tonnes)**	**Grade % K2O[(e)]**	**Ore Mined (tonnes)**	**Grade % K2O[(e)]**
Belle Plaine – MOP[(f)]	3.9	3.0	11.0	19.3	12.6	18.0	11.9	18.0
Esterhazy – MOP[(g)]	6.3	6.0	13.3	23.9	15.0	24.1	11.9	23.6
Colonsay – MOP[(h)]	2.6	1.5	1.0	26.6	0.0	0.0	1.9	26.5
Total Canada	**12.8**	**10.5**	**25.3**	**22.0**	**27.6**	**21.3**	**25.7**	**21.2**
Carlsbad – K-Mag®[(i)]	0.9	0.7	3.1	6.3	3.4	5.7	3.0	6.0
Total United States	**0.9**	**0.7**	**3.1**	**6.3**	**3.4**	**5.7**	**3.0**	**6.0**
Taquari – MOP	0.7	0.5	1.8	15.1	1.8	16.6	1.8	16.1
Total Brazil	**0.7**	**0.5**	**1.8**	**15.1**	**1.8**	**16.6**	**1.8**	**16.1**
Total Potash	14.4	11.7	30.2	20.0	32.8	19.4	30.5	19.4

(a) Represents full capacity based on 350 operating days per annum.
(b) Capacity is based on finished goods capacity, not ore mined. The annualized proven peaking capacity shown above is the capacity currently used to determine our share of Canpotex sales. Canpotex members' respective shares of Canpotex sales are based upon the members' respective proven peaking capacities for producing potash. When a Canpotex member expands its production capacity, the new capacity is added to that member's proven peaking capacity based on a proving run at the maximum production level. Alternatively, after January 2017, Canpotex members may elect to rely on an independent engineering firm and approved protocols to calculate their proven peaking capacity. The annual operational capacity reported in the table above can exceed the annualized proven peaking capacity until the proving run has been completed.
(c) Annual operational capacity is the expected average long-term annual capacity considering constraints represented by the grade, quality and quantity of the reserves being mined as well as equipment performance and other operational factors.
(d) Actual production varies from annual operational capacity shown in the above table due to factors that include, among others, the level of demand for our products, the quality of the reserves, the nature of the geologic formations we are mining at any particular time, maintenance and turnaround time, accidents, mechanical failure, weather conditions, and other operating conditions, as well as the effect of recent initiatives intended to improve operational excellence.
(e) Grade % K_2O is a traditional reference to the percentage (by weight) of potassium oxide contained in the ore. A higher percentage corresponds to a higher percentage of potassium oxide in the ore.
(f) Equivalent to hoisted tonnes at a conventional mine. Ore mined for Belle Plaine is a calculated value (KCl concentrate mined by solution divided by the estimated global grade of the deposit). The calculation is based on actual KCl tonnes mined (January 1, 2021- October 31, 2021) and estimates of KCl tonnes mined (November 1, 2021 - December 31, 2021).
(g) The annual operational capacity at Esterhazy increased by 0.7 million tonnes in 2019 reflecting the ramp-up in capacity from the K3 shaft.
(h) We have the ability to reach an annual operating capacity of 2.1 million tonnes over time at Colonsay by increasing our staffing levels and investment in mine development activities.
(i) K-Mag® is a specialty product that we produce at our Carlsbad facility.

Overview

Overviews for Phosphates, Potash and Mosaic Fertilizantes are shown in Table 2.3, Table 2.4, and Table 2.5 below. All properties are operated by Mosaic. All properties listed below are production stage, except Araxá/Patrocinio. Araxá/Patrocinio is an operating mine that is an exploration stage mine because Mosaic is extracting minerals from this mine without having determined there are mineral reserves under S-K 1300. Information concerning our material properties is located in this Item 2 under the headings "Florida Phosphates," "Esterhazy," "Belle Plaine" and "Tapira".

Table 2.3: Phosphates Overview

Florida Phosphates

See Florida Phosphates Individual Property Disclosure below.

Peru - Compañía Minera Miski Mayo S.R.L. ("*Miski Mayo*")

Location	Sechura Province in the Piura Region, Peru
Type and amount of ownership interests	75% owned by Compañía Minera Miski Mayo S.R.L., a wholly owned indirect subsidiary of Mosaic
Titles, mineral rights, leases or options and acreage	Miski Mayo is the holder of 20 non-metallics mining concessions (76,000 hectares).
Key permit conditions	Permit conditions are dictated by operating licenses, which are maintained and renewed on a regular basis. As of December 31, 2021, all environmental licenses were either still valid or were being renewed pursuant to applications with the Peruvian Environmental Agency within the legal deadlines. In general, environmental commitments are being met; however, there are environmental requirements and commitments related to the expansion of Miski Mayo Line 3 of the Second Amendment of the EIA (2015) that have to be verified and implemented. Miski Mayo's environmental controls are related to monitoring the quality of wastewater, surface water, groundwater and air, as well as waste management. Additional environmental controls are in place for air emissions, air quality and noise. Tailings storage facilities and other impoundment's stability are monitored through specified routine internal and third party inspections.
Mine types and mineralization styles	Miski Mayo is a surface mine. The phosphate deposits of Peru are located within the shallow north-trending Sechura Basin, in the Piura region, hosting successive inter-layered marine sediments of phosphate. We extract phosphate ore from the Miski Mayo Mine using excavators. The ore is then transported by truck for beneficiation in a plant that we own. The beneficiated concentrate is then shipped to North America for use in our own production or sold to third parties.
Processing plants and other facilities	Beneficiation plant

Table 2.4: North America Potash Overview

Belle Plaine Potash Facility ("*Belle Plaine Facility*")

See Belle Plaine Individual Property Disclosure below.

Esterhazy Potash Facility ("*Esterhazy Facility*")

See Esterhazy Individual Property Disclosure below.

Colonsay Potash Facility ("*Colonsay Facility*")

Location	Saskatchewan, Canada
Type and amount of ownership interests	100% owned by Mosaic Potash Colonsay ULC, a wholly-owned, indirect subsidiary of Mosaic.

Titles, mineral rights, leases or options and acreage	We lease approximately 118,378 acres of mineral rights for the Colonsay Facility from the Province of Saskatchewan (the "***Crown***") under Subsurface Mineral Lease KL 108. The lease term is for a period of 21 years, with renewals at our option for additional 21-year lease periods. In addition, we own or lease approximately 14,451 acres of mineral rights within the Colonsay area. All mineral properties owned or leased by Mosaic are for the "subsurface mineral" commodity as defined in The Subsurface Mineral Tenure Regulations (Saskatchewan). We own approximately 5,972 acres of surface rights in the Colonsay area. All infrastructure including the processing plant and tailings management areas ("***TMAs***" or "***TMA***") are located on our owned land.
Key permit conditions	A water rights license issued by the Saskatchewan Water Security Agency is in place and expires in 2032. The license is associated with the allocation of surface water rights for the site. An Approval to Operate Pollutant Control Facilities, issued by the Saskatchewan Ministry of Environment, is also in place and expires in July 2028. It is expected to be renewed at or before expiration. There are no other significant encumbrances, including permitting requirements (existing or anticipated in the future) associated with the Colonsay Facility. Except for the royalties, we do not anticipate any future significant encumbrances based on current known regulations and existing permitting processes. There are no outstanding violations and fines.
Mine types and mineralization styles	The intracratonic Elk Point Basin is a major sedimentary geological feature in western Canada and the northwest U.S. It contains one of the world's largest stratabound potash resources that represents almost 25% of the global potash production. The Prairie Evaporite hosts rich deposits of evaporite minerals including NaCl, KCl and locally, carnallite that occur in three potash deposits: the Esterhazy, Belle Plaine and Patience Lake members. The Colonsay deposit includes two potash-bearing members within its local stratigraphy; the Patience Lake Member and the Belle Plaine Member. Mining at Colonsay is conducted within the upper portion of the Patience Lake Member using a room and pillar mining method. The Colonsay Facility uses an underground room and pillar mining method to extract potash. After being transported along a network of conveyor systems to the shaft, it is hoisted to the surface for onsite processing.
Processing plants and other facilities	Mill facility, beneficiation plant
Carlsbad Potash Facility ("*Carlsbad Facility*")	
Location	New Mexico, U.S.
Type and amount of ownership interests	100% owned by Mosaic Potash Carlsbad Inc., a wholly-owned, indirect subsidiary of Mosaic.
Titles, mineral rights, leases or options and acreage	The property consists of 89% Federally owned and 11% State owned land, and 40 acres of privately owned mineral rights (Freehold Land) that Mosaic leases. We lease approximately 64,267 acres of mineral rights from the United States Department of Interior Bureau of Land Management ("***BLM***"). These lease terms are for a period of 20 years and are reviewed and renewed at their end of term. Surface rights are subject to separate ownership and title from subsurface mineral rights. We own 8,370 acres of surface rights. All infrastructure, including the processing plant, TMA, cluster sites, and pipeline rights of way, are located on Mosaic owned land.

Key permit conditions	Primary environmental resource areas identified include groundwater quality and shorebird habitat. Environmental monitoring for effluents, air and surface/groundwater is in place. Currently, 11 permits or approvals are active for the property. We are in compliance with all such permits or approvals. One of the 11, groundwater discharge permit (DP-1399) issued by the New Mexico Environmental Department ("***NMED***"), is currently being renewed. The discharge permit governs operation of the TMA. A tailings management and inspection plan is in place and active. The permit includes closure and post-closure requirements and financial assurance requirements. A mining and reclamation plan has been developed and approved by the BLM. This plan includes standards for operation and closure of the mine that comply with federal and state of New Mexico environmental regulations. Current and final mine closure plans and reclamation cost estimates are completed and the closure plans have been approved by NMED and the BLM. There are no significant environmental permitting encumbrances (existing or anticipated in the future) associated with the Carlsbad Facility. We do not anticipate any future encumbrances based on current known regulations and existing permitting processes. There are no outstanding violations and fines.
Mine types and mineralization styles	The Carlsbad potash district is located within the northern New Mexico portion of the Delaware Basin. The Delaware Basin is the western subdivision of the greater Permian Basin, one of the deepest intracratonic basins in North America. Potash mineralization at Carlsbad occurs in the Ochoan Epoch (Upper Permian Age) Salado Formation. The Salado Formation, up to a maximum of 2,200 ft. thick, is an evaporite sequence dominated by 650 to 1,300 ft. of halite and muddy halite. It hosts 12 ore zones, 11 in the middle or McNutt Member and the 12th in the Upper Member. The area underlain by the 12 ore zones is about 1,900 sq. miles. The 400-ft. thick McNutt Member is at a depth of 300 to 1,500 ft. below the surface. The Carlsbad Facility utilizes an underground room-and-pillar mining method. Pillars are cut in a manner that creates a panel; panel sizes can be changed based on grade, ground conditions and lease or oil and gas boundaries. The mine currently has five mine panels that consist of 9 to 11 rooms. Drum-style continuous miners are utilized for mining. As the continuous miner advances, ore is fed off a boom, located at the back of the miner into battery-powered ore haulage units. These units transport the ore through the open mine workings and dump it onto an extensive belt system that conveys the ore to the surface for milling.
Processing plants and other facilities	Langbeinite (K-Mag) refinery and a granulation plant

Table 2.5: Brazil Fertilizantes Overview

Complexo Mineroquímic de Araxá ("*Araxá*") / Complexo de Mineração de Patrocínio ("*Patrocínio*")

Location	Near Araxá / Patrocínio, Minas Gerais, Brazil
Type and amount of ownership interests	100% owned by Mosaic Fertilizantes P&K S.A., a wholly owned indirect subsidiary of Mosaic.
Titles, mineral rights, leases or options and acreage	Mining rights in Brazil are governed by the Mining Code, Decree 227, dated February 27, 1967, and further regulation enacted by Agência Nacional de Mineração (the "***ANM***"). All subsoil situated within Brazilian territory is deemed state property, with the mining activities subject to specific permits granted by the ANM.

Key permit conditions	Mosaic currently holds a total of four mining permits within the Araxá area (2,769 hectares) and four mining permits and one exploration permit within the Patrocínio area (3,478 hectares). Permit conditions are dictated by operating licenses, which are maintained and renewed on a regular basis. As of December 31, 2021, all environmental licenses were valid or were being renewed pursuant to applications filed with the Brazilian Environmental Agency. There are action plans in progress to comply with the environmental conditions of the permits that are not met yet within the applicable regulations. Araxá and Patrocínio's environmental controls are related to monitoring the quality of wastewater, surface water, groundwater and air, as well as waste management. Additional environmental controls are in place for air emissions, air quality and noise. Tailings storage facilities and other impoundment's stability are monitored through a continuous monitoring program, as well as routine inspections.
Mine types and mineralization styles	The Araxá and Patrocínio phosphate deposit is part of a series of Late-Cretaceous, carbonatite-bearing alkaline ultramafic plutonic complexes belonging to the Alto Paranaiba Igneous Province. The tropical weather regime prevailing in the region and the inward drainage patterns developed from the weather-resistant quartzite margins of the dome structures resulted in the development of an extremely thick soil cover in most of the complexes. The extreme weathering was responsible for the residual concentration of apatite. The phosphate ore is extracted through surface mining by limited drilling and blasting, loaded into trucks and transported to the beneficiation plants. Patrocinio does not have its own beneficiation plant, so the ore is transported by rail to Araxá for processing.
Processing plants and other facilities	Two beneficiation plants at Araxá
Complexo Mineroquímico de Cajati ("*Cajati*")	
Location	Near Cajati, São Paulo, Brazil
Type and amount of ownership interests	100% owned by Mosaic Fertilizantes P&K S.A., a wholly owned indirect subsidiary of Mosaic.
Titles, mineral rights, leases or options and acreage	Mining rights in Brazil are governed by the Mining Code, Decree 227, dated February 27, 1967, and further regulation enacted by the ANM. All subsoil situated within Brazilian territory is deemed state property, with the mining activities subject to specific permits granted by the ANM.
Key permit conditions	Mosaic currently holds a total of eight mining permits within the Cajati area (5,183 hectares). Permit conditions are dictated by operating licenses, which are maintained and renewed on a regular basis. As of December 31, 2021, all environmental licenses were still valid or were being renewed pursuant to applications filed with the Brazilian Environmental Agency. There are action plans in progress to comply with the environmental conditions of the permits that are not met yet within the environmental permits. CAJ's environmental controls are related to monitoring the quality of wastewater, surface and groundwater and air, as well as waste management. Additional environmental controls are in place for air emissions, air quality and noise. Tailings storage facilities and other impoundment's stability are strictly monitored through a continuous monitoring program as well as routine inspections.

Mine types and mineralization styles	The primary alkaline intrusive complex of interest for CAJ is the Jacupiranga Ultramafic-Carbonatitic Mesozoic Complex. The economically exploitable portion of the Jacupiranga Alkaline Complex is focused on phosphate mineralization within the carbonatite domain of the complex. The phosphate ore is extracted through surface mining by drilling and blasting, loaded into trucks and transported to the beneficiation plant on-site at Cajati.
Processing plants and other facilities	Beneficiation plant

Complexo Mineração de Catalão ("*CMC*")

Location	Near Catalão, Minas Gerais (and Goias), Brazil
Type and amount of ownership interests	100% owned by Mosaic Fertilizantes P&K S.A., a wholly owned indirect subsidiary of Mosaic.
Titles, mineral rights, leases or options and acreage	Mining rights in Brazil are governed by the Mining Code, Decree 227, dated February 27, 1967, and further regulation enacted by the ANM. All subsoil situated within Brazilian territory is deemed state property, with the mining activities subject to specific permits granted by the ANM.
Key permit conditions	Mosaic currently holds a total of eight mining permits within the CMC area (2,131 hectares). Permit conditions are dictated by operating licenses, which are maintained and renewed on a regular basis. As of December 31, 2021, all environmental licenses were either valid or were being renewed pursuant to applications filed with the Brazilian Environmental Agency. There are action plans in progress to comply with the environmental conditions that are not met yet within the environmental permits. CMC's environmental controls are related to monitoring the quality of wastewater, surface and groundwater and air, as well as waste management. Additional environmental controls are in place for air emissions, air quality and noise. Tailings storage facilities and other impoundment's stability are monitored through a continuous monitoring program as well as routine inspections.
Mine types and mineralization styles	The CMC phosphate deposit is part of a series of Late-Cretaceous, carbonatite-bearing alkaline ultramafic plutonic complexes belong to the Alto Paranaiba Igneous Province. The tropical weather regime prevailing in the region and the inward drainage patterns developed from the weather-resistant quartzite margins of the dome structures resulted in the development of an extremely thick soil cover in most of the complexes. The extreme weathering process was responsible for the residual concentration of apatite. The phosphate ore is extracted through surface mining by limited drilling and blasting, loaded into trucks and transported to the beneficiation plant onsite at CMC.
Processing plants and other facilities	Beneficiation plant

Complexo Mineração de Tapira ("*Tapira*")

See the Tapira Individual Property Disclosure below.

Complexo Mineroquímico de Taquari-Vassouras ("*Taquari*")

Location	Near Rosario de Catete, Sergipe, Brazil
Type and amount of ownership interests	100% owned by Mosaic Potássio Mineração Ltda, a wholly owned indirect subsidiary of Mosaic.
Titles, mineral rights, leases or options and acreage	Mining rights in Brazil are governed by the Mining Code, Decree 227, dated February 27, 1967, and further regulation enacted by the ANM. All subsoil situated within Brazilian territory is deemed state property, with the mining activities subject to specific permits granted by the ANM.

Key permit conditions	We currently hold one mining permit within the Taquari area (92,498 hectares). Permit conditions are dictated by operating licenses, which are maintained and renewed on a regular basis. As of December 31, 2021, all environmental licenses were either valid or being renewed pursuant to applications filed with the Brazilian Environmental Agency within the legal deadlines. Licenses are managed through national and state databases. There are action plans in progress to comply with the environmental conditions that are not met yet within the environmental permits. Taquari's environmental controls are related to monitoring the quality of wastewater, surface water, groundwater and air, as well as waste management. Additional environmental controls are in place for air emissions, air quality and noise. The brine pipeline and other impoundment's stability are monitored through a monitoring program as well as routine inspections.
Mine types and mineralization styles	The deposit is in the Taquari-Vassouras sub-basin and is a bedded evaporite where sylvinite is mined in an underground room and pillar mine at depths of 500-700m below surface using continuous miners. The beneficiation process operation begins at the run-of-mine stockpile. The material is conveyed to the processing circuit where it is divided into seven major units: crushing, concentration, dissolution, drying, compaction, storage and shipping.
Processing plants and other facilities	Beneficiation plant

Mineral Resource and Mineral Reserve Estimates

Table 2.6 shows the Mineral Resource tonnage and grade for all properties as of December 31, 2021.

Table 2.6 Summary of Mineral Resources as of December 31, 2021[a]

(in millions of tonnes)

Commodity/Geography/Mine Property Name	Measured Mineral Resources		Indicated Mineral Resources		Measured + Indicated Mineral Resources		Inferred Mineral Resources	
	tonnes	Grade	tonnes	Grade	tonnes	Grade	tonnes	Grade
Phosphate (Grade: P_2O_5)[b]								
United States								
Florida[c]	102.0	30.0	415.0	30.1	517.0	30.0	83.0	30.0
Peru								
Miski Mayo[d]	157.7	16.7	139.0	16.3	296.7	16.5	27.7	16.0
Brazil								
Araxá/Patrocínio[e][f]	115.1	12.4	481.0	12.9	596.1	12.8	174.9	13.4
Cajati[e][g]	28.3	5.3	33.8	5.0	62.1	5.1	5.2	4.8
Catalão[e][h]	54.2	10.4	97.9	10.5	152.1	10.5	60.1	9.4
Tapira[e][i]	62.8	8.0	67.0	7.8	129.8	7.9	112.8	8.6
Total Phosphate	**520.1**	**16.0**	**1,233.7**	**18.4**	**1,753.8**	**17.7**	**463.7**	**14.8**
Potash (Grade: K_2O)[j]								
Canada								
Belle Plaine[k]	—	—	—	—	—	—	4,647.0	19.0
Esterhazy[l]	255.0	23.3	2,092.0	22.8	2,347.0	22.8		
Colonsay[l]	—	—	—	—	—	—	977.0	29.0
United States								
Carlsbad[m]	—	—	—	—	—	—	39.0	6.0
Brazil								
Taquari[n]	—	—	6.8	23.6	6.8	23.6	58.1	22.9
Total Potash	**255.0**	**23.3**	**2,098.8**	**22.8**	**2,353.8**	**22.8**	**5,721.1**	**20.7**

(a) Mineral resources are reported exclusive of mineral reserves, and except as otherwise noted, are stated in-situ. Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.

(b) The percentage of P_2O_5 represents a measure of the phosphate content in phosphate rock or a phosphate ore body. A higher percentage corresponds to a higher percentage of phosphate content in phosphate rock or a phosphate ore body. Brazilian grades, except for Cajati, are P_2O_5ap, which represents the P_2O_5 associated with apatite and was calculated by the evaluation of the CaO / P_2O_5 ratio. Where CaO / P_2O_5 ratio was greater than or equal to 1.34, P_2O_5ap was equal to the total of P_2O_5; where the CaO / P_2O_5 ratio was less than 1.35, P_2O_5ap was equal to the CaO / 1.35 ratio.

(c) Mineral resource tonnages and grade are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade. The cut-offs used to estimate mineral resources include; minimum beneficiation plant concentrate BPL (27.45%P_2O_5), minimum pebble BPL (18.30%P_2O_5, except 22.88%P_2O_5 for Desoto and Pioneer), maximum pebble magnesium oxide concentration and a maximum clay content cut-off for a logged matrix layer and the composite matrix volume. A Life of Mine ("***LOM***") commodity price of US$102.72/tonne of phosphate rock was used to assess prospects for economic extraction but is not used for cut-off purposes.

(d) Mineral resources are presented on the basis of our 75% interest. Cut-off grade of > 8% P_2O_5 was applied for mineral resources. A breakeven pit shell was developed with costs, grade requirements and a sales price of US$97.6/tonne of phosphate concentrate (2020 price evaluation) to develop the mineral resource pit shell.

(e) Measured, indicated and inferred blocks were included in mineral resource estimates if they were inside mining concessions and exploration permits with a final report approved by the ANM, but exclusive of physical structures. For example, depending on the site, a physical structure may consist of a beneficiation plant, crusher or waste pile.

(f) Araxá Oxidized Cut-off grade: Mass Recovery (rend_t) > 0, $P_2O_5 \geq 4.78$, $Fe_2O_3 \geq 1.34$, $SiO_2 \geq 0.05$, BaO ≤ 18.83, CaO to P_2O_5 ratio 0.7 to 1.40. Araxá Micaceous Cut-off grade: Cut-off grade for Micaceous: Mass Recovery (rend_t) > 0, $P_2O_5 \geq 3.11$, $Al_2O_3 \leq 13.15$. For Araxá, a revenue factor of 1.0 with sales price of in Brazilian Real ($R) R$1,798.21 per tonne of phosphate concentrate (2019 price evaluation) was used to develop mineral resource pit shell. Patrocínio BEB-OXI Cut-off grade: $P_2O_5 \geq 3.5$, $Fe_2O_3 \leq 53.0$. Patrocínio CBN-OXI Cut-off grade:$P_2O_5 \geq 4.0$, $SiO_2 \geq 0.2$. Patrocínio BEB-MIC Cut-off grade: $P_2O_5 \geq 3.4$, $Fe_2O_3 < 50.0$, $SiO_2 < 57.5$, MgO < 17.0, TiO2 < 27.0. Patrocinio FET Cut-off grade: $P_2O_5 > 0.0$. Patrocínio RSI Cut-off grade: $P_2O_5 \geq 3.0$, CaO to P_2O_5 ratio < 2.6. For Patrocínio, a revenue factor of 1.0 with a sales price of R$1,635.29 per tonne of phosphate concentrate (2020 LOM price evaluation) was used to develop mineral resource pit shell.

(g) Cut-off grade of > 3% P_2O_5 and < 11% SiO_2 was applied for mineral resources. A revenue factor of 1.0 with sales price of R$1,944.5 per tonne of phosphate concentrate (2020 LOM price evaluation) was used to develop mineral resource pit shell.

(h) Cut-off grade of P_2O_5ap ≥ 5.2% and 0.8 ≤ RCP ≤ 1.6 and MgO < 12% was applied to mineral resources. A revenue factor of 1.0 with a constant sales price of R$1,537.92 per tonne of phosphate concentrate (2020 LOM price evaluation) was used to develop mineral resource pit shell.

(i) Cut-off grade of P_2O_5ap ≥ 5.0% and 0.9 ≤ RCP ≤ 3.0 was applied to mineral resources. A revenue factor of 1.0 with a sales price of R$1,492.92 per tonne of phosphate concentrate (2020 LOM price evaluation) was used to develop the mineral resource pit shell.

(j) %K_2O refers to the total %K_2O of the samples.

(k) No cut-off grade is used to estimate mineral resources as the solution mining method used at the Belle Plaine Facility is not selective. At no point in the cavern development and mining process can a decision be made to mine or not mine the potash mineralization that is in contact with the mining solution. The mining solution dissolves the potash, regardless of its grade, to make a concentrate that is pumped to surface from the mining caverns for processing.

(l) No cut-off grade or value based on commodity price is used to estimate mineral resources as the mining method used at Colonsay or Esterhazy is not grade selective. The potash mineralization is mined on one level by continuous miners following the well-defined and continuous beds of mineralization with relatively consistent grades. The following KCl commodity prices were used to assess prospects for economic extraction for the mineral resources but are not used for cut-off purposes: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for LOM plan $219/tonne. A US$/CAD$ exchange rate of 1.31 was used to assess prospects for economic extraction for the mineral resources but was not used for cut-off purposes.

(m) A 4% K_2O cut-off grade with less than 2% kieserite is used to estimate mineral resources. This is consistent with the definition of mineable potash established by the U.S. Geological Survey. The following K_2O commodity prices (US$) were used to assess economic viability for the mineral resources, but were not used for cut-off purposes: 2022- $318/tonne, 2023-$279/tonne, 2024-$261/tonne, 2025-$237/ton, 2026-$242/tonne, and for the 2021 LOM plan $267/tonne.

(n) Cut-off grade of > 20% KCl, a minimum Sylvinite thickness of 1.8m, and a minimum Sylvinite percentage per block of 50% was applied for mineral resources.

Table 2.7 shows the Mineral Reserve tonnage and grade for all properties as of December 31, 2021.

Table 2.7: Summary of Mineral Reserves as of December 31, 2021[(a)]

(in millions of tonnes)

Commodity/Geography/Mine Property Name	Proven Mineral Reserves		Probable Mineral Reserves		Total Mineral Reserves	
	tonnes	Grade	tonnes	Grade	tonnes	Grade
Phosphate (Grade: P_2O_5)[(b)]						
United States						
Florida[(c)]	59.0	28.2	69.0	27.1	128.0	27.6
Peru						
Miski Mayo[(d)]	109.8	16.2	54.1	15.1	164.0	15.9
Brazil						
Cajati[(e)]	40.5	5.2	32.0	5.0	72.5	5.1
Catalão[(f)]	67.2	10.8	17.4	10.5	84.6	10.8
Tapira[(g)]	193.7	9.4	275.6	9.1	469.3	9.2
Total Phosphate	**470.2**	**13.2**	**448.1**	**12.4**	**918.3**	**12.8**
Potash (Grade: K_2O)						
Canada						
Belle Plaine[(h)]	275.0	19.3	394.0	19.3	669.0	19.3
Esterhazy[(i)]	122.0	23.9	437.0	20.9	559.0	21.5
Colonsay[(i)]	104.0	25.3	163.0	27.2	267.0	26.5
United States						
Carlsbad[(j)]	176.0	6.5	0.0	0.0	176.0	6.5
Brazil						
Taquari[(k)]	0.0	0.0	28.1	14.7	28.1	14.7
Total Potash	**677.0**	**17.7**	**1,022.1**	**21.1**	**1,699.1**	**19.7**

(a) A mineral reserve is the economically mineable part of a measured or indicated mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted. Reserves are measured as Run of Mine ("***ROM***") unless otherwise noted.

(b) Brazil grades, except for Cajati, are P_2O_5ap, which represents the P_2O_5 associated with apatite and was calculated by the evaluation of the CaO / P_2O_5 ratio. Where CaO / P_2O_5 ratio was greater than or equal to 1.34, P_2O_5ap was equal to the total of P_2O_5; where the CaO / P_2O_5 ratio was less than 1.35, P_2O_5ap was equal to the CaO / 1.35 ratio.

(c) Mineral reserve tonnages and grade are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade. A LOM commodity price of US$102.72/tonne of phosphate rock was used to assess prospects for economic extraction but is not used for cut-off purposes. Cut-off based on productivity factors per site have been applied to estimate mineral reserves. Recoverable Finished Product tonnes vs. Matrix Volume Mined ranges from 9.4-9.9%. Recoverable Finished Product tonnes vs. Total Volume Mined is 2.2%.

(d) Mineral reserves are presented on the basis of our 75% interest. The reference point for cut-off grade and pit optimization analysis is tonnes of concentrate at a price of US$97.60/tonne concentrate (2020 LOM price evaluation). We applied a cut-off grade of > 8% P_2O_5 mineral reserves. Additionally, we used a phosphate concentrate grade limitation of a minimum P_2O_5 concentrate grade of 29.5% in the LOM plan.

(e) The reference point for cut-off grade and pit optimization analysis is tonnes of concentrate at a price of R$1,944.47/tonne concentrate (2020 price evaluation). Cut-off grade of > 3% P_2O_5 and < 11% SiO_2 was applied to mineral reserves. Mineral reserves were proven to be economic based on an internal transfer price of R$754/tonne of phosphate rock (2021 LOM price evaluation) that was derived in the discounted cash flow and compared to the gross margin available.

(f) The reference point for cut-off grade and pit optimization analysis is tonnes of concentrate at a price of R$1,537.92/tonne concentrate (2020 price evaluation). Cut-off grade of P_2O_5ap ≥ 5.2% and 0.8 ≤ RCP ≤ 1.6 and MgO < 12% was applied to mineral reserves. Mineral reserves were proven to be economic based on internal transfer price of R$357/tonne of phosphate rock (2021 LOM price evaluation) that was derived in the discounted cash flow and compared to the gross margin available.

(g) The reference point for cut-off grade and pit optimization analysis is tonnes of concentrate at a price of R$1,492.92/tonne concentrate (2020 price evaluation). Cut-off grade of P_2O_5ap ≥ 5.0% and 0.9 ≤ RCP ≤ 3.0 was applied to mineral reserves. Mineral reserves were proven to be economic based on internal transfer price of R$336/tonne of phosphate rock (2021 LOM price evaluation) that was derived in the discounted cash flow and compared to the gross margin available.

(h) No cut-off grade is used to estimate mineral reserves as the solution mining method used at the Belle Plaine Facility is not selective. At no point in the cavern development and mining process can a decision be made to mine or not mine the potash mineralization that is in contact with the mining solution. The mining solution dissolves the potash, regardless of its grade, to make a concentrate that is pumped to surface from the mining cavities for processing. Mine designs based on a solution mining method and design criteria are used to constrain mineral reserves within mineable shapes. The following KCl commodity prices were used to assess economic viability for the mineral reserves, but were not used for cut-off purposes: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for the LOM $219/tonne. A US$/CAD$ exchange rate of 1.31 was used to assess economic viability for the mineral reserves but was not used for cut-off purposes.

(i) No cut-off grade or value based on commodity price is used to estimate mineral reserves as the mining method used at the Esterhazy or Colonsay Facilities is not grade selective. The potash mineralization is mined on one level by continuous miners following the well-defined and continuous beds of mineralization with relatively consistent grades. Underground mining standards and design criteria are used to constrain mineral reserves within mineable shapes. The following KCl commodity prices were used to assess economic viability for the mineral reserves, but were not used for cut-off purposes, 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne and for the LOM plan $219/tonne. A US$/CAD$ exchange rate of 1.31 was used to assess economic viability for the mineral reserves but was not used for cut-off purposes.

(j) A 4% K_2O cut-off grade with less than 2% kieserite is used to estimate mineral resources and mineral reserves. The following K_2O commodity prices (US$) were used to assess economic viability for the mineral reserves, but were not used for cut-off purposes: 2022-$318/tonne, 2023-$279/tonne, 2024-$261/tonne, 2025-$237/ton, 2026-$242/tonne, and for the 2021 LOM plan $267/tonne.

(k) A tonnage reduction of 20% has been applied to the probable mineral reserves to account for geological uncertainty. A KCl grade downgrade of -10% was applied to the probable mineral reserves in order to adjust in-situ grades to ROM grades. A mean density of 2.10 g/cc was applied to all mineral reserve volumes to convert to tonnages. Cut-off grade of ≥ 20% KCl and a minimum Sylvinite thickness of 1.8m was applied for mineral reserves. The reference point for the discounted cash flow utilized K_2O commodity prices (US$) of $418/tonne for 2022, $369/tonne for 2023, $353/tonne for 2024, $324/tonne for 2025, $330/tonne for 2026 and $359/tonne for the remaining LOM. Mineral reserves were proven to be economic based on a positive discounted cash flow.

FLORIDA PHOSPHATES

Our three phosphate production stage mining facilities (South Fort Meade, Four Corners and Wingate) and three exploration properties (DeSoto, Pioneer and South Pasture) in Florida consist of over 210,000 acres of property in Central Florida (Table 2.8 and Figure 2.3). We idled the mining and beneficiation activities at South Pasture. The facilities and properties are in DeSoto, Hardee, Hillsborough, Manatee and Polk counties. Even though we continue to add real property to one or more of these locations, most of the property currently being mined or planned for future mining have been in industry ownership for over 50 years. The mining facilities and exploration properties are owned by or have controlling interest granted to Mosaic Fertilizer LLC, South Ft. Meade Land Management or South Ft. Meade Land Partnership, L.P. ("***SFMLP***"), each a subsidiary of Mosaic.

We either own or have a controlling interest in the mineral rights to the current and future facilities. Mineral and surface rights are joined at the Four Corners, Wingate, Pioneer and South Pasture properties. Portions of the DeSoto property and South Fort Meade facility have the surface and mineral interests severed.

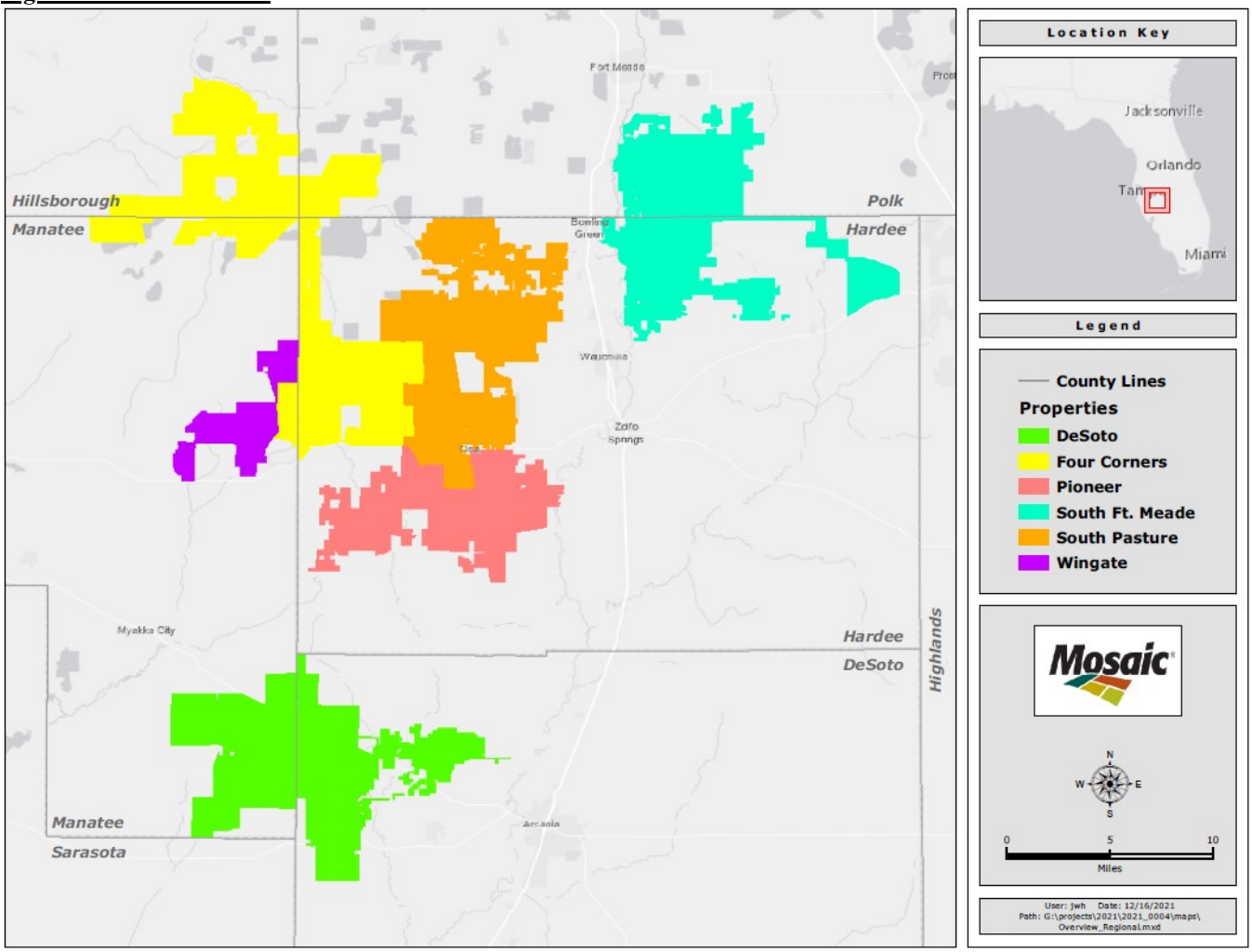
The net book value for our Florida phosphate mining facilities and exploration properties is $1.2 billion as of December 31, 2021.

Table 2.9 lists the land status and acreages for the facilities and properties.

Table 2.8: Property Locations

Property	Location
South Fort Meade Facility	Straddles the county line road beginning 1.3 miles east of the City of Bowling Green and continuing another five miles. Located at 27.667195 N, 81.761349 W.
Four Corners Facility	Located in southeast Hillsborough County, northeast Manatee County and southwest Polk County. Located at 27.646144 N, 82.087305 W.
Wingate Facility	Most of the property associated with this mine is west of Duette Road and north of State Road 64. There is a portion of this property that exists on the east side of Duette Road that begins approximately three miles north of State Road 64. Located at 27.504452 N, 82.132221 W.
DeSoto Property	This exploration property is bisected by State Road 70 and State Road 72 running east and west and the county line running north and south. A portion of the DeSoto property is owned fee simple and the mining interests on the remaining portion is secured by mineral rights. Located at 27.263018 N, 82.035208 W.
Pioneer Property	This exploration property is bisected by County Road 663 running north and south. Several local roads (Murphy, Bridges, Bennett and Post Plant) criss-cross this parcel. Located at 27.439391 N, 81.940020 W.
South Pasture Property	The property is situated along a 10 mile stretch of State Road 64 and a seven mile stretch along Country Road 663. All parcels are bisected by County Road 663, State Road 62, State Road 64 and several local roads. The mining and beneficiation activities at this location have been idled. Located at 27.585787 N, 81.942888 W.

Figure 2.3: Location Plan



The table below includes only land holdings associated with our mining properties.

Table 2.9: Property Status and Acreages

	Status (Acres)			
	Florida Phosphate Property Status and Acreages			
	Fee Simple	Mining Agreement	Mineral Rights [b]	Total
South Fort Meade Facility	13,326	25,528 [a]	112	38,966
Four Corners Facility	54,671			54,671
Wingate Facility	8,761			8,761
DeSoto Property	24,113	8	18,943	43,064
Pioneer Property	26,017			26,017
South Pasture Property	38,723			38,723
Total	165,611	25,536	19,055	210,202

(a) The mining agreement relates to the SFMLP which is 100% controlled by Mosaic or its subsidiaries.
(b) All acres include surface rights with the exception of the DeSoto mineral rights.

Governmental permits and approvals for mining are obtained from federal, state and county authorities, including the Environmental Resource Permit ("***ERP***") issued by Florida Department of Environmental Protection ("***DEP***") and permits

required by Section 404 of the federal Clean Water Act. In connection with these permits, we are required to develop a reclamation plan with respect to these areas. The ERP is associated with a Florida DEP-approved reclamation plan that requires “acre for acre and type for type” reclamation to reclaim mined areas. Mitigation may also be required by ERP conditions which may also require conservation easements to provide permanent protection.

The integrated water use permit (“***IWUP***”) issued by the Southwest Florida Water Management District (“***SWFWMD***”) in 2012 authorizes the withdrawal of groundwater from underground aquifers through permitted wells to provide potable and production-water supplies in support of mining and other operations. The IWUP addresses all of our active mining operations. A separate water use permit (“***WUP***”) was issued by SWFWMD for the South Pasture property in 2017. The IWUP and the South Pasture WUP also regulate mine dewatering to avoid adverse impacts to wetlands and offsite properties. Both the IWUP and the WUP are 20 year permits expiring in 2032 and 2037, respectively.

Pre-mining development follows the issuance of regulatory permits. This involves ditch and berm construction for stormwater control, groundwater draw down mitigation where applicable, land clearing, installation of infrastructure and pre-mining dewatering (only for dragline mining).

There are no significant environmental permitting encumbrances, existing or anticipated, associated with the mining facilities and exploration properties. We do not anticipate any future encumbrances based on current known regulations and existing permitting processes. There are no material outstanding violations and fines.

Existing Infrastructure

The three mining facilities are in rural Central Florida located southeast of Tampa in Hardee, Hillsborough, Manatee and Polk counties. The sites are located in agricultural zones with associated population centers and easy access to multiple transportation hubs in Central Florida. The three exploration properties are located south of the mining facilities. Each will utilize the same water, electrical, railway, and road networks as the active mines.

The mining facilities at South Fort Meade, Four Corners, Wingate and South Pasture commenced operations between 1981 and 1995, as noted below under “History and Exploration”. The phosphate mines have the infrastructure to meet our current production plans and long-range production goals. The current infrastructure includes major roads and highway access, railway support from CSX Transportation and electricity supplied by Duke Energy, TECO, PRECO, Florida Power and Mosaic cogeneration in associated distribution areas. Water supply is from Mosaic-owned deep wells and recycle sources. Current clay and tailings management areas footprints are expected to meet present demands, with additional capacity planned to meet the maximum volume and deposition rates from the LOM plan, which covers the period between 2022 and 2035. An integrated operations center remotely controls certain functions at our Florida Phosphate mines.

Additional infrastructure may be added to increase production reliability or flexibility. The assets currently in place are maintained through a workflow process that focuses on proactive inspections and preventative maintenance, while trying to minimize reactive maintenance. Except for South Pasture, which is currently idled, minimal infrastructure is currently in place at the other exploration properties.

We expect the sites to continue to operate effectively during the LOM while continuing to maintain the built infrastructure and renewing the long-term agreements in place for the site’s water, electricity, and logistics needs.

We focus on reliability-centered maintenance with the goal of extending the life of the majority of assets to align with the LOM plan. We expect that some infrastructure will need to be replaced as it reaches end of life and has been factored into the relevant capital cost requirements.

Phosphate mining in Central Florida is a mature industry. A network of suppliers, machine shops, fabricators, and specialty contractors exist to support mining, and post-mining, land reclamation activities. Many large component vendors have branch offices in either Lakeland or Tampa, Florida. Engineering, design, and technical services are readily available in Bartow, Lakeland, and Tampa, Florida.

Mining Method

Our mining operations in Central Florida extract phosphate using surface mining techniques. The active mines utilize either electric walking draglines or dredges to remove overburden and mine phosphate ore (matrix). Matrix is hydraulically transported via centrifugal pumping systems to the beneficiation plant.

Pre-mining development follows the issuance of regulatory permits. This involves ditch and berm construction for stormwater control, groundwater draw down mitigation where applicable, land clearing, installation of infrastructure and pre-mining dewatering (only for dragline mining).

Development of the mine plan is based on several factors, including geological data, equipment, property boundaries, geotechnical considerations, clay impoundment, reclamation schedule, production (volume and quality) demands, permits (local, state and federal) and third-party agreements, such as agreements with local community groups, neighboring properties or NGO's which do not materially impair the mine plan. Production is monitored through dragline/dredge monitoring systems, mass-flow instrumentation on slurry pumping systems and pit surveys. In addition to draglines and dredges, heavy mobile equipment is used to support mining activities. While each mine is staffed with Mosaic personnel to handle production and maintenance, contractors are used on an as-needed basis.

Processing Recovery Method

Phosphate matrix mined at the three mining facilities is processed through on-site beneficiation plants. The principal production components of the beneficiation plants consist of a washer, sizing system and flotation plant.

Matrix at each mine is slurried for transport to the beneficiation plant. After receiving matrix, washers separate minerals into four separate material groups. These are debris, pebbles, clay, and under-sized flotation feed. The pebble is one of the final products and the under-sized flotation feed material contains recoverable phosphate rock. The washers separate >1.0 mm phosphate product and the <1.0 mm slurry of liberated clay, sand and phosphate particles. The clay is removed with hydrocyclones and pumped to clay settling areas while the >0.1 mm sand and phosphate move on to the sizing section.

The >0.1 mm sand and phosphate is separated into different size fractions using hydrosizers. An upward flow of water is injected into the hydrosizer that forces the fine particles to rise and overflow the sizer, while the coarse particles gently fall and flow out the sizer's underflow. The segregated fine and coarse particles are then sent to the flotation plant so the phosphate can be separated from the sand.

The two-step flotation process, rougher flotation and cleaning flotation, is next utilized to separate phosphate from the sand. In the rougher flotation process, the phosphate mineral is recovered using flotation machines by adding fatty acid, oil, soda ash, and sodium silicate. To increase the recovered rougher phosphate grade, a second cleaning flotation process is used to remove the residual sand using amine.

History and Exploration

Table 2.10 lists the important historical dates and events relevant to the mining facilities and exploration properties:

Table 2.10: History

Date	Event/Activity
1881	Pebble phosphate discovered along the Peace River south of Fort Meade by Captain J. Francis LeBaron, chief engineer of a detachment of the Engineering Corps, United States Army.
1888	Phosphate rock first commercially mined along the Peace River.
1977	Farmland Industries purchased the Pioneer (eastern portion a.k.a. Hickory Creek) property.
1981	Beker Phosphate Company opened Wingate.
1983	Four Corners construction was completed. The operation was an equal partnership between IMC and W.R. Grace Corporation.
1985	Wingate was closed after Beker Phosphate Company filed for bankruptcy.
1985	Four Corners started production.
1986	IMC purchased Brewster Phosphates and closed the Lonesome Mine which would later be consolidated into Four Corners.
1986	Four Corners is idled due to market conditions.
1986	The DeSoto (also know as Pine Level) property is sold by AMAX Chemical Company to Consolidated Minerals, Incorporated.
1988	IMC gained 100% control of Four Corners.
1989	IMC restarted Four Corners.
1990	Wingate is acquired by Nu-Gulf.
1992	Wingate is reopened after a joint venture by Nu-Gulf and Royster Industries but closed later that year.
1993	IMC-Agrico is created by a joint venture between IMC and Agrico Chemical Company (a subsidiary of Freeport McMoRan).
1995	CF Industries opened and started production at South Pasture.
1995	Mobil Chemical Corporation opened and started production at South Fort Meade.
1996	Cargill Fertilizer (later Cargill Crop Nutrition) acquired South Fort Meade.
1996	DeSoto (a.k.a. Pine Level) and Ona (includes western portion of the Pioneer property) properties are sold by CMI to IMC-Agrico.
1997	IMC acquired Freeport McMoRan's share of IMC-Agrico.
1998	Wingate is reopened.
1999	Wingate is closed.
2002	Cargill Crop Nutrition acquired the Pioneer property (eastern portion a.k.a. Hickory Creek) from Farmland-Hydro.
2004	Cargill Crop Nutrition acquired and reopened the Wingate Facility.
2004	Mosaic created out of a merger between IMC and Cargill Crop Nutrition.
2005	Wingate is shutdown.
2006	The Fort Green site is closed permanently, and the property is consolidated into Four Corners and Wingate.
2008	Wingate is reopened.
2014	Mosaic acquired CF Industries' phosphate business in Florida, which included the South Pasture property.
2018	South Pasture Facility is idled.
2018	Ona (western portion) property is consolidated into Four Corners.
2020	South Fort Meade acquired the Eastern Reserves.

Geology and Mineralization

The phosphate deposits of Florida are sedimentary in origin and part of a phosphate-bearing province that extends from southern Florida north along the Atlantic coast into southern Virginia. Sedimentary phosphate deposits consist of rock in which the phosphate mineral(s) occur in grains, pellets, nodules, and as phosphate replacement of calcium in the remains of animal skeletal material and excrement.

Florida has phosphate rock distributed along the entire peninsula with varying lateral extents and abundance. There are five phosphate districts recognized in Florida identified as Northern, Northeast, Hardrock, Southeast and Central. The phosphates of Florida occur in sedimentary rocks and are of secondary origin, having been redeposited either by mechanical or chemical action. During deposition, most of the carbonate platform was drowned, and deposition was widespread. The intensity of reworking by marine processes allows some deposits to remain relatively near their origins and contribute to massive deposits while others were transported and winnowed into deposits of nodules, grains and pellets.

All our phosphate deposits are located in the Central Florida Phosphate District. The general description of the phosphatic deposits in Central Florida consist of two geological facies. The phosphate bearing units are within the Bone Valley Member of the Peace River Formation and the undifferentiated Member of the Peace River Formation within the South Florida Extension region of the Central District. The deposit characteristics transition from north east to the south west. The major phosphate bearing units in the north east consist of a productive Bone Valley Member with limited production in the Undifferentiated Member. The phosphate bearing units in the south west exhibit limited production in the Bone Valley Member and a productive Undifferentiated Member of the Peace River Formation.

The phosphate stratigraphy consists of 5 to 50 feet thick, white to brown poorly graded quartz sand with varying abundance of reworked phosphate grains as waste overburden. The economic zone is 13 to 50 feet thick, with a grade ranging from 27 to 35% P_2O_5. It consists of tan-gray to gray quartz sands, dark gray to dark gray-blue-green clays and silts with phosphate nodules and pellets present with phosphate grains and clasts predominate. There can be interbedded waste zones of 0 to 15 feet thick comprised of beds of cream to green barren sandy clay, clays or dense dolomitic clays. The basal units are dark gray to black clays to phosphatic limestone rubble to beds of phosphatic limestone.

Mineral Resource and Mineral Reserve Assumptions and Modifying Factors

The key mineral resource and mineral reserve assumptions and modifying factors are listed in Table 2.11.

Table 2.11: Key Assumptions and Modifying Factors:

Parameter	Value	TRS Section
Supporting Information	Regional geologic studies, 55,585 drill holes and greater than 40 years of mining history.	Section 7
Average total thickness of the phosphate mineralization	13 to 50 ft.	Section 6
Minimum Concentrate %P_2O_5	0.2745	Section 11
Minimum Pebble %P_2O_5	18.30 to 22.88%	Section 11
Maximum pebble magnesium oxide ("***MgO***") cut-off volume	0.025	Section 11
Maximum Clay Content	40 to 50%	Section 11
Maximum Dragline Mining depth	85 ft.	Section 11
Maximum dredge mining depth	109 ft.	Section 11
Production Days per Year	365 days	Section 11
Mining Method	Dredge and dragline mining	Section 13
Production Rate	Approximately 9 to 13 million tonnes per year (2022-2030).	Section 13
Mineral Resource Cut-offs	Minimum beneficiation plant concentrate BPL (27.45%P_2O_5), minimum pebble BPL (18.30%P_2O_5, except 22.88%P_2O_5 for DeSoto and Pioneer), maximum pebble magnesium oxide concentration and a maximum clay content cut-off for a logged matrix layer and the composite matrix volume.	Section 11
Mineral Reserve Cut-off	Cut-off based on productivity factors per site have been applied to estimate mineral reserves.	Section 12
Mining Dilution	12.4 to 18.9% minimum pebble volume dilution and 10.30 to 10.95% minimum concentrate volume dilution.	Section 11
Mineral Resource Impurity Recovery	100%	Section 11
Mineral Reserve Pebble Impurity Recovery	87 to 100% Fe_2O_3, 97 to 119% aluminum oxide ("***Al_2O_3***"), 100% CaO, 90 to 166% MgO	Section 12
Mineral Reserve Concentrate Impurity Recovery	86 to 100% Fe_2O_3, 91 to 109% Al_2O_3, 100% CaO, 75 to 105% MgO	Section 12
Processing Method	Beneficiation plants at the facilities consisting of washer, sizing and flotation processes.	Section 14
Mineral Resource Beneficiation Plant Recovery	100%	Section 11
Mineral Reserves Beneficiation Plant Recovery	Pebble: 99.2 to 102.4%, Concentrate: 64.3 to 92.8%	Section 12
Deleterious Elements and Impact	Major elements include MgO, pyrite (FeS2) and Al_2O_3 affecting flotation and filtering processes.	Section 10, 11,12
Environmental Requirements, Permits etc.	No significant environmental permitting encumbrances.	Section 17
Geotechnical Factors (if any)	No concerns.	Section 13
Hydrological or hydrogeological factors (if any)	Water inflow onto mining areas can impact recovery and dilution.	Section 13
Commodity Price	$102.72/tonne of phosphate rock.	Section 16

Mineral Resource Estimates

Mosaic's phosphate mineral resources are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade, including a total primary impurities ratio ("***MER***").

The geological information used to estimate the phosphate mineral resources for the mining facilities and exploration properties is based on drilling and sampling. The mineral resource estimates are completed using a proprietary software that applies specific grade, physical and impurity limits to the raw drill data of the property. These factors are used to select material that contains sufficient grade, limited impurities and is physically extractable to be included in the mineral resource estimate. The confidence and classification of the mineral resources is estimated based on the drill density of the evaluated area.

Mineral resources that are not mineral reserves have not demonstrated economic viability utilizing the criteria and assumptions required.

The methodology for estimating mineral resources consists of interpreting the available geological data to create composites of lithological units that meet the specified criteria. These composites are then mapped to determine the mineral resource boundary. The boundary is then trimmed to account for permit and mine boundary limitations. The composite data is also used to create a geologic model composed of volume, density, grade, and impurity grids created using inverse distance weighted as the interpolation method. Elevation grids are created using triangulation based on LiDAR (Light Detection and Ranging) or survey data assigned to each drill hole. A utility macro is used to adjust elevations to account for holes with no matrix that meets the mine requirements. The data from each grid is then volumetrically combined using product volumes for the specific mineral resource shape and mineral resource classification creating a block of uniform constituents. Estimation of mineralization tonnage, grade and impurities is done by applying the volume weight percent of pebble, feed, and clay for the given mineral resource shape.

Additional details regarding the estimation methodology are listed in Section 11 of the 2021 Florida Phosphate Mining TRS filed as an Exhibit to the 10-K Report.

Table 2.12 lists the total mineral resource estimates. Mineral resources are reported exclusive of the mineral reserves.

Table 2.12: Mineral Resources at the End of the Fiscal Year Ended December 31, 2021 Based on a LOM Plan Phosphate Rock Price of $102.72 per tonne[(a)(b)(c)(d)(f)]

(tonnes in millions)

Category	Tonnes[(e)]	Grade %P_2O_5[(e)]	Cut-off Grade	Metallurgical Recovery %
Measured	102.0	30.0	n/a	100 %
Indicated	415.0	30.1	n/a	100 %
Measured + Indicated	**517.0**	**30.1**	n/a	100 %
Inferred	83.0	30.0	n/a	100 %

(a) Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.
(b) Mineral resources are reported as mineralization (matrix) tonnage, grade and impurities after beneficiation.
(c) Mineral resources assume dragline mining at all sites except Wingate mine where dredging is assumed.
(d) Mineral resources amenable to a dragline mining method are contained within a conceptual mine pit design using the same technical parameters as used for mineral reserves.
(e) The cut-offs used to estimate mineral resources include: minimum beneficiation plant concentrate BPL (27.45%P_2O_5), minimum pebble BPL (18.30%P_2O_5, except 22.88%P_2O_5 for Desoto and Pioneer), maximum pebble magnesium oxide concentration and a maximum clay content cut-off for a logged matrix layer, and the composite matrix volume.
(f) A LOM commodity price of $102.72/tonne of phosphate rock was used to assess prospects for economic extraction but is not used for cut-off purposes.

No mineral resources were reported in 2020, as the Company reported under Industry Guide 7, which did not recognize mineral resources. As a result of the change in reporting to Regulation S-K 1300, the mineral resources are being reported for the first time.

Mineral Reserve Estimates

Mosaic's estimated mineral reserves are located at the South Fort Meade, Four Corners and Wingate mine facilities and are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total MER. Mineral reserves have demonstrated economic viability utilizing the criteria and assumptions required at each phosphate facility and meet all the mining criteria required including, but not limited to mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.

The methodology for estimating mineral reserves consists of interpreting the available geological data to create composites of lithological units that meet the specified reserve criteria. A utility macro is used to apply reserve plant volume recoveries, adjust insoluble limits to the geologic model and to adjust elevations grids to account for holes with no matrix that meets the mine requirements. Dragline or dredge pit design work and scheduling are applied to the geologic model by the mine planner. Tonnes, grades and product quality are estimated by applying the mining shapes to the geological model. The data from each grid is then volumetrically combined using product volumes for the specific mine pit shape creating a block of uniform constituents. The recoverable tonnes of pebble and feed for the entire mine pit are calculated based on the area of the mine pit. The beneficiation plant grade recoveries are then applied to the recoverable feed tonnes to estimate the mineral reserves and recoverable concentrate tonnes.

Additional details regarding the estimation methodology are listed in Section 12 of the 2021 Florida Phosphate Mining TRS filed as an Exhibit to this 10-K Report.

The mineral reserve estimates are listed in Table 2.13.

Table 2.13: Mineral Reserves at the End of the Fiscal Year Ended December 31, 2021 Based on a LOM Plan Phosphate Rock Price of $102.72 per tonne[(a)(b)(c)(d)(e)]

(tonnes in millions)

Category	Tonnes	Grade %P_2O_5	Metallurgical Recovery %
Proven	59	28.2	Pebble: 99.2 to 102.4%, Concentrate: 64.3 to 81.9%
Probable	69	27.1	Pebble: 99.2 to 102.4%, Concentrate: 64.3 to 81.9%
Proven + Probable	**128**	**27.6**	Pebble: 99.2 to 102.4%, Concentrate: 64.3 to 81.9%

(a) South Fort Meade and Four Corners mineral reserves are mined by a dragline mining method. The Wingate mineral reserves are mined by dredge mining.
(b) Cut-off based on productivity factors per site have been applied to estimate mineral reserves. Recoverable finished product tonnes vs. matrix volume mined ranges from 9.4-9.9%. Recoverable finished product tonnes vs. total volume mined is 2.2%
(c) Mine designs are used to constrain measured and indicated mineral resources within mineable pit shapes.
(d) Only after a positive economic test and inclusion in the LOM plan are the mineral reserve estimates considered and disclosed as mineral reserves.
(e) A commodity price of $102.72/tonne of phosphate rock was used to assess the economic viability of the mineral reserves in the LOM.

Mineral Resources and Mineral Reserves Comparison

As of December 31, 2021, we had mineral reserves of 127 million tonnes compared to 515 million in the prior year, resulting in a decrease of 75%. Changes in mineral reserve tonnage from the prior year are the result of mining depletion, small changes to beneficiation plant factors, the change from Industry Guide 7 to S-K 1300, and the reclassification of South Pasture reserves to resources due to the idling of the South Pasture property.

BELLE PLAINE

The Belle Plaine Facility is in the rural municipality of Pense (No. 160) in the province of Saskatchewan, Canada. It is located north of the TransCanada Highway (Hwy. 1) approximately 32 miles west of Regina (Figure 2.4). It is the oldest and largest potash solution mine in the world. Coordinates for the Belle Plaine facility are +50° 25’ 39.57, -105° 11’ 53.87” +50° 25’ 39.57,” -105° 11’ 53.87”.

We lease 53,133 acres of mineral rights from the Crown under Subsurface Mineral Lease KL 106-R. Table 2.14 lists additional information regarding the lease. Table 2.15 outlines the lease acreage designated by township and section. The lease term is for a period of 21 years from July 2012, with renewals at the Company’s option for additional 21-year periods.

In addition, we own 19,284 acres of mineral rights within the Belle Plaine area as shown in Table 2.16 below. All mineral titles owned or leased by us include “subsurface minerals,” which under The Subsurface Mineral Tenure Regulations, 2015 (Saskatchewan) means “all-natural mineral salts of boron, calcium, lithium, magnesium, potassium, sodium, bromine, chlorine, fluorine, iodine, nitrogen, phosphorus and sulfur, and their compounds, occurring more than 197.0 feet (60.0 m) below the surface of the land”. Other commodities (e.g., petroleum and natural gas, coal, etc.) may be included within mineral rights we lease or own but are not specifically sought after when acquired.

Within the total acreage leased from the Crown or owned by us are parcels of land where we own or lease less than a 100% share of the mineral rights. In order to mine these properties, we would need to acquire 100% control either by lease or ownership. Acreages currently not mineable for this reason are listed in Table 2.17 below.

There are no significant environmental permitting encumbrances, existing or anticipated in the future, associated with the Belle Plaine Facility. We do not anticipate any future encumbrances based on current known regulations and existing permitting processes. There are no outstanding fines or material violations.

The net book value for Belle Plaine is $0.9 billion as of December 2021.

Figure 2.4: Location Plan

Table 2.14: Mineral Lease

Crown Lease Number	Type	Area (Ha)	E Expiration Date
KL 106-R	Subsurface Mineral Lease	21,501	July 1, 2033

Table 2.15: Sections and Acreages Owned by the Crown

Township/Range	Sections of Mineral Rights Owned by Crown*	Area of Mineral Rights Owned by Crown (acres)
18/21	2/100	12
19/21	4-13/16	3,087
17/22	4-14/16	3,118
18/22	9-10/16	6,166
19/22	9-6/16	5,991
17/23	9-11/16	6,201
18/23	14-13/16	9,475
17/24	7-1/16	4,500
18/24	18-7/16	11,813
18/25	4-5/16	2,768
Total	83-2/100	53,131

*Full sections range from 640 acres to 644 acres; total acreage shown above is based on 640 acres per section where actual survey acreage is not available.

Table 2.16: Sections and Acreages of Mosaic Owned Mineral Rights

Township/Range	Sections of Mineral Rights Owned by Mosaic*	Area of Mineral Rights Owned by Mosaic (acres)	Area of Full Quarter Sections Owned by Mosaic (acres)
17/23	10-14/16	6,962	5,910
18/23	6-11/16	4,275	3,817
17/24	7-7/16	4,762	3,526
18/24	5-2/16	3,286	2,871
Total	30-2/16	19,285	16,124

*Full sections range from 640 acres to 644 acres; total acreage shown above is based on 640 acres per section where actual survey acreage is not available.

Table 2.17: Partial Mineral Rights Area

Township/Range	Sections of Crown Mineral Rights Leased by Mosaic, Currently Not Mineable*	Crown Mineral Rights Leased by Mosaic, Currently Not Mineable (acres)
18/22	1-2/100	652
19/22	1-7/100	682
18/23	38/100	241
18/24	48/100	307
Total	2-94/100	1,882

*Full sections range from 640 acres to 644 acres; total acreage shown above is based on 640 acres per section where actual survey acreage is not available.

Existing Infrastructure

The Belle Plaine Facility has been operating since 1964 and consists of a mining area and a processing plant and has an expected mine life based on mineral reserves of 63 years. The processing plant consists of a refinery and cooling pond. The Belle Plaine Facility has the infrastructure in place to meet the current production goals and LOM plan. The current infrastructure includes major road and highway access; railway support from Canadian National Railway ("***CNR***") and

Canadian Pacific Railway ("***CPR***"); SaskPower-supplied electricity; TransGas-supplied natural gas; and potable and non-potable water supplied from a local fresh water source. We expect the current TMA footprint to support the volume and deposition rates indicated in the 2021 LOM plan.

The main source of water (non-potable) required for production is provided by SaskWater from the Buffalo Pound Lake, located northwest of the mine. It also supplies potable water for the cities of Regina, Moose Jaw and surrounding regions. Water levels are controlled by the SaskWater Security Agency and managed through the Lake Diefenbaker Dam.

SaskPower provides a portion of the power required to run the Belle Plaine Facility. This power comes in off the main SaskPower grid which could be fed from any number of SaskPower plants, along the highline running north and south along Kalium Road. A total of 138 kV comes into the Belle Plaine Facility substation where it is then stepped down to 13.8 kV using two transformers (28 MVA and 33.3 MVA). The Belle Plaine Facility owns and manages a substation where there is also a 138 kV grounding transformer and a 138 kVA gas insulated breaker lineup. The Belle Plaine Facility generates power from the powerhouse from two turbine generators.

TransGas supplies natural gas to the Belle Plaine Facility. The gas flows from the main lines into a local regulator station situated just north of the administration building and powerhouse. This station takes the high-pressure feed from the main lines and cuts it down through on-site filtration and also does some pre-heating to provide low pressure gas directly to the facility.

There are a variety of local or site roads on or to the Belle Plaine Facility. These are typically gravel roads. Roads around the processing plant are paved.

CNR and CPR are available to the Belle Plaine Facility to move final product to port. There is an operating agreement between Mosaic, CPR and CNR which governs the joint operation and interaction of all parties for freight services at the Belle Plaine Facility.

The Belle Plaine Facility is located between the cities of Moose Jaw and Regina, Saskatchewan. Moose Jaw has a population of approximately 34,000 people and is located 17 miles west of the Belle Plaine Facility. Regina, located 27 miles east of the Belle Plaine Facility, has a population of approximately 214,000 people.

Our workforce primarily lives in Regina and Moose Jaw and are typically trained through a variety of trades programs offered at the Saskatchewan Polytechnic campuses, the University of Regina or the University of Saskatchewan.

The province of Saskatchewan offers a large variety of suppliers for the potash mine operators. The potash industry in Saskatchewan is very mature which makes it easier to attract vendors to support the needs of the various mine sites throughout the province.

Saskatoon and Regina, Saskatchewan both have large industrial sectors with a variety of machine shops and industrial support services. Some specialty services are provided from the Alberta oil and gas industry.

Supplies are sourced locally, regionally and internationally based on availability or commercial considerations. Lead times and on-hand inventory are balanced to meet the needs of the site.

Mining Method

The Belle Plaine Facility utilizes an underground, solution mining process where paired wells are directionally drilled, cased, and cemented to the base of the potash beds. Solution mining techniques are used to target mining of the potash ("***KCl***") bedding while minimizing mining of the halite salts ("***NaCl***"). Current mining practices allow for all three potash beds in the formation to be mined. During the mining process, the two wells are mined to connect with each other underground, allowing one well to become the feed well and the other well to become the return well. Water, or a weaker brine, is injected into the cavern to return a salt saturated and potash rich brine. This fluid is pumped through pipelines from the mining area and sent to the refinery complex as raw feed for further processing. The total life cycle of each cavern is approximately 25 years. Once the potash recovery is exhausted, each cavern is plugged and decommissioned in accordance with local government regulations.

The mining area capability is scheduled to ramp up to support a finished tonnage projection of 3.0 million tonnes per year and will do so until drilling is completed in the year 2066 at which point there is a ramp down in production until 2084.

The 2021 Belle Plaine LOM plan based on mineral reserves has an expected total mine life of 63 years, ending in 2084 and yielding an estimated total of 166.85 million tonnes of final product KCl.

Processing Recovery Method

The Belle Plaine Facility processing plant receives KCl-NaCl rich brine, known as raw feed, from the mine and achieves KCl recovery through the refinery and cooling pond areas. We use well established solubility curves of H_2O-NaCl-KCl systems to monitor the selective dropout of products in the process.

The refinery subjects the raw feed brine from the mining area to changing temperatures and pressures that selectively precipitates the NaCl and then the KCl out of solution in different stages of the process. Selective drop out of NaCl is achieved through two parallel lines of evaporators that heat the brine with steam, that is generated on-site through natural gas fired boilers. The heating of the raw feed brine results in water liberation, causing NaCl to concentrate in the brine and then precipitate out of solution. After the brine is conditioned in the evaporator circuit, it is pumped to the thickener area for clarification and then pumped into a crystallizer circuit for KCl recovery. The crystallizer circuit subjects the process brine to a vacuum that allows further boiling, creating a cooling effect on the brine. As the brine cools, the KCl is forced to precipitate out of solution. The solid KCl is withdrawn from the crystallizer vessel as a slurry and pumped to the dewatering and drying area. The brine that overflows the crystallizer circuit, which still contains some dissolved KCl and NaCl, is fed to the cooling pond area for further KCl recovery.

The cooling pond area consists of multiple ponds that are fed with brine from the refinery and with raw feed brine from the mining area. The ponds facilitate atmospheric cooling, which allows KCl to preferentially precipitate out of the brine and then settle to the bottom of the ponds. The cooling pond area contains several KCl dredges that are comprised of a cutter wheel that fluidizes the deposited KCl from the bottom of a cooling pond and a slurry pump that moves the KCl slurry toward the dewatering and drying areas.

The dewatering and drying area removes the bulk of the brine in the slurry through process equipment and then conveys the KCl product into natural gas fired industrial dryers. The dried KCl product is then fed into the sizing area or compaction area for compacting, crushing, and screening processes to achieve product size specifications. Finished product is then conveyed to the on-site storage area, where it is held until being reclaimed, rescreened and shipped off site, primarily through rail.

We expect site production to increase by 2025 to 3.0 million tonnes per year until the year 2066, at which time we expect to stop drilling new cavities and ramp down production to 2084. The site's ability to produce at a sustained 3.0 million tonnes per year in future years is backed by a Canpotex proving run in 2016/2017, in which the Belle Plaine Facility achieved a production nameplate of 3.9 million tonnes per year. We expect total site processing recovery to average 79% throughout the remaining life of the mine and is dependent on sustained drilling activities. Future projections are modeled with mass and energy balance software to predict the future production and recovery capabilities.

History and Exploration

The Belle Plaine Facility started production in 1964, after a period of significant research into solution mining, potash recovery and processing plant construction. Table 2.18 summarizes the important historical dates and events for the Belle Plaine Facility.

Table 2.18: History

Date	Event/Activity
1928	Discovery of evaporites in the sedimentary sequence in Saskatchewan.
1956 to 1966	Pittsburgh Plate Glass completed significant research and development over a decade and published several research papers concerning solution mining and potash recovery.
1960	A pilot solution mining project located at the current site was constructed, convincing Pittsburgh Plate Glass to develop the first commercial potash solution mining operation in the world based on the pilot plant results. The first exploration well drilled at the Belle Plaine property was Standard Chemical Stony Beach #1 in August 1960. Fourteen additional exploration wells were drilled from August 1960 to June 1968.

1963	Kalium Chemicals, Ltd, a joint subsidiary of Pittsburgh Plate Glass and Armour and Co. started construction of the original processing plant for a capacity of 0.544 million tonnes annually. The main plant construction consisted of the North and South evaporators (all 8), crystallizers #1 to #4, #1 and #2 compactor systems, #1 to #5 beehive warehouses, loadout building and the office and maintenance buildings.
1964	Mine and processing plant construction completed and production commences. The first rail car of potash was produced and shipped in August.
1968	Capacity expansion to 0.9 million tonnes per year. Main assets added included three more crystallizers (#5, #6 and #7), a third cooling tower, a sixth beehive warehouse and a barn style warehouse #7, a fluid bed dryer and filter table and a third boiler.
1980 to 1984	Two capacity expansions, first to 1.1 million tonnes and the second to 1.5 million tonnes per year. The major assets added included bucket elevators for each product, the fine fluid bed dryer, #4 compactor, reheat system barometric, additional galleries and conveyors to the warehouse (1A), cooling ponds, scrubbers and the Cold Leach Area.
1989	Belle Plaine Facility sold to Sullivan & Proops (Vigoro).
1990s	Capacity expansion to 2.0 million tonnes per year. Assets added included the K-Life System, #4 Turbo Generator, dual conveyors, conversion of the compaction system and additional compactors installed.
1995	IMC purchased Belle Plaine.
1998	The first 2D seismic survey at the Belle Plaine mine site was completed. A total of 160 line km was completed covering an area of approximately 14 sq. km.
2000	The first 3D seismic survey at the Belle Plaine Facility was completed, providing critical geological information about the geology of the potash members. This has become a critical tool used to provide confidence in the interpretation of the potash mineralization.
2001	The 2001 Belle Plaine Facility 3D seismic survey was completed. The survey covered approximately 13 sq. km. and was adjacent to and merged with the 2000 survey. This survey program utilized 56 km of source lines and 72 km of receiver lines.
2004	Mosaic created out of a merger between IMC and Cargill Crop Nutrition.
2005	The 2005 Belle Plaine Facility 3D seismic survey was completed. The survey covered approximately 11 sq. km and was adjacent to and merged with previous 3D surveys. This survey program utilized 47 km of source lines and 55 km of receiver lines.
2008	The 2008 3D seismic survey covered approximately 72 sq. km and was adjacent to and merged with previous 3D surveys. This survey program utilized 385 km. of source lines and 378 km of receiver lines.
2008 to 2012	Capacity was expanded to 2.86 million tonnes per year. Assets added the injection wells 3 and 4, reclaim brine system, #4 boiler, process water building, cold leach motor control center room, #5 compaction system, #8 warehouse building, #2 reclaim, reclaim losses system, pond return slurry tank and centrifuge upgrades, rotary dryer #3, #2 loadout system, 60 km of new mine field pipelines, a drilling rig, new substation and replacement of the #4 crystallizer.
2010	The Pense 3D seismic survey was completed that covered approximately 40 sq. km and was adjacent to and merged with the previous 3D surveys. This survey program consisted of 219 km of source lines and 208 km of receiver lines.
2014	Plant upgrades included the adding and commissioning of Compaction #6.
2016/2017	The site's ability to produce at a sustained 3.0 million tonnes per year in future years was validated through a "proving run" completed in 2016 when the Belle Plaine Facility achieved a proven peak capacity of 3.9 million tonnes per year.

2019	Plant upgrades were completed, consisting of adding the east thickener and advanced dewatering techniques.
2020	Two production wells were cored in 2020 to support the grade interpretation and calibration of the gamma geophysical logging system. The recent calibration check has been evaluated by a third party potash consultant to ensure applicability of the method regarding sample quality grade estimation.

Geology and Mineralization

The intracratonic Elk Point Basin is a major sedimentary geological feature in western Canada and the northwest U.S. It contains one of the world's largest stratabound potash resources. The nature of this type of deposition is largely continuous with predictable depths and thickness. It is mined at several locations, including Belle Plaine.

Potash at the Belle Plaine Facility occurs conformably within Middle Devonian-age sedimentary rocks ranging in thicknesses from approximately 100 to 131 feet at a depth of approximately 5,345 to 5,740 feet.

The Prairie Evaporite Formation, host to the potash mineralization, is divided into a basal lower salt and an overlying unnamed unit containing three potash-bearing units and one unit containing thin marker beds. In ascending order, the potash horizons in the upper unit are the Esterhazy Member, White Bear Marker Beds, Belle Plaine Member, and Patience Lake Member. Mineralogically, these members consist of sylvite and halite with minor amounts of carnallite (KCl, $MgCl_2$, $6H_2O$).

The Esterhazy, Belle Plaine, and Patience Lake Members underly the Belle Plaine property. Also present are the White Bear Formation marker beds which occur between the Belle Plaine and Esterhazy Members but are of insufficient thickness to be minable.

The following is a summary of the key stratigraphic units for the Belle Plaine Facility area:

- Patience Lake Member: The uppermost member of the Prairie Evaporite Formation with potash production potential. Between the top of the Prairie Evaporite and the top of the Patience Lake Member is a 0 to 45 feet thick unit of halite with clay bands called the Salt Back. The sylvite-rich horizons within the Patience Lake Member are mined using conventional underground mining techniques along a trend from Vanscoy to Lanigan in the Saskatoon area and by solution mining techniques at Belle Plaine.

- Belle Plaine Member: The Belle Plaine Member underlies the Patience Lake Member and is separated from it by a zone of low grade sylvinite. The Belle Plaine Member is mined using solution mining techniques at the Belle Plaine Facility.

- White Bear Formation: The White Bear Formation consists of marker beds that are a distinctive unit of thin interbedded clay, halite, and sylvinite horizons that are not minable due to their insufficient thicknesses of only 4.0 to 5.0 feet (1.2 to 1.5 m).

- Esterhazy Member: The Esterhazy Member is separated from the Belle Plaine Member by the White Bear Formation marker beds, a sequence of clay seams, low-grade sylvinite, and halite. The Esterhazy Member is mined using conventional underground techniques at the Esterhazy Facility in southeastern Saskatchewan, and by solution mining techniques at the Belle Plaine Facility. The potash mined at the Belle Plaine Facility is a mixture of halite and sylvite and in some parts of the mining area, small amounts of carnallite. There are a number of insoluble clay-rich zones that are not recovered in the solution mining process. The potash deposit at Belle Plaine is uniform and laterally continuous. Solution mining methods can more easily accommodate any local variations in geological condition due to the non-selective concentrate mining process.

When considering the sequence of mining at the Belle Plaine Facility, the following terminology is applied to the beds. This describes the geology in a way that best summarizes the grades that are available for solution mining.

- The Upper Mining Zone consists of beds 38 to 31 of the Patience Lake Member and beds 23 to 21 of the Belle Plaine Member. The Upper Mining Zone is about 90 feet thick.

- The Salt Stringer is a thin bed of salt located between Beds 31 and 23 in the Upper Mining Zone. The Salt Stringer is approximately 10 feet thick.
- The Interzonal Salt is a thick bed of salt located between the Lower and Upper Mining Zones.
- The Marker Bed is a small, very rich potash bed located midway through the Interzonal Salt.
- The Lower Mining Zone consists of beds 13, 12 and 11 of the Esterhazy Member. The Lower Mining Zone is approximately 20 feet thick.

Potash mineralization contains sylvinite: a mixture of the iron oxide-stained halite, sylvite and locally carnallite. When present interstitially or as massive pods, carnallite can deteriorate rapidly or be preferentially dissolved. The color of the potash can vary from light orange to deep red rimmed crystals. The mineralization can be locally bedded or massive. The halite and sylvite crystals can range from small to more typically coarse to large which can be attributed to the conditions during deposition as there has been no alteration.

Mineral Resource and Mineral Reserve Assumption and Modifying Factors

The key mineral resource and mineral reserve assumptions and modifying factors are listed in Table 2.19.

Table 2.19: Key Assumptions and Modifying Factors

Parameter	Value	TRS Section
Supporting Information	Regional geologic studies, 719 production wells, seismic surveys and 57 years of mining history from approximately 350 caverns.	Section 7, 11
Average composited total thickness of the potash mineralization amenable to solution mining	102.2 ft.	Section 11
Tonnage Factor	17.2 cu ft./tonne (2,054 kilograms per cubic meter).	Section 11
Average KCl grade from all drilling	30.6% (19.3% K_2O)	Section 11
Operating Days per Year	365 days	Section 13
Mining Method	Solution mining from surface installations.	Section 13
Production Rate	3.0 million tonnes per year.	Section 13
Cut-off	No cut-off grade is applied.	Section 11, 12
Mining Recovery	22%	Section 13
External Dilution	None	Section 12
Processing Method	KCl recovered from brine solution.	Section 14
Processing Recovery	79 to 96%	Section 14
Deleterious Elements and Impact	Trace NaCl and $MgCl_2$	Section 10
Environmental Requirements – Permits, etc.	No significant environmental permitting encumbrances.	Section 17
Geotechnical Factors (if any)	No concerns.	Section 13
Hydrological or Hydrogeological Factors (if any)	No concerns.	Section 13
Commodity Prices	KCl commodity prices: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne and for LOM $219/tonne.	Section 16
Exchange Rate (US$/C$)	1.31	Section 6

Mineral Resource Estimates

The Belle Plaine Facility mineral resources are reported as in-situ mineralization and are exclusive of mineral reserves. The mineral resources occur in the Esterhazy, Belle Plaine, and Patience Lake Members. Mineral resources that are not mineral reserves have not demonstrated economic viability utilizing the criteria and assumptions required at the Belle Plaine Facility.

The methodology for estimating mineral resources consists of interpreting the available geological data in plain view using AutoCAD 2020 software. The plan is updated to include the current mineral rights status, seismic survey interpretations, the limits of the current mining footprint, known areas (geological anomalies, town sites and other surface infrastructure) that make the mineral resource inaccessible and the planned cluster sites.

Additional details regarding the estimation methodology are listed in Section 11 of the 2021 Belle Plaine Facility TSR filed as an Exhibit to this 10-K Report.

The mineral resource estimates for the Belle Plaine Facility are listed in Table 2.20.

Table 2.20: Mineral Resources as of December 31, 2021 Based on a LOM Plan KCl Price of $219 per tonne[(a)(b)(c)(d)]

(tonnes in millions)

Category	Tonnes	Grade $\%K_2O$	Grade %KCl	Cut-off Grade[(e)]	Metallurgical Recovery
Inferred	4,647	19	31	n/a	79 to 90%

(a) Mineral resources are reported exclusive of those mineral resources that have been converted to mineral reserves.
(b) Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.
(c) Mineral resources assume solution mining.
(d) Mineral resources amenable to a solution mining method are contained within a conceptual cluster and cavern design using the same technical parameters as used for mineral reserves.
(e) No cut-off grade is used to estimate mineral resources as the solution mining method used at the Belle Plaine Facility is not selective. At no point in the cavern development and mining process can a decision be made to mine or not mine the potash mineralization that is in contact with the mining solution. There is no control on what potash grade the mining solution dissolves to make a concentrate that is pumped to surface from the mining caverns for processing.

No mineral resources were reported in 2020, as the Company reported under Industry Guide 7, which did not recognize mineral resources. As a result of the change in reporting to S-K 1300, mineral resources are being reported for the first time.

Mineral Reserve Estimates

The Belle Plaine Facility mineral reserve estimates are reported as in-situ mineralization accounting for all applicable modifying factors. Mineral reserves meet all the mining criteria required at the Belle Plaine Facility including, but not limited to mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.

The methodology for estimating mineral reserves consists of solution mining design work and scheduling and the application of mining recovery and unplanned dilution. Additional details regarding the estimation methodology are listed in Section 12 of the 2021 Belle Plaine Facility TRS filed as an Exhibit to this 10-K Report.

The mineral reserve estimates for the Belle Plaine Facility are listed in Table 2.21.

Table 2.21: Mineral Reserves at the End of the Fiscal Year Ended December 31, 2021 Based on LOM Plan KCl Price of $219 per tonne[a][b][c][d][e][f]

(tonnes in millions)

Category	KCl Tonnes	Grade %KCl	Grade %K_2O	Metallurgical Recovery %
Proven	275	30.6	19.3	81.2%
Probable	394	30.6	19.3	81.2%
Proven + Probable	**669**	**30.6**	**19.3**	**81.2%**

(a) Mineral reserves are based on measured and indicated mineral resources only.
(b) All mineral reserves are mined by a solution mining method. Mine designs based on a solution mining method and design criteria are used to constrain measured and indicated mineral resources within mineable shapes.
(c) No cut-off grade is used to estimate mineral reserves. The solution mining method used at the Belle Plaine Facility is not selective. At no point in the cavern development and mining process can a decision be made to mine or not mine the potash mineralization that is in contact with the mining solution. There is no control on what potash grade the mining solution dissolves to make a concentrate that is pumped to surface from the mining cavities for processing.
(d) Only after a positive economic test and inclusion in the LOM plan is the mineral reserve estimate included as a mineral reserve.
(e) The following KCl commodity prices were used to assess economic viability for the mineral reserves, but were not used for cut-off purposes: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for the LOM $219/tonne.
(f) A US$/CAD$ exchange rate of 1.31 was used to assess economic viability for the mineral reserves but was not used for cut-off purposes.

Mineral Resources and Mineral Reserves Comparison

As of December 31, 2021, our estimated mineral reserves were 668 million tonnes compared to 828 million as of the prior year-end, resulting in a change of 19%. Year-over-year changes are due to mining depletion, re-evaluation of the mining thickness and global grade, a change in the mining recovery and the change from Industry Guide 7 to S-K 1300.

ESTERHAZY

The Esterhazy Facility is approximately 10 miles to the east of the town of Esterhazy, 56 miles southeast of the city of Yorkton and 137 miles east of the city of Regina (Figure 2.5). The K1 mill site is located nine miles northeast of Esterhazy. The K2 mill site is located 12 miles east of Esterhazy. The K3 mine site is located four miles east of Esterhazy and the K4 mineral resources are located 18 miles northeast of Esterhazy. The geographic coordinates for K1 are latitude 50.726463 N and longitude -101.933506 W. The K2 coordinates are latitude 50.6574 N and longitude -101.8422 W and the K3 coordinates are latitude 50.64623 N and longitude -101.99346 W.

Mosaic, through Mosaic Potash Esterhazy Limited Partnership, a wholly owned indirect subsidiary of Mosaic, leases 197,920 acres of mineral rights from the Crown under Subsurface Mineral Leases KL 105, KL 126, and KLSA 003. Table 2.22 lists additional information regarding the three Crown leases. Table 2.23 outlines the total acreage of the Crown leases designated by township and range. The lease terms are 21 years, with renewals at our option for successive 21-year periods.

We also own or lease 206,228 acres of freehold mineral rights within the Esterhazy area as shown in Table 2.24 below. All mineral titles owned or leased by Mosaic include the “subsurface mineral” which under The Subsurface Mineral Tenure Regulations (Saskatchewan) means all natural mineral salts of boron, calcium, lithium, magnesium, potassium, sodium, bromine, chlorine, fluorine, iodine, nitrogen, phosphorus and sulfur, and their compounds, occurring more than 60m below the surface of the land. Other commodities (e.g., petroleum and natural gas, coal, etc.) that are not specifically sought after when acquired may be on mineral titles that Mosaic leases or owns.

Within the total acreage leased from the Crown or owned/leased by us are parcels of land where we own or lease less than a 100% share of the mineral rights. To mine these properties, we would need to acquire 100% control either by lease or ownership. Acres currently not mineable for this reason are listed in Table 2.25 below.

There are no significant environmental permitting encumbrances (existing or anticipated in the future) associated with the Esterhazy Facility. Except for royalties, we do not anticipate any future encumbrances based on current known regulations and existing permitting processes. There are no outstanding fines or material violations.

The net book value for Esterhazy is $3.4 billion as of December 2021.

Figure 2.5: Location Plan

Table 2.22: Mineral Lease

Crown Lease Number	Type	Area (Hectares)	Expiration Date
KL 105	Subsurface Mineral Lease	26,125	November 2, 2023
KL 126	Subsurface Mineral Lease	28,473	October 25, 2026
KLSA 003	Subsurface Mineral Lease	25,498	November 18, 2030

Table 2.23: Sections and Acreages Owned by the Crown

Township/Range	Sections of Mineral Rights Owned by Crown*	Area of Mineral Rights Owned by Crown (acres)
19/30	19-2/16	12,221
20/30	18-1/16	11,542
21/30	18-6/16	11,753
22/30	2-1/16	1,331
19/31	18-1/16	11,561
20/31	19-3/16	12,265
21/31	13-7/16	8,613
22/31	15-15/16	10,238
18/32	5-7/16	3,471
19/32	18-15/16	12,116
20/32	14-11/16	9,388
21/32	17-2/16	10,970
22/32	4-6/16	2,799
18/33	5-12/16	3,662
19/33	10-11/16	6,850
20/33	11-7/16	7,326
21/33	8-5/16	5,313
22/33	1-6/16	878
18/1	15-9/16	9,969
19/1	15-14/16	10,158
20/1	16-7/16	10,533
21/1	14-6/16	9,207
22/1	4-3/16	2,668
19A/1	2-12/16	1,762
18/2	6-1/16	3,865
19/2	4-13/16	3,083
19A/2	1-12/16	1,130
Total	309-4/16	194,672

*Full sections range from 640 acres to 644 acres; total acreage shown above is based on 640 acres per section where actual survey acreage is not available.

Table 2.24: Sections and Acreages of Mosaic-Owned Mineral Rights

Township/Range	Sections of Mineral Rights Owned/ Leased by Mosaic*	Area of Mineral Rights Owned/Leased by Mosaic (acres)
19/30	17-14/16	11,420
20/30	19-7/16	12,430
21/30	18-8/16	11,822
19/31	16-13/16	10,760
20/31	17-13/16	11,389
21/31	23-6/16	14,954
22/31	4-7/16	2,846
18/32	4-15/16	3,168
19/32	18-8/16	11,843
20/32	22-12/16	14,553
21/32	19-12/16	12,624
22/32	4-8/16	2,868
18/33	5-14/16	3,764
19/33	10-6/16	6,631
20/33	9-8/16	6,087
21/33	12-10/16	8,075
22/33	2-3/16	1,390
18/1	2-8/16	1,583
19/1	18-14/16	12,084
19A/1	4-15/16	3,177
20/1	20-8/16	13,134
21/1	21-7/16	13,707
22/1	9-15/16	6,343
18/2	2-9/16	1,631
19/2	10-4/16	6,579
19A/2	2-2/16	1,365
Total	30-2/16	206,227

*Full sections range from 640 acres to 644 acres; total acreage shown above is based on 640 acres per section where actual survey acreage is not available.

Table 2.25: Partial Mineral Rights Area

Township/Range	Crown Mineral Rights Leased by Mosaic, Currently Not Mineable (acres)*	Mineral Rights Owned/Leased by Mosaic, Currently Not Mineable (acres)*
21/30	321	—
20/31	80	—
21/31	80	—
22/31	80	514
21/32	321	—
21/33		74
18/1	150	—
19/1	1209	138
19A/1	322	—
20/1	221	—
21/1	80	159
18/2	160	—
19/2	161	—
19A/2	61	—
Total	3246	885

*Less than 100% share of a mineral rights parcel.

Existing Infrastructure

The Esterhazy Facility consists of an underground mine and two processing plants that started production in 1962. The mine has an additional expected life, based on mineral reserves of 33 years, to 2054. The Esterhazy Facility has the infrastructure in place to meet the current production goals and LOM plan. The current infrastructure includes: major road and highway access; railway support from CNR and CPR; SaskPower supplied electricity; TransGas and SaskEnergy supplied natural gas; and potable and non-potable water supplied from local fresh water sources. The long-term TMA development plan is being revised to support production at the levels indicated in the 2021 LOM plan.

Process and potable water for the K1 mill is provided by three approximately 200 ft. deep wells drilled into the upper Dundurn aquifer. The K2 mill water supply comes from the Cutarm Creek dam reservoir that is owned and operated by Mosaic. Located 1.5 miles northeast of the K2 site, the dam forms a reservoir approximately 5.25 miles long and 650 feet wide. K3 mine water is supplied from K2 via a 7.4 mile long pipeline.

The power to operate the Esterhazy Potash Facility is supplied by the provincial utility, SaskPower. The K1 mill is serviced by a 72 kV line with approximately 36 MVA capacity. The K2 mill has two services at 72 kV and 138 kV respectively, with a combined capacity of 125 MVA. The K3 mine is serviced by a 230 kV line from SaskPower with 140 MVA capacity. Two transformers step down the voltage, each rated at 70 MVA.

TransGas is the primarily supplier of an uninterrupted supply of natural gas to the Esterhazy Potash Facility. Esterhazy has regulator stations for the natural gas at each of the sites, with a low-pressure distribution piping network.

The K1 and K2 sites are serviced by the CNR main line, and by spur lines to the CPR. The surrounding area is developed for agriculture with a road network, villages and towns.

Regina International Airport is 140 miles by highway west of the Esterhazy Facility, while Yorkton municipal airport is 55 miles to the northwest. The Town of Esterhazy maintains a paved 3,000 feet long airstrip, located 8 miles southwest of the K1 mill.

The Esterhazy Facility's workforce lives throughout the area, generally within 62 miles of the mine sites. This includes the Russell and Binscarth areas of western Manitoba. Education and healthcare facilities are in Esterhazy, Russell, Melville, and Yorkton.

The province of Saskatchewan offers a large variety of suppliers for the potash mine operators. The potash industry in Saskatchewan is very mature, making it easier to attract vendors to support the needs of the various mine sites throughout the province.

Saskatoon and Regina have large industrial sectors with a variety of machine shops and industrial support services. Some specialty services are provided from the Alberta oil and gas industry.

Supplies are sourced locally, regionally and internationally based on availability or commercial considerations. Lead times and on-hand inventory are balanced to meet the needs of the site.

Mining Method

At the Esterhazy Facility, potash is extracted by underground mining using the room-and-pillar method. Current mine design allows for the planned extraction of 27.6% of the in-situ ore. Pillars are left in place between mining rooms to support overlying strata and prevent failure of the upper rock formations or an inflow of brine from any water-bearing zones above.

The 2021 LOM plan for the Esterhazy Facility includes the K3 mineral reserves. The K4 mineral resources are currently scheduled after depletion of the K3 mineral resources. Production is based on an average production rate of 17.527 million tonnes per year based on 365 production days per year.

We expect the K3 mineral reserves production to ramp up to full production by 2024. We expect the mine to ramp down starting in 2051, with mining anticipated to be completed in 2054.

Our current schedule to begin mining The K4 mineral resources is to start mining in 2050. We expect the mine to ramp up to full production in 2055 and ending in 2090.

Processing Recovery Method

The Esterhazy Facility's processing plant consists of two separate mill facilities, designated as K1 and K2. Each mill processes the raw ore feed stock received from the underground mining operations through crushing, separation, screening and compaction unit operations to produce on-grade, saleable product. The plants utilize online grade analyzers to monitor the process as well as routine samples that are analyzed by the onsite lab. The milling can be broken down into two main functions: the wet end separates potash and salt, while the dry end sizes potash for sale.

The wet end of the mill begins with raw ore sizing and crushing to prepare it for the separation processes. In heavy media, the larger size fraction is separated into potash and salt through dense media separation that is driven by differences of buoyancy in salt and potash. Flotation receives the smaller size fraction and has specific reagents added that allow the potash crystals to float while the salt is rejected as tailings material. At K2 there is also a crystallizer circuit that produces potash using solubility, temperature, and pressure differences. Dewatering and drying is the final stage in the wet end, where potash is sent through centrifuges and industrial driers to remove all moisture.

Once the product is dried, it is sent to a screen to separate right-sized material from the over and undersized material for all the different product grades. Oversized material is sent through a crushing circuit to break it down to right-sized material. The undersized material is upgraded through compaction to a larger product.

We plan to ramp up milling rates once the K3 mine is up to full capacity. We then expect to stabilize at a total milling rate to the end of mine life. The differences in final product tonnes will be based on supplied raw ore grade as it varies throughout the mine workings. We believe that the site's ability to produce at the increasing rates being forecasted in the LOM plan is supported by a proving run in 2013, when the Esterhazy Facility achieved a production nameplate of 6.3 million tonnes overall.

History and Exploration

The Esterhazy Facility K1 started production in 1962 and K2 started production in 1967. Table 2.26 lists the important historical dates and events for Esterhazy.

Table 2.26: History

Date	Event/Activity
1928	Discovery of evaporites in the sedimentary sequence in Saskatchewan.
1955	International Minerals and Chemicals (IMC, Canada) Ltd. acquired >500,000 acre lease in Esterhazy area and started drilling.
1957 to 1962	IMC Corporation begins shaft sinking at K1. K1 mine production officially started in September 1962 at a capacity of 0.9 million tonnes per year.
1965	K2 TMA Phase I expansion.
1966	The K1 mine capacity was expanded to 1.5 million tonnes per year.
1967	The K2 shaft sinking was completed to a capacity of 2.4 million tonnes per year. The first potash production from K2 was in April/May.
1968	The K2 TMA Phase II expansion was completed.
1974	K2 mill expansion, heavy media circuit.
1981	The K2 TMA Phase III expansion was completed.
1985	Inflow 10B was detected December 29, 1985 in the D400 entry at a point 3.5 miles (5.6 km) southwest of the K2 shaft. Initial inflow was estimated to be 1,000 gpm. Information obtained using seismic surveys allowed for targeted drilling and placement of calcium chloride and various grouts to reduce the inflow to manageable levels. The pumping capacity was increased through a series of stages to bring online a total of 22 pumps, to a maximum capacity of 4,000 gpm. As a result of these efforts, K1 and K2 sites continued normal mining operations.
1987	Mineral Resource Location Study – Vibroseis Study was completed.
1989	12 exploration drill holes to delineate the K1 and K2 mining area were completed.
1991 to 1998	Seismic surveys in the Gerald, Gerald West and Cutarm areas.
1997	IMC Kalium merged with IMC Global and Freeport-McMorRan.
1999	Company renamed IMC Potash.
2000-03	Seismic surveys: 2D and 3D (K1 and K2).
2004	Mosaic created out of a merger between IMC and Cargill Crop Nutrition.
2005	3D seismic surveys completed at K1 (19.5 sq. km) and K2 (10.3 sq. km).
2006-09	Various seismic surveys completed. Hoist expansion at K2. Processing plant capacity increased to 4.8 million tonnes per year. K2 TMA expansion completed. Exploration drilling of 10 holes including two shaft pilot holes completed as part of the K3 expansion project.
2010	Completion of the crushing expansion at K1.
2011	3D seismic surveys at K1 North (51.4 sq. km) and Perrin Lake (37.3 sq. km).
2012	K3 South shaft pre-sink was completed. Esterhazy exits Tolling Agreement with PCS. A number of 3D seismic surveys were completed including Saskman, K1 NW, K1 SWD Field. Seven brine injection wells were drilled at Farfield.
2013	K3 South Shaft sunk to the potash level. 3D seismic survey at Panel 11Q (9.2 sq. km) completed. Completion of mill expansion at K2 for an additional 0.7 million tonnes per year. A Canpotex proving run was successfully completed increasing the site nameplate processing plant capacity from 4.8 million tonnes per year to 6.3 million tonnes per year.
2014	3D seismic survey at Panel 11Q 3C (9.3 sq. km) completed.
2015	3D seismic surveys at Gerald (12.1 sq. km) and K3 (232.4 sq. km) completed.
2016	Nine exploration drill holes completed.

2017	The K3 North shaft sinking was completed and the first K3 ore from the South shaft was skipped to surface and trucked to the K1 mill.
	The K3 to K2 overland conveyor construction was completed. The K3 North shaft steel and Keope hoist rope up were completed. The K3 North shaft first ore skipped in December 18 and trucked to the K2 mill.
2018	The first K3 ore was conveyed on the overland conveyor to the K2 mill in December.
2019	Commissioned the K3 Koepe production and Blair service hoists. Four drum miners cutting K3 shaft pillar development started. Two four rotor miner assemblies completed. The K3 South shaft sinking was completed in November.
2020	Completion of the South shaft bottom steel, added a third four rotor miner, installed the Mainline conveyor, added a fourth rotor miner cutting and completed the K3 South Headframe concrete slip. K3 shaft pillar development completed in December. The K3 fifth four rotor miner started cutting in October. The first ore from K3 conveyed to K1.
2021	The sixth K3 four rotor miner started cutting in January and the seventh four rotor miner started cutting in May. The K1 and K2 mines were closed 9 months ahead of schedule in response to brine inflow conditions.

Geology and Mineralization

The intracratonic Elk Point Basin is a major sedimentary geological feature in western Canada and the northwest U.S. It contains one of the world's largest stratabound potash resources. The nature of this type of deposition is largely continuous with predictable depths and thickness. It is mined at several locations, including the Esterhazy Facility.

Potash at the Esterhazy Facility area occurs conformably within Middle Devonian-age sedimentary rocks and is found in total thicknesses ranging from approximately 100 to 131 feet (30 to 40 m) at a depth of approximately 5,345 to 5,740 feet (1,630 to 1,750 m).

The Prairie Evaporite Formation, host to the potash mineralization, is divided into a basal "lower salt" and an overlying unnamed unit containing three potash-bearing units and one unit containing thin marker beds. In ascending order, the potash horizons in the upper unit are the Esterhazy Member, White Bear Marker Beds, Belle Plaine Member, and Patience Lake Member. Mineralogically, these members consist of sylvite and halite, with minor amounts of carnallite (KCl, $MgCl_2$, $6H_2O$).

In the Esterhazy area, the Esterhazy, White Bear and Belle Plaine Members are present, and the Patience Lake Member is absent. The following is a summary of the key stratigraphic units for the Esterhazy Potash Facility area:

- Belle Plaine Member: The Belle Plaine Member underlies Second Red Bed and makes up part of the salt back that is critical to isolating the mining horizon from the formations above. The Belle Plaine Member is mined using solution mining techniques at the Belle Plaine Facility and is not mined at the Esterhazy Facility.

- White Bear Member: The White Bear Member consists of marker beds that are a distinctive unit of thin interbedded clay, halite, and sylvinite horizons that are not minable due to their insufficient thickness of only 4.0 to 5.0 feet.

- Esterhazy Member: The Esterhazy Member is separated from the Belle Plaine Member by the White Bear Member marker beds, a sequence of clay seams, low-grade sylvinite, and halite. The Esterhazy Member is mined using conventional underground techniques at the Esterhazy Facility in southeastern Saskatchewan, and by solution mining techniques at the Belle Plaine Facility.

The typical sylvinite intervals within the Prairie Evaporite Formation consist of a mass of interlocked sylvite crystals that range from pink to translucent and may be rimmed by greenish-grey clay or bright red iron insoluble material, with minor halite randomly disseminated throughout the mineralized zones. Local large one inch (2.5 cm) cubic translucent to cloudy halite crystals may be present within the sylvite groundmass, and overall, the sylvinite ranges from a dusky brownish red color (lower grade, 23% to 27% K_2O with an increase in the amount of insoluble material) to a bright, almost translucent pinkish orange color (high grade, 30%+ K_2O). Carnallite is also present locally in the Prairie Evaporite Formation as a mineral fraction of the depositional sequence. The intervening barren salt beds consist of brownish red, vitreous to translucent halite with minor sylvite and carnallite and increased insoluble materials content.

Mineral Resource and Mineral Reserve Assumptions and Modifying Factors

The key mineral resource and mineral reserve assumptions and modifying factors are listed in Table 2.27.

Table 2.27: Key Assumptions and Modifying Factors

Parameter	Value	TRS Section
Supporting Information	Regional geologic studies, 59 exploration holes, seismic surveys, in-mine channel samples and 50 years of mining history at K1 and K2.	Section 7
Average total thickness of the potash mineralization	8.55 ft., based on the ratio of 8.5 ft. production panel mining height and 9.0 ft. development mining height.	Section 11
Density	129.878 lbs./cu ft. (2,080.446 kg/cu m)	Section 11
In-mine channel samples grade	27.1% K_2O	Section 11
Operating Days per Year	365 days	Section 13
Mining Method	Underground room and pillar mining.	Section 13
Production Rate	17.527 million tonnes per year.	Section 13
Cut-off	No cutoff grade is applied.	Section 11
Mining Recovery	27.6%	Section 12, 13
External Dilution	None	Section 12, 13
Processing Method	Two mill facilities that crush, float, screen and compact KCl.	Section 14
Processing Recovery	85 to 88% (86.1% average)	Section 14
Deleterious Elements and Impact	Increased amounts of NaCl can significantly impact production volumes.	Section 10
Environmental Requirements, Permits, etc.	No significant environmental permitting encumbrances.	Section 17
Geotechnical Factors (if any)	No concerns/issues.	Section 13
Hydrological or Hydrogeological Factors (if any)	Undersaturated brines from adjacent aquifers.	Section 13
Commodity Prices	KCl commodity prices (US$): 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for the LOM $219/tonne.	Section 16
Exchange Rate (US$/CAD$)	1.31	Section 16

Mineral Resource Estimates

The Esterhazy Facility's mineral resources are reported as in-situ mineralization and are exclusive of mineral reserves. The mineral resources occur in the Esterhazy, White Bear and Belle Plaine Members. We assume that the mineralization is laterally continuous and consistent, based on publicly available regional geological information and our knowledge of the local geology and area.

Mineral resources that are not mineral reserves have not demonstrated economic viability utilizing the criteria and assumptions required at the Esterhazy Facility.

The methodology for estimating mineral resources consists of interpreting the available geological data in plain view using AutoCAD 2020 software. The plan is updated to include the current mineral rights status, seismic survey interpretations, the limits of the current mining footprint, known areas (geological anomalies, town sites and other surface infrastructure) that make the mineral resource inaccessible and therefore excluded from the mineral resource estimation process, property boundary pillars, pillars around exploration holes and infrastructure, "no mining" areas in the uncontrolled mineral rights locations and a pillar between the K1 and K2 mining area and the adjacent K4 mineral resource areas.

Additional details regarding the estimation methodology are listed in Section 11 of the 2021 Esterhazy Facility TRS filed as an Exhibit to this 10-K Report.

The mineral resource estimates for the Esterhazy Facility are listed in Table 2.28.

Table 2.28: Mineral Resources at the End of the Fiscal Year Ended December 31, 2021 Based on a LOM Plan KCl Price of $219 per tonne[(a)(b)(c)(d)(e)(g)(h)]

(tonnes in millions)

Category	Tonnes	Grade $\%K_2O$[(f)]	Metallurgical Recovery
Measured	255.0	23.3	86.1
Indicated	2,092.0	22.8	86.1
Measured + Indicated	**2,347.0**	**22.8**	**86.1**

(a) Mineral resources are reported exclusive of those mineral resources that have been converted to mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
(b) Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.
(c) Mineral resources assume an underground room and pillar mining method.
(d) Mineral resources amenable to underground mining methods are accessed via shaft and scheduled for extraction based on a conceptual room and pillar design using the same technical parameters as for mineral reserves.
(e) No cut-off grade or value based on commodity price is used to estimate mineral resources. This is because the mining method used at Esterhazy is not grade selective. The potash mineralization is mined on one level by continuous miners following the well-defined and continuous beds of mineralization with relatively consistent grades (Section 11.2 of TRS).
(f) $\%K_2O$ refers to the total $\%K_2O$ of the samples.
(g) We used the following KCl commodity prices to assess prospects for economic extraction for the mineral resources but are not used for cut-off purposes: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for the LOM plan $219/tonne.
(h) We used a US$/CAD$ exchange rate of 1.31 to assess prospects for economic extraction for the mineral resources but was not used for cut-off purposes.

No mineral resources were reported in 2020, as the Company was reporting under Industry Guide 7, which did not recognize mineral resources. As a result of the change in reporting to S-K 1300, mineral resources are being reported for the first time.

Mineral Reserve Estimates

The Esterhazy Facility's mineral reserves are reported as in-situ mineralization, accounting for all applicable modifying factors. Mineral reserves meet all the mining criteria required at Esterhazy including, but not limited to mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

The methodology for estimating mineral reserves consists of post pillar mine design work and scheduling and the application of mining recovery and unplanned dilution. Additional details regarding the estimation methodology are listed in Section 12 of the 2021 Esterhazy Facility TRS.

The mineral reserve estimates for the Esterhazy Facility are listed in Table 2.29.

Table 2.29: Mineral Reserves at the End of the Fiscal Year Ended December 31, 2021 Based on a LOM Plan KCl Price of $219 per tonne[(a)(b)(d)(e)]

(tonnes in millions)

Category	Tonnes	Grade $\%K_2O$[(c)]	Metallurgical Recovery %
Proven	122.0	23.9	86.1
Probable	437.0	20.8	86.1
Proven + Probable	**559.0**	**21.5**	**86.1**

(a) The mineral reserves are based on measured and indicated resources only and are reported as in-situ mineralization.
(b) We used underground mining standards and design criteria to constrain measured and indicated mineral resources within mineable shapes. Only after a positive economic test and inclusion in the LOM plan is the mineral reserve estimate included as mineral reserves.
(c) $\%K_2O$ refers to the total $\%K_2O$ of the samples.
(d) We used the following KCl commodity prices to assess economic viability for the mineral reserves, but were not used for cut-off purposes: 2022-$271/tonne, 2023-$231/tonne, 2024-$219/tonne, 2025-$185/tonne, 2026-$188/tonne, and for the LOM plan $219/tonne.
(e) We used a US$/CAD$ exchange rate of 1.31 to assess economic viability for the mineral reserves but was not used for cut-off purposes.

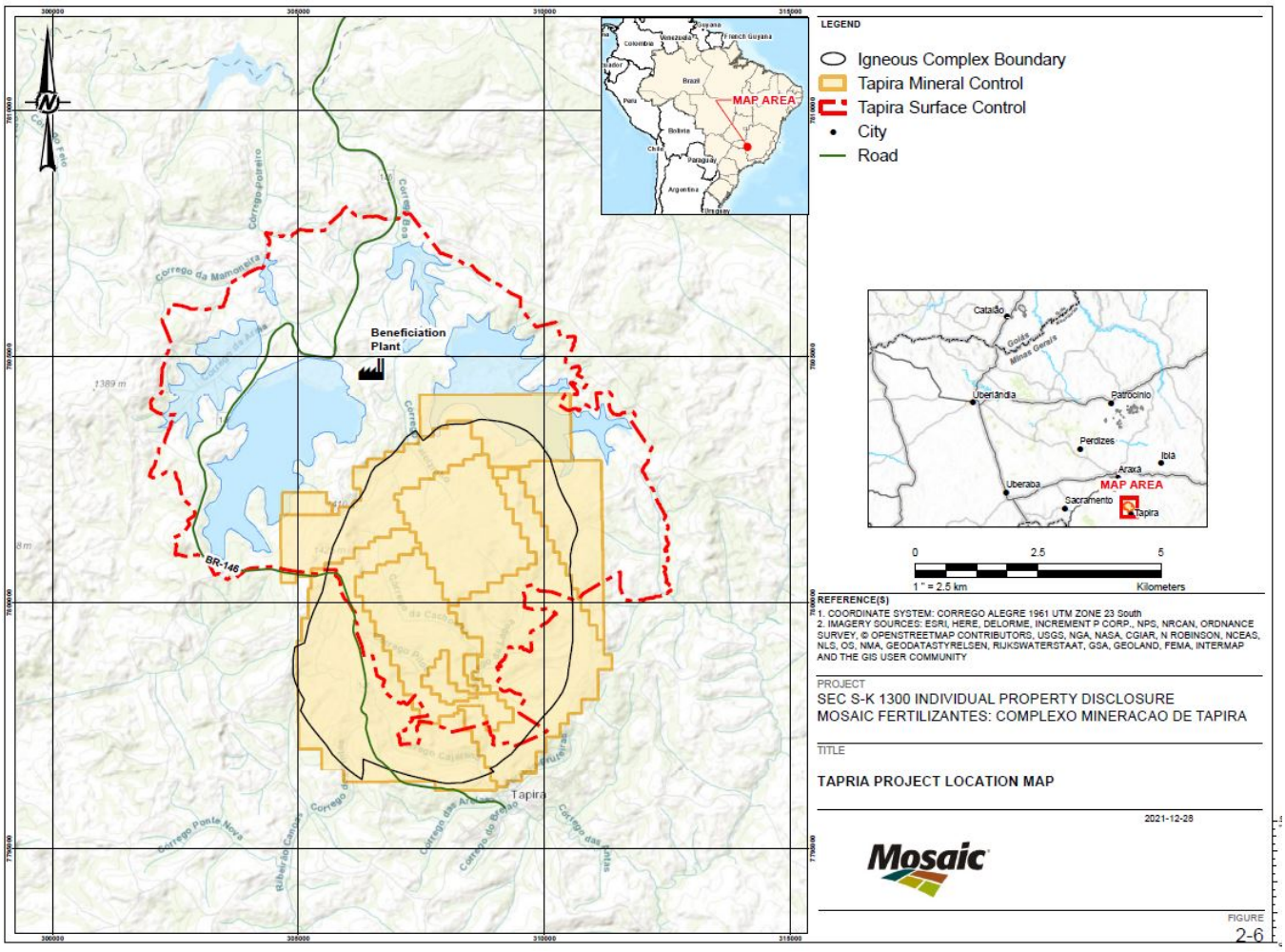
Mineral Resources and Mineral Reserves Comparison

Our mineral reserves decreased by 36% to 557 million tonnes at December 31, 2021 compared to 875 million tonnes at December 31, 2020. Year-over-year changes are due to mining depletion, the closure of the K1/K2 mining operation in June 2021, a change in the density, mining recovery and average mining height, and the change from Industry Guide 7 to S-K 1300 reporting.

TAPIRA

Tapira is located in the western portion of the state of Minas Gerais, in the southeast of Brazil, to the north of the town of Tapira, and approximately 35 km south-southeast of the city of Araxá (Figure 2.6). The mine is 420 km by road to the Minas Gerais state capital of Belo Horizonte, via the BR-262 highway to Araxá and then the BR 146 highway to Tapira. The property extends from approximately UTM 7,805,000 N to 7,799,500 N, and from 304,000 E to 310,000 E (Corrego Alegre 1961, UTM Zone 23 South), and is centered approximately at 19º52’S/46º51’W. The Tapira complex consists of a mine and a phosphate beneficiation plant. The plant produces phosphate conventional and ultrafine concentrate, which is sent by pipeline (conventional) and truck (ultrafine) to local Mosaic chemical plants for finished product production.

Figure 2.6: Project Location Plan



Infrastructure

Tapira is located in a highly developed region known as Alto Parnaíba. This region is known for its excellent, modern infrastructure with high standards of living compared with other regions in Brazil. The local infrastructure available to Tapira is excellent, as it is situated within a well-established mining area, 35 km from the well-developed city of Araxá and within 25 km of two other mining operations.

The supply of electricity occurs via a 138 kiloVolt ("***kV***") transmission line that is operated by CEMIG and Vale Energia Concessionaires. Tapira has a total receipt of 40 megawatts and an annual power usage around 305 GW. The main substation receives 138 kV in three oil-type transformers which is transferred to secondary substations. From the secondary substations, power is distributed to the end-use areas at 110 volts ("***V***"), 220 V, 280 V, 440 V, or 4,160 V.

Water intake comes from the Ribeirão do Inferno and artesian wells, as well as recovered water from the tailings dams. Additionally, there are four artesian wells at Tapira. The industrial reuse system used to recover water from the dams includes 10 pumps (four operating and six on stand-by) and 36" pipes covering varying distances to the different dam areas. The distance from BR1 dam is approximately nine km with a rated capacity of 4,400 cubic meters per hour (m^3/hr). The distance from BL1 dam is approximately three km with a rated capacity of 10,400 m^3/hr. The distance from BR dam is approximately four km with a rated capacity of 4,900 m^3/hr.

There is currently no rail or airport access at Tapira. The closest rail and airport access is in the city of Araxá.

Infrastructure includes a phosphate beneficiation plant with associated support infrastructure, including tailings storage facilities, maintenance facilities, warehouses, and various administrative and other support facilities. The mine infrastructure

includes overburden storage and other material storage facilities, surface water management features, and maintenance, warehouse and other typical support infrastructure.

Tapira includes an impoundment stability monitoring system that covers all the operating impoundments at Tapira.

Network connectivity is in place at the mine buildings and a telephone system provides coverage throughout the mine unit. A radio system provides the ability to dispatch and control the mining equipment and transport trucks as well as communicate with the control room in the beneficiation plant.

Mineral and Surface Rights

Mining rights in Brazil are governed by the Mining Code, Decree 227, dated February 27, 1967, and further regulation enacted by the ANM. This governmental agency, which controls the mining activities throughout Brazil, was recently created as a replacement of the former National Department of Mineral Production ("***DNPM***"). All sub-soil situated within Brazilian territory is deemed state property, with the mining activities subject to specific permits granted by the ANM.

We currently hold a total of eight mining permits within the Tapira area (3,842 hectares). The Tapira mineral assets are part of a Consortium named Consórcio Vale Fosfértil Tapira created by Decree number 98.962 (February 16, 1990), process number 930.785/1988 (4,355.76 hectares) granted to Vale S.A. (previously Vale do Rio Doce S.A.) and Vale Fertilizantes Fosfatados S.A. – Fosfértil.

The Tapira Mining Consortium and all mining permits except for one permit, 803.387/1974 which is currently pending, have transferred from Vale S.A to Mosaic Fertilizantes P&K Ltda. Tapira operates via the Tapira Mining Consortium, therefore, the transfer process of mining right ANM 803.387/1974 does not affect the continuity of the mining operations.

Tapira has an overall surface rights area of 8,008 hectares distributed in 18 different property registrations. The surface area within the ultimate pit is currently mostly controlled by Mosaic. There is a small area near a local village that is not within the current property rights. The relocation of the village and State Highway MG-146 will be necessary to fully realize the LOM tonnages. The area surrounding the village and State Highway MG-146 is currently included in the currently controlled mining permits, and is therefore not seen as a significant encumbrance to Tapira.

The capacity requirements are not currently in place for all tailings disposal for total LOM capacity requirements. However, Tapira has an ongoing permitting and development plan to support the mining operations that will continue through the LOM requirements.

Present Condition of the Property

The Tapira mine has been in operation since 1978 and is a production stage property.

All required fixed and permanent infrastructure of power, pipelines and primary roadways, and project access are established. Drainage, water controls, and mine access roads and ramps are established for current operations and will be expanded and continued as the pit progresses through its planned life of operations.

The ore at Tapira is recovered using open-pit conventional truck and shovel mining methods, due to the proximity of the ore to the surface and the physical characteristics of the deposit. The ore is transported via truck to a homogenization pile where it is later fed to the beneficiation plant via conveyors. The beneficiation plant produces phosphate conventional and ultrafine concentrate which is sent by pipeline (conventional) and truck (ultrafine) to local Mosaic chemical plants for finished product production.

The mining equipment at Tapira is leased and therefore not owned by us. The beneficiation plant has been in operation since Tapira started 43 years ago. The tailings dams, water dams and sedimentation ponds have been active at Tapira since mining started 43 years ago as well. Currently the BR1 dam is being raised to its final design height to accommodate the LOM plan.

The net book value for Tapira is $297 million as of December 31, 2021.

Exploration activities are ongoing for in-fill drilling for phosphate production to complete the current LOM. Additional areas of exploration and research include better understanding the non-weathered material and titanium mineralization for future mining prospects.

History of Previous Operations

Tapira has been in operation since 1978 and has produced more than 70 million tonnes (Mt) of phosphate concentrate. Since 1978, Titanium Dioxide (TiO_2) bearing material, mainly in the form of anatase, has been stockpiled, with more than 200,000 tonnes awaiting the implementation of an economical beneficiation method.

The geological structure of the alkaline complex of Tapira was first recognized in 1953, through magnetometric and radiometric investigations carried out by the Brazil-Germany Project. There was an agreement between the two countries to carry out regional geophysical aero-survey programs, performed by the Geological Survey of Brazil in the 1950s, 1960s, and 1970s.

In 1968, three major private groups – Pedro Maciel, Companhia Meridional de Mineração, and Companhia Brasileira de Metalurgia e Mineração – had exploration research requests granted by DNPM. In early1971, Vale (previously known as Companhia Vale do Rio Doce) joined Pedro Maciel to create the company Titan International S.A., which changed its name to Rio Doce Titânio in later years. Vale acquired the rights of Pedro Maciel at the end of 1971, with the mining rights incorporated into the company Mineração Rio Paranaíba. At the time, a series of intensive and detailed systematic works were undertaken, and important occurrences of phosphate, titanium, niobium, rare earths, and vermiculite were identified.

Extensive exploration works were undertaken between 1971 and 1973, with particular focus on the occurrences of titanium. From 1973 to 1977, the exploration priorities changed to occurrences of phosphate, with the aim of replacing the massive imports of fertilizers in the agricultural sector that was then undergoing a period of expansion in Brazil. In 1977, the Fosfértil (Fertilizantes Fosfatados S.A.) company was created under the administration of Petrofértil (a subsidiary of Petrobras, the Brazilian state oil company). In 1992, Fosfértil was privatized, and a pool of investors held the company shares.

In 2010, Vale S.A. acquired complete control of Fósfertil and after created a new company, Vale Fertilizantes S.A. which included other fertilizer assets. At the start of 2018, Mosaic Fertilizantes P&K S.A. acquired the assets of Vale Fertilizantes, including the Tapira mineral deposit.

Mineral Resources and Mineral Reserves

The regional and local geology, mineral resources, and mineral reserves are detailed in the sub-sections below.

Regional and Local Geology

The Tapira phosphate deposit is part of a series of Late-Cretaceous, carbonatite-bearing alkaline ultramafic plutonic complexes belong to the Alto Paranaiba Igneous Province. The Tapira igneous rocks intrude the phyllites, schists, and quartzites of the Late-Proterozoic Brasília mobile belt. The Tapira igneous complex is roughly elliptical, 35 square kilometers (km^2) in area and consists predominantly of alkaline pyroxenite rocks with subordinate carbonatite, serpentinite (dunite), glimmerite, syenite, and ultramafic potassic dikes.

The tropical weathering regime prevailing in the region and the inward drainage patterns developed from the weathering-resistant quartzite margins of the dome structures resulted in the development of an extremely thick soil cover in most of the complexes. The extreme weathering process was responsible for the residual concentration of apatite. The main geological types identified in the deposit are a combination of the igneous protoliths (bebedourites, phoscorites, and carbonatites) and the products of the weathering process.

Mineral Resources

The mineral resources at Tapira were estimated based on the long-standing exploration drilling and sampling completed at Tapira since 1967. The drilling results were loaded into the geological database, verified, and vetted for errors, and then used in the geological model to create the lithology and weathering surfaces. The geological model was used in creating the block model, where geological domains based on the lithology and weathering surfaces were utilized to interpret grade, density, and mass recovery in a geologically appropriate manner. Exploratory Data Analysis and geostatistical analysis were completed on the raw and composite data sets to help define interpolation parameters and mineral resource classifications. The mineral resources were restricted based on an optimized pit limit that took into account cut-off grade, price, mining costs, infrastructure limitations, and mineral licenses. The mineral resources are exclusive of mineral reserves and include approximately 129.8 million tonnes of measured and indicated mineral resources with a P_2O_5ap grade of 7.9%. There are an additional 112.8 million tonnes of inferred mineral resources with a P_2O_5ap grade of 8.6% (Table 2.30).

Table 2.30: Mineral Resources at the End of the Fiscal Year Ended 2021 Based on R$ 1,492.92/tonne of Phosphate Concentrate

(tonnes in millions)

Category	Tonnes	Grade (%P_2O_5ap)	Metallurgical Recovery (%P_2O_5ap)
Measured	62.8	8.0	52.7
Indicated	67.0	7.8	53.2
Measured + Indicated	**129.8**	**7.9**	**53.0**
Inferred	112.8	8.6	52.4

Notes to table:

(a) Additional details are described in the TRS filed as an Exhibit to this 10-K Report.

(b) Mineral resources are reported exclusive of mineral reserves. Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.

(c) Grades are P_2O_5ap, which represents the P_2O_5 associated with apatite and was calculated by the evaluation of the CaO / P_2O_5 ratio. Where CaO / P_2O_5 ratio was greater than or equal to 1.34, P_2O_5ap was equal to the total of P_2O_5; where the CaO / P_2O_5 ratio was less than 1.35, P_2O_5ap was equal to the CaO / 1.35 ratio.

(d) Mineral resource tonnages and grade are stated in-situ and exclusive of mineral reserves. Cut-off grade of P_2O_5ap ≥ 5.0% and 0.9 ≤ Ratio of CaO to P_2O_5 (RCP) ≤ 3.0 was applied to mineral resources. Measured, indicated and inferred blocks were included in mineral resource estimates if they were inside mining concessions and exploration permits with a final report approved by ANM, but exclusive of physical structures such as the crusher and waste piles. A revenue factor of 1.0 with sales price of R$1,492.92 per tonne of phosphate concentrate (2020 price evaluation) was used to develop the mineral resource pit shell.

Mineral Reserves

A mineral reserve estimate has been prepared for Tapira. Mineral reserves are limited by the Tapira property boundary, and the ultimate pit designed for the LOM plan, which was limited with an economic optimized pit analysis.

The mineral reserve estimate includes mining modifying adjustments for mining ore recovery, mining dilution, and ore concentration recovery factors. The mineral reserve estimate is limited to a cut-off grade of 5.0% P_2O_5ap, as well as certain geometallurgical beneficiation criteria, including:

a. Diluted ratio of CaO to P_2O_5 (RCP) between 0.9 and 3.0
b. Within one of the four mineralized domains characterized by lithology and alteration

The beneficiation plant generates conventional (coarse) and ultrafine concentrates from the Tapira ore. The beneficiation process includes milling of the ore, magnetite separation, hydro-sizing and fines separation and flotation. The mass recovery of coarse concentrate is forecast based on the results of laboratory flotation tests performed on drill core samples. The mass recovery of coarse concentrate is predicted based on a mass recovery regression equation as a function of the ROM Fe_2O_3, CaO and P_2O_5 chemical compositions.

The metallurgical recovery is calculated from the mass recovery, the concentrate % P_2O_5, and the ROM % P_2O_5 according to the following equation:

$$\textit{Metallurgical recovery} = 100 \times \textit{Mass recovery} \times \textit{Concentrate \% } P_2O_5 \,/\, \textit{ROM \% } P_2O_5$$

The annual production estimates were used to determine annual estimates of capital and operating costs. All cost estimates were in real 2021 R$ terms. Total capital costs included R$3.8 billion of sustaining capital and opportunity costs. Annual operating costs were based predominantly on historical consumption factors and unit costs. They included costs for ongoing, final reclamation, and closure. Annual total cost of rock production varied from R$458 per tonne to R$604 per tonne, with an average total cost of production for a tonne of phosphate rock concentrate at R$530.

For the purpose of reporting for our total financial statistics, the discounted cash flow was converted from Reais to U.S. Dollars at an exchange rate of R$4.69 = US$1.00.

Because Tapira is a captive operation supplying rock to other Mosaic-owned chemical plants, there is no transparent mined phosphate rock commodities price market in Brazil. Mineral reserves for Tapira were estimated based on an internal transfer price. This internal transfer price was set as a constant number of US$71.64 per tonne (R$336.00 per tonne).

Table 2.31 Mineral Reserves at the End of the Fiscal Year Ended 2021 Based on R$1,492,92/tonne of Phosphate Concentrate

(tonnes in millions)

Category	Tonnes (Dry)	Grade (%P_2O_5ap)(Dry)	Metallurgical Recovery (%P_2O_5ap)
Proven	193.7	9.4	57.4
Probable	275.6	9.1	62.6
Proven + Probable	**469.3**	**9.2**	**60.4**

(a) Additional details are described in the TRS filed as an Exhibit to this 10-K Report.
(b) Mineral reserves are within measured and indicated mineral resource limits.
(c) Only after a positive economic test and inclusion in the LOM plan is the mineral reserve estimate included as a mineral reserve.
(d) Grades are P_2O_5ap, which represents the P_2O_5 associated with apatite and was calculated by the evaluation of the CaO / P_2O_5 ratio. Where CaO / P_2O_5 ratio was greater than or equal to 1.34, P_2O_5ap was equal to the total of P_2O_5; where the CaO / P_2O_5 ratio was less than 1.35, P_2O_5ap was equal to the CaO / 1.35 ratio.
(e) Mineral reserve tonnages and grade are stated as ROM tonnages. The mineral reserves are constrained by a pit design that honors site specific geotechnical designs by pit sector. The mine plan considers constraints required for surface and groundwater management, appropriate extraction methodology, labor and equipment requirements, beneficiation plant mass and metallurgical recoveries, and are dependent upon all permits and environmental licenses in place and continued approved status. The reference point for cut-off grade and pit optimization analysis is tonnes of concentrate at a price of R$1,492.92/tonne concentrate (2020 price evaluation). Cut-off grade of P_2O_5ap $\geq$ 5.0% and 0.9 $\leq$ RCP $\leq$ 3.0 was applied to mineral reserves. Mineral reserves were proven to be economic based on internal transfer price that was derived in the discounted cash flow and compared to the gross margin available.

Mineral Resources and Mineral Reserves Comparison

No mineral resources were reported in 2020, as the Company was reporting under Industry Guide 7 which did not recognize mineral resources. As a result of the change in reporting to S-K 1300, the mineral resources are being reported for the first time.

As of December 31, 2021 we had mineral reserves of 469.3 million tonnes compared to 610.5 million in the prior year, resulting in a decrease of 23%. Changes in mineral reserve tonnage from the prior year are the result of mining depletion, small changes to beneficiation plant factors and the change from Industry Guide 7 to S-K 1300.

REGULATION S-K 1300 INTERNAL CONTROLS DISCLOSURE

Qualified persons, including third parties and Mosaic employees, are responsible for estimating mineral resources and reserves. Mosaic has a Global Review Team, consisting of a broad spectrum of internal personnel outside the operating organization whose primary responsibilities include review of the mineral resources and reserves estimation reporting for compliance with SEC rules and regulations. The Global Review Team includes members from Mosaic's accounting, finance, business units and legal departments. Reports prepared by qualified persons and third parties are reviewed at various levels of the Global Review Team before they are ultimately reviewed and approved by our senior leadership team. In future years, Mosaic expects to modify and streamline our S-K 1300 processes and internal controls.

Item 3. Legal Proceedings.

We have included information about legal and environmental proceedings in Note 22 of our Notes to Consolidated Financial Statements. That information is incorporated herein by reference.

We are also subject to the following legal and environmental proceedings in addition to those described in Note 22 of our Consolidated Financial Statements included in this report:

Countervailing Duty Petitions. In 2020, we filed petitions with the U.S. Department of Commerce ("***DOC***") and the U.S. International Trade Commission ("***ITC***") that requested the initiation of countervailing duty investigations into imports of

phosphate fertilizers from Morocco and Russia. The purpose of the petitions was to remedy the distortions that we believe foreign subsidies have caused or are causing in the U.S. market for phosphate fertilizers, and thereby restore fair competition. On February 16, 2021, the DOC made final affirmative determinations that countervailable subsidies were being provided by those governments. On March 11, 2021, the ITC made final affirmative determinations that the U.S. phosphate fertilizer industry is materially injured by reason of subsidized phosphate fertilizer imports from Morocco and Russia. As a result of these determinations, the DOC issued countervailing duty orders on phosphate fertilizer imports from Russia and Morocco, which are scheduled to remain in place for at least five years. Currently, the cash deposit rates for such imports are approximately 20 percent for Moroccan producer OCP, 9 percent and 47 percent for Russian producers PhosAgro and Eurochem, respectively, and 17 percent for all other/Russian producers. The final determinations in the DOC and ITC investigations are subject to challenge before U.S. federal courts and the World Trade Organization. Mosaic has initiated actions at the U.S. Court of International Trade contesting certain aspects of the DOC's final determinations that, we believe, failed to capture the full extent of Moroccan and Russian phosphate fertilizer subsidies. Moroccan and Russian producers have also initiated U.S. Court of International Trade actions, seeking lower cash deposit rates and revocation of the countervailing duty orders. Further, the cash deposit rates and the amount of countervailing duties owed by importers on such imports could change based on the results of the litigation as well as DOC's annual administrative review proceedings.

The South Pasture Extension Mine Litigation. On January 8, 2020, the Hardee County Mining Coordinator issued a Notice of Violation ("***NOV***") for the failure by Mosaic to proceed with reclamation of two designated reclamation units within the South Pasture Mine footprint. These two reclamation units comprise 166 acres of mined lands. The NOV cites noncompliance with the County Land Development Regulations and with the conditions of Development of Regional Impact ("***DRI***") Development Order 12-21 that was issued in 2012 to authorize continued mining at the South Pasture Mine, continued operation of the South Pasture beneficiation plant, and mining at the South Pasture Mine Extension. Through the NOV, the county requested that Mosaic submit a revised reclamation plan and schedule to demonstrate when initial reclamation activities would be completed for the two reclamation units identified in the NOV.

The delay in meeting the required reclamation schedule at the two reclamation units is tied to the idling and eventual shutdown of the Plant City fertilizer plant and the idling of the South Pasture Mine beneficiation plant. The Plant City facility was first idled in late 2017. In June 2019, Mosaic announced that the Plant City facility would be closed permanently.

Given the relationship between the Plant City fertilizer plant and the South Pasture beneficiation plant, and facing adverse market conditions, Mosaic idled the South Pasture beneficiation plant in September 2018. Idling of the South Pasture Mine beneficiation plant in September 2018 resulted in no tailings sand being produced by the processing of phosphate matrix. As a result, there was no tailings sand available for use in sand backfilling reclamation at the South Pasture Mine, and specifically, the two reclamation units identified in the county's January 8th NOV.

On March 10, 2020, Mosaic filed an "Application for Waiver and Reclamation Schedule Extension" to secure Board of County Commissioners ("***BOCC***") approval of extended reclamation deadlines for the South Pasture Mine. To obtain waiver relief from the BOCC, a quasi-judicial hearing would be required.

Extensive negotiations between Mosaic and county legal and technical staff resulted in an agreement that involved two separate but related actions: (1) secure a waiver and reclamation schedule extension through formal action by the BOCC at a quasi-judicial public hearing; and (2) enter into a settlement agreement that would require payment of a civil penalty by Mosaic for the non-compliance in meeting the required reclamation deadlines of the South Pasture Mine Development Order and the County Mining Ordinance. The settlement agreement would also be presented and acted upon at a formal public hearing before the BOCC.

On May 7, 2020, a quasi-public judicial hearing was held before the Hardee County BOCC. At that hearing, the BOCC voted unanimously to issue a waiver of the applicable reclamation deadlines of the South Pasture Development Order and the county ordinance for three specific reclamation areas of the South Pasture Mine. The waiver also included a negotiated alternative reclamation schedule that extends the deadline for completion of reclamation until the end of 2023. At that same hearing, the BOCC approved a settlement agreement that resolved all outstanding non-compliance associated with reclamation obligations at the South Pasture Mine and required Mosaic to pay an agreed settlement amount of $249,000.

Mosaic has satisfied the payment obligation of the settlement agreement and continues to implement the alternative reclamation schedule, as required. Monitoring programs have been put in place to ensure continued compliance with the waiver and settlement agreement.

Cruz Litigation. On August 27, 2020, a putative class action complaint was filed in the Circuit Court of the Thirteenth Judicial Circuit in Hillsborough County, Florida against our wholly owned subsidiary, Mosaic Global Operations Inc., and

two unrelated co-defendants. The complaint alleges claims related to elevated levels of radiation at two manufactured housing communities located on reclaimed mining land in Mulberry, Polk County, Florida, allegedly due to phosphate mining and reclamation activities occurring decades ago. Plaintiffs seek monetary damages, including punitive damages, injunctive relief requiring remediation of their properties, and a medical monitoring program funded by the defendants. On October 14, 2021, the court substantially granted a motion to dismiss we filed late in 2020, with leave for the plaintiffs to amend their complaint.

On November 3, 2021, plaintiffs filed an amended complaint and in response, Mosaic filed a motion to dismiss that complaint with prejudice on November 15, 2021. On December 23, 2021, plaintiffs opposed that motion and Mosaic replied to that opposition on January 26, 2022.

We intend to vigorously defend this matter.

Item 4. Mine Safety Disclosures.

Information concerning mine safety violations or other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K is included in Exhibit 95 to this report.

PART II.

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

We have included information about the market price of, dividends on and the number of holders of our common stock under "Quarterly Results (Unaudited)" in the financial information that is incorporated by reference in this report in Part II, Item 8, "Financial Statements and Supplementary Data".

The principal stock exchange on which our common stock is traded is The New York Stock Exchange under the symbol "MOS".

The following provides information related to equity compensation plans:

Plan category	Number of shares to be issued upon exercise of outstanding options, warrants and rights [(a)]	Weighted-average exercise price of outstanding options, warrants and rights [(b)]	Number of shares remaining available for future issuance under equity compensation plans (excluding shares reflected in first column)
Equity compensation plans approved by stockholders	7,403,892	$ 38.47	9,958,309
Equity compensation plans not approved by stockholders	—	—	—
Total	7,403,892	$ 38.47	9,958,309

(a) Includes grants of stock options, time-based restricted stock units and total shareholder return ("***TSR***") performance units. For purposes of the table above, the number of shares to be issued under a performance unit award reflects the maximum number of shares of our common stock that may be issued pursuant to such performance award. The actual number of shares to be issued under a TSR performance unit award will depend on the change in the market price of our common stock over a three-year vesting period, with no shares issued if the market price of a share of our common stock at the vesting date plus dividends thereon is less than 50% of its market price on the date of grant and the maximum number issued only if the market price of a share of our common stock at the vesting date plus dividends thereon is at least twice its market price on the date of grant.

(b) Includes weighted average exercise price of stock options only.

Pursuant to our equity compensation plans, we have granted and may in the future grant employee stock options to purchase shares of common stock of Mosaic for which the purchase price may be paid by means of delivery to us by the optionee of shares of common stock of Mosaic that are already owned by the optionee (at a value equal to market value on the date of the option exercise). During the period covered by this report, no options to purchase shares of common stock of Mosaic were exercised for which the purchase price was so paid.

On August 23, 2021, our Board of Directors authorized the 2021 Repurchase Program, which replaces the previous authorization that had $700 million of the original $1.5 billion remaining. The 2021 Repurchase Program allows us to repurchase up to $1.0 billion of our Common Stock through open market purchases, accelerated share repurchase arrangements, privately negotiated transactions or otherwise. The 2021 Repurchase Program has no set expiration date.

The following table sets forth information with respect to shares of our Common Stock that we purchased under the 2021 Repurchase Program during the quarter ended December 31, 2021:

Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of a publicly announced program	Maximum approximate dollar value of shares that may yet be purchased under the program[a]
Common Stock				
October 1, 2021- October 31, 2021	326,582	$ 40.30	326,582	$ 965,837,597
November 1, 2021- November 30, 2021	8,629,670 [b]	36.82	8,629,670	648,071,790
December 1, 2021- December 31, 2021	1,614,297	36.55	1,614,297	589,073,883
Total	10,570,549	$ 36.89	10,570,549	$ 589,073,883

(a) At the end of the month shown.
(b) Includes 8,544,144 shares purchased in an underwritten secondary offering by Vale S.A.

Item 6. Reserved.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The Management's Discussion and Analysis of Financial Condition and Results of Operations listed in the Financial Table of Contents included in this report is incorporated herein by reference.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

We have included a discussion about market risks under "Market Risk" in the Management's Analysis that is included in this report in Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations". This information is incorporated herein by reference.

Item 8. Financial Statements and Supplementary Data.

Our Consolidated Financial Statements, the Notes to Consolidated Financial Statements, the report of our Independent Registered Public Accounting Firm, and the information under "Quarterly Results" listed in the Financial Table of Contents included in this report are incorporated herein by reference. All other schedules for which provision is made in the applicable accounting regulation of the SEC are not required under the related instructions or are inapplicable, and therefore, have been omitted.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosures.

None.

Item 9A. Controls and Procedures.

(a) Disclosure Controls and Procedures

We maintain disclosure controls and procedures designed to ensure that information required to be disclosed in our filings under the Securities Exchange Act of 1934 (the "***Exchange Act***") is (i) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and (ii) accumulated and communicated to management, including our principal executive officer and our principal financial officer, to allow timely decisions regarding required disclosures. Our management, with the participation of our principal executive officer and our principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this annual report on Form 10-K. Our principal executive officer and our principal financial officer have concluded, based on such evaluations, that our disclosure controls and procedures were effective for the purpose for which they were designed as of the end of such period.

(b) Management's Report on Internal Control Over Financial Reporting

We have included management's report on internal control over financial reporting under "Management's Report on Internal Control Over Financial Reporting" listed in the Financial Table of Contents included in this report.

We have included our registered public accounting firm's attestation report on our internal controls over financial reporting under "Report of Independent Registered Public Accounting Firm" listed in the Financial Table of Contents included in this report.

This information is incorporated herein by reference.

(c) Changes in Internal Control Over Financial Reporting

Our management, with the participation of our principal executive officer and our principal financial officer, has evaluated any change in internal control over financial reporting that occurred during the quarter ended December 31, 2021 in accordance with the requirements of Rule 13a-15(d) promulgated by the SEC under the Exchange Act. There were no changes in internal control over financial reporting identified in connection with management's evaluation that occurred during the quarter ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

PART III.

Item 10. Directors, Executive Officers and Corporate Governance.
"The information required by this item is included in the Company's 2022 Proxy Statement to be filed with the SEC within 120 days after December 31, 2021 in connection with the solicitation of proxies for the Company's 2022 annual meeting of stockholders, and is incorporated here by reference.

The information contained under the headings "Proposal No. 1–Election of Directors," "Corporate Governance–Committees of the Board of Directors," and " Beneficial Ownership of Securities" included in our definitive proxy statement for our 2022 annual meeting of stockholders and the information contained under "Information About our Executive Officers" in Part I, Item 1, "Business," in this report is incorporated herein by reference. Add Section 16 heading as we will be reporting late Form 4.

We have a Code of Business Conduct and Ethics within the meaning of Item 406 of Regulation S-K adopted by the SEC under the Exchange Act that applies to our principal executive officer, principal financial officer and principal accounting officer. Our Code of Business Conduct and Ethics is available on Mosaic's website (www.mosaicco.com) and we intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding any amendment to, or waiver from, a provision of our code of ethics by posting such information on our website. The information contained on Mosaic's website is not being incorporated herein.

Item 11. Executive Compensation.

The information under the headings "Director Compensation" and "Executive Compensation" included in our definitive proxy statement for our 2022 annual meeting of stockholders is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information under the headings "Beneficial Ownership of Securities" and "Certain Relationships and Related Transactions" included in our definitive proxy statement for our 2022 annual meeting of stockholders is incorporated herein by reference. The table containing information related to equity compensation plans set forth in Part II, Item 5 "Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities" of this report is also incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information under the headings "Corporate Governance–Board Independence," "Corporate Governance–Committees of the Board of Directors," "Corporate Governance–Other Policies Relating to the Board of Directors–Policy and Procedures Regarding Transactions with Related Persons," and "Certain Relationships and Related Transactions" included in our definitive proxy statement for our 2022 annual meeting of stockholders is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

Our independent registered public accounting firm is KPMG LLP, Dallas, TX, Auditor Firm ID: 185.

The information included under "Audit Committee Report and Payment of Fees to Independent Registered Public Accounting Firm–Fees Paid to Independent Registered Public Accounting Firm" and "Audit Committee Report and Payment of Fees to Independent Registered Public Accounting Firm–Pre-approval of Independent Registered Public Accounting Firm Services" included in our definitive proxy statement for our 2022 annual meeting of stockholders is incorporated herein by reference.

PART IV.

Item 15. Exhibits and Financial Statement Schedules.

(a) (1) Consolidated Financial Statements filed as part of this report are listed in the Financial Table of Contents included in this report and incorporated by reference in this report in Part II, Item 8, "Financial Statements and Supplementary Data".

(2) All schedules for which provision is made in the applicable accounting regulations of the SEC are listed in this report in Part II, Item 8, "Financial Statements and Supplementary Data".

(3) Reference is made to the Exhibit Index in (b) below.

(b) Exhibits

Exhibit No.	Description	Incorporated Herein by Reference to	Filed with Electronic Submission
2.i.	Agreement and Plan of Merger and Contribution, dated as of January 26, 2004, by and among IMC Global Inc. (now known as Mosaic Global Holdings Inc.), Global Nutrition Solutions, Inc. (now known as The Mosaic Company ("Mosaic"), as successor by merger to MOS Holdings Inc. ("MOS Holdings")), GNS Acquisition Corp., Cargill, Incorporated ("Cargill") and Cargill Fertilizer, Inc., as amended by Amendment No. 1 to Agreement and Plan of Merger and Contribution, dated as of June 15, 2004, and as further amended by Amendment No. 2 to Agreement and Plan of Merger and Contribution, dated as of October 18, 2004 (1)	Exhibit 2.1 to Mosaic's Current Report on Form 8-K dated October 22, 2004, and filed on October 28, 2004(2)	
3.i.	Restated Certificate of Incorporation of Mosaic, effective May 19, 2016	Exhibit 3.i to Mosaic's Current Report on Form 8-K dated May 19, 2016 and filed on May 23, 2016(2)	
3.ii.	Amended and Restated Bylaws of Mosaic, effective March 5, 2020	Exhibit 3.1 to Mosaic's Current Report on Form 8-K dated March 5, 2020 and filed on March 6, 2020(2)	
4.i	Credit Agreement dated as of August 19, 2021, among Mosaic, Bank of America, N.A., as administrative agent, Swing Line Lender and an L/C Issuer, and the lenders and other L/D Issuers party thereto	Exhibit 4.i to Mosaic's Current Report on Form 8-K dated August 23, 2021 and filed on August 23, 2021(2)	
4.ii.	Indenture dated as of October 24, 2011, between Mosaic and U.S. Bank National Association, as trustee. Registrant hereby agrees to furnish to the Commission, upon request, all other instruments defining the rights of holders of each issue of long-term debt of the Registrant and its consolidated subsidiaries	Exhibit 4.1 to Mosaic's Current Report on Form 8-K dated October 24, 2011 and filed on October 24, 2011(2)	
4.iii	Description of Registrant's Common Stock	Exhibit 4.iii to Mosaic's Annual Report on Form 10-K for the fiscal year ended December 31, 2019	
10.ii.a	Time Charter dated as of October 24, 2017 between Tampa Port Services, LLC and Savage Harvest Operations, LLC	Exhibit 10.1 to Mosaic's Current Report on Form 8-K dated October 24, 2017 and filed on October 30, 2017	

10.ii.b	Guaranty dated as of October 24, 2017 by The Mosaic Company	Exhibit 10.2 to Mosaic's Current Report on Form 8-K dated October 24, 2017 and filed on October 30, 2017	
10.iii.a.[3]	The Mosaic Company 2004 Omnibus Stock and Incentive Plan (the "Omnibus Incentive Plan"), as amended October 8, 2009	Appendix A to Mosaic's Proxy Statement dated August 25, 2009[2]	
10.iii.a.1[3]	Form of Amendment dated May 11, 2011, to the Omnibus Incentive Plan	Exhibit 10.iii.u. to Mosaic's Annual Report on Form 10-K for the Fiscal Year ended May 31, 2011[2]	
10.iii.a.2[3]	Form of Employee Nonqualified Stock Option Award Agreement under the Omnibus Incentive Plan, approved July 20, 2011	Exhibit 10.iii.b. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended August 31, 2011[2]	
10.iii.b[3]	Description of Mosaic Management Incentive Program		X
10.iii.c.1[3]	Mosaic Nonqualified Deferred Compensation Plan, as amended and restated effective October 9, 2008	Exhibit 10.iii.b. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended November 30, 2008[2]	
10.iii.c.2[3]	Amendment dated April 13, 2011, to the Mosaic Nonqualified Deferred Compensation Plan, as amended and restated effective October 9, 2008	Exhibit 10.iii.r. to Mosaic's Annual Report on Form 10-K for the Fiscal Year ended May 31, 2011[2]	
10.iii.c.3[3]	Mosaic LTI Deferral Plan, approved March 5, 2015	Exhibit 10.1 to Mosaic's Current Report on Form 8-K dated March 5, 2015 and filed on March 11, 2015[2]	
10.iii.c.4[3]	Amendment to Mosaic LTI Deferral Plan, approved March 1, 2017	Exhibit 10.iii.c.4 to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2017[2]	
10.iii.c.5[3]	Amendment dated December 20, 2018, to the Mosaic Nonqualified Deferred Compensation Plan, as amended and restated effective October 9, 2008.	Exhibit 10.iii.c.5 to Mosaic's Annual Report on Form 10-K for the Fiscal Year ended December 31, 2018	
10.iii.c.6[3]	Amendment dated December 16, 2020, to the Mosaic Nonqualified Deferred Compensation Plan, as amended and restated effective October 9, 2008	Exhibit 10.iii.c.6 to Mosaic's Annual Report on Form 10-K for the Fiscal Year ended December 31, 2020	
10.iii.d.1[3]	Form of Senior Management Severance and Change in Control Agreement effective April 1, 2020	Exhibit 10.iii.d to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2020	

10.iii.d.2[3]	Form of Non-Competition, Non-Solicitation, Non-Defamation and Confidentiality Agreement effective April 1, 2020		X
10.iii.d.3[3]	Form of expatriate agreement dated May 18, 2017 between Mosaic and an executive officer	Exhibit 10.1 to Mosaic's Current Report on Form 8-K dated May 17, 2017 and filed on May 19, 2017[2]	
10.iii.d.4[3]	Amendment approved by Mosaic on May 22, 2019 to expatriate agreement dated May 18, 2017, between Mosaic and an executive officer	Described in Item 5.02 in Mosaic's Current Report on Form 8-K dated May 24, 2019 and filed on May 24, 2017	
10.iii.d.5[3]	Form of expatriate agreement dated November 1, 2019 between Mosaic and an executive officer	Exhibit 10.1 to Mosaic's Current Report on Form 8-K dated October 31, 2019 and filed on November 4, 2019	
10.iii.e.1[3]	Agreement between Cargill and Mosaic relating to certain former Cargill employees' participation in the Cargill International Pension Plan	Exhibit 10.iii.b. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended August 31, 2012[2]	
10.iii.e.2[3]	Form of Supplemental Agreement between Mosaic and certain former participants in the Cargill International Pension Plan	Exhibit 10.iii.x. to Mosaic's Annual Report on Form 10-K of Mosaic for the fiscal year ended May 31, 2013[2]	
10.iii.f.[3]	Form of Indemnification Agreement between Mosaic and its directors and executive officers	Exhibit 10.iii. to Mosaic's Current Report on Form 8-K dated October 8, 2008, and filed on October 14, 2008[2]	
10.iii.g.[3]	Summary of Board of Director Compensation of Mosaic	Exhibit 10.iii.g. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended June 30, 2021	
10.iii.h.[3]	Executive Perquisite Program	The material under "Compensation Discussion and Analysis—Other Executive Compensation Arrangements, Policies and Practices —Perquisites" in Mosaic's Proxy Statement dated April 8, 2020	
10.iii.i.[3]	The Mosaic Company 2014 Stock and Incentive Plan (the "2014 Incentive Plan")	Appendix B to Mosaic's Proxy Statement dated April 2, 2014[2]	
10.iii.j.[3]	Form of Amendment dated August 14, 2019, to the 2014 Incentive Plan	Exhibit 10.iii.j to Mosaic's Annual Report on Form 10-K for the fiscal year ended December 31, 2019	

10.iii.k.1[3]	Form of Non-Qualified Stock Option Award Agreement under the 2014 Incentive Plan, approved March 5, 2015	Exhibit 10.iii.a. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2015[2]
10.iii.k.2[3]	Form of Non-Qualified Stock Option Award Agreement under the 2014 Incentive Plan, approved March 2, 2016	Exhibit 10.iii.a. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2016[2]
10.iii.k.3[3]	Form of Employee Restricted Stock Unit Award Agreement under the 2014 Incentive Plan, approved March 2, 2016	Exhibit 10.iii.e. to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2016[2]
10.iii.k.4[3]	Form of Director Restricted Stock Unit Award Agreement under the 2014 Incentive Plan, approved May 19, 2016	Exhibit 10.iii.kk to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period Ended June 30, 2016[2]
10.iii.k.5[3]	Form of Employee TSR Performance Unit Award Agreement under the 2014 Incentive Plan, approved March 1, 2017	Exhibit 10.iii.k.1 to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2017[2]
10.iii.k.6[3]	Form of Executive TSR Performance Unit Award Agreement under the 2014 Incentive Plan, approved March 1, 2017	Exhibit 10.iii.k.2 to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period ended March 31, 2017[2]
10.iii.k.7[3]	Form of Retention Award Agreement under the 2014 Incentive Plan, approved October 31, 2019	Exhibit 10.2 to Mosaic's Current Report on Form 8-K dated October 31, 2019 and filed on November 4, 2019
10.iii.k.8[3]	Form of Executive TSR Cash Settled Performance Unit Award Agreement under the 2014 Incentive Plan, approved March 6, 2019	Exhibit 10.iii.k.11 to Mosaic's Annual Report on Form 10-K for the fiscal year ended December 31, 2019
10.iii.k.9[3]	Form of Restricted Stock Unit Award Agreement under the 2014 Incentive Plan approved March 4, 2020	Exhibit 10.iii.a to Mosaic's Quarterly Report on Form 10-K for the Quarterly Period ended March 31, 2020
10.iii.k.10[3]	Form of Executive TSR Stock Settled Performance Unit Award Agreement under the 2014 Incentive Plan, approved March 4, 2020	Exhibit 10.iii.b to Mosaic's Quarterly Report on Form 10-K for the Quarterly Period ended March 31, 2020
10.iii.k.11[3]	Form of Executive TSR Cash Settled Performance Unit Award Agreement under the 2014 Incentive Plan, approved March 4, 2020	Exhibit 10.iii.c to Mosaic's Quarterly Report on Form 10-K for the Quarterly Period ended March 31, 2020
10.v.a	Consent Decree dated September 30, 2015 among the United States of America, the Florida Department of Environmental Protection, Mosaic Fertilizer, LLC and The Mosaic Company[4]	Exhibit 10.1. to Mosaic's Current Report on Form 8-K dated September 30, 2015 and filed on October 6, 2015(2)

10.v.b	Description of Modifications to Consent Decree dated September 30, 2015 among the United States of America, the Florida Department of Environmental Protection, Mosaic Fertilizer, LLC and The Mosaic Company, filed as Exhibit 10.1 to the Current Report on Form 8-K of Mosaic dated September 30, 2015 and filed on October 6, 2015	Exhibit 10.v.i to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period Ended June 30, 2016(2)	
10.v.c	Consent Decree dated September 30, 2015 among the United States of America, the Louisiana Department of Environmental Quality, Mosaic Fertilizer, LLC and The Mosaic Company[(4)]	Exhibit 10.2. to Mosaic's Current Report on Form 8-K dated September 30, 2015 and filed on October 6, 2015(2)	
10.v.d	Description of Modifications to Consent Decree dated September 30, 2015 among the United States of America, the Louisiana Department of Environmental Quality, Mosaic Fertilizer, LLC and The Mosaic Company, filed as Exhibit 10.2 to the Current Report on Form 8-K of Mosaic dated September 30, 2015 and filed on October 6, 2015	Exhibit 10.v.ii to Mosaic's Quarterly Report on Form 10-Q for the Quarterly Period Ended June 30, 2016(2)	
21	Subsidiaries of the Registrant		X
23.1	Consent of KPMG LLP, independent registered public accounting firm for Mosaic		X
23.2	Florida Phosphate Mining Consent of Qualified Persons		X
23.3	Belle Plaine Potash Facility Consent of Qualified Persons		X
23.4	Esterhazy Potash Facility Consent of Qualified Persons		X
23.5	Tapira Consent of Qualified Persons		X
24	Power of Attorney		X
31.1	Certification of Chief Executive Officer Required by Rule 13a-14(a)		X
31.2	Certification of Chief Financial Officer Required by Rule 13a-14(a)		X
32.1	Certification of Chief Executive Officer Required by Rule 13a-14(b) and Section 1350 of Chapter 63 of Title 18 of the United States Code		X
32.2	Certification of Chief Financial Officer Required by Rule 13a-14(b) and Section 1350 of Chapter 63 of Title 18 of the United States Code		X
95	Mine Safety Disclosures		X
96.1	Florida Phosphate Mining Technical Report Summary		X
96.2	Esterhazy Potash Facility Technical Report Summary		X
96.3	Belle Plaine Potash Facility Technical Report Summary		X
96.4	Tapira Technical Report Summary		X
101	Interactive Data Files		X

(c) Summarized financial information of 50% or less owned persons is included in Note 8 of Notes to Consolidated Financial Statements. Financial statements and schedules are omitted as none of such persons are significant under the tests specified in Regulation S-X under Article 3.09 of general instructions to the financial statements.

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(1) Mosaic agrees to furnish supplementally to the Commission a copy of any omitted schedules and exhibits to the extent required by rules of the Commission upon request.

(2) SEC File No. 001-32327

(3) Denotes management contract or compensatory plan.

(4) Confidential information has been omitted from this Exhibit and filed separately with the Securities and Exchange Commission pursuant to a confidential treatment request under Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Item 16. Form 10-K Summary.

None.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

THE MOSAIC COMPANY
(Registrant)

/s/ James "Joc" C. O'Rourke
James "Joc" C. O'Rourke
Chief Executive Officer and President

Date: February 23, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Name	Title	Date
/s/ James "Joc" C. O'Rourke James "Joc" C. O'Rourke	Chief Executive Officer and President and Director (principal executive officer)	February 23, 2022
/s/ Clint C. Freeland Clint C. Freeland	Senior Vice President and Chief Financial Officer (principal financial officer and principal accounting officer)	February 23, 2022
* Gregory L. Ebel	Chairman of the Board of Directors	February 23, 2022
* Cheryl K. Beebe	Director	February 23, 2022
* Oscar P. Bernardes	Director	February 23, 2022
* Timothy S. Gitzel	Director	February 23, 2022
* Denise C. Johnson	Director	February 23, 2022
* Emery N. Koenig	Director	February 23, 2022
* Luciano Siani Pires	Director	February 23, 2022
* David T. Seaton	Director	February 23, 2022
* Steven M. Seibert	Director	February 23, 2022
* Gretchen H. Watkins	Director	February 23, 2022
* Kelvin R. Westbrook	Director	February 23, 2022

***By:**

/s/ Mark J. Isaacson

Mark J. Isaacson
Attorney-in-Fact

Financial Table of Contents

Management's Discussion and Analysis of Financial Condition and Results of Operations

Introduction

The Mosaic Company (before or after the Cargill Transaction, as defined below, "***Mosaic,***" and with its consolidated subsidiaries, "***we,***" "***us,***" "***our***" or the "***Company***") is the parent company of the business that was formed through the business combination ("***Combination***") of IMC Global Inc. and the Cargill Crop Nutrition fertilizer businesses of Cargill, Incorporated and its subsidiaries (collectively, "***Cargill***") on October 22, 2004. In May 2011, Cargill divested its approximately 64% equity interest in us in a split-off to its stockholders and a debt exchange with certain Cargill debt holders.

We produce and market concentrated phosphate and potash crop nutrients. We conduct our business through wholly and majority owned subsidiaries as well as businesses in which we own less than a majority or a non-controlling interest, including consolidated variable interest entities and investments accounted for by the equity method.

We are organized into the following business segments:

- Our **Phosphates** business segment owns and operates mines and production facilities in Florida, which produce concentrated phosphate crop nutrients and phosphate-based animal feed ingredients, and processing plants in Louisiana, which produce concentrated phosphate crop nutrients for sale domestically and internationally. We have a 75% economic interest in the Miski Mayo Phosphate Mine ("***Miski Mayo Mine***") in Peru. These results are consolidated in the Phosphates segment. The Phosphates segment also includes our 25% interest in the Ma'aden Wa'ad Al Shamal Phosphate Company ("***MWSPC***"), a joint venture to develop, own and operate integrated phosphate production facilities in the Kingdom of Saudi Arabia. We market approximately 25% of the MWSPC phosphate production. We recognize our equity in the net earnings or losses relating to MWSPC on a one-quarter reporting lag in our Consolidated Statements of Earnings (Loss).

- Our **Potash** business segment owns and operates potash mines and production facilities in Canada and the U.S. which produce potash-based crop nutrients, animal feed ingredients and industrial products. Potash sales include domestic and international sales. We are a member of Canpotex, Limited ("***Canpotex***"), an export association of Canadian potash producers through which we sell our Canadian potash outside the U.S. and Canada.

- Our **Mosaic Fertilizantes** business segment includes five phosphate rock mines, four phosphate chemical plants and a potash mine in Brazil. The segment also includes our distribution business in South America, which consists of sales offices, crop nutrient blending and bagging facilities, port terminals and warehouses in Brazil and Paraguay. We also have a majority interest in Fospar S.A., which owns and operates a single superphosphate granulation plant and a deep-water port and throughput warehouse terminal facility in Brazil.

Intersegment eliminations, unrealized mark-to-market gains/losses on derivatives, debt expenses, Streamsong Resort® results of operations, and the results of the China and India distribution businesses are included within Corporate, Eliminations and Other. See Note 24 of the Consolidated Financial Statements in this report for segment results.

Key Factors that can Affect Results of Operations and Financial Condition

Our primary products, phosphate and potash crop nutrients, are, to a large extent, global commodities that are also available from a number of domestic and international competitors, and are sold by negotiated contracts or by reference to published market prices. The markets for our products are highly competitive, and the most important competitive factor for our products is delivered price. Business and economic conditions and governmental policies affecting the agricultural industry and customer sentiment are the most significant factors affecting worldwide demand for crop nutrients. The profitability of our businesses is heavily influenced by worldwide supply and demand for our products, which affects our sales prices and volumes. Our costs per tonne to produce our products are also heavily influenced by fixed costs associated with owning and operating our major facilities, significant raw material costs in our Phosphates and Mosaic Fertilizantes businesses, and fluctuations in currency exchange rates.

Our products are generally sold based on the market prices prevailing at the time the sales contract is signed or through contracts which are priced at the time of shipment. Additionally, in certain circumstances the final price of our products is determined after shipment based on the current market at the time the price is agreed to with the customer. Forward sales programs at fixed prices increase the lag between prevailing market prices and our average realized selling prices. The mix

and parameters of these sales programs vary over time based on our marketing strategy, which considers factors that include, among others, optimizing our production and operating efficiency within warehouse limitations, as well as customer requirements. The use of forward sales programs and the level of customer prepayments may vary from period to period due to changing supply and demand environments, seasonality, and market sentiments.

World prices for the key raw material inputs for concentrated phosphate products, including ammonia, sulfur and phosphate rock, have an effect on industry-wide phosphate prices and production costs. The primary feedstock for producing ammonia is natural gas, and costs for ammonia are generally highly dependent on the supply and demand balance for ammonia. In North America, we purchase approximately one-third of our ammonia from various suppliers in the spot market, with the remaining two-thirds either purchased through a long-term ammonia supply agreement (the "***CF Ammonia Supply Agreement***") with an affiliate of CF Industries, Inc. ("***CF***") or produced internally at our Faustina, Louisiana location. The CF Ammonia Supply Agreement provides for U.S. natural gas-based pricing that is intended to lessen pricing volatility. We entered into the agreement in late 2013, and we began purchasing under it in the second half of 2017. If the price of natural gas rises or the market price for ammonia falls outside of the range anticipated at execution of the agreement, we may not realize a cost benefit from the natural gas-based pricing over the term of the agreement, or the cost of our ammonia under the agreement could be a competitive disadvantage. During 2021, the contract has provided an advantage over pricing in the spot market. At times, we have paid more or less for ammonia under the agreement than in the spot market. We expect the agreement will provide us a competitive advantage over its term, including by providing a reliable long-term ammonia supply. In Brazil, we purchase all of our ammonia from a single supplier.

Sulfur is a global commodity that is primarily produced as a by-product of oil refining. The market price is based primarily on the supply and demand balance for sulfur. There is currently tightness in the sulfur market which we are monitoring. At this time, we do not expect this to have a material impact on our business. We believe our current and future investments in sulfur transformation and transportation assets will enhance our competitive advantage. We produce and procure most of our phosphate rock requirements through either wholly or partly owned mines. In addition to producing phosphate rock, Mosaic Fertilizantes purchases phosphates, potash and nitrogen products which are either used to produce blended crop nutrients ("***Blends***") or for resale.

Our per tonne selling prices for potash are affected by shifts in the product mix, geography and customer mix. Our Potash business is significantly affected by Canadian resource taxes and royalties that we pay to the Province of Saskatchewan in order for us to mine and sell our potash products. In addition, cost of goods sold is affected by a number of factors, including: fluctuations in the Canadian dollar; the level of periodic inflationary pressures on resources in western Canada, where we produce most of our potash; and natural gas costs for operating our potash solution mine at Belle Plaine, Saskatchewan. In the past, we have also incurred operating costs to manage salt saturated brine inflows at our Esterhazy, Saskatchewan K1 and K2 mine shafts which we closed in June 2021 due to an acceleration of brine inflows. Mining has now transitioned to the K3 mine shaft which is expected to be in full production in the first quarter of 2022.

Our results of operations are also affected by changes in currency exchange rates due to our international footprint. The most significant currency impacts are generally from the Canadian dollar and the Brazilian real.

A discussion of these and other factors that affected our results of operations and financial condition for the periods covered by this Management's Discussion and Analysis of Financial Condition and Results of Operations is set forth in further detail below. This Management's Discussion and Analysis of Financial Condition and Results of Operations should also be read in conjunction with the narrative description of our business in Item 1, and the risk factors described in Item 1A, of Part I of this annual report on Form 10-K, and our Consolidated Financial Statements, accompanying notes and other information listed in the accompanying Financial Table of Contents.

This section of this Form 10-K discusses 2021 and 2020 items and year-to-year comparisons between 2021 and 2020. Discussions of 2019 items and year-to-year comparisons between 2020 and 2019 that are not included in this Form 10-K can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of the Company's annual report on Form 10-K for the year ended December 31, 2020 and are incorporated by reference herein.

Throughout the discussion below, we measure units of production, sales and raw materials in metric tonnes which are the equivalent of 2,205 pounds, unless we specifically state that we mean short or long ton(s), which are the equivalent of 2,000 pounds and 2,240 pounds, respectively. In addition, we measure natural gas, a raw material used in the production of our products, in MM Btu, which stands for one million British Thermal Units ("***BTU***"). One BTU is equivalent to 1.06 Joules.

In the following table, there are certain percentages that are not considered to be meaningful and are represented by "NM".

Results of Operations

The following table shows the results of operations for the years ended December 31, 2021, 2020, and 2019:

	Years Ended December 31,			2021-2020		2020-2019	
(in millions, except per share data)	2021	2020	2019	Change	Percent	Change	Percent
Net sales	$ 12,357.4	$ 8,681.7	$ 8,906.3	$ 3,675.7	42 %	$ (224.6)	(3)%
Cost of goods sold	9,157.1	7,616.8	8,009.0	1,540.3	20 %	(392.2)	(5)%
Gross margin	3,200.3	1,064.9	897.3	2,135.4	NM	167.6	19 %
Gross margin percentage	25.9 %	12.3 %	10.1 %	13.6 %		2.2 %	
Selling, general and administrative expenses	430.5	371.5	354.1	59.0	16 %	17.4	5 %
Impairment, restructuring and other expenses	158.1	—	1,462.1	158.1	NM	(1,462.1)	(100)%
Other operating expenses	143.2	280.5	176.0	(137.3)	(49)%	104.5	59 %
Operating earnings (loss)	2,468.5	412.9	(1,094.9)	2,055.6	NM	1,507.8	(138)
Interest expense, net	(169.1)	(180.6)	(182.9)	11.5	(6)%	2.3	(1)%
Foreign currency transaction (loss) gain	(78.5)	(64.3)	20.2	(14.2)	22 %	(84.5)	NM
Other income	3.9	12.9	1.5	(9.0)	(70)%	11.4	NM
Earnings (loss) from consolidated companies before income taxes	2,224.8	180.9	(1,256.1)	2,043.9	NM	1,437.0	(114)
Provision for (benefit from) income taxes	597.7	(578.5)	(224.7)	1,176.2	NM	(353.8)	157
Earnings (loss) from consolidated companies	1,627.1	759.4	(1,031.4)	867.7	114 %	1,790.8	(174)
Equity in net earnings (loss) of nonconsolidated companies	7.8	(93.8)	(59.4)	101.6	(108)%	(34.4)	58
Net earnings (loss) including noncontrolling interests	1,634.9	665.6	(1,090.8)	969.3	146 %	1,756.4	(161)
Less: Net earnings (loss) attributable to noncontrolling interests	4.3	(0.5)	(23.4)	4.8	NM	22.9	(98)
Net earnings (loss) attributable to Mosaic	$ 1,630.6	$ 666.1	$ (1,067.4)	$ 964.5	145 %	$ 1,733.5	(162)
Diluted net earnings (loss) per share attributable to Mosaic	$ 4.27	$ 1.75	$ (2.78)	$ 2.52	144 %	$ 4.53	(163)
Diluted weighted average number of shares outstanding	381.6	381.3	383.8				

Overview of the Years ended December 31, 2021 and 2020

Net earnings attributable to Mosaic for the year ended December 31, 2021 was $1.6 billion, or $4.27 per diluted share, compared to $0.7 billion, or $1.75 per diluted share for 2020.

In 2021, net earnings were negatively impacted by $291 million, net of tax, or $(0.76) per diluted share, related to notable items as follows (noted on a pre-tax basis, with the exception of discrete income tax):

- Expense related to the closure of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine of $158 million, or $(0.30) per diluted share
- Foreign currency transaction loss of $79 million, or ($0.16) per diluted share
- Discrete income tax provision of $43 million, or $(0.11) per diluted share
- Other operating expenses of $50 million, or $(0.10) per diluted share, related to maintaining closed and indefinitely idled facilities
- Depreciation expense of $37 million, or $(0.08) per diluted share, related to the acceleration of the closure of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan mine
- Expense related to the impact of Hurricane Ida on our Louisiana operations of $27 million, or $(0.05) per diluted share
- Asset retirement obligation costs of $25 million, or $(0.05) per diluted share, related to revisions in the estimated costs of our asset retirement obligations
- Unrealized loss on derivatives of $14 million, or $(0.02) per diluted share
- Other operating income of $20 million, or $0.04 per diluted share, related to the sale of our warehouse in Houston, Texas
- Functional currency impact in cost of goods sold of $20 million, or $0.04 per diluted share
- Other operating income of $13 million, or $0.02 per share, related to a decrease in reserves for legal contingencies that were part of our acquisition (the "***Acquisition***") of Vale Fertilizantes S.A. (now known as Mosaic Fetilizantes P&K S.A. or the "***Acquired Business***")
- Other non-operating income of $2 million, or $0.01 per diluted share, related to a realized gain on RCRA trust securities

Net earnings for 2020 included the following notable items that positively impacted net earnings by $341 million, net of tax, or $0.88 per diluted share:

- Discrete income tax benefit of $609 million, or $1.60 per diluted share, which included the reversal of a tax valuation reserve established with the Acquisition
- Asset retirement obligation costs of $134 million, or $(0.21) per diluted share, related to revisions in the estimated costs of our asset retirement obligations
- Depreciation expense of $79 million, or $(0.12) per diluted share, related to the acceleration of the closure of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan mine as we ramped up K3
- Other operating expenses of $69 million, or $(0.14) per diluted share, related to maintaining closed and indefinitely idled facilities
- Foreign currency transaction loss of $64 million, or $(0.10) per diluted share
- A change in the effective annual tax rate, creating a negative impact of $41 million, or $(0.11) per diluted share
- Other operating expenses of $35 million, or $(0.05) per diluted share, related to an increase in an environmental remediation reserve at our New Wales, FL facility
- Other operating expenses of $20 million, or $(0.03) per share, related to an increase in reserves for legal contingencies of the Acquired Business, integration costs of our North American business operations and a write-down of assets in our Mosaic Fertilizantes segment
- Idle plant costs of $13 million, or $(0.02) per diluted share, related to the government-mandated shutdown on March 16, 2020, of the Miski Mayo Mine due to the Covid-19 outbreak, which reopened on May 13, 2020
- Unrealized gain on derivatives of $22 million, or $0.03 per diluted share

- Other non-operating income of $14 million, or $0.02 per diluted share, related to a realized gain on RCRA trust securities
- Other operating income of $7 million, or $0.01 per diluted share, related to a legal settlement

Additional significant factors that affected our results of operations and financial condition in 2021 and 2020 are listed below. These factors are discussed in more detail in the following sections of this Management's Discussion and Analysis of Financial Condition and Results of Operations.

Year ended December 31, 2021

Phosphates operating results for the year ended December 31, 2021 were favorably impacted by higher phosphate average selling prices compared to the prior year period. After reaching a low in the first quarter of 2020, sales prices continued to rise in 2021, driven by tightness in global supply and demand, strong farmer economics and improved grain prices, and continue to remain strong into the first quarter of 2022. Operating results in 2021 were unfavorably impacted by lower finished product sales volumes, and higher raw material costs, primarily sulfur and ammonia. The purchase prices of these raw materials are driven by global supply and demand. In addition, during the first half of 2021, availability of molten sulfur was impacted by refinery closures in 2020 and 2021, due to lower fuel demand and extreme cold weather in the first quarter of 2021 in the southern U.S., where several refineries are located. The low sulfur availability constrained our production in the first half of 2021. Operating results in 2021 were also unfavorably impacted by higher idle plant and maintenance turnaround costs compared to the prior year, mainly driven by the impacts of Hurricane Ida on our Louisiana operations.

Potash operating results were favorably impacted in our Potash segment in 2021 by higher average sales prices compared to the prior year. Prices began to strengthen in North America and Brazil in the fourth quarter of 2020, due to increased demand, tight supply and improved farmer economics. Prices continued to increase through the end of 2021 and into the first quarter of 2022. The global potash market is expected to remain tight throughout 2022 given recent sanctions against Belarus which could impact global supply. Operating results in 2021 were unfavorably impacted by lower sales volumes caused by decreased production volumes associated with the closure of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine. We reopened our previously idled Colonsay, Saskatchewan potash mine during the third quarter of 2021, and ramped up production at our K3 mine shaft which partially replaced this lost production.

Mosaic Fertilizantes operating results in 2021 were favorably impacted by increased sales prices compared to the prior year, due to tight global supply and demand. The favorable results were partially offset by lower sales volumes due to lower product availability and production challenges, low inventory levels and increased raw materials costs, as global prices of sulfur and ammonia were higher in 2021 compared to the prior year.

Other highlights in 2021:

- During the second quarter of 2021, due to increased brine inflows, we made the decision to accelerate the timing of the shutdown of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine. Closing the K1 and K2 shafts are key pieces of the transition to the K3 shaft, but the timeline for the closure was accelerated by approximately nine months. We recognized pre-tax costs of $158.1 million related to the permanent closure of these facilities. In the third quarter of 2021, we resumed production at our previously idled Colonsay potash mine to offset a portion of the production lost by the early closure of the K1 and K2 shafts at Esterhazy. In December 2021, the K3 shaft became fully operational and is expected to reach full operating capacity in the first quarter of 2022. The closure of the K1 and K2 shafts will eliminate future brine management expenses at these sites.

- In August 2021 we entered into a new, unsecured five-year credit facility of up to $2.5 billion, with a maturity date of August 19, 2026, which replaces our prior $2.2 billion line of credit. This increase in size provides additional security and flexibility and reflects the growth in our business.

- In August 2021 we prepaid the outstanding balance of $450 million on our 3.75% senior notes, due November 15, 2021, without premium or penalty.

- During the third quarter of 2021, our Board of Directors approved a new $1 billion share repurchase authorization (the "***2021 Repurchase Program***"), replacing our previous $1.5 billion authorization (the "***2015 Repurchase Program***") that had $700 million remaining. This new, expanded authorization reflects our unchanged commitment to a balanced deployment of excess capital that includes returning capital to stockholders. During 2021, we repurchased 11,200,371 shares of Common Stock, including 8,544,144 shares that we purchased in an underwritten secondary offering by Vale S.A., at an average price of $36.69, for a total of approximately $410.9 million.

- In November 2021, Vale S.A. sold its 34,176,574 shares of common stock of Mosaic in an underwritten secondary offering. Vale S.A. no longer holds any shares of Mosaic common stock.

- In the fourth quarter of 2021, our Board of Directors approved a 50% increase in our annual dividend, to $0.45 per share, beginning in 2022.

- In 2020, we filed petitions with the U.S. Department of Commerce *("**DOC**")* and the U.S. International Trade Commission *("**ITC**")* that requested the initiation of countervailing duty investigations into imports of phosphate fertilizers from Morocco and Russia. The purpose of the petitions was to remedy the distortions that we believe foreign subsidies have caused or are causing in the U.S. market for phosphate fertilizers, and thereby restore fair competition. During the first quarter of 2021, the DOC made final affirmative determinations that countervailable subsidies were being provided by those governments and the ITC made final affirmative determinations that the U.S. phosphate fertilizer industry is materially injured by reason of subsidized phosphate fertilizer imports from Morocco and Russia. As a result of these determinations, the DOC issued countervailing duty orders on phosphate fertilizer imports from Russia and Morocco, which are scheduled to remain in place for at least five years. Currently, the cash deposit rates for such imports are approximately 20 percent for Moroccan producer OCP, 9 percent and 47 percent for Russian producers PhosAgro and Eurochem, respectively, and 17 percent for all other Russian producers. The final determinations in the DOC and ITC investigations are subject to possible challenges before U.S. federal courts and the World Trade Organization, and Mosaic has initiated actions at the U.S. Court of International Trade contesting certain aspects of the DOC's final determinations that, we believe, failed to capture the full extent of Moroccan and Russian phosphate fertilizer subsidies. Moroccan and Russian producers have also initiated U.S. Court of International Trade actions, seeking lower cash deposit rates and revocation of the countervailing duty orders. Further, the cash deposit rates and the amount of countervailing duties owed by importers on such imports could change based on the results of the DOC's annual administrative review proceedings.

- In response to Covid-19, we continued to implement measures in 2021 that were intended to provide for the immediate health and safety of our employees, including working remotely and alternating work schedules, in order to minimize the number of employees at a single location. Businesses have been impacted by short-term labor shortages due to illness, transportation issues such as trucking delays and port congestion which are slowing delivery of inputs to facilities and products to end customers. At this time, we have experienced limited adverse financial or operational impacts related to Covid-19.

Subsequent to December 31, 2021, we expect to enter into an accelerated share repurchase ("***ASR***") of $400 million, which would be initiated in February 2022. This ASR will exhaust most of the remaining share repurchase authorization established in the 2021 Repurchase Program. Following the completion of the current authorization, our Board of Directors has approved the establishment of a new $1 billion share repurchase authorization, which will go into effect following completion of this ASR. The Board of Directors has also approved a regular dividend increase to $0.60 per share annually from $0.45, beginning with the second quarter 2022 payment.

Year ended December 31, 2020:

Phosphates operating results for the year ended December 31, 2020 were favorably impacted by an increase in sales volumes compared to 2019. Increased sales volumes were driven by strong spring and fall application seasons, as well as decreased competitor shipments into North America. Competitor shipments were impacted by anticipation of potential import duties against producers in Morocco and Russia resulting from the countervailing duty investigations, instituted by us in the U.S., into imports of phosphate fertilizers. The benefit of increased sales volumes was partially offset by a decrease in phosphates average selling prices in 2020 compared to 2019. Although selling prices were higher than the low levels seen at the end of 2019, the average selling price was still below that of the 2019 average. Prices rose throughout 2020 due to tightness in global supply and demand. The increase in demand was partially mitigated by suppliers, including Mosaic, increasing

production in the second half of 2020 and carrying into the first quarter of 2021. Operating earnings in 2020 also benefited from lower raw material costs, primarily sulfur and ammonia, which are driven by global supply and demand.

Potash operating results were unfavorably impacted by decreases in the average selling price in 2020 compared to 2019, partially offset by higher sales volumes. Selling prices began declining in the first half of 2019 due to adverse weather conditions in North America. They continued to decline in the first half of 2020, due to lower export prices, as China and India contract prices set a floor for the market, and to new suppliers entering the marketplace. Prices began to strengthen in North America and Brazil in the fourth quarter of 2020, due to increased demand and tight supply; however, prices were still below levels seen in 2019. Operating results were favorably impacted by higher potash sales volumes in 2020 compared to 2019. In 2019, sales volumes were impacted by low demand due to adequate inventories, delayed contract settlements, and adverse weather conditions throughout North America.

Mosaic Fertilizantes operating results in 2020 were favorably impacted by increased sales volumes. Sales volumes increased compared to 2019, due to strong market demand and efforts to grow our market share in 2020. Operating results were also favorably impacted by lower raw material costs in 2020 compared to the prior year, driven by global supply and demand and the impact of foreign currency changes. In 2020 results were also favorably impacted by lower production costs as 2019 was impacted by new tailings dam legislation, which resulted in higher idle and turnaround costs. Lower average selling prices, driven by international pricing trends, unfavorably impacted operating earnings in 2020 compared to 2019.

Phosphates Net Sales and Gross Margin

The following table summarizes the Phosphates segment's net sales, gross margin, sales volume, selling prices and raw material prices:

	Years Ended December 31,			2021-2020		2020-2019	
(in millions, except price per tonne or unit)	**2021**	**2020**	**2019**	**Change**	**Percent**	**Change**	**Percent**
Net sales:							
North America	$ 3,251.4	$ 1,953.1	$ 1,816.6	$ 1,298.3	66 %	$ 136.5	8 %
International	1,671.5	1,163.3	1,424.7	508.2	44 %	(261.4)	(18)%
Total	4,922.9	3,116.4	3,241.3	1,806.5	58 %	(124.9)	(4)%
Cost of goods sold	3,617.5	2,990.9	3,323.6	626.6	21 %	(332.7)	(10)%
Gross margin	$ 1,305.4	$ 125.5	$ (82.3)	$ 1,179.9	NM	$ 207.8	NM
Gross margin as a percentage of net sales	26.5 %	4.0 %	(2.5)%				
Sales volumes[a] (in thousands of metric tonnes)							
DAP/MAP	3,904	4,936	5,003	(1,032)	(21)%	(67)	(1)%
Performance and Other[b]	3,789	3,598	3,177	191	5 %	421	13 %
Total finished product tonnes	7,693	8,534	8,180	(841)	(10)%	354	4 %
Rock[c]	1,772	739	1,934	1,033	140 %	(1,195)	(62)%
Total Phosphates Segment Tonnes[a]	9,465	9,273	10,114	192	2 %	(841)	(8)%
Realized prices ($/tonne)							
Average finished product selling price (destination)[d]	$ 618	$ 360	$ 379	$ 258	72 %	$ (19)	(5)%
DAP selling price (fob mine)	$ 564	$ 310	$ 325	$ 254	82 %	$ (15)	(5)%
Average cost per unit consumed in cost of goods sold:							
Ammonia (metric tonne)	$ 396	$ 287	$ 324	$ 109	38 %	$ (37)	(11)%
Sulfur (long ton)	$ 181	$ 83	$ 128	$ 98	118 %	$ (45)	(35)%
Blended rock (metric tonne)	$ 60	$ 61	$ 62	$ (1)	(2)%	$ (1)	(2)%
Production volume (in thousands of metric tonnes) - North America	7,331	8,160	8,077	(829)	(10)%	83	1 %

(a) Includes intersegment sales volumes.
(b) Includes sales volumes of MicroEssentials® and animal feed ingredients.
(c) Sales volumes of rock are presented on a wet tonne basis based on average moisture levels of 3.5% to 4.5% as it exits the drying process and is prepared for shipping.
(d) Excludes sales revenue and tonnes associated with rock sales.

Year Ended December 31, 2021 compared to Year Ended December 31, 2020

The Phosphates segment's net sales were $4.9 billion for the year ended December 31, 2021, compared to $3.1 billion for the same period a year ago. The increase in net sales was primarily due to higher average finished goods selling prices, which resulted in an increase in net sales of approximately $1.82 billion. Net sales was also positively impacted by increased sulfur and ammonia sales, which resulted in an increase in net sales of approximately $100 million. Higher prices and sales volumes at the Miski Mayo Mine contributed approximately $70 million to the current year increase. These increases were partially offset by lower sales volumes, which decreased net sales by approximately $200 million.

Our average finished product selling price increased 72%, to $618 per tonne for the year ended December 31, 2021, compared to $360 per tonne for the same period a year ago, due to the factors discussed in the Overview.

The Phosphates segment's sales volumes of finished products decreased to 7.7 million tonnes for the year ended December 31, 2021, compared to 8.5 million tonnes in 2020, due to low inventory levels impacted by availability of molten sulfur in the first half of 2021 and production impacts related to Hurricane Ida in the second half of 2021. The increase in the sales volumes of rock, shown in the table above, was due to the Miski Mayo Mine being temporarily idled for a portion of the prior year due to a government mandated shutdown related to Covid-19.

Gross margin for the Phosphates segment increased to $1.3 billion in the current year compared with $0.1 billion for the prior year. The increase was primarily driven by higher sales prices, which impacted gross margin by approximately $1.8 billion. This was partially offset by higher raw material prices (primarily sulfur and ammonia) of approximately $440 million compared to the prior-year period. Gross margin was also unfavorably impacted in the current year by higher idle plant and maintenance turnaround costs of approximately $90 million and higher conversion costs of approximately $40 million. Lower sales volumes unfavorably impacted gross margin by approximately $70 million.

Our average consumed price for ammonia in our North American operations increased to $396 per tonne in 2021 from $287 a year ago. The average consumed price for sulfur for our North American operations increased to $181 per long ton for the year ended December 31, 2021 from $83 in the prior-year period. The purchase price of these raw materials is driven by global supply and demand. The consumed ammonia and sulfur prices also include transportation, transformation, and storage costs. The average consumed cost of purchased and produced rock decreased slightly to $60 per tonne in the current year, from $61 a year ago.

For the year ended December 31, 2021, our North American phosphate rock production decreased to 11.1 million tonnes from 12.8 million tonnes for the prior year, due to geology of rock and operational challenges as we transition into new mining areas.

The Phosphates segment's production of crop nutrient dry concentrates and animal feed ingredients decreased to 7.3 million tonnes for the year ended December 31, 2021, compared to 8.2 million in 2020. Current year production was negatively impacted by sulfur availability issues, downtime at our New Wales, Florida site due to equipment damage, and downtime at our Louisiana location related to Hurricane Ida. For the year ended December 31, 2021, our operating rate for processed phosphate production decreased to 74%, compared to 82% in the same period of the prior year.

Potash Net Sales and Gross Margin

The following table summarizes the Potash segment's net sales, gross margin, sales volume and selling price:

	Years Ended December 31,			2021-2020		2020-2019	
(in millions, except price per tonne or unit)	**2021**	**2020**	**2019**	**Change**	**Percent**	**Change**	**Percent**
Net sales:							
North America	$ 1,456.8	$ 1,147.2	$ 1,096.4	$ 309.6	27 %	$ 50.8	5 %
International	1,170.0	872.1	1,017.4	297.9	34 %	(145.3)	(14)%
Total	2,626.8	2,019.3	2,113.8	607.5	30 %	(94.5)	(4)%
Cost of goods sold	1,569.3	1,551.0	1,497.0	18.3	1 %	54.0	4 %
Gross margin	$ 1,057.5	$ 468.3	$ 616.8	$ 589.2	126 %	$ (148.5)	(24)%
Gross margin as a percentage of net sales	40.3 %	23.2 %	29.2 %				
Sales volume[(a)] (in thousands of metric tonnes)							
MOP	7,277	8,456	7,059	(1,179)	(14)%	1,397	20 %
Performance and Other[(b)]	909	941	784	(32)	(3)%	157	20 %
Total Potash Segment Tonnes	8,186	9,397	7,843	(1,211)	(13)%	1,554	20 %
Realized prices ($/tonne)							
Average finished product selling price (destination)	$ 321	$ 215	$ 270	$ 106	49 %	$ (55)	(20)%
MOP selling price (fob mine)	$ 285	$ 181	$ 237	$ 104	57 %	$ (56)	(24)%
Production volume (in thousands of metric tonnes)	8,204	8,433	7,868	(229)	(3)%	565	7 %

(a) Includes intersegment sales volumes.
(b) Includes sales volumes of K-Mag®, Aspire and animal feed ingredients.

Year Ended December 31, 2021 compared to Year Ended December 31, 2020

The Potash segment's net sales increased to $2.6 billion for the year ended December 31, 2021, compared to $2.0 billion in the prior year. The increase in net sales was driven by a favorable impact from higher sales prices of approximately $840 million, partially offset by unfavorable sales volumes of approximately $230 million.

Our average finished product selling price was $321 per tonne for the year ended December 31, 2021, an increase of $106 per tonne compared with the prior year period, due to the factors discussed in the Overview.

The Potash segment's sales volumes decreased to 8.2 million tonnes for the year ended December 31, 2021, compared to 9.4 million tonnes in the same period a year ago, due to the factor discussed in the Overview.

Gross margin for the Potash segment increased to $1.1 billion in the current year, from $0.5 billion in the prior year period. Gross margin was positively impacted by $840 million related to the increase in selling prices, partially offset by approximately $80 million due to lower sales volumes. The increase in gross margin was also partially offset by increased Canadian resource taxes of approximately $100 million, unfavorable foreign currency impacts of approximately $50 million. and higher idle costs of approximately $30 million. Canadian resource taxes and other costs affecting gross margin are discussed in more detail below.

We had expense of $259.5 million from Canadian resource taxes for the year ended December 31, 2021, compared to $146.1 million in the prior year. Royalty expense increased to $42.0 million for the year ended December 31, 2021, from $30.0 million in the prior year. The fluctuations in Canadian resource taxes and royalties are due to higher average selling prices and margins in the current year, compared to the prior year.

On June 4, 2021, due to increased brine inflows, we made the decision to immediately close the K1 and K2 shafts at our Esterhazy mine, which eliminated future brine inflow management expenses. Therefore, brine inflow management expense, including depreciation, decreased to $46.0 million in the current year, from $108.0 million in the prior year. We remain on

track in our development of the K3 shaft at our Esterhazy mine, which became fully operational in December 2021 and is expected to reach full operational capacity in the first quarter of 2022.

For the year ended December 31, 2021, potash production decreased to 8.2 million tonnes, compared to 8.4 million tonnes in the prior year period, resulting in an operating rate of 75% for 2021, compared to 87% for 2020. Decreased production in 2021 is primarily due to the shutdown of our K1 and K2 shafts at our Esterhazy mine, partially offset by the restart of our Colonsay mine during the third quarter of 2021.

Mosaic Fertilizantes Net Sales and Gross Margin

The following table summarizes the Mosaic Fertilizantes segment's net sales, gross margin, sales volume and selling price.

	Years Ended December 31,			2021-2020		2020-2019	
(in millions, except price per tonne or unit)	**2021**	**2020**	**2019**	**Change**	**Percent**	**Change**	**Percent**
Net Sales	$ 5,088.5	$ 3,481.6	$ 3,782.8	$ 1,606.9	46 %	$ (301.2)	(8)%
Cost of goods sold	4,245.8	3,062.0	3,492.7	1,183.8	39 %	(430.7)	(12)%
Gross margin	$ 842.7	$ 419.6	$ 290.1	$ 423.1	101 %	$ 129.5	45 %
Gross margin as a percent of net sales	16.6 %	12.1 %	7.7 %				
Sales volume (in thousands of metric tonnes)							
Phosphate produced in Brazil	2,543	3,813	2,605	(1,270)	(33)%	1,208	46 %
Potash produced in Brazil	240	305	327	(65)	(21)%	(22)	(7)%
Purchased nutrients	7,319	6,446	6,312	873	14 %	134	2 %
Total Mosaic Fertilizantes Segment Tonnes	10,102	10,564	9,244	(462)	(4)%	1,320	14 %
Realized prices ($/tonne)							
Average finished product selling price (destination)	$ 504	$ 330	$ 409	$ 174	53 %	$ (79)	(19)%
Brazil MAP price (delivered price to third party)	$ 597	$ 333	$ 402	$ 264	79 %	$ (69)	(17)%
Purchases ('000 tonnes)							
DAP/MAP from Mosaic	311	597	839	(286)	(48)%	(242)	(29)%
MicroEssentials® from Mosaic	1,226	1,108	935	118	11 %	173	19 %
Potash from Mosaic/Canpotex	2,510	2,081	2,071	429	21 %	10	— %
Average cost per unit consumed in cost of goods sold:							
Ammonia (metric tonne)	$ 580	$ 336	$ 369	$ 244	73 %	$ (33)	(9)%
Sulfur (long ton)	$ 194	$ 108	$ 181	$ 86	80 %	$ (73)	(40)%
Blended rock (metric tonne)	$ 80	$ 69	$ 104	$ 11	16 %	$ (35)	(34)%
Production volume (in thousands of metric tonnes)	3,725	3,918	3,327	(193)	(5)%	591	18 %

Year Ended December 31, 2021 compared to Year Ended December 31, 2020

The Mosaic Fertilizantes segment's net sales were $5.1 billion for the year ended December 31, 2021, compared to $3.5 billion for 2020. The increase in net sales was due to higher sales prices, which favorably impacted net sales by approximately $1.43 billion. Net sales also increased due to higher prices and volumes of other products, primarily gypsum, magnetite and sulfuric acid, which favorably impacted net sales by approximately $290 million. This was partially offset by a decrease in sales volumes which impacted net sales by approximately $110 million.

The overall average finished product selling price increased $174 per tonne to $504 per tonne for 2021 due to the increase in global prices referenced in the Overview.

The Mosaic Fertilizantes segment's sales volume decreased to 10.1 million tonnes for the year ended December 31, 2021, compared to 10.6 million tonnes for the prior year period, due to the factors discussed in the Overview.

Gross margin for the Mosaic Fertilizantes segment increased to $842.7 million for the year ended December 31, 2021, from $419.6 million in the prior year. The increase was driven by higher sales prices, which favorably impacted gross margin by approximately $1.47 billion. Gross margin was also favorably impacted by $110 million related to other product sales and by favorable foreign currency and hedging impacts of approximately $50 million. This was partially offset by approximately $1.16 billion of higher raw material and production costs, negatively impacted by inflation pressures, and the impact of lower sales volumes of approximately $30 million compared to the prior year. Gross margin was unfavorably impacted by approximately $20 million due to higher idle and maintenance turnaround costs in the current year as we experienced unplanned maintenance stoppages.

The average consumed price for ammonia for our Brazilian operations was $580 per tonne for the year ended December 31, 2021, compared to $336 per ton in the prior year. The average consumed sulfur price for our Brazilian operations was $194 per long ton for the year ended December 31, 2021, compared to $108 in the prior year. The purchase price of these raw materials is driven by global supply and demand, and also includes transportation, transformation, and storage costs.

The Mosaic Fertilizantes segment's production of crop nutrient dry concentrates and animal feed ingredients decreased 5% to 3.7 million tonnes for the year ended December 31, 2021, compared to 3.9 million tonnes in the prior year. The lower production in the current year was due to unplanned maintenance down time and lower quality ore compared to the prior year period. For the year ended December 31, 2021, our phosphate operating rate was 86%, compared to 89% in the prior year.

Our Brazilian phosphate rock production decreased to 4.0 million tonnes for the year ended December 31, 2021, from 4.3 million tonnes in the prior year.

Corporate, Eliminations and Other

In addition to our three operating segments, we assign certain costs to Corporate, Eliminations and Other, which is presented separately in Note 24 of our Notes to Consolidated Financial Statements. The Corporate, Eliminations and Other category includes intersegment eliminations, including profit on intersegment sales, unrealized mark-to-market gains and losses on derivatives, debt expenses, Streamsong Resort® results of operations, and the results of the China and India distribution businesses.

Gross margin for Corporate, Eliminations and Other was a loss of $5.3 million for the year ended December 31, 2021, compared to a gain of $51.5 million in the same period a year ago. The change was driven by an unfavorable impact of $131.0 million related to the elimination of intersegment sales in the current year period, compared to an unfavorable impact of $3.4 million in the prior year period. Contributing to the change was a net unrealized loss of $13.6 million in the current year period, primarily on foreign currency derivatives, compared to a net unrealized gain of $22.0 million in the prior year period. Distribution operations in India and China had revenues and gross margin of $730.1 million and $141.6 million, respectively, for the year ended December 31, 2021, compared to revenues and gross margin of $639.4 million and $58.7 million, respectively, for the year ended December 31, 2020. The increase was primarily due to increased sales prices in the current year compared to the prior year period. This was partially offset by lower sales volumes in the current year, and higher product cost due to tighter global supply and demand. Sales volumes of finished products were 1.6 million tonnes and 2.0 million tonnes for the years ended December 31, 2021 and 2020, respectively.

Other Income Statement Items

(in millions)	Years Ended December 31, 2021	2020	2019	2021-2020 Change	Percent	2020-2019 Change	Percent
Selling, general and administrative expenses	$ 430.5	$ 371.5	$ 354.1	$ 59.0	16 %	$ 17.4	5 %
Impairment, restructuring and other expenses	158.1	—	1,462.1	158.1	NM	(1,462.1)	(100)%
Other operating expenses	143.2	280.5	176.0	(137.3)	(49)%	104.5	59 %
Interest (expense)	(194.3)	(214.1)	(216.0)	19.8	(9)%	1.9	(1)%
Interest income	25.2	33.5	33.1	(8.3)	(25)%	0.4	1 %
Interest expense, net	(169.1)	(180.6)	(182.9)	11.5	(6)%	2.3	(1)%
Foreign currency transaction (loss) gain	(78.5)	(64.3)	20.2	(14.2)	22 %	(84.5)	NM
Other income	3.9	12.9	1.5	(9.0)	(70)%	11.4	NM
Provision for (benefit from) income taxes	597.7	(578.5)	(224.7)	1,176.2	NM	(353.8)	157
Equity in net earnings (loss) of nonconsolidated companies	7.8	(93.8)	(59.4)	101.6	(108)%	(34.4)	58

Selling, General and Administrative Expenses

Selling, general and administrative expenses were $430.5 million for the year ended December 31, 2021, compared to $371.5 million for the same period a year ago. The increase was due to approximately $50 million of higher incentive compensation expense in the current year and approximately $5 million of higher consulting and professional service expenses related to executing on our strategic priorities.

Impairment, Restructuring and Other Expenses

Impairment, restructuring and other expenses include costs associated with asset impairments, employee severance and pension expense, and other exit costs to close or indefinitely idle facilities. Due to increased brine inflows, on June 4, 2021, we made the decision to accelerate the timing of the shutdown of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine. We recognized pre-tax costs of $158.1 million related to the permanent closure of these facilities in 2021. These costs consisted of $110.0 million related to the write-off of fixed assets, $37.1 million related to asset retirement obligation ("***AROs***"), and $11.0 million related to inventory and other reserves.

Other Operating Expenses

Other operating expenses were $143.2 million for the year ended December 31, 2021, compared to $280.5 million for the prior year period. Other operating expenses typically relate to five major categories: (1) AROs, (2) environmental and legal reserves, (3) idle facility costs, (4) insurance reimbursements and (5) gain/loss on sale or disposal of fixed assets. The current year includes approximately $25 million of ARO expenses and adjustments, approximately $65 million related to environmental and legal expenses and approximately $50 million related to closed and indefinitely idled facility costs. The current year includes income of approximately $20 million related to a gain on selling a warehouse and approximately $13 million related to the recovery of a reserve for the Acquired Business.

Interest Expense, Net

Net interest expense decreased to $169.1 million for the year ended December 31, 2021, compared to $180.6 million in 2020, due to lower debt levels and lower interest rates in the current year.

Foreign Currency Transaction (Loss) Gain

In 2021, we recorded a foreign currency transaction loss of $78.5 million, compared to a loss of $64.3 million in 2020. The loss was primarily the result of the effect of the strengthening of the U.S. dollar relative to the Brazilian real on significant U.S. dollar-denominated payables held by our Brazilian subsidiaries.

Other Income

For the year ended December 31, 2021, we had other income of $3.9 million compared to expense of $12.9 million in the prior year. Current year income is primarily related to a realized gain of $2 million on investments held in two financial assurance trust funds created in 2016 to provide additional financial assurance for the estimated costs of closure and long-term care of our Florida and Louisiana phosphogypsum management systems (the "***RCRA Trusts***").

Equity in Net Earnings (Loss) of Nonconsolidated Companies

For the year ended December 31, 2021, we had a gain from equity of nonconsolidated companies of $7.8 million, net of tax, compared to a loss of $93.8 million, net of tax, for the prior year. The current year gain was primarily related to the operations of MWSPC, which was favorably impacted by higher phosphate selling prices, and the continued ramp-up of its operations.

Provision for (Benefit from) Income Taxes

	Effective Tax Rate	Provision for Income Taxes
Year Ended December 31, 2021	26.9 %	$ 597.7
Year Ended December 31, 2020	(319.8)%	(578.5)
Year Ended December 31, 2019	17.9 %	(224.7)

For all years, our income tax is impacted by the mix of earnings across jurisdictions in which we operate, by a benefit associated with depletion and by the impact of certain entities being taxed in both their foreign jurisdiction and the U.S., including foreign tax credits for various taxes incurred.

For the year ended December 31, 2021, tax expense specific to the period included a net expense of $0.6 million. The net expense relates to the following: $23.9 related to true-up of estimates primarily related to our U.S. tax return and $20.3 million related to an increase in non-U.S. reserves. The tax expenses are partially offset by net tax benefits related to $43.7 million of Esterhazy mine closure costs and $1.1 million related to a benefit for withholding taxes related to undistributed earnings and other miscellaneous tax expenses.

Critical Accounting Estimates

We prepare our Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States of America which requires us to make various judgments, estimates and assumptions that could have a significant impact on our reported results and disclosures. We base these estimates on historical experience and other assumptions we believe to be reasonable at the time we prepare our financial statements. Changes in these estimates could have a material effect on our Consolidated Financial Statements.

Our significant accounting policies can be found in Note 2 of our Notes to Consolidated Financial Statements. We believe the following accounting policies include a higher degree of judgment and complexity in their application and are most critical to aid in fully understanding and evaluating our reported financial condition and results of operations.

Recoverability of Goodwill

Goodwill is the excess of the purchase price consideration over the estimated fair value of net assets of acquired businesses. The carrying value of goodwill in our reporting units is tested annually as of October 31 for possible impairment. We typically use an income approach valuation model, representing present value of future cash flows, to determine the fair value of a reporting unit. Growth rates for sales and profits are determined using inputs from our annual strategic and long range planning process. The rates used to discount projected future cash flows reflect a weighted average cost of capital based on the Company's industry, capital structure and risk premiums, including those reflected in the current market capitalization. When preparing these estimates, management considers each reporting unit's historical results, current operating trends, and specific plans in place. These estimates are impacted by various factors, including inflation, the general health of the economy and market competition. In addition, events and circumstances that might be indicators of possible impairment are assessed during other interim periods. As of October 31, 2021, the date of our annual impairment testing, the Company concluded that the fair values of the reporting units which included goodwill were in substantial excess of their respective carrying values and the goodwill for those units was not impaired.

See Note 9 of our Notes to Consolidated Financial Statements for additional information regarding the goodwill impairment analysis, including the methodologies and assumptions used in estimating the fair values of our reporting units. As of December 31, 2021, we had $1.2 billion of goodwill.

Environmental Liabilities and Asset Retirement Obligations
We record accrued liabilities for various environmental and reclamation matters including the demolition of former operating facilities, and AROs.

Contingent environmental liabilities are described in Note 22 of our Notes to Consolidated Financial Statements. Accruals for environmental matters are based primarily on third-party estimates for the cost of remediation at previously operated sites and estimates of legal costs for ongoing environmental litigation. We regularly assess the likelihood of material adverse judgments or outcomes, the effects of potential indemnification, as well as potential ranges or probability of losses. We determine the amount of accruals required, if any, for contingencies after carefully analyzing each individual matter. Estimating the ultimate settlement of environmental matters requires us to develop complex and interrelated assumptions based on experience with similar matters, our history, precedents, evidence, and facts specific to each matter. Actual costs incurred in future periods may vary from the estimates, given the inherent uncertainties in evaluating environmental exposures. As of December 31, 2021, and 2020, we had accrued $57.3 million and $61.4 million, respectively, for environmental matters.

As indicated in Note 13 of our Notes to Consolidated Financial Statements, we recognize AROs in the period in which we have an existing legal obligation, and the amount of the liability can be reasonably estimated. We utilize internal engineering experts as well as third-party consultants to assist in determining the costs of retiring certain of our long-term operating assets. Assumptions and estimates reflect our historical experience and our best judgments regarding future expenditures. The assumed costs are inflated based on an estimated inflation factor and discounted based on a credit-adjusted risk-free rate. For active facilities, fluctuations in the estimated costs (including those resulting from a change in environmental regulations), inflation rates and discount rates can have a significant impact on the corresponding assets and liabilities recorded in the Consolidated Balance Sheets. However, changes in the assumptions for our active facilities would not have a significant impact on the Consolidated Statements of Earnings in the year they are identified. For closed facilities, fluctuations in the estimated costs, inflation, and discount rates have an impact on the Consolidated Statements of Earnings in the year they are identified as there is no asset related to these items. Phosphate land reclamation activities in North America generally occur concurrently with mining operations; as such, we accrue and expense reclamation costs as we mine. As of December 31, 2021, and 2020, $1.7 billion and $1.4 billion, respectively, was accrued for AROs (current and noncurrent amounts) in North and South America. In August 2016, Mosaic deposited $630 million into two trust funds as financial assurance to support certain estimated future asset retirement obligations. See Note 13 of our Notes to Consolidated Financial Statements for additional information regarding the Environmental Protection Agency ("***EPA***") RCRA Initiative.

Income Taxes
We make estimates for income taxes in three major areas: uncertain tax positions, valuation allowances, and U.S. deferred income taxes on our non-U.S. subsidiaries' undistributed earnings.

A valuation allowance is provided for deferred tax assets for which it is more likely than not that the related tax benefits will not be realized. Significant judgment is required in evaluating the need for and magnitude of appropriate valuation allowances. The realization of the Company's deferred tax assets, specifically, the evaluation of net operating loss carryforwards and foreign tax credit carryforwards, is dependent on generating certain types of future taxable income, using both historical and projected future operating results, the source of future income, the reversal of existing taxable temporary differences, taxable income in prior carry-back years (if permitted) and the availability of tax planning strategies. As of December 31, 2021, and 2020, we had a valuation allowance of $774.7 million and $683.0 million, respectively. Changes in tax laws, assumptions with respect to future taxable income, tax planning strategies, resolution of matters under tax audit and foreign currency exchange rates could result in adjustment to these allowances.

Due to Mosaic's global operations, we assess uncertainties and judgments in the application of complex tax regulations in a multitude of jurisdictions. Future changes in judgment related to the expected ultimate resolution of uncertain tax positions will affect earnings in the quarter of such change. While it is often difficult to predict the final outcome or the timing of resolution of any particular uncertain tax position, our liabilities for income taxes reflect what we believe to be the more likely than not outcome. We adjust these liabilities, as well as the related interest, in light of changing facts and circumstances, including negotiations with taxing authorities in various jurisdictions, outcomes of tax litigation, and resolution of disputes arising from tax audits in the normal course of business. Settlement of any particular position may

require the use of cash. The Company is currently in negotiations with non-U.S. tax authorities where settlements could result in different tax outcomes than what is currently accounted for. Based upon an analysis of tax positions taken on prior year returns and expected positions to be taken on the current year return, management has identified gross uncertain income tax positions of $124.6 million as of December 31, 2021.

Any dividends from controlled foreign corporations are tax-free from a U.S. income tax perspective. Additionally, there will not be any foreign tax credits associated with foreign dividends. Therefore, there are no material federal U.S. implications of future repatriations on non-U.S. subsidiaries' undistributed earnings. However, since there are no U.S. foreign tax credits associated with foreign dividends, any foreign withholding tax associated with a future repatriation will need to be accrued if the earnings are not permanently reinvested.

We have included a further discussion of income taxes in Note 12 of our Notes to Consolidated Financial Statements.

Liquidity and Capital Resources

We define liquidity as the ability to generate or access adequate amounts of cash to meet current cash needs. We assess our liquidity in terms of our ability to fund working capital requirements, fund sustaining and opportunity capital projects, pursue strategic opportunities and make capital management decisions, which include making payments on and issuing indebtedness and making distributions to our stockholders, either in the form of share repurchases or dividends. Our liquidity is subject to general economic, financial, competitive and other factors that are beyond our control.

We have a target liquidity buffer of up to $3.0 billion, including cash and available credit facilities. We expect our liquidity to fluctuate from time to time, especially in the first quarter of each year, to manage through the seasonality of our business. We also target debt leverage ratios that are consistent with investment grade credit metrics. Our capital allocation priorities include maintaining our target investment grade metrics and financial strength, sustaining our assets, including ensuring the safety and reliability of our assets, investing to grow our business, either through organic growth or taking advantage of strategic opportunities, and returning excess cash to stockholders, including paying our dividend. During 2021, we returned capital to our stockholders through share repurchases of $0.4 billion and paid dividends of $0.1 billion. Our Board of Directors also approved a 50% increase to our annual dividend to $0.45 per share, beginning in the first quarter of 2022. Subsequent to year-end our Board of Directors approved the following:

- A regular dividend increase to $0.60 per share annually from $0.45, beginning with the second quarter 2022 payment.
- An ASR of $400 million, which is expected to be initiated in February 2022.
- Establishment of a new $1 billion share repurchase authorization, which will go into effect following completion of the ASR.

As of December 31, 2021, we had cash and cash equivalents of $0.8 billion, marketable securities held in trusts to fund future obligations of $0.7 billion, long-term debt including current maturities of $4.0 billion, short-term debt of $0.3 billion and stockholders' equity of $10.7 billion. In addition, we had $0.7 billion of commercial arrangements for certain customer purchases in Brazil through structured payable arrangements, as discussed in Note 10 of our Notes to Consolidated Financial Statements.

All of our cash and cash equivalents are diversified in highly rated investment vehicles. Our cash and cash equivalents are held either in the U.S. or held by non-U.S. subsidiaries and are not subject to significant foreign currency exposures, as the majority are held in investments denominated in U.S. dollars as of December 31, 2021. These funds may create foreign currency transaction gains or losses, however, depending on the functional currency of the entity holding the cash. In addition, there are no significant restrictions that would preclude us from bringing funds held by non-U.S. subsidiaries back to the U.S., aside from withholding taxes.

Sources and Uses of Cash

As of December 31, 2021, we had cash and cash equivalents and restricted cash of $0.8 billion. Funds generated by operating activities, available cash and cash equivalents and our revolving credit facility continue to be our most significant sources of liquidity. We believe funds generated from the expected results of operations and available cash, cash equivalents and borrowings either under our revolving credit facility or through long-term borrowings will be sufficient to finance our operations, including our expansion plans, existing strategic initiatives and expected dividend payments for the next 12

months. We expect our capital expenditures to be approximately $1.1 billion in 2022. There can be no assurance, however, that we will continue to generate cash flows at or above current levels. At December 31, 2021, we had $2.49 billion available under our $2.5 billion revolving credit facility. See Note 10 of our Notes to Consolidated Financial Statements for additional information relating to our financing arrangements, which is hereby incorporated by reference.

We have certain contractual obligations that require us to make cash payments on a scheduled basis. These include, among other things, long-term debt payments, interest payments, operating leases, unconditional purchase obligations and funding requirements of pension and postretirement obligations. Our long-term debt has maturities ranging from one year to 22 years. Unconditional purchase obligations are our largest contractual cash obligations. These include obligations for contracts to purchase raw materials such as sulfur, ammonia, phosphate rock and natural gas, obligations to purchase raw materials for our international distribution activities, and maintenance and services. Other large cash obligations are our AROs and other environmental obligations primarily related to our Phosphates and Mosaic Fertilizantes segments. We expect to fund our AROs, purchase obligations, long-term debt and capital expenditures with a combination of operating cash flows, cash and cash equivalents and borrowings.

The following is a summary of our material contractual cash obligations as of December 31, 2021:

		Payments by Calendar Year			
(in millions)	**Total**	**Less than 1 year**	**1 - 3 years**	**3 - 5 years**	**More than 5 years**
Long-term debt[a]	$ 3,978.8	$ 596.6	$ 1,099.3	$ 31.4	$ 2,251.5
Estimated interest payments on long-term debt[b]	1,701.5	177.9	273.7	234.4	1,015.5
Operating leases	139.5	63.3	48.3	10.2	17.7
Purchase commitments[c]	9,100.7	5,687.1	1,586.3	653.3	1,174.0
Pension and postretirement liabilities[d]	449.7	10.3	100.1	99.2	240.1
Total contractual cash obligations	$ 15,370.2	$ 6,535.2	$ 3,107.7	$ 1,028.5	$ 4,698.8

(a) Long-term debt primarily consists of unsecured notes, finance leases, unsecured debentures and secured notes.
(b) Based on interest rates and debt balances as of December 31, 2021.
(c) Based on prevailing market prices as of December 31, 2021. The majority of value of items more than 5 years is related to our CF Ammonia Supply Agreement. For additional information related to our purchase commitments, see Note 21 of our Notes to Consolidated Financial Statements.
(d) The 2022 pension plan payments are based on minimum funding requirements. For years thereafter, pension plan payments are based on expected benefits paid. The postretirement plan payments are based on projected benefit payments. The above amounts include our North America and Brazil plans.

See Off-Balance Sheet Arrangements and Obligations below for more information on other environmental obligations.

In addition to various operational and environmental regulations primarily related to our Phosphates segment, we incur liabilities for reclamation activities under which we are subject to financial assurance requirements. In various jurisdictions in which we operate, particularly Florida and Louisiana, we are required to pass a financial strength test or provide credit support, typically in the form of cash deposits, surety bonds or letters of credit. See Other Commercial Commitments under Off-Balance Sheet Arrangements and Obligations and Note 21 of our Notes to Consolidated Financial Statements for additional information about these requirements.

Summary of Cash Flows

The following table represents a comparison of the net cash provided by operating activities, net cash used in investing activities and net cash used in financing activities for calendar years 2021, 2020 and 2019:

(in millions)	**Years Ended December 31,**			**2021-2020**		**2020-2019**	
Cash Flow	**2021**	**2020**	**2019**	**Change**	**Percent**	**Change**	**Percent**
Net cash provided by operating activities	$ 2,187.0	$ 1,582.6	$ 1,095.4	$ 604.4	38 %	$ 487.2	44 %
Net cash used in investing activities	(1,322.3)	(1,189.5)	(1,360.9)	(132.8)	(11)%	171.4	13 %
Net cash used in financing activities	(682.1)	(283.8)	(82.2)	(398.3)	(140)%	(201.6)	(245)%

Operating Activities

Net cash flow from operating activities has provided us with a significant source of liquidity. For the year ended December 31, 2021, net cash provided by operating activities was $2.2 billion, compared to $1.6 billion in the prior year. Our results of operations, after non-cash adjustments to net earnings, contributed $2.8 billion to cash flows from operating activities during 2021, compared to $1.1 billion during 2020. During 2021, we had an unfavorable working capital change of $629.7 million, compared to a favorable change of $526.9 million during 2020.

The change in working capital for the year ended December 31, 2021 was primarily driven by unfavorable impacts from changes in accounts receivable of $683.6 million and inventories of $1.1 billion partially offset by favorable changes in accounts payable and accrued liabilities of $995.1 million. The unfavorable change in accounts receivable was primarily related to higher sales prices at the end of the current year compared to the prior year. The change in inventories was driven primarily by an increase in raw material prices and finished goods cost in Brazil and an increase in inventory volumes in our Potash and Mosaic Fertilizantes segments. These changes were partially offset by an increase

accounts payable and accrued liabilities driven by an increase in material purchases in our international locations, the price of raw material purchases, an increase in customer prepayments in Brazil and an increase in taxes payable.

Investing Activities

Net cash used in investing activities for the year ended December 31, 2021 was $1.3 billion, compared to $1.2 billion in the same period a year ago, primarily driven by capital expenditures of $1.3 billion in 2021.

Financing Activities

Net cash used in financing activities was $682.1 million for the year ended December 31, 2021 compared to $283.8 million in the prior year. In 2021, we received net proceeds from short-term borrowings of $302.7 million, net proceeds from structured accounts payable of $94.3 million. We also had net collections on behalf of the bank under our Receivable Purchasing Agreement of $81.1 million, which had not yet been remitted to them as of December 31, 2021. Payments on our long-term debt, net of borrowings, were $608.3 million. In 2021 we made repurchases of our common stock of $410.9 million and paid dividends of $135.0 million.

Debt Instruments, Guarantees and Related Covenants

See Note 10 of our Notes to Consolidated Financial Statements for additional information relating to our financing arrangements, which is hereby incorporated by reference.

Financial Assurance Requirements

In addition to various operational and environmental regulations primarily related to our Phosphates segment, we incur liabilities for reclamation activities under which we are subject to financial assurance requirements. In various jurisdictions in which we operate, particularly Florida and Louisiana, we are required to pass a financial strength test or provide credit support, typically in the form of cash deposits, surety bonds or letters of credit. See Other Commercial Commitments under Off-Balance Sheet Arrangements and Obligations and Note 22 of our Notes to Consolidated Financial Statements for additional information about these requirements, which is hereby incorporated by reference.

Off-Balance Sheet Arrangements and Obligations

Off-Balance Sheet Arrangements

In accordance with the definition under rules of the Securities and Exchange Commission ("***SEC***"), the following qualify as off-balance sheet arrangements:

- certain obligations under guarantee contracts that have "any of the characteristics identified in Financial Accounting Standards Board ("***FASB***") Accounting Standards Codification ("***ASC***") paragraph ASC 460-10-15-4 (Guarantees Topic)";
- a retained or contingent interest in assets transferred to an unconsolidated entity or similar arrangement that serves as credit, liquidity or market risk support to that entity for such assets;
- any obligation, including a contingent obligation, under a contract that would be accounted for as derivative instruments except that it is both indexed to the registrant's own stock and classified as equity; and
- any obligation, arising out of a variable interest in an unconsolidated entity that is held by, and material to, the registrant, where such entity provides financing, liquidity, market risk or credit risk support to the registrant, or engages in leasing, hedging or research and development services with the registrant.

Information regarding guarantees that meet the above requirements is included in Note 16 of our Notes to Consolidated Financial Statements and is hereby incorporated by reference. We do not have any contingent interest in assets transferred, derivative instruments, or variable interest entities that qualify as off-balance sheet arrangements under SEC rules.

Other Commercial Commitments

The following is a summary of our other commercial commitments as of December 31, 2021:

		Commitment Expiration by Calendar Year			
(in millions)	**Total**	**Less than 1 year**	**1 - 3 years**	**3 - 5 years**	**More than 5 years**
Letters of credit	$ 65.6	$ 65.6	$ —	$ —	$ —
Surety bonds	645.7	645.4	—	0.3	—
Total	$ 711.3	$ 711.0	$ —	$ 0.3	$ —

The surety bonds and letters of credit generally expire within one year or less but a substantial portion of these instruments provide financial assurance for continuing obligations and, therefore, in most cases, must be renewed on an annual basis. We issue letters of credit through our revolving credit facility and bilateral agreements. As of December 31, 2021, we had $10.9 million of outstanding letters of credit through our credit facility and $54.7 million outstanding through bilateral agreements. We primarily incur liabilities for reclamation activities in our Florida operations and for phosphogypsum management system ("***Gypstack***" or "***Gypstacks***") closure in our Florida and Louisiana operations where, for permitting purposes, we must either pass a test of financial strength or provide credit support, typically in the form of cash deposits, surety bonds or letters of credit. As of December 31, 2021, we had $356.1 million in surety bonds and a $50 million letter of credit included in the total amount above. These bonds and letters of credit are outstanding for reclamation obligations, primarily related to mining in Florida. Also, as of December 31, 2021, we had delivered a $249.7 million surety bond to EPA as a substitute for the financial assurance provided through the Plant City Trust. The surety bonds generally require us to obtain a discharge of the bonds or to post additional collateral (typically in the form of cash or letters of credit) at the request of the issuer of the bonds.

We are subject to financial assurance requirements related to the closure and post-closure care of our Gypstacks in Florida and Louisiana. These requirements include Florida and Louisiana state financial assurance regulations, and financial assurance requirements under the terms of consent decrees that we have entered into with respect to our facilities in Florida and Louisiana. These include a consent decree (the "***Plant City Consent Decree***") with EPA and the Florida Department of Environmental Protection ("***FDEP***") relating to the Plant City, Florida facility we acquired as part of the CF Phosphate Assets Acquisition (the "***Plant City Facility***") and two separate consent decrees (collectively, the "***2015 Consent Decrees***") with federal and state regulators that include financial assurance requirements for the closure and post-closure care of substantially all of our Gypstacks in Florida and Louisiana, other than those acquired as part of the CF Phosphate Assets Acquisition, which are discussed separately below.

See Note 13 of our Notes to Consolidated Financial Statements for additional information relating to our financial assurance obligations, including the Plant City Consent Decree and the 2015 Consent Decrees, which information is incorporated by reference.

Currently, state financial assurance requirements in Florida and Louisiana for the closure and post-closure care of Gypstacks are, in general terms, based upon the same assumptions and associated estimated values as the AROs recognized for financial reporting purposes. For financial reporting purposes, we recognize the AROs based on the estimated future closure and post-closure costs of Gypstacks, the undiscounted value of which is approximately $2.4 billion. The value of the AROs for closure and post-closure care of Mosaic's Gypstacks, discounted to the present value, based on a credit-adjusted, risk-free rate, is reflected on our Consolidated Balance Sheets in the amount of approximately $883.2 million as of December 31, 2021. Compliance with the financial assurance requirements in Florida and Louisiana is generally based on the undiscounted Gypstack closure estimates.

We satisfy substantially all of our Florida, Louisiana and federal financial assurance requirements through compliance with the financial assurance requirements under the 2015 Consent Decrees, by providing third-party credit support in the form of surety bonds (including under the Plant City Consent Decree), and a financial test mechanism supported by a corporate guarantee (*"**Bonnie Financial Test**"*) related to a closed Florida phosphate concentrates facility in Bartow, Florida (the "***Bonnie Facility***") as discussed below. We comply with our remaining state financial assurance requirements because our financial strength permits us to meet applicable financial strength tests. However, at various times we have not met the applicable financial strength tests and there can be no assurance that we will be able to meet the applicable financial strength tests in the future. In the event we do not meet either financial strength test, we could be required to seek an alternate financial strength test acceptable to state regulatory authorities or provide credit support, which may include surety bonds, letters of credit and cash escrows or trust funds. Cash escrows or trust funds would be classified as restricted cash on our Consolidated Balance Sheets. Assuming we maintain our current levels of liquidity and capital resources, we do not expect that these Florida and Louisiana requirements will have a material effect on our results of operations, liquidity or capital resources.

As part of the CF Phosphate Assets Acquisition, we assumed certain AROs related to the estimated costs (*"**Gypstack Closure Costs**"*) at both the Plant City Facility and the Bonnie Facility. Associated with these assets are two related financial assurance arrangements for which we became responsible and that provided sources of funds for the estimated Gypstack Closure Costs for these facilities, pursuant to federal or state law, which the government can draw against in the event we cannot perform such closure activities. One was initially a trust (the *"**Plant City Trust**"*) established to meet the requirements under a consent decree with EPA and the FDEP with respect to U.S. Resource Conservation and Recovery Act ("***RCRA***") compliance at Plant City that also satisfied Florida financial assurance requirements at that site. Beginning in September 2016, as a substitute for the financial assurance provided through the Plant City Trust, we have provided financial assurance for Plant City in the form of a surety bond delivered to EPA (the *"**Plant City Bond**"*). The amount of the Plant City Bond is $249.7 million, at December 31, 2021, which reflects our closure cost estimates at that date. The other was also a trust fund (the *"**Bonnie Facility Trust**"*) established to meet the requirements under Florida financial assurance regulations that apply to the Bonnie Facility. On July 27, 2018, we received $21.0 million from the Bonnie Facility Trust by substituting the trust fund for the Bonnie Financial Test supported by a corporate guarantee as allowed by state regulations. Both financial assurance funding obligations require estimates of future expenditures that could be impacted by refinements in scope, technological developments, new information, cost inflation, changes in regulations, discount rates and the timing of activities. Under our current approach to satisfying applicable requirements, additional financial assurance would be required in the future if increases in cost estimates exceed the face amount of the Plant City Bond or the amount supported by the Bonnie Financial Test.

Other Long-Term Obligations

The following is a summary of our other long-term obligations, including Gypstacks and land reclamation, as of December 31, 2021:

		Payments by Calendar Year			
(in millions)	**Total**	**Less than 1 year**	**1 - 3 years**	**3 - 5 years**	**More than 5 years**
ARO[(a)]	$ 3,801.8	$ 234.4	$ 279.4	$ 204.7	$ 3,083.3

(a) Represents the undiscounted estimated cash outflows required to settle the AROs. The corresponding present value of these future expenditures is $1.7 billion as of December 31, 2021 and is reflected in our accrued liabilities and other noncurrent liabilities in our Consolidated Balance Sheets.

Most of our export sales of potash crop nutrients are marketed through a North American export association, Canpotex, which funds its operations in part through third-party financing facilities. As a member, Mosaic or our subsidiaries are, subject to certain conditions and exceptions, contractually obligated to reimburse Canpotex for their pro rata share of any operating expenses or other liabilities incurred. The reimbursements are made through reductions to members' cash receipts from Canpotex.

Commitments are set forth in Note 21 of our Notes to Consolidated Financial Statements and are hereby incorporated by reference.

Income Tax Obligations

Gross uncertain tax positions as of December 31, 2021 of $124.6 million are not included in the other long-term obligations table presented above because the timing of the settlement of unrecognized tax benefits cannot be reasonably determined. For further discussion, refer to Note 12 of our Notes to Consolidated Financial Statements.

Market Risk

We are exposed to the impact of fluctuations in the relative value of currencies, fluctuations in interest rates, fluctuations in the purchase prices of natural gas, nitrogen, ammonia and sulfur consumed in operations, and changes in freight costs, as well as changes in the market value of our financial instruments. We periodically enter into derivatives in order to mitigate our interest rate risks, foreign currency risks and the effects of changing commodity prices and freight prices, but not for speculative purposes. Unrealized mark-to-market gains and losses on derivatives are recorded in Corporate, Eliminations and Other. Once realized, they are recorded in the related business segment.

Foreign Currency Exchange Rates

Due to the global nature of our operations, we are exposed to currency exchange rate changes, which may cause fluctuations in earnings and cash flows. Our primary foreign currency exposures are the Canadian dollar and Brazilian real. To reduce economic risk and volatility on expected cash flows that are denominated in the Canadian dollar and Brazilian real, we use financial instruments that may include forward contracts, zero-cost collars and/or futures.

The functional currency of several of our Canadian entities is the Canadian dollar. For those entities, sales are primarily denominated in U.S. dollars, but the costs are paid principally in Canadian dollars. We generally enter into derivative instruments for a portion of the currency risk exposure on anticipated cash inflows and outflows, including contractual outflows for our Potash segment expansion and other capital expenditures denominated in Canadian dollars. Mosaic hedges cash flows on a declining basis, up to 18 months for the Canadian dollar. We may also enter into hedges up to 36 months for expected Canadian dollar capital expenditures related to our Esterhazy K3 expansion program. A stronger Canadian dollar generally reduces these entities' operating earnings. A weaker Canadian dollar has the opposite effect. Depending on the underlying exposure, such derivatives can create additional earnings volatility because we do not apply hedge accounting. Gains or losses on these derivative contracts, both for open contracts at quarter-end (unrealized) and settled contracts (realized), are recorded in either cost of goods sold or foreign currency transaction gain (loss).

The functional currency for our Brazilian subsidiaries is the Brazilian real. We finance our Brazilian inventory purchases with U.S. dollar-denominated liabilities. We hedge cash flows on a declining basis, up to 12 months for the Brazilian real. A stronger Brazilian real relative to the U.S. dollar has the impact of reducing these liabilities on a functional currency basis. When this occurs, an associated foreign currency transaction gain is recorded as non-operating income. A weaker Brazilian real generally has the opposite effect. We also enter into derivative instruments for a portion of our currency risk exposure on anticipated Brazilian real cash flows and record an associated gain or loss in either cost of goods sold or foreign currency transaction gain (loss) line in the Consolidated Statements of Earnings. A stronger Brazilian real generally reduces our Brazilian subsidiaries operating earnings. A weaker Brazilian real has the opposite effect.

As discussed above, we have Canadian dollar, Brazilian real, and other foreign currency exchange contracts. As of December 31, 2021, and 2020, the fair value of our major foreign currency exchange contracts was ($18.6) million and $10.0 million, respectively. We recorded an unrealized loss of $26.7 million in cost of goods sold and recorded an unrealized loss of $1.4 million in foreign currency transaction gain (loss) in the Consolidated Statements of Earnings for 2021.

The table below provides information about Mosaic's significant foreign exchange derivatives.

	As of December 31, 2021				As of December 31, 2020			
	Expected Maturity Date Years ending December 31,				Expected Maturity Date Years ending December 31,			
(in millions)	2022	2023	2024	Fair Value	2021	2022	2023	Fair Value
Foreign Currency Exchange Forwards								
Canadian Dollar				$ 3.8				$ 31.9
Notional (million US$) - short Canadian dollars	$ 421.2	$ 78.3	$ 28.2		$ 170.0	$ 48.4	$ 6.0	
Weighted Average Rate - Canadian dollar to U.S. dollar	1.2731	1.2665	1.2874		1.3089	1.3285	1.3304	
Notional (million US$) - long Canadian dollars	$ 1,030.7	$ 192.0	$ 35.2		$ 670.5	$ 196.5	$ 59.4	
Weighted Average Rate - Canadian dollar to U.S. dollar	1.2708	1.2893	1.2346		1.3291	1.3153	1.3299	
Foreign Currency Exchange Collars								
Canadian Dollar				$ 0.4				$ 0.4
Notional (million US$) - long Canadian dollars	$ 15.5	$ —	$ —		$ —	$ 30.3	$ —	
Weighted Average Participation Rate - Canadian dollar to U.S. dollar	1.3433	—	—		—	1.3432	—	
Weighted Average Protection Rate - Canadian dollar to U.S. dollar	1.2875	—	—		—	1.2874	—	
Foreign Currency Exchange Non-Deliverable Forwards								
Brazilian Real				$ (20.8)				$ (19.4)
Notional (million US$) - short Brazilian real	$ 531.5	$ —	$ —		$ 582.4	$ —	$ —	
Weighted Average Rate - Brazilian real to U.S. dollar	5.7121	—	—		5.2160	—	—	
Notional (million US$) - long Brazilian real	$ 679.2	$ —	$ —		$ 924.6	$ —	$ —	
Weighted Average Rate - Brazilian real to U.S. dollar	5.6748	—	—		5.3068	—	—	
Indian Rupee				$ (1.5)				$ (2.1)
Notional (million US$) - short Indian rupee	$ 125.0	$ —	$ —		$ 146.0	$ —	$ —	
Weighted Average Rate - Indian rupee to U.S. dollar	75.7627	—	—		74.5083	—	—	
China Renminbi				$ (0.5)				$ (0.8)
Notional (million US$) - short China renminbi	$ 68.0	$ —	$ —		$ 78.0	$ —	$ —	
Weighted Average Rate - China renminbi to U.S. dollar	6.4750	—	—		6.6211	—	—	
Total Fair Value				$ (18.6)				$ 10.0

Commodities

We use forward purchase contracts, swaps and occasionally three-way collars to reduce the risk related to significant price changes in our inputs and product prices. In addition, the natural gas-based pricing under the CF Ammonia Supply Agreement is intended to lessen ammonia pricing volatility.

All gains and losses on commodities contracts are recorded in cost of goods sold in the Consolidated Statements of Earnings.

As of December 31, 2021, and 2020, the fair value of our major commodities contracts was $18.8 million and $5.3 million, respectively. We recorded an unrealized gain of $13.1 million in cost of goods sold on the Consolidated Statements of Earnings for 2021.

Our primary commodities exposure relates to price changes in natural gas.

The table below provides information about Mosaic's natural gas derivatives which are used to manage the risk related to significant price changes in natural gas.

	As of December 31, 2021					As of December 31, 2020				
	Expected Maturity Date Years ending December 31,					Expected Maturity Date Years ending December 31,				
(in millions)	2022	2023	2024	2025	Fair Value	2021	2022	2023	2024	Fair Value
Natural Gas Swaps					$ 18.8					$ 5.3
Notional (million MMBtu) - long	9.4	9.4	4.8	—		17.7	8.5	1.2	—	
Weighted Average Rate (US$/MM Btu)	$ 2.21	$ 2.34	$ 2.72	$ —		$ 1.93	$ 2.16	$ 2.88	$ —	
Total Fair Value					$ 18.8					$ 5.3

Interest Rates

From time to time, we enter into interest rate swap agreements to hedge our exposure to changes in future interest rates related to anticipated debt issuances. At December 31, 2021, we had no interest rate swap agreements in effect.

Summary

Overall, there have been no material changes in our primary market risk exposures since the prior year. In 2022, we do not expect any material changes in our primary risk exposures. Additional information about market risk associated with our investments held in the RCRA Trusts is provided in Note 11 of our Notes to Consolidated Financial Statements. For additional information related to derivatives, see Notes 14 and 15 of our Notes to Consolidated Financial Statements.

Environmental, Health, Safety and Security Matters

We are subject to complex and evolving international, federal, state, provincial and local environmental, health, safety and security ("***EHS***") laws that govern the production, distribution and use of crop nutrients and animal feed ingredients. These EHS laws regulate or propose to regulate: (i) conduct of mining, production and supply chain operations, including employee safety and facility security procedures; (ii) management or remediation of potential impacts to air, soil and water quality from our operations; (iii) disposal of waste materials; (iv) beneficial use of co-products and residuals; (v) reclamation of lands after mining; (vi) management and handling of raw materials; (vii) product content; and (viii) use of products by both us and our customers.

We have a comprehensive EHS management program that seeks to achieve sustainable, predictable and verifiable EHS performance. Key elements of our EHS program include: (i) identifying and managing EHS risk; (ii) complying with legal requirements; (iii) improving our EHS procedures and protocols; (iv) educating employees regarding EHS obligations; (v) retaining and developing professional qualified EHS staff; (vi) evaluating facility conditions; (vii) evaluating and enhancing safe workplace behaviors; (viii) performing audits; (ix) formulating EHS action plans; and (x) assuring accountability of all managers and other employees for EHS performance. Our business units are responsible for implementing day-to-day elements of our EHS program, assisted by an integrated staff of EHS professionals. We conduct

audits to verify that each facility has identified risks, achieved regulatory compliance, improved EHS performance, and incorporated EHS management systems into day-to-day business functions.

New or proposed regulatory programs can present significant challenges in ascertaining future compliance obligations, implementing compliance plans, and estimating future costs until implementing regulations have been finalized and definitive regulatory interpretations have been adopted. New or proposed regulatory requirements may require modifications to our facilities or to operating procedures and these modifications may involve significant capital costs or increases in operating costs.

We have expended, and anticipate that we will continue to expend, substantial financial and managerial resources to comply with EHS standards and to continue to improve our environmental stewardship. In 2022, excluding capital expenditures arising out of the consent decrees referred to under "EPA RCRA Initiative" in Note 13 of our Notes to Consolidated Financial Statements, we expect environmental capital expenditures to total approximately $300 million, primarily related to: (i) modification or construction of waste management infrastructure and water treatment systems; (ii) construction and modification projects associated with Gypstacks and clay settling ponds at our Phosphates facilities and tailings management areas for our Potash mining and processing facilities; (iii) upgrading or new construction of air pollution control equipment at some of the concentrates plants; and (iv) capital projects associated with remediation of contamination at current or former operations. Additional expenditures for land reclamation, Gypstack closure and water treatment activities are expected to total approximately $170 million in 2022. In 2023, we estimate environmental capital expenditures will be approximately $300 million and expenditures for land reclamation activities, Gypstack closure and water treatment activities are expected to be approximately $150 million. We spent approximately $410 million and $350 million for the years ended December 31, 2021 and 2020, respectively, for environmental capital expenditures, land reclamation activities, Gypstack closure and water treatment activities. No assurance can be given that greater-than-anticipated EHS capital expenditures or land reclamation, Gypstack closure or water treatment expenditures will not be required in 2022 or in the future.

Operating Requirements and Impacts

Permitting. We hold numerous environmental, mining and other permits and approvals authorizing operations at our facilities. Our ability to continue operations at a facility could be materially affected by a government agency decision to deny or delay issuing a new or renewed permit or approval, to revoke or substantially modify an existing permit or approval or to substantially change conditions applicable to a permit modification, or by legal actions that successfully challenge our permits.

Expanding our operations or extending operations into new areas is also predicated upon securing the necessary environmental or other permits or approvals. We have been engaged in, and over the next several years will be continuing, efforts to obtain permits in support of our anticipated Florida operations at certain of our properties. For years, we have successfully permitted properties and anticipate that we will be able to permit these properties as well.

A denial of our permits, the issuance of permits with cost-prohibitive conditions, substantial delays in issuing key permits, legal actions that prevent us from relying on permits or revocation of permits can prevent or delay our mining at the affected properties and thereby materially affect our business, results of operations, liquidity or financial condition.

In addition, in the U.S., local community involvement has become an increasingly important factor in the permitting process for companies like ours, and various counties and other parties, particularly in Florida, have in the past filed and continue to file lawsuits or administrative appeals challenging the issuance of some of the permits we require. These actions can significantly delay permit issuance. Additional information regarding certain potential or pending permit challenges is provided in Note 22 to our Consolidated Financial Statements and is incorporated herein by reference.

*Federal Initiatives to Define "Waters of the United States" ("**WOTUS**").* The 1972 amendments to the Clean Water Act ("***CWA***") established federal jurisdiction over "navigable waters," defined in the Act as the "waters of the United States" (CWA Section 502(7)). WOTUS is a threshold term in the CWA and establishes the scope of federal jurisdiction under the CWA Act. As it relates to Mosaic's operations and facilities, the scope of WOTUS dictates legal requirements for our National Pollutant Discharge Elimination System wastewater discharge permits and impacts to surface waters and wetlands associated with our phosphate mining operations. A broad definition of WOTUS, and thus the scope of federal jurisdiction, increases the time required to identify and delineate the boundaries of which wetlands and waterways are subject to federal requirements, and the mitigation required to compensate for any losses or impacts to jurisdictional WOTUS.

The current regulatory definition of WOTUS was promulgated jointly on April 21, 2020 (85 Fed.Reg. 22250), by the U.S. EPA and the U.S. Army Corps of Engineers ("***Corps***") as a regulation referred to as the "Navigable Waters Protection Rule" (the "***NWPR***"). The NWPR was intended to provide clarity, predictability and consistency so that the regulated community can better understand where the CWA applies and where it does not. The new NWPR revised the definition of WOTUS under the CWA to include: (i) territorial seas and traditional navigable waters; (ii) perennial and intermittent tributaries to those waters; (iii) certain lakes, ponds, and impoundments; and (iv) wetlands adjacent to jurisdictional waters. The final NWPR was challenged in a number of U.S. district courts.

On June 9, 2021, the EPA announced its plans to repeal and replace the NWPR based on its determination that the rule "… is leading to significant environmental degradation". On August 30, 2021, the U.S. District Court for Arizona vacated the NWPR and remanded the rule back to EPA and the Corps. On that same date, EPA announced that due to court's vacating of the NWPR, EPA and the Corps will halt implementation of the NWPR and are interpreting WOTUS consistent with U.S. Supreme Court precedent.

EPA and the Corps are moving forward with formal rulemaking to implement a new definition of WOTUS. On December 7, 2021, EPA and the Corps announced a proposed rule to re-establish the pre-2015 definition of WOTUS which had been in place for decades, updated to reflect consideration of U.S. Supreme Court decisions.

Water Quality Regulations for Nutrient Discharges. New nutrient regulatory initiatives could have a material effect on either us or our customers. For example, the Gulf Coast Ecosystem Restoration Task Force, established by executive order of the U.S. President and comprised of five gulf states and eleven federal agencies, has delivered a final strategy for long-term ecosystem restoration for the Gulf Coast. The strategy calls for, among other matters, reduction of the flow of excess nutrients into the Gulf of Mexico through state nutrient reduction frameworks, new nutrient reduction approaches and reduction of agricultural and urban sources of excess nutrients. Implementation of the strategy will require legislative or regulatory action at the state level. We cannot predict what the requirements of any such legislative or regulatory action could be or whether or how it would affect us or our customers.

Reclamation Obligations. During phosphate mining, we remove overburden in order to retrieve phosphate rock reserves. Once we have finished mining in an area, we use the overburden and sand tailings produced by the beneficiation process to reclaim the area in accordance with approved reclamation plans and applicable laws. We have incurred and will continue to incur significant costs to fulfill our reclamation obligations.

Management of Residual Materials and Closure of Management Areas. Mining and processing of potash and phosphate generate residual materials that must be managed both during the operation of the facility and upon and after facility closure. Potash tailings, consisting primarily of salt and clay, are stored in surface disposal sites. Phosphate clay residuals from mining are deposited in clay settling ponds. Processing of phosphate rock with sulfuric acid generates phosphogypsum that currently is stored in Gypstacks.

During the life of the tailings management areas, clay settling ponds and Gypstacks, we have incurred and will continue to incur significant costs to manage our potash and phosphate residual materials in accordance with environmental laws and regulations and with permit requirements. Additional legal and permit requirements will take effect when these facilities are closed. Our asset retirement obligations are further discussed in Note 13 of our Notes to Consolidated Financial Statements.

New Wales Water Loss Incident. In August 2016, a sinkhole developed under one of the two cells of the Phase II Gypstack at our New Wales facility in Polk County, Florida, resulting in process water from the stack draining into the sinkhole. The incident was reported to the FDEP and EPA and in connection with the incident, our subsidiary, Mosaic Fertilizer, LLC ("***Mosaic Fertilizer***"), entered into a consent order (the "***Order***") with the FDEP in October 2016 under which Mosaic Fertilizer agreed to, among other things, implement an approved remediation plan to close the sinkhole; perform additional water monitoring and if necessary, assessment and rehabilitation activities in the event of identified off-site impacts; provide financial assurance; and evaluate the risk of potential future sinkhole formation at our active Florida Gypstack operations. The incident and the Order are further discussed in Note 22 of our Notes to Consolidated Financial Statements.

Financial Assurance. Separate from our accounting treatment for reclamation and closure liabilities, some jurisdictions in which we operate have required us either to pass a test of financial strength or provide credit support, typically cash deposits, surety bonds, financial guarantees or letters of credit, to address phosphate mining reclamation liabilities and closure liabilities for clay settling areas and Gypstacks. See "Other Commercial Commitments" under "Off-Balance Sheet Arrangements and Obligations" above for additional information about these requirements. We also have obligations under

certain consent decrees and a separate financial assurance arrangement relating to our facilities in Florida and Louisiana. Two consent decrees that became effective in 2016 resolved claims under RCRA and state hazardous waste laws relating to our management of certain waste materials onsite at certain fertilizer manufacturing facilities in Florida and Louisiana. Under these consent decrees, in 2016 we deposited $630 million in cash into two trust funds to provide additional financial assurance for the estimated costs of closure and post-closure care of our phosphogypsum management systems. In addition, in 2017, we issued a letter of credit in the amount of $50 million to further support our financial assurance obligation under the Florida 2015 Consent Decree. While our actual Gypstack Closure Costs are generally expected to be paid by us in the normal course of our Phosphates business over a period that may not end until three decades or more after a Gypstack has been closed, the funds on deposit in the RCRA Trusts can be drawn by the applicable governmental authority in the event we cannot perform our closure and long-term care obligations. If and when our estimated Gypstack Closure Costs with respect to the facilities associated with a RCRA Trust are sufficiently lower than the amount on deposit in that RCRA Trust, we have the right to request that the excess funds be released to us. The same is true for the RCRA Trust balance remaining after the completion of our obligations, which will be performed over a period that may not end until three decades or more after a Gypstack has been closed. See the discussion under “EPA RCRA Initiative” in Note 13 of our Notes to Consolidated Financial Statements for additional information about these matters.

We have established a trust fund valued at $25 million (Canadian dollars) in satisfaction of financial assurance requirements for closure of our Saskatchewan Potash facilities. As of the end of 2021, Mosaic has completed all required cash contributions to the trust fund. Trust fund performance is subject to review by the Province of Saskatchewan every five years during its existence.

In 2020, we executed and thereafter have maintained surety bonds in the amount of approximately $82 million to establish financial assurance for closure of our Carlsbad, New Mexico potash facility with the U.S. Department of the Interior, Bureau of Land Management and the New Mexico Environment Department.

Examination of Working Places in Metal and Nonmetal Mines. The U.S. Mine Safety and Health Administration has reinstated the regulatory provisions for examinations of working places in metal and nonmetal mines that were originally published on January 23, 2017. The U.S. Court of Appeals for the District of Columbia Circuit issued an order on June 11, 2019, and a mandate on August 23, 2019, requiring this action. The reinstated final rule was effective on September 30, 2019, with implementation and compliance required by January 2020. In order to comply with these changes, we have adjusted our daily mine workplace examination procedures and added additional requirements for the documentation of adverse conditions when they are identified during the daily examinations.

Climate Change

We are committed to finding ways to meet the challenges of crop nutrient and animal feed ingredient production and distribution in the context of the need to reduce greenhouse gas emissions. While focused on helping the world grow the food it needs, we have proven our commitment to using our resources more efficiently and have implemented innovative energy recovery technologies that result in our generation of much of the energy we need, particularly in our U.S. Phosphates operations, from high efficiency heat recovery systems that result in lower greenhouse gas emissions. In 2021, we announced our goal to achieve net-zero greenhouse gas emissions in Florida, U.S. by 2030 and companywide by 2040.

Climate Change Regulation. Various governmental initiatives to limit greenhouse gas emissions are under way or under consideration around the world. These initiatives could restrict our operating activities, require us to make changes in our operating activities that would increase our operating costs, reduce our efficiency or limit our output, require us to make capital improvements to our facilities, increase our energy, raw material and transportation costs or limit their availability, or otherwise adversely affect our results of operations, liquidity or capital resources, and these effects could be material to us.

The direct greenhouse gas emissions from our operations result primarily from:

- Combustion of natural gas to produce steam and dry potash products at our Belle Plaine, Saskatchewan potash solution mine. To a lesser extent, at our potash shaft mines, natural gas is used as a fuel to heat fresh air supplied to the shaft mines and for drying potash products.
- The use of natural gas as a feedstock in the production of ammonia at our Faustina, Louisiana facility.
- Process reactions from naturally occurring carbonates in phosphate rock.
- Operation of transport trucks, mining and construction equipment, and other machinery powered by internal combustion engines utilizing fossil fuels.

In addition, the production of energy and raw materials that we purchase from unrelated parties for use in our business and energy used in the transportation of our products and raw materials are sources of greenhouse gas emissions.

Governmental greenhouse gas emission initiatives include, among others, the December 2015 agreement (the "***Paris Agreement***") which was the outcome of the 21st session of the Conference of the Parties under the United Nations Framework Convention on Climate Change. The Paris Agreement, which was signed by nearly 200 nations including the U.S. and Canada, entered into force in late 2016 and sets out a goal of limiting the average rise in temperatures for this century to below 2 degrees Celsius. Each signatory is expected to develop its own plan (referred to as a Nationally Determined Contribution, or "***NDC***") for reaching that goal.

On January 20, 2021 the U.S.rejoined the Paris Agreement, which was effective February 19, 2021. In 2015, prior to this announcement, the U.S. had submitted an NDC aiming to achieve, by 2025, an economy-wide target of reducing greenhouse gas emissions by 26-28% below its 2005 level. The NDC also aims to use best efforts to reduce emissions by 28%. The U.S. target covers all greenhouse gases that were a part of the 2014 Inventory of Greenhouse Gas Emissions and Sinks. While the future of the U.S.'s involvement in the Paris Agreement and the status of this NDC are unclear, various legislative or regulatory initiatives relating to greenhouse gases have been adopted or considered by the U.S. Congress, EPA or various states and those initiatives already adopted may be used to implement a U.S. NDC. Additionally, more stringent laws and regulations may be enacted to accomplish the goals set out in the NDC.

Brazil ratified the Paris Agreement on September 21, 2016, committing to an NDC that includes an economy-wide target of 1.3 GtCO2e by 2025 and 1.2 GtCO2e by 2030. In 2020, Brazil submitted a new NDC, which reaffirms the country's commitment to reducing total net greenhouse gas emissions by 37% in 2025 and by 43% in 2030. The NDC further commits to achieving climate neutrality in 2060. Since 2009, Brazil has a National Policy on Climate Change. This Policy is implemented by two instruments: the National Plan on Climate Change and the National Climate Change Fund. Additionally, Brazil has sector-specific policies, such as the National Plan for Low Carbon Emission in Agriculture. As part of its commitments in the Paris Agreement, Brazil enforced a Biofuels National Policy ("***RenovaBio***") program in 2020, which sets a carbon credit mechanism based on emission reductions from the use of biofuels. RenovaBio aims to increase biofuels rate in the country's energy matrix and reached 97% of its target on the first year. Under RenovaBio, fossil fuel distributor are required to compensate for the carbon emissions through the acquisition of CBIOS (decarbonization certificates), issued by biofuel producers (e.g., ethanol plants). Since 2020, the Brazilian Congress became active in proposing other climate-related legislation and could approve new instruments to combat climate change in this current legislature. We will continue to monitor developments relating to the anticipated legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources.

Canada's intended NDC aims to achieve, by 2030, an economy-wide target of reducing greenhouse gas emissions by 40-45% below 2005 levels. In late 2016, the Canadian federal government announced plans for a comprehensive tax on carbon emissions, under which provinces opting out of the tax would have the option of adopting a cap-and-trade system. In the plans, the federal government also committed to implementing a federal carbon pricing backstop system that will apply in any province or territory that does not have a carbon pricing system in place by 2018. As of January 1, 2022, a carbon tax of $50 per tonne now applies in Canada for any emitter not covered under the federal backstop program or approved provincial program. In December 2017, Saskatchewan announced a comprehensive plan to address climate change that does not include an economy-wide price on carbon but does include a system of tariffs and credits for large emitters. The plan was reviewed and approved, in part, by the federal government in October 2018. Our Saskatchewan Potash facilities are subject to the Saskatchewan climate change plan regarding emissions at our facilities; however, indirect costs from the carbon tax associated with electricity, natural gas consumption, and transportation are currently passed through to Mosaic. As implementation of the Paris Agreement proceeds, more stringent laws and regulations may be enacted to accomplish the goals set out in Canada's NDC. We will also continue to monitor developments relating to the anticipated legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources.

It is possible that future legislation or regulation addressing climate change, including in response to the Paris Agreement or any new international agreements, could adversely affect our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources, and these effects could be material or adversely impact our competitive advantage. In addition, to the extent climate change restrictions imposed in countries where our competitors operate, such as China, India, former Soviet Union countries or Morocco, are less stringent than in the U.S., Brazil or Canada, our competitors could gain cost or other competitive advantages over us.

Operating Impacts Due to Climate Change. The prospective impact of climate change on our operations and those of our customers and farmers remains uncertain. Scientists have hypothesized that the impacts of climate change could include changes in 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. Severe climate change could impact our costs and operating activities, the location and cost of global grain and oilseed production, and the supply and demand for grains and oilseeds. At the present time, we cannot predict the prospective impact of climate change on our results of operations, liquidity or capital resources, or whether any such effects could be material to us.

Remedial Activities

Comprehensive Environmental Response, Compensation and Liability Act ("***CERCLA***") (aka Superfund) and state analogues impose liability, without regard to fault or to the legality of a party's conduct, on certain categories of persons, including those who have disposed of "hazardous substances" at a location. Under Superfund, or its various state analogues, one party may be responsible for the entire site, regardless of fault or the locality of its disposal activity. We have contingent environmental remedial liabilities that arise principally from three sources which are further discussed below: (i) facilities currently or formerly owned by our subsidiaries or their predecessors; (ii) facilities adjacent to currently or formerly owned facilities; and (iii) third-party Superfund or state equivalent sites where we are alleged to have disposed of hazardous materials. Taking into consideration established accruals for environmental remedial matters of approximately $57.3 million as of December 31, 2021, expenditures for these known conditions currently are not expected, individually or in the aggregate, to have a material effect on our business or financial condition. However, material expenditures could be required in the future to remediate the contamination at known sites or at other current or former sites.

Remediation at Our Facilities. Many of our formerly owned or current facilities have been in operation for a number of years. The historical use and handling of regulated chemical substances, crop and animal nutrients and additives as well as by-product or process tailings at these facilities by us and predecessor operators have resulted in soil, surface water and groundwater impacts.

At many of these facilities, spills or other releases of regulated substances have occurred previously and potentially could occur in the future, possibly requiring us to undertake or fund cleanup efforts under Superfund or otherwise. In some instances, we have agreed, pursuant to consent orders or agreements with the appropriate governmental agencies, to undertake certain investigations, which currently are in progress, to determine whether remedial action may be required to address site impacts. At other locations, we have entered into consent orders or agreements with appropriate governmental agencies to perform required remedial activities that will address identified site conditions. Taking into account established accruals, future expenditures for these known conditions currently are not expected, individually or in the aggregate, to have a material adverse effect on our business or financial condition. However, material expenditures by us could be required in the future to remediate the environmental impacts at these or at other current or former sites.

Remediation at Third-Party Facilities. Various third parties have alleged that our historical operations have impacted neighboring off-site areas or nearby third-party facilities. In some instances, we have agreed, pursuant to orders from or agreements with appropriate governmental agencies or agreements with private parties, to undertake or fund investigations, some of which currently are in progress, to determine whether remedial action, under Superfund or otherwise, may be required to address off-site impacts. Our remedial liability at these sites, either alone or in the aggregate, taking into account established accruals, currently is not expected to have a material adverse effect on our business or financial condition. As more information is obtained regarding these sites, this expectation could change.

Liability for Off-Site Disposal Locations. Currently, we are involved or concluding involvement for off-site disposal at several Superfund or equivalent state sites. Moreover, we previously have entered into settlements to resolve liability with regard to Superfund or equivalent state sites. In some cases, such settlements have included "reopeners," which could result in additional liability at such sites in the event of newly discovered contamination or other circumstances. Our remedial liability at such disposal sites, either alone or in the aggregate, currently is not expected to have a material adverse effect on our business or financial condition. As more information is obtained regarding these sites and the potentially responsible parties involved, this expectation could change.

Product Requirements and Impacts

International, federal, state and provincial standards require us to register many of our products before these products can be sold. The standards also impose labeling requirements on these products and require us to manufacture the products to

formulations set forth on the labels. We believe that, when handled and used as intended, based on the available data, crop nutrient materials do not pose harm to human health or the environment and that any additional standards or regulatory requirements relating to product requirements and impacts will not have a material adverse effect on our business or financial condition.

Additional Information

For additional information about phosphate mine permitting in Florida, our environmental liabilities, the environmental proceedings in which we are involved, our asset retirement obligations related to environmental matters, and our related accounting policies, see Environmental Liabilities and AROs under Critical Accounting Estimates above and Notes 2, 13, and 22 of our Notes to Consolidated Financial Statements.

Sustainability

We are committed to making informed choices that improve our corporate governance, financial strength, operational efficiency, environmental stewardship, community engagement and resource management. Through these efforts, we intend to sustain our business and experience lasting success.

We have included, or incorporate by reference, throughout this annual report on Form 10-K discussions of various matters relating to our sustainability, in its broadest sense, that we believe may be material to our investors. These matters include, but are not limited to, discussions about: corporate governance, including the leadership and respective roles of our Board of Directors and its committees, and management; recent and prospective developments in our business; product development; risk, enterprise risk management and risk oversight; the regulatory and permitting environment for our business and ongoing regulatory and permitting initiatives; executive compensation practices; employee and contractor safety; human capital matters and other EHS matters, including climate change, water management, energy and other operational efficiency initiatives, reclamation and asset retirement obligations. Other matters relating to sustainability are included in our sustainability reports that are available on our website at www.mosaicco.com/ourresponsibility. Our sustainability reports are not incorporated by reference in this annual report on Form 10-K.

Contingencies

Information regarding contingencies in Note 22 of our Notes to Consolidated Financial Statements is incorporated herein by reference.

Related Parties

Information regarding related party transactions is set forth in Note 23 of our Notes to Consolidated Financial Statements and is incorporated herein by reference.

Recently Issued Accounting Guidance

None.

Cautionary Statement Regarding Forward Looking Information

All statements, other than statements of historical fact, appearing in this report constitute “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These forward looking statements include, among other things, statements about our expectations, beliefs, intentions or strategies for the future, including statements about proposed or pending future transactions or strategic plans, statements concerning our future operations, financial condition and prospects, statements regarding our expectations for capital expenditures, statements concerning our level of indebtedness and other information, and any statements of assumptions regarding any of the foregoing. In particular, forward-looking statements may include words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “potential,” “predict,” “project” or “should”. These statements involve certain risks and uncertainties that may cause actual results to differ materially from expectations as of the date of this filing.

Factors that could cause reported results to differ materially from those expressed or implied by the forward-looking statements include, but are not limited to, the following:

- the impact of the novel coronavirus Covid-19 pandemic on the global economy and our business, suppliers, customers, employees and the communities in which we operate, as further described in Part I, Item 1A of this 10-K Report;
- business and economic conditions and governmental policies affecting the agricultural industry where we or our customers operate, including price and demand volatility resulting from periodic imbalances of supply and demand;
- the potential drop in oil demand, which could lead to a significant decline in production, and its impact on the availability and price of sulfur, a key raw material input for our Phosphates, segment operations;
- because of political and economic instability, civil unrest or changes in government policies in Brazil, Saudi Arabia, Peru or other countries in which we do business, our operations could be disrupted as higher costs of doing business could result, including those associated with implementation of new freight tables and new mining legislation;
- changes in farmers' application rates for crop nutrients;
- changes in the operation of world phosphate or potash markets, including consolidation in the crop nutrient industry, particularly if we do not participate in the consolidation;
- the expansion or contraction of production capacity or selling efforts by competitors or new entrants in the industries in which we operate, including the effects of actions by members of Canpotex to prove the production capacity of potash expansion projects, through proving runs or otherwise;
- the effect of future product innovations or development of new technologies on demand for our products;
- seasonality in our business that results in the need to carry significant amounts of inventory and seasonal peaks in working capital requirements, which may result in excess inventory or product shortages;
- changes in the costs, or constraints on supplies, of raw materials or energy used in manufacturing our products, or in the costs or availability of transportation for our products;
- declines in our selling prices or significant increases in costs that can require us to write down our inventories to the lower of cost or market, or require us to impair goodwill or other long-lived assets, or establish a valuation allowance against deferred tax assets;
- the lag in realizing the benefit of falling market prices for the raw materials we use to produce our products that can occur while we consume raw materials that we purchased or committed to purchase in the past at higher prices;
- disruptions of our operations at any of our key production, distribution, transportation or terminaling facilities, including those of Canpotex or any joint venture in which we participate;
- shortages or other unavailability of railcars, tugs, barges and ships for carrying our products and raw materials;
- the effects of and change in trade, monetary, environmental, tax and fiscal policies, laws and regulations;
- foreign exchange rates and fluctuations in those rates;
- tax regulations, currency exchange controls and other restrictions that may affect our ability to optimize the use of our liquidity;
- risks associated with our international operations, including any potential and actual adverse effects related to the Miski Mayo Mine;
- adverse weather conditions affecting our operations, including the impact of potential hurricanes, excessive heat, cold, snow, rainfall or drought;
- difficulties or delays in receiving, challenges to, increased costs of obtaining or satisfying conditions of, or revocation or withdrawal of required governmental and regulatory approvals, including permitting activities;
- changes in the environmental and other governmental regulation that applies to our operations, including federal legislation or regulatory action expanding the types and extent of water resources regulated under federal law and the possibility of further federal or state legislation or regulatory action affecting or related to greenhouse gas emissions, including carbon taxes or other measures that may be implemented in Canada or other jurisdictions in

which we operate, or of restrictions or liabilities related to elevated levels of naturally-occurring radiation that arise from disturbing the ground in the course of mining activities or possible efforts to reduce the flow of nutrients into the Gulf of Mexico, the Mississippi River basin or elsewhere;

- the potential costs and effects of implementation of federal or state water quality standards for the discharge of nitrogen and/or phosphorus into Florida waterways;
- the financial resources of our competitors, including state-owned and government-subsidized entities in other countries;
- the possibility of defaults by our customers on trade credit that we extend to them or on indebtedness that they incur to purchase our products and that we guarantee;
- any significant reduction in customers' liquidity or access to credit that they need to purchase our products;
- the effectiveness of the processes we put in place to manage our significant strategic priorities, including the expansion of our Potash business and our investment in MWSPC, and to successfully integrate and grow acquired businesses;
- actual costs of various items differing from management's current estimates, including, among others, asset retirement, environmental remediation, reclamation or other environmental obligations and Canadian resource taxes and royalties, or the costs of MWSPC or its existing or future funding;
- the costs and effects of legal and administrative proceedings and regulatory matters affecting us, including environmental, tax or administrative proceedings, complaints that our operations are adversely impacting nearby farms, businesses, other property uses or properties, settlements thereof and actions taken by courts with respect to approvals of settlements, costs related to defending and resolving global audit, appeal or court activity, and other, and other further developments in legal proceedings and regulatory matters;
- the success of our efforts to attract and retain highly qualified and motivated employees;
- strikes, labor stoppages or slowdowns by our work force or increased costs resulting from unsuccessful labor contract negotiations, and the potential costs and effects of compliance with new regulations affecting our workforce, which increasingly focus on wages and hours, healthcare, retirement and other employee benefits;
- brine inflows at our potash mines;
- accidents or other incidents involving our properties or operations, including potential fires, explosions, seismic events, sinkholes, unsuccessful tailings management, ineffective mine safety procedures, or releases of hazardous or volatile chemicals;
- terrorism, armed conflict or other malicious intentional acts, including cybersecurity risks such as attempts to gain unauthorized access to, or disable, our information technology systems, or our costs of addressing malicious intentional acts;
- actions by the holders of controlling equity interests in businesses in which we hold a noncontrolling interest;
- changes in our relationships with other members of Canpotex or any joint venture in which we participate or their or our exit from participation in Canpotex or any such export association or joint venture, and other changes in our commercial arrangements with unrelated third parties;
- difficulties in realizing benefits under our long-term natural gas based pricing ammonia supply agreement with CF Industries, Inc., including the risks that the cost savings initially anticipated from the agreement may not be fully realized over the term of the agreement or that the price of natural gas or the market price for ammonia during the agreement's term are at levels at which the agreement's natural gas based pricing is disadvantageous to us, compared with purchases in the spot market; and
- other risk factors reported from time to time in our SEC reports.

Material uncertainties and other factors known to us are discussed in Item 1A, "Risk Factors," of our annual report on Form 10-K for the year ended December 31, 2021 and incorporated by reference herein as if fully stated herein.

We base our forward-looking statements on information currently available to us, and we undertake no obligation to update or revise any of these statements, whether as a result of changes in underlying factors, new information, future events or other developments.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
The Mosaic Company:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of The Mosaic Company and subsidiaries (the Company) as of December 31, 2021 and 2020, the related consolidated statements of earnings (loss), comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 22, 2022 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Evaluation of asset retirement obligations for water treatment costs

As discussed in Note 13 to the consolidated financial statements, the Company has recorded asset retirement obligations (AROs) of $1,749.3 million as of December 31, 2021. The ARO includes the planned treatment of contaminated water ("water treatment costs") and other asset retirement activities at the Company's Florida and Louisiana facilities.

We identified the evaluation of asset retirement obligations for water treatment costs as a critical audit matter. Specialized skills and knowledge were required to evaluate the Company's selection of planned water treatment activities to satisfy their legal obligation. In addition, there was a high degree of subjective auditor judgment due to the sensitivity of the AROs to minor changes to significant assumptions, such as the volume of contaminated water and the forecasted level of contamination used to estimate the water treatment costs per thousand gallons ("unit costs").

The following are the primary procedures performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Company's ARO process. This included controls related to the knowledge, skill, and ability of third-party specialists and their relationship to the Company, determination of necessary activities required to treat contaminated water, and the development of the significant assumptions utilized in the process. We compared water treatment unit cost estimates to actual spending and water quality measurements. We evaluated the Company's ability to accurately estimate water treatment costs by comparing the Company's prior year estimates to the actual water treatment costs incurred. We performed sensitivity analyses over the volume of contaminated water and the unit costs assumptions to assess their impact on the water treatment costs estimate. Due to the specialized skills and knowledge used by the Company to select water treatment activities, we involved an environmental engineering professional with specialized skills and knowledge. This professional assisted in assessing the professional qualifications of the Company's environmental engineers and engineering firm, including the knowledge, skill, and ability of the engineers, and the relationship of the engineers and engineering firm to the Company. In addition, the environmental engineering professional evaluated the Company's planned asset retirement activities by analyzing the Company's specialist's reports. This professional evaluated significant engineering assumptions listed above and compared the planned activities per the specialist's reports to other information obtained during the audit, such as:

- permits obtained which specify the Company's legal obligations
- reports to state regulators on the level of contamination in water balances.

We evaluated the Company's changes in assumptions for the volume of contaminated water and the forecasted level of contamination by comparing them to actual results from the prior year, as well as assessing operational changes that could impact estimated water volumes, contamination levels, or necessary treatment activities.

Evaluation of the realizability of certain deferred tax assets

As discussed in Note 12 of the consolidated financial statements, the Company recognizes deferred income tax assets and liabilities attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases in each jurisdiction. A valuation allowance is recorded in each jurisdiction in which a deferred income tax asset is recorded when it is more likely than not that the deferred income tax asset will not be realized. As of December 31, 2021, the Company had gross deferred tax assets of $1,747.3 million and a related valuation allowance of $774.7 million.

We identified the evaluation of the realizability of certain deferred tax assets as a critical audit matter. Specifically, the evaluation of foreign tax credit carryforwards, required subjective auditor judgment to assess certain forecasted revenue and cost assumptions used to estimate forecasted future taxable income over the periods in which those temporary differences become deductible. Changes to these assumptions could have an effect on the Company's evaluation of the realizability of the deferred tax assets. In addition, there is complexity in the application of the relevant tax regulations to the Company's forecasted future taxable income.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Company's deferred tax asset valuation process. This included controls related to the Company's development of assumptions listed above and application of the relevant tax regulations in estimating forecasted future taxable income. We analyzed certain forecasted revenue and cost assumptions by comparing to external forecasts from industry publications and performed sensitivity analyses to assess the impact of changes in those assumptions on the Company's determination of the ability to utilize certain deferred tax assets. To assess the Company's ability to forecast, we compared the Company's historical revenue and cost forecasts to actual results. We involved federal and international tax professionals with specialized skills and knowledge, who assisted in assessing the Company's application of the relevant tax regulations and evaluating the realizability of certain deferred tax assets.

/s/ KPMG LLP

We have served as the Company's auditor since 2004.

Tampa, Florida
February 23, 2022

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
The Mosaic Company:

Opinion on Internal Control Over Financial Reporting

We have audited The Mosaic Company and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.
We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of earnings (loss), comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes (collectively, the consolidated financial statements), and our report dated February 22, 2022 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ KPMG LLP

Tampa, Florida
February 23, 2022

Consolidated Statements of Earnings (Loss)
In millions, except per share amounts

	Years Ended December 31,		
	2021	**2020**	**2019**
Net sales	$ 12,357.4	$ 8,681.7	$ 8,906.3
Cost of goods sold	9,157.1	7,616.8	8,009.0
Gross margin	3,200.3	1,064.9	897.3
Selling, general and administrative expenses	430.5	371.5	354.1
Impairment, restructuring and other expenses	158.1	—	1,462.1
Other operating expenses	143.2	280.5	176.0
Operating earnings (loss)	2,468.5	412.9	(1,094.9)
Interest expense, net	(169.1)	(180.6)	(182.9)
Foreign currency transaction (loss) gain	(78.5)	(64.3)	20.2
Other income	3.9	12.9	1.5
Earnings (loss) from consolidated companies before income taxes	2,224.8	180.9	(1,256.1)
Provision for (benefit from) income taxes	597.7	(578.5)	(224.7)
Earnings (loss) from consolidated companies	1,627.1	759.4	(1,031.4)
Equity in net earnings (loss) of nonconsolidated companies	7.8	(93.8)	(59.4)
Net earnings (loss) including noncontrolling interests	1,634.9	665.6	(1,090.8)
Less: Net earnings (loss) attributable to noncontrolling interests	4.3	(0.5)	(23.4)
Net earnings (loss) attributable to Mosaic	$ 1,630.6	$ 666.1	$ (1,067.4)
Basic net earnings (loss) per share attributable to Mosaic	$ 4.31	$ 1.76	$ (2.78)
Basic weighted average number of shares outstanding	378.1	379.0	383.8
Diluted net earnings (loss) per share attributable to Mosaic	$ 4.27	$ 1.75	$ (2.78)
Diluted weighted average number of shares outstanding	381.6	381.3	383.8

See Accompanying Notes to Consolidated Financial Statements

Consolidated Statements of Comprehensive Income (Loss)
In millions

	Years Ended December 31,		
	2021	**2020**	**2019**
Net earnings (loss) including noncontrolling interest	$ 1,634.9	$ 665.6	$ (1,090.8)
Other comprehensive income (loss), net of tax			
Foreign currency translation (loss) gain	(108.2)	(249.5)	69.4
Net actuarial gain (loss) and prior service cost	36.9	19.9	(24.3)
Realized gain on interest rate swap	1.5	1.6	1.7
Net (loss) gain on marketable securities held in trust fund	(17.6)	12.8	10.9
Other comprehensive (loss) income	(87.4)	(215.2)	57.7
Comprehensive income (loss)	1,547.5	450.4	(1,033.1)
Less: Comprehensive income (loss) attributable to noncontrolling interest	2.5	(7.7)	(24.6)
Comprehensive income (loss) attributable to Mosaic	$ 1,545.0	$ 458.1	$ (1,008.5)

See Accompanying Notes to Consolidated Financial Statements

Consolidated Balance Sheets
In millions, except per share amounts

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 769.5	$ 574.0
Receivables, net	1,531.9	881.1
Inventories	2,741.4	1,739.2
Other current assets	282.5	326.9
Total current assets	5,325.3	3,521.2
Property, plant and equipment, net	12,475.3	11,854.3
Investments in nonconsolidated companies	691.8	673.1
Goodwill	1,172.2	1,173.0
Deferred income taxes	997.1	1,179.4
Other assets	1,374.7	1,388.8
Total assets	$ 22,036.4	$ 19,789.8
Liabilities and Equity		
Current liabilities:		
Short-term debt	$ 302.8	$ 0.1
Current maturities of long-term debt	596.6	504.2
Structured accounts payable arrangements	743.7	640.0
Accounts payable	1,260.7	769.1
Accrued liabilities	1,883.6	1,233.1
Total current liabilities	4,787.4	3,146.5
Long-term debt, less current maturities	3,382.2	4,073.8
Deferred income taxes	1,016.2	1,060.8
Other noncurrent liabilities	2,102.1	1,753.5
Equity:		
Preferred stock, $0.01 par value, 15,000,000 shares authorized, none issued and outstanding as of December 31, 2021 and 2020	—	—
Common stock, $0.01 par value, 1,000,000,000 shares authorized, 390,815,099 shares issued and 368,732,231 shares outstanding as of December 31, 2021, 389,974,041 shares issued and 379,091,544 shares outstanding as of December 31, 2020	3.7	3.8
Capital in excess of par value	478.0	872.8
Retained earnings	12,014.2	10,511.0
Accumulated other comprehensive loss	(1,891.8)	(1,806.2)
Total Mosaic stockholders' equity	10,604.1	9,581.4
Non-controlling interests	144.4	173.8
Total equity	10,748.5	9,755.2
Total liabilities and equity	$ 22,036.4	$ 19,789.8

See Accompanying Notes to Consolidated Financial Statements

Consolidated Statements of Cash Flows
In millions, except per share amounts

	Years Ended December 31,		
	2021	2020	2019
Cash Flows from Operating Activities			
Net earnings (loss) including noncontrolling interests	$ 1,634.9	$ 665.6	$ (1,090.8)
Adjustments to reconcile net earnings including noncontrolling interests to net cash provided by operating activities:			
Depreciation, depletion and amortization	812.9	847.6	882.7
Amortization of acquired inventory	—	—	(5.5)
Deferred and other income taxes	98.8	(684.0)	(261.3)
Equity in net (earnings) loss of nonconsolidated companies, net of dividends	(2.1)	97.1	64.6
Accretion expense for asset retirement obligations	71.9	68.0	62.4
Accretion expense for leases	13.4	24.2	18.6
Share-based compensation expense	29.5	17.8	27.9
Impairment of goodwill	—	—	588.6
Unrealized (gain) loss on derivatives	7.2	(26.6)	(59.2)
Foreign currency adjustments	(2.6)	14.1	50.1
Net proceeds from settlement of interest rate swaps	—	34.7	—
Mine closure costs	158.1	—	871.0
(Gain) loss on disposal of fixed assets	(5.3)	16.3	18.7
Other	—	(19.1)	(3.2)
Changes in assets and liabilities:			
Receivables, net	(683.6)	(153.6)	34.6
Inventories, net	(1,067.9)	191.4	128.1
Other current assets and noncurrent assets	(18.0)	66.1	(36.0)
Accounts payable and accrued liabilities	995.1	333.3	(175.2)
Other noncurrent liabilities	144.7	89.7	(20.7)
Net cash provided by operating activities	2,187.0	1,582.6	1,095.4
Cash Flows from Investing Activities			
Capital expenditures	(1,288.6)	(1,170.6)	(1,272.2)
Purchases of available-for-sale securities - restricted	(433.6)	(618.7)	(557.6)
Proceeds from sale of available-for-sale securities - restricted	410.1	607.2	533.2
Proceeds from sale of assets	28.1	—	4.0
Acquisition, net of cash acquired	(24.1)	—	(55.1)
Purchases of held-to-maturity securities	(3.2)	(6.1)	(15.4)
Proceeds from sale of held-to-maturity securities	0.8	1.7	2.3
Other	(11.8)	(3.0)	(0.1)
Net cash used in investing activities	(1,322.3)	(1,189.5)	(1,360.9)
Cash Flows from Financing Activities			
Payments of short-term debt	(726.6)	(1,542.5)	(554.2)
Proceeds from issuance of short-term debt	1,029.3	1,521.1	591.0
Payments of structured accounts payable arrangements	(1,028.4)	(1,156.2)	(977.1)
Proceeds from structured accounts payable arrangements	1,122.7	1,037.4	1,124.2
Collections of transferred receivables	445.0	—	—
Payments of transferred receivables	(363.9)	—	—
Payments of long-term debt	(608.3)	(66.9)	(48.3)
Proceeds from issuance of long-term debt	—	4.7	—
Repurchases of stock	(410.9)	—	(149.9)
Cash dividends paid	(103.7)	(75.8)	(67.2)
Dividends paid to non-controlling interest	(31.3)	(0.6)	(0.7)
Other	(6.0)	(5.0)	—
Net cash used in financing activities	(682.1)	(283.8)	(82.2)
Effect of exchange rate changes on cash	9.3	(47.2)	9.0
Net change in cash, cash equivalents and restricted cash	191.9	62.1	(338.7)
Cash, cash equivalents and restricted cash—beginning of year	594.4	532.3	871.0
Cash, cash equivalents and restricted cash—end of year	$ 786.3	$ 594.4	$ 532.3

See Accompanying Notes to Consolidated Financial Statements

THE MOSAIC COMPANY
CONSOLIDATED STATEMENTS OF CASH FLOWS (Continued)
(In millions)

	Years Ended December 31,		
	2021	**2020**	**2019**
Reconciliation of cash, cash equivalents and restricted cash reported within the consolidated balance sheets to the consolidated statements of cash flows:			
Cash and cash equivalents	$ 769.5	$ 574.0	$ 519.1
Restricted cash in other current assets	8.3	8.1	7.8
Restricted cash in other assets	8.5	12.3	5.4
Total cash, cash equivalents and restricted cash shown in the statement of cash flows	$ 786.3	$ 594.4	$ 532.3

See Accompanying Notes to Consolidated Financial Statements

Consolidated Statements of Equity
In millions, except per share data

	Shares	Dollars					
		Mosaic Shareholders					
	Common Stock	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Loss	Non-Controlling Interests	Total Equity
Balance as of December 31, 2018	385.5	$ 3.8	$ 985.9	$ 11,064.7	$ (1,657.1)	$ 207.4	$ 10,604.7
Adoption of ASC Topic 842	—	—	—	0.6	—	—	0.6
Total comprehensive income (loss)	—	—	—	(1,067.4)	58.9	(24.6)	(1,033.1)
Vesting of restricted stock units	0.4	—	(5.6)	—	—	—	(5.6)
Stock based compensation	—	—	27.9	—	—	—	27.9
Repurchases of stock	(7.1)	—	(149.8)	—	—	—	(149.8)
Dividends ($0.20 per share)	—	—	—	(76.4)	—	—	(76.4)
Dividends for noncontrolling interests	—	—	—	—	—	(0.7)	(0.7)
Balance as of December 31, 2019	378.8	3.8	858.4	9,921.5	(1,598.2)	182.1	9,367.6
Total comprehensive income (loss)	—	—	—	666.1	(208.0)	(7.7)	450.4
Vesting of restricted stock units	0.3	— —	(2.7)	—	—	—	(2.7)
Stock based compensation	—	—	17.1	—	—	—	17.1
Dividends ($0.20 per share)	—	—	—	(76.6)	—	—	(76.6)
Dividends for noncontrolling interests	—	—	—	—	—	(0.6)	(0.6)
Balance as of December 31, 2020	379.1	3.8	872.8	10,511.0	(1,806.2)	173.8	9,755.2
Total comprehensive income (loss)	—	—	—	1,630.6	(85.6)	2.5	1,547.5
Vesting of restricted stock units	0.8	—	(11.3)	—	—	—	(11.3)
Stock based compensation	—	—	26.4	—	—	—	26.4
Stock option exercises	—	—	3.2	—	—	—	3.2
Repurchases of stock	(11.2)	(0.1)	(410.8)	—	—	—	(410.9)
Dividends ($0.30 per share)	—	—	—	(127.4)	—	—	(127.4)
Dividends for noncontrolling interests	—	—	—	—	—	(31.3)	(31.3)
Purchase of noncontrolling interests	—	—	(2.3)	—	—	(0.6)	(2.9)
Balance as of December 31, 2021	368.7	$ 3.7	$ 478.0	$ 12,014.2	$ (1,891.8)	$ 144.4	$ 10,748.5

See Accompanying Notes to Consolidated Financial Statements

Notes to Consolidated Financial Statements
Tables in millions, except per share amounts

1. ORGANIZATION AND NATURE OF BUSINESS

The Mosaic Company ("***Mosaic***," and, with its consolidated subsidiaries, "***we***," "***us***," "***our***," or the "***Company***") produces and markets concentrated phosphate and potash crop nutrients. We conduct our business through wholly and majority owned subsidiaries and businesses in which we own less than a majority or a noncontrolling interest, including consolidated variable interest entities and investments accounted for by the equity method.

We are organized into the following business segments:

- Our **Phosphates** business segment owns and operates mines and production facilities in Florida which produce concentrated phosphate crop nutrients and phosphate-based animal feed ingredients, and processing plants in Louisiana which produce concentrated phosphate crop nutrients. We have a 75% economic interest in the Miski Mayo Phosphate Mine in Peru. These results are consolidated in the Phosphates segment. The Phosphates segment also includes our 25% interest in the Ma'aden Wa'ad Al Shamal Phosphate Company (the "***MWSPC***"), a joint venture to develop, own and operate integrated phosphate production facilities in the Kingdom of Saudi Arabia. We market approximately 25% of the MWSPC phosphate production. We recognize our equity in the net earnings or losses relating to MWSPC on a one-quarter lag in our Consolidated Statements of Earnings.
- Our **Potash** business segment owns and operates potash mines and production facilities in Canada and the U.S. which produce potash-based crop nutrients, animal feed ingredients and industrial products. Potash sales include domestic and international sales. We are a member of Canpotex, Limited ("***Canpotex***"), an export association of Canadian potash producers through which we sell our Canadian potash outside the U.S. and Canada.
- Our **Mosaic Fertilizantes** business segment includes five Brazilian phosphate rock mines, four phosphate chemical plants and a potash mine in Brazil. The segment also includes our distribution business in South America, which consists of sales offices, crop nutrient blending and bagging facilities, port terminals and warehouses in Brazil and Paraguay. We also have a majority interest in Fospar S.A., which owns and operates a single superphosphate granulation plant and a deep-water crop nutrition port and throughput warehouse terminal facility in Brazil.

Intersegment eliminations, unrealized mark-to-market gains/losses on derivatives, debt expenses, Streamsong Resort® results of operations, and the results of the China and India distribution businesses are included within Corporate, Eliminations and Other.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Statement Presentation and Basis of Consolidation

The accompanying Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("***U.S. GAAP***"). Throughout the Notes to Consolidated Financial Statements, amounts in tables are in millions of dollars except for per share data and as otherwise designated.

The accompanying Consolidated Financial Statements include the accounts of Mosaic and its majority owned subsidiaries. Certain investments in companies in which we do not have control but have the ability to exercise significant influence are accounted for by the equity method.

Accounting Estimates

Preparation of the Consolidated Financial Statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of net sales and expenses during the reporting periods. The most significant estimates made by management relate to the estimates of fair value of acquired assets and liabilities, the recoverability of non-current assets including goodwill, the useful lives and net realizable values of long-lived assets, environmental and reclamation liabilities, including asset retirement obligations ("***ARO***"), and income tax-related accounts, including the valuation allowance against deferred income tax assets. Actual results could differ from these estimates.

Revenue Recognition

We generate revenues primarily by producing and marketing phosphate and potash crop nutrients. Revenue is recognized when control of the product is transferred to the customer, which is generally upon transfer of title to the customer based on the contractual terms of each arrangement. Title is typically transferred to the customer upon shipment of the product. In certain circumstances, which are referred to as final price deferred arrangements, we ship product prior to the establishment of a valid sales contract. In such cases, we retain control of the product and do not recognize revenue until a sales contract has been agreed to with the customer.

Revenue is measured as the amount of consideration we expect to receive in exchange for the transfer of our goods. Our products are generally sold based on market prices prevailing at the time the sales contract is signed or through contracts which are priced at the time of shipment, except for the final priced deferred arrangements discussed above. Sales incentives are recorded as a reduction of revenue at the time of initial sale. We estimate the variable consideration related to our sales incentive programs based on the sales terms with customers and historical experience. Shipping and handling costs are included as a component of cost of goods sold.

We generally expense sales commissions when incurred because the amortization period would have been one year or less. These costs are recorded within sales and marketing expenses.

We have elected to recognize the cost for freight and shipping as an expense in cost of sales, when control over the product has passed to the customer.

For information regarding sales by product type and by geographic area, see Note 24 of our Notes to Consolidated Financial Statements.

Non-Income Taxes

We pay Canadian resource taxes consisting of the Potash Production Tax and resource surcharge. The Potash Production Tax is a Saskatchewan provincial tax on potash production and consists of a base payment and a profits tax. In addition to the Canadian resource taxes, royalties are payable to the mineral owners with respect to potash reserves or production of potash. These resource taxes and royalties are recorded in our cost of goods sold. Our Canadian resource tax and royalty expenses were $301.5 million, $176.1 million and $211.9 million during 2021, 2020 and 2019, respectively.

We have approximately $112.5 million of assets recorded as of December 31, 2021 related to PIS and Cofins, which is a Brazilian federal value-added tax, mostly earned in 2008 through 2021 that we believe will be realized through offsetting income tax payments or other federal taxes or receiving cash refunds. Should the Brazilian government determine that these are not valid credits upon audit, this could impact our results in such period. We have recorded the PIS and Cofins credits at amounts which we believe are probable of collection. Information regarding PIS and Cofins taxes already audited is included in Note 22 of our Notes to Consolidated Financial Statements.

Foreign Currency Translation

The Company’s reporting currency is the U.S. dollar; however, for operations located in Canada and Brazil, the functional currency is the local currency. Assets and liabilities of these foreign operations are translated to U.S. dollars at exchange rates in effect at the balance sheet date, while income statement accounts and cash flows are translated to U.S. dollars at the average exchange rates for the period. For these operations, translation gains and losses are recorded as a component of accumulated other comprehensive income in equity until the foreign entity is sold or liquidated. Transaction gains and losses result from transactions that are denominated in a currency other than the functional currency of the operation, primarily accounts receivable and intercompany loans in our Canadian entities denominated in U.S. dollars, intercompany loans receivable in our U.S. entities denominated in Brazilian real, and accounts payable in Brazil denominated in U.S. dollars. These foreign currency transaction gains and losses are presented separately in the Consolidated Statement of Earnings.

Cash and Cash Equivalents

Cash and cash equivalents include short-term, highly liquid investments with original maturities of 90 days or less and other highly liquid investments that are payable on demand such as money market accounts, certain certificates of deposit and repurchase agreements. The carrying amount of such cash equivalents approximates their fair value due to the short-term and highly liquid nature of these instruments.

Concentration of Credit Risk

In the U.S., we sell our products to manufacturers, distributors and retailers, primarily in the Midwest and Southeast. Internationally, our potash products are sold primarily through Canpotex, an export association. A concentration of credit risk arises from our sales and accounts receivable associated with the international sales of potash product through Canpotex. We consider our concentration risk related to the Canpotex receivable to be mitigated by their credit policy, which requires the underlying receivables to be substantially insured or secured by letters of credit. As of December 31, 2021, and 2020, there were $382.5 million and $89.4 million, respectively, of trade accounts receivable due from Canpotex. During 2021, 2020 and 2019, sales to Canpotex were $1.1 billion, $795.2 million and $952.5 million, respectively.

Inventories

Inventories of raw materials, work-in-process products, finished goods and operating materials and supplies are stated at the lower of cost or net realizable value. Costs for substantially all inventories are determined using the weighted average cost basis. To determine the cost of inventory, we allocate fixed expense to the costs of production based on the normal capacity, which refers to a range of production levels and is considered the production expected to be achieved over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. Fixed overhead costs allocated to each unit of production should not increase due to abnormally low production. Those excess costs are recognized as a current period expense. When a production facility is completely shut down temporarily, it is considered “idle”, and all related expenses are charged to cost of goods sold.

Net realizable value of our inventory is defined as forecasted selling prices less reasonably predictable selling costs. Significant management judgment is involved in estimating forecasted selling prices including various demand and supply variables. Examples of demand variables include grain and oilseed prices, stock-to-use ratios and changes in inventories in the crop nutrients distribution channels. Examples of supply variables include forecasted prices of raw materials, such as phosphate rock, sulfur, ammonia and natural gas, estimated operating rates and industry crop nutrient inventory levels. Results could differ materially if actual selling prices differ materially from forecasted selling prices. Charges for lower of cost or market are recognized in our Consolidated Statements of Earnings in the period when there is evidence of a decline of market value below cost.

Property, Plant and Equipment and Recoverability of Long-Lived Assets

Property, plant and equipment are stated at cost. Costs of significant assets include capitalized interest incurred during the construction and development period. Repairs and maintenance, including planned major maintenance and plant turnaround costs, are expensed when incurred.

Depletion expenses for mining operations, including mineral reserves, are generally determined using the units-of-production method based on estimates of recoverable reserves. Depreciation is computed principally using the straight-line method and units-of-production method over the following useful lives: machinery and equipment three to 25 years, and buildings and leasehold improvements three to 40 years.

We estimate initial useful lives based on experience and current technology. These estimates may be extended through sustaining capital programs. Factors affecting the fair value of our assets or periods of expected use may also affect the estimated useful lives of our assets and these factors can change. Therefore, we periodically review the estimated remaining lives of our facilities and other significant assets and adjust our depreciation rates prospectively where appropriate.

Long-lived assets, including fixed assets and right-of-use assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment assessment involves management judgment and estimates of factors such as industry and market conditions, the economic life of the asset, sales volume and prices, inflation, raw materials costs, cost of capital, tax rates and capital spending. The carrying amount of a long-lived asset group is not recoverable if it exceeds the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the asset group. If it is determined that an impairment loss has occurred, the loss is measured as the amount by which the carrying amount of the long-lived asset group exceeds its fair value.

Leases

Right of use (“***ROU***”) assets represent our right to use an underlying asset for the lease term. Lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at the

commencement date of the lease, based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at the commencement date in determining the present value of lease payments. The Company's incremental borrowing rate for a lease is the rate of interest it would have to pay on a collateralized basis to borrow an amount equal to the lease payments under similar terms. For both operating and finance leases, the initial ROU asset equals the lease liability, plus initial direct costs, less lease incentives received. Our lease agreements may include options to extend or terminate the lease, which are included in the lease term at the commencement date when it is reasonably certain that we will exercise that option. In general, we do not consider optional periods included in our lease agreements as reasonably certain of exercise at inception.

At inception, we determine whether an arrangement is a lease and the appropriate lease classification. Operating leases with terms greater than twelve months are included as operating lease ROU assets within other assets and the associated lease liabilities within accrued liabilities and other noncurrent liabilities on our consolidated balance sheets. Finance leases with terms greater than twelve months are included as finance ROU assets within property and equipment and the associated finance lease liabilities within current maturities of long-term debt and long-term debt on our consolidated balance sheets.

Leases with terms of less than twelve months, referred to as short-term leases, do not create a ROU asset or lease liability on the balance sheet.

We have lease agreements with lease and non-lease components, which are generally accounted for separately. For full-service railcar leases, we account for the lease and non-lease components as a single lease component. Additionally, for certain equipment leases, we apply assumptions using a portfolio approach, given the generally consistent terms of the agreements. Lease payments based on usage (for example, per-mile or per-hour charges), referred to as variable lease costs, are recorded separately from the determination of the ROU asset and lease liability.

Contingencies

Accruals for environmental remediation efforts are recorded when costs are probable and can be reasonably estimated. In determining these accruals, we use the most current information available, including similar past experiences, available technology, consultant evaluations, regulations in effect, the timing of remediation and cost-sharing arrangements. Adjustments to accruals, recorded as needed in our Consolidated Statement of Earnings each quarter, are made to reflect changes in and current status of these factors.

We are involved from time to time in claims and legal actions incidental to our operations, both as plaintiff and defendant. We have established what we currently believe to be adequate accruals for pending legal matters. These accruals are established as part of an ongoing worldwide assessment of claims and legal actions that takes into consideration such items as advice of legal counsel, individual developments in court proceedings, changes in the law, changes in business focus, changes in the litigation environment, changes in opponent strategy and tactics, new developments as a result of ongoing discovery and our experience in defending and settling similar claims. The litigation accruals at any time reflect updated assessments of the then-existing claims and legal actions. The final outcome or potential settlement of litigation matters could differ materially from the accruals which we have established. Legal costs are expensed as incurred.

Pension and Other Postretirement Benefits

Mosaic offers a number of benefit plans that provide pension and other benefits to qualified employees. These plans include defined benefit pension plans, supplemental pension plans, defined contribution plans and other postretirement benefit plans.

We accrue the funded status of our plans, which is representative of our obligations under employee benefit plans and the related costs, net of plan assets measured at fair value. The cost of pensions and other retirement benefits earned by employees is generally determined with the assistance of an actuary using the projected benefit method prorated on service and management's best estimate of expected plan investment performance, salary escalation, retirement ages of employees and expected healthcare costs.

Additional Accounting Policies

To facilitate a better understanding of our consolidated financial statements we have disclosed the following significant accounting policies (with the exception of those identified above) throughout the following notes, with the related financial

disclosures by major caption:

3. LEASES

Leasing Activity

We have operating and finance leases for heavy mobile equipment, railcars, fleet vehicles, field and plant equipment, river and cross-gulf vessels, corporate offices, land, and computer equipment. Our leases have remaining lease terms of 1 year to 29 years, some of which include options to extend the lease for up to 10 years and some of which include options to terminate the lease within 1 year.

Supplemental balance sheet information related to leases as of December 31, 2021 and December 31, 2020 is as follows:

Type of Lease Asset or Liability	December 31, 2021	December 31, 2020	Balance Sheet Classification
	(in millions)		
Operating Leases			
Right-of-use assets	$ 120.2	$ 173.1	Other assets
Lease liabilities:			
Short-term	59.7	64.0	Accrued liabilities
Long-term	64.3	109.6	Other noncurrent liabilities
Total	$ 124.0	$ 173.6	
Finance Leases			
Right-of-use assets:			
Gross assets	$ 459.1	$ 457.9	
Less: accumulated depreciation	122.8	89.3	
Net assets	$ 336.3	$ 368.6	Property, plant and equipment, net
Lease liabilities:			
Short-term	$ 41.2	$ 49.9	Current maturities of long-term debt
Long-term	171.8	294.6	Long-term debt, less current maturities
Total	$ 213.0	$ 344.5	

Lease expense is generally included within cost of goods sold and selling, general and administrative expenses, except for interest on lease liabilities, which is recorded within net interest. The components of lease expense were as follows:

(in millions)	December 31, 2021	December 31, 2020	December 31, 2019
Operating lease cost	$ 78.8	$ 81.7	$ 98.4
Finance lease cost:			
Amortization of right-of-use assets	40.6	37.7	28.3
Interest on lease liabilities	6.3	13.3	15.2
Short-term lease cost	3.1	3.1	10.5
Variable lease cost	19.2	21.8	21.5
Total lease cost	$ 148.0	$ 157.6	$ 173.9

Rental expense for 2021, 2020 and 2019 was $211.8 million, $226.9 million and $249.1 million, respectively.

Supplemental cash flow information related to leases was as follows:

(In millions)	December 31, 2021	2020	2019
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows from operating leases	$ 78.8	$ 96.6	$ 107.9
Operating cash flows from finance leases	6.3	8.4	10.7
Financing cash flows from finance leases	142.5	46.9	41.3
Right-of-use assets obtained in exchange for lease obligations:			
Operating leases	$ 18.4	$ 22.4	$ 56.0
Finance leases	8.9	36.4	88.2

Other information related to leases was as follows:

	December 31, 2021
Weighted Average Remaining Lease Term	
Operating leases	4.3 years
Finance leases	3.1 years
Weighted Average Discount Rate	
Operating leases	4.8 %
Finance leases	2.4 %

Future lease payments under non-cancellable leases recorded as of December 31, 2021, were as follows:

(in millions)	Operating Leases	Finance Leases
2022	$ 63.3	$ 45.4
2023	29.7	70.9
2024	18.6	86.9
2025	7.1	4.8
2026	3.1	4.0
Thereafter	17.7	10.8
Total future lease payments	$ 139.5	$ 222.8
Less imputed interest	(15.5)	(9.8)
Total	$ 124.0	$ 213.0

4. OTHER FINANCIAL STATEMENT DATA

The following provides additional information concerning selected balance sheet accounts:

(in millions)	December 31, 2021	December 31, 2020
Receivables		
Trade - External	$ 954.6	$ 632.8
Trade - Affiliate	390.1	99.7
Non-trade	187.7	149.0
	1,532.4	881.5
Less allowance for doubtful accounts	0.5	0.4
	$ 1,531.9	$ 881.1
Inventories		
Raw materials	$ 296.6	$ 92.1
Work in process	741.1	634.5
Finished goods	1,534.3	868.2
Final price deferred [(a)]	31.4	23.0
Operating materials and supplies	138.0	121.4
	$ 2,741.4	$ 1,739.2
Other current assets		
Income and other taxes receivable	$ 126.1	$ 181.4
Prepaid expenses	107.3	80.4
Other	49.1	65.1
	$ 282.5	$ 326.9
Other assets		
Restricted cash	$ 8.5	$ 12.3
MRO inventory	144.7	137.7
Marketable securities held in trust - restricted	731.5	734.3
Operating lease right-of-use assets	120.2	173.1
Indemnification asset	21.0	23.0
Long-term receivable	41.5	52.6
Other	307.3	255.8
	$ 1,374.7	$ 1,388.8

(in millions)	December 31, 2021	December 31, 2020
Accrued liabilities		
Accrued dividends	$ 43.6	$ 20.4
Payroll and employee benefits	235.9	195.5
Asset retirement obligations	222.4	190.2
Customer prepayments [(b)]	437.7	287.6
Accrued income and other taxes	184.3	83.1
Operating lease obligation	59.7	64.0
Servicing liability	81.1	—
Other	618.9	392.3
	$ 1,883.6	$ 1,233.1
Other noncurrent liabilities		
Asset retirement obligations	$ 1,526.9	$ 1,203.7
Operating lease obligation	64.3	109.6
Accrued pension and postretirement benefits	114.4	158.5
Unrecognized tax benefits	156.6	46.4
Other	239.9	235.3
	$ 2,102.1	$ 1,753.5

(a) Final price deferred is product that has shipped to customers, but we retain control and do not recognize revenue until a sales contract has been agreed to with the customer.

(b) The timing of recognition of revenue related to our performance obligations may be different than the timing of collection of cash related to those performance obligations. Specifically, we collect prepayments from certain customers in Brazil. In addition, cash collection from Canpotex may occur prior to delivery of product to the end customer. We generally satisfy our contractual liabilities within one quarter of incurring the liability.

Interest expense, net was comprised of the following in 2021, 2020 and 2019:

(in millions)	Years Ended December 31, 2021	2020	2019
Interest income	$ 25.2	$ 33.5	$ 33.1
Less interest expense	194.3	214.1	216.0
Interest expense, net	$ (169.1)	$ (180.6)	$ (182.9)

5. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consist of the following:

(in millions)	December 31, 2021	December 31, 2020
Land	$ 341.6	$ 325.7
Mineral properties and rights	5,791.3	5,035.2
Buildings and leasehold improvements	3,452.5	3,306.2
Machinery and equipment	9,893.6	9,846.9
Construction in-progress	1,234.4	1,447.1
	20,713.4	19,961.1
Less: accumulated depreciation and depletion	8,238.1	8,106.8
	$ 12,475.3	$ 11,854.3

Depreciation and depletion expense was $811.8 million, $846.4 million and $877.6 million for 2021, 2020 and 2019, respectively. Capitalized interest on major construction projects was $30.1 million, $33.3 million and $28.5 million for 2021, 2020 and 2019, respectively.

6. EARNINGS PER SHARE

The numerator for basic and diluted earnings per share ("***EPS***") is net earnings attributable to Mosaic. The denominator for basic EPS is the weighted average number of shares outstanding during the period. The denominator for diluted EPS also includes the weighted average number of additional common shares that would have been outstanding if the dilutive potential common shares had been issued, unless the shares are anti-dilutive.

The following is a reconciliation of the numerator and denominator for the basic and diluted EPS computations:

(in millions)	Years Ended December 31, 2021	2020	2019
Net earnings (loss) attributable to Mosaic	$ 1,630.6	$ 666.1	$ (1,067.4)
Basic weighted average number of shares outstanding attributable to common stockholders	378.1	379.0	383.8
Dilutive impact of share-based awards	3.5	2.3	—
Diluted weighted average number of shares outstanding	381.6	381.3	383.8
Basic net earnings (loss) per share	$ 4.31	$ 1.76	$ (2.78)
Diluted net earnings (loss) per share	$ 4.27	$ 1.75	$ (2.78)

A total of 0.5 million shares for 2021, 2.3 million shares for 2020 and 2.5 million shares for 2019 of common stock subject to issuance related to share-based awards have been excluded from the calculation of diluted EPS because the effect would have been anti-dilutive.

7. CASH FLOW INFORMATION

Supplemental disclosures of cash paid for interest and income taxes and non-cash investing and financing information is as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
Cash paid during the period for:			
Interest	$ 220.0	$ 232.8	$ 231.3
Less amount capitalized	30.1	33.3	28.5
Cash interest, net	$ 189.9	$ 199.5	$ 202.8
Income taxes	$ 208.6	$ 6.2	$ 46.5

Acquiring or constructing property, plant and equipment by incurring a liability does not result in a cash outflow for us until the liability is paid. In the period the liability is incurred, the change in operating accounts payable on the Consolidated Statements of Cash Flows is adjusted by such amount. In the period the liability is paid, the amount is reflected as a cash outflow from investing activities. The applicable net change in operating accounts payable that was classified to investing activities on the Consolidated Statements of Cash Flows was $18.6 million, $(29.8) million and $63.2 million for 2021, 2020 and 2019, respectively.

We accrued $43.6 million related to the dividends declared in 2021 that will be paid in 2022. At December 31, 2020 and 2019, we had accrued dividends of $20.4 million and $20.0 million which were paid in 2021 and 2020, respectively.

We had non-cash investing and financing transactions related to right-of-use assets obtained in exchange for lease obligations assets under finance leases in 2021 of $8.9 million. Non-cash investing and financing transactions related to assets acquired under capital leases were $36.4 million and $88.2 million for 2020 and 2019, respectively.

Depreciation, depletion and amortization includes $811.8 million, $846.4 million and $877.6 million related to depreciation and depletion of property, plant and equipment, and $1.1 million, $1.2 million and $5.1 million related to amortization of intangible assets for 2021, 2020 and 2019, respectively.

8. INVESTMENTS IN NON-CONSOLIDATED COMPANIES

We have investments in various international and domestic entities and ventures. The equity method of accounting is applied to such investments when the ownership structure prevents us from exercising a controlling influence over operating and financial policies of the businesses but still allow us to have significant influence. Under this method, our equity in the net earnings or losses of the investments is reflected as equity in net earnings of non-consolidated companies on our Consolidated Statements of Earnings. The effects of material intercompany transactions with these equity method investments are eliminated, including the gross profit on sales to and purchases from our equity-method investments which is deferred until the time of sale to the final third-party customer. The cash flow presentation of dividends received from equity method investees is determined by evaluation of the facts, circumstances and nature of the distribution.

A summary of our equity-method investments, which were in operation as of December 31, 2021, is as follows:

Entity	Economic Interest
Gulf Sulphur Services LTD., LLLP	50.0 %
River Bend Ag, LLC	50.0 %
IFC S.A.	45.0 %
MWSPC	25.0 %
Canpotex*	36.2 %

*In 2021 our realized percentage was 33% as a result of lower shipments due to the early closure of the K1 and K2 mine shafts at Esterhazy.

The summarized financial information shown below includes all non-consolidated companies carried on the equity method.

(in millions)	Years Ended December 31, 2021	2020	2019
Net sales	$ 4,758.2	$ 3,463.2	$ 4,058.5
Net earnings (loss)	70.1	(405.3)	(215.0)
Mosaic's share of equity in net earnings (loss)	7.8	(93.8)	(59.4)
Total assets	10,685.6	8,944.4	9,682.5
Total liabilities	8,864.7	7,184.9	7,512.7
Mosaic's share of equity in net assets	466.9	452.5	554.7

The difference between our share of equity in net assets as shown in the above table and the investment in non-consolidated companies as shown on the Consolidated Balance Sheets is mainly due to the July 1, 2016, equity contribution of $120 million we made to MWSPC, representing the remaining liability for our portion of mineral rights value transferred to MWSPC from Saudi Arabian Mining Company ("***Ma'aden***"). As of December 31, 2021, MWSPC represented 70% of the total assets and 65% of the total liabilities in the table above. MWSPC commenced ammonia operations in late 2016 and, on December 1, 2018, commenced commercial operations of its DAP plant, thereby bringing the entire project to the commercial production phase. In 2021, 2020 and 2019 our share of equity in net earnings (loss) was $5.0 million, $(97.3) million, and $(62.1) million, respectively.

MWSPC owns and operates a mine and two chemical complexes that produce phosphate fertilizers and other downstream phosphates products in the Kingdom of Saudi Arabia. The cost to develop and construct the integrated phosphate production facilities (the "***Project***") was approximately $8.0 billion, which has been funded primarily through investments by us, Ma'aden and SABIC (together, the "***Project Investors***"), and through borrowing arrangements and other external project financing facilities ("***Funding Facilities***"). The production facilities are expected to have a capacity of approximately 3.0 million tonnes of finished product per year when fully operational. We market approximately 25% of the phosphate production of the joint venture.

On June 30, 2014, MWSPC entered into Funding Facilities with a consortium of 20 financial institutions for a total amount of approximately $5.0 billion. Also on June 30, 2014, in support of the Funding Facilities, we, together with Ma'aden and SABIC, agreed to provide our respective proportionate shares of the funding necessary for MWSPC by:

a. Contributing equity or making shareholder subordinated loans of up to $2.4 billion to fund project costs to complete and commission the Project (the "***Equity Commitments***").
b. Through the earlier of Project completion or June 30, 2020, contributing equity, making shareholder subordinated loans or providing bank subordinated loans, to fund cost overruns on the Project (the "***Additional Cost Overrun Commitment***").
c. Through the earlier of Project completion or June 30, 2020, contributing equity, making shareholder loans or providing bank subordinated loans to fund scheduled debt service (excluding accelerated amounts) payable under the Funding Facilities and certain other amounts (such commitment, the "***DSU Commitment***" and such scheduled debt service and other amounts, "***Scheduled Debt Service***").
d. From the earlier of the Project completion date or June 30, 2020, to the extent there is a shortfall in the amounts available to pay Scheduled Debt Service, depositing for the payment of Scheduled Debt Service an amount up to the respective amount of certain shareholder tax amounts, and severance fees under MWSPC's mining license, paid within the prior 36 months by MWSPC on behalf of the Project Investors, if any.

In January 2016, MWSPC received approval from the Saudi Industrial Development Fund ("***SIDF***") for loans in the total amount of approximately $1.1 billion for the Project, subject to the finalization of definitive agreements. In 2017, MWSPC entered into definitive agreements with SIDF to draw up to $560 million from the total SIDF-approved amount (the "***SIDF Loans***"). In September of 2018, we received communication that SIDF agreed to waive Mosaic's parent guarantee. MWSPC received approval to access the remaining SIDF facility of $506 million which was subsequently drawn in December 2018.

On June 20, 2020, MWSPC refinanced its commercial loans while retaining the SIDF loans. The refinancing extended debt repayment to 2037 and deferred principal payments until June 30, 2022. The refinancing removes recourse to Mosaic by all lenders to MWSPC (DSU Commitment and Scheduled Debt Service). Mosaic's contractual commitment to make future cash contributions to MWSPC was also eliminated.

As of December 31, 2021, our cash investment was $770 million. We did not make any contributions in 2021 and do not expect future contributions will be needed.

Canpotex is a Saskatchewan export association used by two Canadian potash producers to market, sell and distribute Canadian potash products outside of Canada and the U.S. to unrelated third party customers at market prices. It operates as a break-even entity. We have concluded that the sales to Canpotex are not at arm's-length, due to the unique pricing and payment structure and financial obligations of the shareholders. Therefore, the full profit on sales to Canpotex are eliminated until Canpotex no longer has control of the related inventory and has sold it to an unrelated third party customer. We eliminate the intra-entity profit with Canpotex at the end of each reporting period and present that profit elimination by reversing revenue and cost of goods sold for the inventory still remaining at Canpotex. Any equity earnings or loss, which have historically been insignificant, are recorded in the equity in net earnings or loss line within the Consolidated Statement of Earnings.

9. GOODWILL

Goodwill is carried at cost, not amortized, and represents the excess of the purchase price and related costs over the fair value assigned to the net identifiable assets of a business acquired. We test goodwill for impairment on a quantitative basis at the reporting unit level on an annual basis or upon the occurrence of events that may indicate possible impairment. Impairment is measured as the excess carrying value over the fair value of goodwill.

The changes in the carrying amount of goodwill, by reporting unit, as of December 31, 2021 and 2020, are as follows:

(in millions)	Potash	Mosaic Fertilizantes	Corporate, Eliminations and Other	Total
Balance as of December 31, 2019	$ 1,039.8	$ 105.0	$ 12.1	$ 1,156.9
Foreign currency translation	23.4	(7.3)	—	16.1
Balance as of December 31, 2020	$ 1,063.2	$ 97.7	$ 12.1	$ 1,173.0
Foreign currency translation	1.0	(1.8)	—	(0.8)
Balance as of December 31, 2021	$ 1,064.2	$ 95.9	$ 12.1	$ 1,172.2

As of October 31, 2021, we performed our annual quantitative assessment. In performing our assessment, we estimated the fair value of each of our reporting units using the income approach, also known as the discounted cash flow ("***DCF***") method. The income approach utilized the present value of cash flows to estimate fair value. The future cash flows for our reporting units were projected based on our estimates, at that time, for revenue, operating income and other factors (such as working capital and capital expenditures for each reporting unit). To determine if the fair value of each of our reporting units with goodwill exceeded its carrying value, we assumed sales volume growth rates based on our long-term expectations, our internal selling prices and projected raw material prices for years one through five, which were anchored in projections from CRU International Limited ("***CRU***"), an independent third party data source. Selling prices and raw material prices for years six and beyond were based on anticipated market growth and long-term CRU outlooks. The discount rates used in our DCF method were based on a weighted-average cost of capital ("***WACC***"), determined from relevant market comparisons. A terminal value growth rate of 2% was applied to all years thereafter for the projected period and reflected our estimate of stable growth. We then calculated a present value of the respective cash flows for each reporting unit to arrive at an estimate of fair value under the income approach. Finally, we compared our estimates of fair values for our reporting units, to our October 31, 2021 total public market capitalization, based on our common stock price at that date.

In making this assessment, we considered, among other things, expectations of projected net sales and cash flows, assumptions impacting the WACC, changes in our stock price and changes in the carrying values of our reporting units with goodwill. We also considered overall business conditions.

The Potash, Mosaic Fertilizantes and Corporate, Eliminations and Other reporting units were evaluated and not considered at risk of goodwill impairment at October 31, 2021.

As of December 31, 2021, $3.0 million of goodwill was tax deductible.

For the year ending December 31, 2019, we recognized a goodwill impairment charge of $588.6 million in our Phosphates reporting unit as we concluded that the carrying value of this reporting unit was in excess of its fair value due to a reduction in our long-range forecast, primarily related to changes in projected selling prices and raw material prices.

10. FINANCING ARRANGEMENTS

Mosaic Credit Facility

On August 19, 2021, we entered into a new committed unsecured five-year credit facility of up to $2.5 billion (the "***Mosaic Credit Facility***"), comprised of a $2.5 billion revolving facility, with a maturity date of August 19, 2026, which is intended to serve as our primary senior unsecured bank credit facility. The Mosaic Credit Facility increased and extended our prior unsecured revolving credit facility of up to $2.2 billion (the "***Prior Credit Facility***"), maturing on November 18, 2022.

The Mosaic Credit Facility has cross-default provisions that, in general, provide that a failure to pay principal or interest under, or any other amount payable under, any indebtedness with outstanding principal amount of $100 million or more, or breach or default under such indebtedness that permits the holders thereof to accelerate the maturity thereof, will result in a cross-default.

The Mosaic Credit Facility requires Mosaic to maintain certain financial ratios, including a ratio of Consolidated Indebtedness, which has been redefined to exclude unrestricted cash and cash equivalents, to Consolidated Capitalization Ratio (as defined) of no greater than 0.65 to 1.0 as well as a minimum Interest Coverage Ratio (as defined) of not less than 3.0 to 1.0. We were in compliance with these ratios as of December 31, 2021.

The Mosaic Credit Facility also contains other events of default and covenants that limit various matters. These provisions include limitations on indebtedness, liens, investments and acquisitions (other than capital expenditures), certain mergers, certain sales of assets and other matters customary for credit facilities of this nature.

As of December 31, 2021, we had outstanding letters of credit that utilized a portion of the amount available for revolving loans under the Mosaic Credit Facility of $10.9 million. At December 31, 2020, we had outstanding letters of credit of $12.4 million. The net available borrowings for revolving loans under the Mosaic Credit Facility were approximately $2.49 billion as of December 31, 2021. Unused commitment fees accrued at an average annual rate of 0.15% under the new Mosaic Credit Facility during 2021, decreasing from the average annual rate of 0.40% under the Prior Credit Facility. Unused commitment fees generated expenses of $7.0 million during 2021. As of December 2020 and 2019, unused commitment fees accrued at an average rate of 0.40% and 0.20%, generating expenses of $6.0 million and $4.0 million.

Short-Term Debt

Short-term debt consists of the revolving credit facility under the Mosaic Credit Facility, under which there were no borrowings as of December 31, 2021, working capital financing arrangements and various other short-term borrowings related to our international operations in India, China and Brazil. These other short-term borrowings outstanding were $302.8 million and $0.1 million as of December 31, 2021 and 2020, respectively.

On January 7, 2020, we entered into an inventory financing arrangement to sell up to $400 million of certain inventory for cash and subsequently to repurchase the inventory at an agreed upon price and time in the future, not to exceed 180 days. Under the terms of the agreement, we may borrow up to 90% of the value of the inventory. It is later repurchased by Mosaic at the original sale price plus interest and any transaction costs. As of December 31, 2021, we had sold $302.7 million of inventory under this arrangement. Subsequent to year-end in February 2022, the borrowing capacity under this agreement was increased to $625.0 million.

We have a Receivable Purchasing Agreement ("***RPA***"), with a bank whereby, from time-to-time, we sell certain receivables. The purchase price of the receivable sold under the RPA is the face value of the receivable less an agreed upon discount. In January 2021, we entered into a First Amendment to the RPA. This amendment made certain adjustments so that the receivables sold under the RPA are accounted for as a true sale. Upon sale, these receivables are removed from the Consolidated Balance Sheets. Cash received is presented as cash provided by operating activities in the Consolidated Statements of Cash Flows. Prior to the amendment, we recorded the purchase price as short-term debt, and recognized interest expense by accreting the liability through the due date of the underlying receivables. Subsequent to year-end in February 2022, the RPA was amended to increase the borrowing capacity under the agreement from $250 million to $400 million.

The Company sold approximately $589.7 million and $302.0 million as of December 31, 2021 and 2020, respectively, of accounts receivable under this arrangement. Discounts on sold receivables were not material for any period presented. Following the sale to the bank, we continue to service the collection of the receivable on behalf of the bank without further consideration. As of December 31, 2021, $81.1 million had been collected but not yet remitted to the bank. This amount is classified in accrued liabilities on the Consolidated Balance Sheets. Cash collected and remitted are included in financing activities in the Consolidated Statements of Cash Flows.

We had additional outstanding bilateral letters of credit of $54.7 million as of December 31, 2021, which includes $50.0 million as required by the 2015 Consent Decrees as described further in Note 13 of our Consolidated Financial Statements.

Long-Term Debt, including Current Maturities

On November 13, 2017, we issued new senior notes consisting of $550 million aggregate principal amount of 3.250% senior notes due 2022 and $700 million aggregate principal amount of 4.050% senior notes due 2027 (collectively, the "***Senior Notes of 2017***").

We have additional senior notes outstanding, consisting of $900 million aggregate principal amount of 4.25% senior notes due 2023, $500 million aggregate principal amount of 5.45% senior notes due 2033 and $600 million aggregate principal amount of 5.625% senior notes due 2043 (collectively, the "***Senior Notes of 2013***"); and $300 million aggregate principal amount of 4.875% senior notes due 2041 (collectively, the "***Senior Notes of 2011***"). In 2021, we prepaid the outstanding balance of $450 million on our 3.75% senior notes, due November 15, 2021, without premium or penalty.

The Senior Notes of 2011, the Senior Notes of 2013 and the Senior Notes of 2017 are Mosaic's senior unsecured obligations and rank equally in right of payment with Mosaic's existing and future senior unsecured indebtedness. The indenture governing these notes contains restrictive covenants limiting debt secured by liens, sale and leaseback transactions and mergers, consolidations and sales of substantially all assets, as well as other events of default.

A debenture issued by Mosaic Global Holdings, Inc., one of our consolidated subsidiaries, due in 2028 (the "***2028 Debenture***"), is outstanding as of December 31, 2021, with a balance of $147.1 million. The indenture governing the 2028 Debenture also contain restrictive covenants limiting debt secured by liens, sale and leaseback transactions and mergers, consolidations and sales of substantially all assets, as well as events of default. The obligations under the 2028 Debenture are guaranteed by the Company and several of its subsidiaries.

Long-term debt primarily consists of unsecured notes, term loans, finance leases, unsecured debentures and secured notes. Long-term debt as of December 31, 2021 and 2020, respectively, consisted of the following:

(in millions)	December 31, 2021 Stated Interest Rate	December 31, 2021 Effective Interest Rate	Maturity Date	December 31, 2021 Stated Value	Combination Fair Market Value Adjustment	Discount on Notes Issuance	December 31, 2021 Carrying Value	December 31, 2020 Stated Value	Combination Fair Market Value Adjustment	Discount on Notes Issuance	December 31, 2020 Carrying Value
Unsecured notes	3.25% - 5.63%	5.18%	2022-2043	$ 3,550.0	$ —	$ (6.6)	$ 3,543.4	$ 4,000.0	$ —	$ (5.3)	$ 3,994.7
Unsecured debentures	7.30%	7.19%	2028	147.1	0.7	—	147.8	147.1	0.9	—	148.0
Finance leases	0.60% - 19.72%	2.39%	2022-2030	213.0	—	—	213.0	344.5	—	—	344.5
Other[a]	6.53% - 8.00%	4.08%	2022-2026	64.9	9.7	—	74.6	78.8	12.0	—	90.8
Total long-term debt				3,975.0	10.4	(6.6)	3,978.8	4,570.4	12.9	(5.3)	4,578.0
Less current portion				594.8	2.3	(0.5)	596.6	502.9	2.3	(1.0)	504.2
Total long-term debt, less current maturities				$ 3,380.2	$ 8.1	$ (6.1)	$ 3,382.2	$ 4,067.5	$ 10.6	$ (4.3)	$ 4,073.8

(a) Includes deferred financing fees related to our long term debt.

Scheduled maturities of long-term debt are as follows for the periods ending December 31:

	(in millions)
2022	$ 596.6
2023	996.2
2024	103.1
2025	15.7
2026	15.7
Thereafter	2,251.5
Total	$ 3,978.8

Structured Accounts Payable Arrangements

In Brazil, we finance some of our potash-based fertilizer, sulfur, ammonia and other raw material product purchases through third-party contractual arrangements. These arrangements provide that the third-party intermediary advance the amount of the scheduled payment to the vendor, less an appropriate discount, at a scheduled payment date and Mosaic makes payment to the third-party intermediary at a later date, stipulated in accordance with the commercial terms negotiated. At December 31, 2021 and 2020, these structured accounts payable arrangements were $743.7 million and $640.0 million, respectively.

11. MARKETABLE SECURITIES HELD IN TRUSTS

In August 2016, Mosaic deposited $630 million into two trust funds (together, the "***RCRA Trusts***") created to provide additional financial assurance in the form of cash for the estimated costs ("***Gypstack Closure Costs***") of closure and long-term care of our Florida and Louisiana phosphogypsum management systems ("***Gypstacks***"), as described further in Note 13 of our Notes to Consolidated Financial Statements. Our actual Gypstack Closure Costs are generally expected to be paid by us in the normal course of our Phosphates business; however, funds held in each of the RCRA Trusts can be drawn by the applicable governmental authority in the event we cannot perform our closure and long-term care obligations. When our estimated Gypstack Closure Costs with respect to the facilities associated with a RCRA Trust are sufficiently lower than the amount on deposit in that RCRA Trust, we have the right to request that the excess funds be released to us. The same is true for the RCRA Trust balance remaining after the completion of our obligations, which will be performed over a period that may not end until three decades or more after a Gypstack has been closed. The investments held by the RCRA Trusts are managed by independent investment managers with discretion to buy, sell, and invest pursuant to the objectives and standards set forth in the related trust agreements. Amounts reserved to be held or held in the RCRA Trusts (including losses or reinvested earnings) are included in other assets on our Consolidated Balance Sheets.

The RCRA Trusts hold investments, which are restricted from our general use, in marketable debt securities classified as available-for-sale and are carried at fair value. As a result, unrealized gains and losses are included in other comprehensive income until realized, unless it is determined that the entire unamortized cost basis of the investment is not expected to be recovered. A credit loss would then be recognized in operations for the amount of the expected credit loss. As of December 31, 2021, we expect to recover our amortized cost on all available-for-sale securities and have not established an allowance for credit loss..

We review the fair value hierarchy classification on a quarterly basis. Changes in the ability to observe valuation inputs may result in a reclassification of levels for certain securities within the fair value hierarchy. We determine the fair market values of our available-for-sale securities and certain other assets based on the fair value hierarchy described below:

Level 1: Values based on unadjusted quoted prices in active markets that are accessible at the measurement date for identical assets or liabilities.

Level 2: Values based on quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, or model-based valuation techniques for which all significant assumptions are observable in the market.

Level 3: Values generated from model-based techniques that use significant assumptions not observable in the market. These unobservable assumptions reflect our own estimates of assumptions that market participants would use in pricing

the asset or liability. Valuation techniques include use of option pricing models, discounted cash flow models and similar techniques.

The estimated fair value of the investments in the RCRA Trusts as of December 31, 2021 and December 31, 2020 are as follows:

	December 31, 2021			
(in millions)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Level 1				
Cash and cash equivalents	$ 8.1	$ —	$ —	$ 8.1
Level 2				
Corporate debt securities	198.8	5.6	(0.9)	203.5
Municipal bonds	198.1	6.5	(0.5)	204.1
U.S. government bonds	305.3	—	(6.1)	299.2
Total	$ 710.3	$ 12.1	$ (7.5)	$ 714.9

	December 31, 2020			
(in millions)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Level 1				
Cash and cash equivalents	$ 11.8	$ —	$ —	$ 11.8
Level 2				
Corporate debt securities	193.3	14.0	—	207.3
Municipal bonds	190.5	8.8	(0.3)	199.0
U.S. government bonds	300.7	4.7	(0.1)	305.3
Total	$ 696.3	$ 27.5	$ (0.4)	$ 723.4

The following tables show gross unrealized losses and fair values of the RCRA Trusts' available-for-sale securities that have been in a continuous unrealized loss position for which an allowance for credit losses has not been recorded as of December 31, 2021 and December 31, 2020.

	December 31, 2021		December 31, 2020	
Securities that have been in a continuous loss position for less than 12 months *(in millions)*:	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate debt securities	$ 67.1	$ (0.8)	$ 1.5	$ —
Municipal bonds	39.9	(0.4)	16.0	(0.2)
U.S. government bonds	152.2	(2.5)	120.3	(0.1)
Total	$ 259.2	$ (3.7)	$ 137.8	$ (0.3)

	December 31, 2021		December 31, 2020	
Securities that have been in a continuous loss position for more than 12 months *(in millions)*:	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate debt securities	$ 3.6	$ (0.1)	$ —	$ —
Municipal bonds	4.5	(0.1)	4.6	(0.1)
U.S. government bonds	143.4	(3.6)	—	—
Total	$ 151.5	$ (3.8)	$ 4.6	$ (0.1)

The following table summarizes the balance by contractual maturity of the available-for-sale debt securities invested by the RCRA Trusts as of December 31, 2021. Actual maturities may differ from contractual maturities because the issuers of the securities may have the right to prepay obligations before the underlying contracts mature.

(in millions)	December 31, 2021
Due in one year or less	$ 26.4
Due after one year through five years	351.9
Due after five years through ten years	293.9
Due after ten years	34.6
Total debt securities	$ 706.8

For the year ended December 31, 2021, realized gains and (losses) were $5.8 million and $(3.4) million, respectively. For the year ended December 31, 2020, realized gains and (losses) were $17.7 million and $(1.5) million, respectively.

12. INCOME TAXES

In preparing our Consolidated Financial Statements, we utilize the asset and liability approach in accounting for income taxes. We recognize income taxes in each of the jurisdictions in which we have a presence. For each jurisdiction, we estimate the actual amount of income taxes currently payable or receivable, as well as deferred income tax assets and liabilities attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred income tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which these temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

The provision for income taxes for 2021, 2020 and 2019, consisted of the following:

	Years Ended December 31,		
(in millions)	2021	2020	2019
Current:			
Federal	$ (12.7)	$ (22.0)	$ (75.5)
State	5.6	1.3	(5.2)
Non-U.S.	386.9	114.4	119.1
Total current	379.8	93.7	38.4
Noncurrent:			
Federal	$ —	$ —	$ —
State	—	—	—
Non-U.S.	110.0	3.2	—
Total noncurrent	110.0	3.2	—
Deferred:			
Federal	$ 141.9	$ (66.7)	$ (194.8)
State	21.4	(12.9)	(6.7)
Non-U.S.	(55.4)	(595.8)	(61.6)
Total deferred	107.9	(675.4)	(263.1)
Provision for (benefit from) income taxes	$ 597.7	$ (578.5)	$ (224.7)

The components of earnings from consolidated companies before income taxes, and the effects of significant adjustments to tax computed at the federal statutory rate, were as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
U.S.earnings (loss)	$ 900.1	$ (449.0)	$ (1,096.2)
Non-U.S. earnings	1,324.7	629.9	(159.9)
Earnings (loss) from consolidated companies before income taxes	$ 2,224.8	$ 180.9	$ (1,256.1)
Computed tax at the U.S. federal statutory rate	21.0 %	21.0 %	21.0 %
State and local income taxes, net of federal income tax benefit	1.2 %	(7.0)%	2.6 %
Percentage depletion in excess of basis	(1.1)%	(10.3)%	2.5 %
Impact of non-U.S. earnings	6.3 %	42.1 %	5.3 %
Change in valuation allowance	(0.3)%	(330.0)%	(3.1)%
Phosphates goodwill impairment	— %	— %	(5.0)%
Non-U.S. incentives	(5.7)%	(35.6)%	— %
Other items (none in excess of 5% of computed tax)	5.5 %	— %	(5.4)%
Effective tax rate	26.9 %	(319.8)%	17.9 %

2021 Effective Tax Rate

In the year ended December 31, 2021, there were two items impacting the effective tax rate: 1) items attributable to ordinary business operations during the year, and 2) other items specific to the period, including the Esterhazy mine closure costs.

The tax impact of our ordinary business operations is affected by the mix of earnings across jurisdictions in which we operate, by a benefit associated with depletion, by a benefit associated with non-U.S. incentives, changes in valuation allowances and by the impact of certain entities being taxed in both their foreign jurisdiction and the U.S., including foreign tax credits for various taxes incurred.

Tax expense specific to the period included a net benefit of $0.6 million. The net expense relates to the following: $23.9 million related to true-up of estimates primarily related to our U.S. tax return and $20.4 million related to an increase in non-U.S. reserves. The tax expenses are partially offset by net tax benefits related to $43.7 million of Esterhazy mine closure costs and $1.2 million related to a benefit for withholding taxes related to undistributed earnings and other miscellaneous tax expenses.

2020 Effective Tax Rate

In the year ended December 31, 2020, there were two items impacting the effective tax rate: 1) items attributable to ordinary business operations during the year, and 2) other items specific to the period, including impacts recorded due to the Coronavirus Aid, Relief, and Economic Security Act (the *"**CARES Act**"*). The CARES Act provides various tax relief measures to taxpayers impacted by the coronavirus.

The tax impact of our ordinary business operations is affected by the mix of earnings across jurisdictions in which we operate, by a benefit associated with depletion, by a benefit associated with non-U.S. incentives, changes in valuation allowances and by the impact of certain entities being taxed in both their foreign jurisdiction and the U.S., including foreign tax credits for various taxes incurred.

Tax expense specific to the period included a net benefit of $609.0 million. The net benefit relates to the following: $582.6 million for changes to valuation allowances in the U.S. and foreign jurisdictions, $23.6 million related to certain provisions of the CARES Act, $5.5 million related to release of the sequestration on AMT and miscellaneous tax expense of $2.7 million. The change to the valuation allowance in Brazil related to the Acquired Business. As of December 31, 2020, the Acquired Business has achieved cumulative income and therefore we were able to rely on future forecasts of taxable income which support realization of its deferred tax assets.

2019 Effective Tax Rate

In the year ended December 31, 2019, there were two items impacting the effective tax rate: 1) items attributable to ordinary business operations during the year, and 2) other items specific to the period, including impacts recorded due to the U.S. Tax Cuts and Jobs Act (the *"**Act**"*).

The tax impact of our ordinary business operations is impacted by the mix of earnings across jurisdictions in which we operate, by a benefit associated with depletion, changes in valuation allowances and by the impact of certain entities being taxed in both their foreign jurisdiction and the U.S., including foreign tax credits for various taxes incurred.

Tax expense specific to the period included a benefit of $355.6 million. The benefit relates to various notable items, which resulted in the following tax benefits: $263.4 million related to the indefinite idling of the Colonsay mine, $81.0 million related to the Plant City closure costs, and $79.6 million related to the phosphates goodwill impairment. These tax benefits are partially offset by tax expense of: $21.2 million for changes in certain provisions of the Act, $15.9 million for valuation allowances in the U.S. and foreign jurisdictions, $14.0 million related to state tax rate changes, $12.5 million related to changes in estimates related to prior years (including changes in certain provisions of the Act), and miscellaneous tax expense of $4.8 million. The tax expense of $21.2 million related to certain provisions of the Act and is the reversal of the benefit recorded in December 31, 2018 that pertained to the one-time "deemed" repatriation.

Deferred Tax Liabilities and Assets

Significant components of our deferred tax liabilities and assets as of December 31 were as follows:

(in millions)	December 31, 2021	December 31, 2020
Deferred tax liabilities:		
Depreciation and amortization	$ 456.2	$ 232.5
Depletion	430.1	527.0
Partnership tax basis differences	66.3	69.0
Undistributed earnings of non-U.S. subsidiaries	—	3.8
Other liabilities	39.1	32.5
Total deferred tax liabilities	$ 991.7	$ 864.8
Deferred tax assets:		
Deferred revenue	$ —	$ 62.4
Capital loss carryforwards	—	0.1
Foreign tax credit carryforwards	775.1	628.6
Net operating loss carryforwards	232.3	321.8
Pension plans and other benefits	19.8	34.2
Asset retirement obligations	337.3	262.9
Disallowed interest expense under §163(j)	31.6	68.8
Other assets	351.2	287.6
Subtotal	1,747.3	1,666.4
Valuation allowance	774.7	683.0
Net deferred tax assets	972.6	983.4
Net deferred tax liabilities	$ (19.1)	$ 118.6

We have certain non-U.S. entities that are taxed in both their local jurisdiction and the U.S. As a result, we have deferred tax balances for both jurisdictions. As of December 31, 2021 and 2020, these non-U.S. deferred taxes are offset by approximately $185.1 million and $191.0 million, respectively, of anticipated foreign tax credits included within our depreciation and depletion components of deferred tax liabilities above. Due to the Act, we have recorded a valuation allowance against the anticipated foreign tax credits of $229.6 million and $235.5 million for December 31, 2021 and 2020, respectively.

Tax Carryforwards

As of December 31, 2021, we had estimated carryforwards for tax purposes as follows: net operating losses of $1.5 billion, foreign tax credits of $775.1 million and $3.9 million of non-U.S. business credits. These carryforward benefits may be subject to limitations imposed by the Internal Revenue Code, and in certain cases, provisions of foreign law. Approximately $507.6 million of our net operating loss carryforwards relate to Brazil and can be carried forward indefinitely but are limited to 30 percent of taxable income each year. The majority of the remaining net operating loss carryforwards relate to U.S. federal and certain U.S. states and can be carried forward for 20 years. Of the $775.1 million of foreign tax credits, approximately $33.3 million have an expiration date of 2023, approximately $332.7 million have an expiration date of 2026, approximately $20.2 million have an expiration date of 2029, and approximately $14.6 million have an expiration date of 2030. The realization of our foreign tax credit carryforwards is dependent on market conditions, tax law changes, and other business outcomes including our ability to generate certain types of taxable income in the future. Due to current business operations and future forecasts, the Company has determined that no valuation allowance is required on its general basket foreign tax credits. As a result of changes in U.S. tax law due to the Act, the Company valuation allowances recorded against its branch basket foreign tax credits of $364.7 million as of December 31, 2021.

As of December 31, 2021, we have not recognized a deferred tax liability for un-remitted earnings of approximately $2.3 billion from certain foreign operations because we believe our subsidiaries have invested the undistributed earnings indefinitely, or the earnings will be remitted in a tax-neutral transaction. It is not practicable for us to determine the amount of unrecognized deferred tax liability on these reinvested earnings. As part of the accounting for the Act, we recorded local country withholding taxes related to certain entities from which we began repatriating undistributed earnings and will continue to record local country withholding taxes, including foreign exchange impacts, on all future earnings.

Valuation Allowance

In assessing the need for a valuation allowance, we consider whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. We evaluate our ability to realize the tax benefits associated with deferred tax assets by analyzing the relative impact of all the available positive and negative evidence regarding our forecasted taxable income using both historical and projected future operating results, the reversal of existing taxable temporary differences, taxable income in prior carry-back years (if permitted) and the availability of tax planning strategies. The ultimate realization of deferred tax assets is dependent upon the generation of certain types of future taxable income during the periods in which those temporary differences become deductible. In making this assessment, we consider the scheduled reversal of deferred tax liabilities, our ability to carry back the deferred tax asset, projected future taxable income, and tax planning strategies. A valuation allowance will be recorded in each jurisdiction in which a deferred income tax asset is recorded when it is more likely than not that the deferred income tax asset will not be realized. Changes in deferred tax asset valuation allowances typically impact income tax expense.

For the year ended December 31, 2021, the valuation allowance increased by $91.7 million, of which a $111.2 million increase related to changes in the valuation allowance to U.S. branch foreign tax credits. These increases to the valuation allowance were partially offset by a decrease of $13.9 million related to changes in valuation allowances and currency translation in Brazil, $2.4 million decrease to net operating losses for certain U.S. states, and $3.4 million changes in valuation allowances in other foreign jurisdictions.

For the year ended December 31, 2020, the valuation allowance decreased by $774.1 million, of which a $763.5 million decrease related to changes in valuation allowances and currency translation in Brazil, $3.5 million related to net operating losses for certain U.S. states and $32.2 million related to our conclusion that we are more likely than not to use attributes at other foreign jurisdictions. These decreases to the valuation allowance were partially offset by the following increases: $24.1 million increase related to U.S. branch foreign tax credits and $0.9 million related to net operating losses in Peru.

For the year ended December 31, 2019, the valuation allowance decreased by $73.4 million, of which a $48.0 million decrease related to changes in valuation allowances and currency translation in Brazil, and a $49.8 million decrease related to U.S. branch foreign tax credits. These decreases to the valuation allowance were offset by the following increases: $6.8 million related to net operating losses for certain U.S. states, $8.3 million related to net operating losses in Peru, and $9.2 million related to our conclusion that we are not more likely than not to use attributes at other foreign jurisdictions.

Changes to our income tax valuation allowance were as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
Income tax valuation allowance, related to deferred income taxes			
Balance at beginning of period	$ 683.0	$ 1,457.10	$ 1,530.5
Charges or (reductions) to costs and expenses	91.7	(774.1)	(73.4)
Balance at end of period	$ 774.7	$ 683.0	$ 1,457.1

Uncertain Tax Positions

Accounting for uncertain income tax positions is determined by prescribing a minimum probability threshold that a tax position must meet before a financial statement benefit is recognized. This minimum threshold is that a tax position is more likely than not to be sustained upon examination by the applicable taxing authority, including resolution of any related appeals or litigation processes, based on the technical merits of the position. The tax benefit to be recognized is measured as the largest amount of benefit that is greater than a fifty percent likelihood of being realized upon ultimate settlement.

As of December 31, 2021, we had $124.6 million of gross uncertain tax positions. If recognized, the benefit to our effective tax rate in future periods would be approximately $48.0 million of that amount. During 2021, we recorded net increases in our uncertain tax positions of $87.7 million related to certain U.S. and non-U.S. tax matters, of which $3.0 million impacted the effective tax rate. This increase was offset by items not included in gross uncertain tax positions.

Based upon the information available as of December 31, 2021, we expect to reach an agreement on $96.5 million of the unrecognized tax benefits in the next twelve months. Any other possible changes cannot reasonably be estimated as of December 31, 2021.

A summary of gross unrecognized tax benefit activity is as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
Gross unrecognized tax benefits, beginning of period	$ 36.9	$ 39.5	$ 38.1
Gross increases:			
Prior period tax positions	84.7	—	—
Current period tax positions	3.0	2.8	5.1
Gross decreases:			
Prior period tax positions	—	(5.9)	(4.9)
Currency translation	—	0.5	1.2
Gross unrecognized tax benefits, end of period	$ 124.6	$ 36.9	$ 39.5

We recognize interest and penalties related to unrecognized tax benefits as a component of our income tax expense. Interest and penalties accrued in our Consolidated Balance Sheets as of December 31, 2021 and 2020 were $31.1 million and $9.0 million, respectively, and are included in other noncurrent liabilities in the Consolidated Balance Sheets.

Open Tax Periods

We operate in multiple tax jurisdictions, both within the U.S.and outside the U.S., and face audits from various tax authorities regarding transfer pricing, deductibility of certain expenses, and intercompany transactions, as well as other matters. With few exceptions, we are no longer subject to examination for tax years prior to 2012.

Mosaic is continually under audit by various tax authorities in the normal course of business. Such tax authorities may raise issues contrary to positions taken by the Company. If such positions are ultimately not sustained by the Company this could result in material assessments to the Company. The costs related to defending, if needed, such positions on appeal or in court may be material. The Company believes that any issues considered are properly accounted for.

We are currently under audit by the Canada Revenue Agency for the tax years ended May 31, 2012 through December 31, 2017. Based on the information available, we do not anticipate significant changes to our unrecognized tax benefits as a result of these examinations other than the amounts discussed above.

13. ASSET RETIREMENT OBLIGATIONS

We recognize our estimated asset retirement obligations ("***AROs***") in the period in which we have an existing legal obligation associated with the retirement of a tangible long-lived asset and the amount of the liability can be reasonably estimated. The ARO is recognized at fair value when the liability is incurred with a corresponding increase in the carrying amount of the related long lived asset. We depreciate the tangible asset over its estimated useful life. The liability is adjusted in subsequent periods through accretion expense which represents the increase in the present value of the liability due to the passage of time. Such depreciation and accretion expenses are included in cost of goods sold for operating facilities and other operating expense for indefinitely closed facilities.

Our legal obligations related to asset retirement require us to: (i) reclaim lands disturbed by mining as a condition to receive permits to mine phosphate ore reserves; (ii) treat low pH process water in Gypstacks to neutralize acidity; (iii) close and monitor Gypstacks at our Florida and Louisiana facilities at the end of their useful lives; (iv) remediate certain other conditional obligations; (v) remove all surface structures and equipment, plug and abandon mine shafts, contour and revegetate, as necessary, and monitor for five years after closing our Carlsbad, New Mexico facility; (vi) decommission facilities, manage tailings and execute site reclamation at our Saskatchewan potash mines at the end of their useful lives; (vii) de-commission mines in Brazil and Peru acquired as part of the acquisition (the "***Acquisition***") of Vale Fertilizantes S.A. (now known as Mosaic Fetilizantes P&K S.A. and (viii) de-commission plant sites and close Gypstacks in Brazil, also as part of the Acquisition. The estimated liability for these legal obligations is based on the estimated cost to satisfy the above obligations which is discounted using a credit-adjusted risk-free rate.

A reconciliation of our AROs is as follows:

(in millions)	Years Ended December 31, 2021	Years Ended December 31, 2020
AROs, beginning of period	$ 1,393.9	$ 1,315.2
Liabilities incurred	20.2	10.8
Liabilities settled	(163.1)	(125.1)
Accretion expense	71.9	68.0
Revisions in estimated cash flows	443.3	167.3
Foreign currency translation	(16.9)	(42.3)
AROs, end of period	1,749.3	1,393.9
Less current portion	222.4	190.2
Non-current portion of AROs	$ 1,526.9	$ 1,203.7

North America Gypstack Closure Costs

A majority of our ARO relates to Gypstack Closure Costs in Florida and Louisiana. For financial reporting purposes, we recognize our estimated Gypstack Closure Costs at their present value. This present value determined for financial reporting purposes is reflected on our Consolidated Balance Sheets in accrued liabilities and other noncurrent liabilities. As of December 31, 2021 and 2020, the present value of our Gypstack Closure Costs ARO reflected in our Consolidated Balance Sheet was approximately $883.2 million and $669.9 million, respectively.

As discussed below, we have arrangements to provide financial assurance for the estimated Gypstack Closure Costs associated with our facilities in Florida and Louisiana.

EPA RCRA Initiative. On September 30, 2015, we and our subsidiary, Mosaic Fertilizer, LLC ("***Mosaic Fertilizer***"), reached agreements with the U.S. Environmental Protection Agency ("***EPA***"), the U.S. Department of Justice ("***DOJ***"), the Florida Department of Environmental Protection ("***FDEP***") and the Louisiana Department of Environmental Quality on the terms of two consent decrees (collectively, the "***2015 Consent Decrees***") to resolve claims relating to our management of certain waste materials onsite at our Riverview, New Wales, Mulberry, Green Bay, South Pierce and Bartow fertilizer manufacturing facilities in Florida and our Faustina and Uncle Sam facilities in Louisiana. This followed a 2003 announcement by the EPA

Office of Enforcement and Compliance Assurance that it would be targeting facilities in mineral processing industries, including phosphoric acid producers, for a thorough review under the U.S. Resource Conservation and Recovery Act ("***RCRA***") and related state laws. As discussed below, a separate consent decree was previously entered into with EPA and the FDEP with respect to RCRA compliance at the Plant City, Florida phosphate concentrates facility (the "***Plant City Facility***") that we acquired as part of our acquisition (the "***CF Phosphate Assets Acquisition***") of the Florida phosphate assets and assumption of certain related liabilities of CF Industries, Inc. ("***CF***").

The remaining monetary obligations under the 2015 Consent Decrees include:

- Modification of certain operating practices and undertaking certain capital improvement projects over a period of several years that are expected to result in remaining capital expenditures likely to exceed $20 million in the aggregate.
- Provision of additional financial assurance for the estimated Gypstack Closure Costs for Gypstacks at the covered facilities. The RCRA Trusts are discussed in Note 11 to our Consolidated Financial Statements. In addition, we have agreed to guarantee the difference between the amounts held in each RCRA Trust (including any earnings) and the estimated closure and long-term care costs.

As of December 31, 2021, the undiscounted amount of our Gypstack Closure Costs ARO associated with the facilities covered by the 2015 Consent Decrees, determined using the assumptions used for financial reporting purposes, was approximately $1.8 billion, and the present value of our Gypstack Closure Costs ARO reflected in our Consolidated Balance Sheet for those facilities was approximately $603 million.

Plant City and Bonnie Facilities. As part of the CF Phosphate Assets Acquisition, we assumed certain AROs related to Gypstack Closure Costs at both the Plant City Facility and a closed Florida phosphate concentrates facility in Bartow, Florida (the "***Bonnie Facility***") that we acquired. Associated with these assets are two related financial assurance arrangements for which we became responsible and that provided sources of funds for the estimated Gypstack Closure Costs for these facilities. Pursuant to federal or state laws, the applicable government entities are permitted to draw against such amounts in the event we cannot perform such closure activities. One of the financial assurance arrangements was initially a trust (the "***Plant City Trust***") established to meet the requirements under a consent decree with the EPA and the FDEP with respect to RCRA compliance at Plant City. The Plant City Trust also satisfied Florida financial assurance requirements at that site. Beginning in September 2016, as a substitute for the financial assurance provided through the Plant City Trust, we have provided financial assurance for the Plant City Facility in the form of a surety bond (the "***Plant City Bond***"). The amount of the Plant City Bond is $249.7 million, which reflects our closure cost estimates as of December 31, 2021. The other financial assurance arrangement was also a trust fund (the "***Bonnie Facility Trust***") established to meet the requirements under Florida financial assurance regulations that apply to the Bonnie Facility. In July 2018, we received $21.0 million from the Bonnie Facility Trust by substituting for the trust fund a financial test mechanism ("***Bonnie Financial Test***") supported by a corporate guarantee as allowed by state regulations. Both financial assurance funding obligations require estimates of future expenditures that could be impacted by refinements in scope, technological developments, new information, cost inflation, changes in regulations, discount rates and the timing of activities. Under our current approach to satisfying applicable requirements, additional financial assurance would be required in the future if increases in cost estimates exceed the face amount of the Plant City Bond or the amount supported by the Bonnie Financial Test.

As of December 31, 2021 and 2020, the aggregate amounts of AROs associated with the combined Plant City Facility and Bonnie Facility Gypstack Closure Costs included in our consolidated balance sheet were $262.9 million and $251.8 million, respectively. The aggregate amount represented by the Plant City Bond exceeds the present value of the aggregate amount of ARO associated with that facility. This is because the amount of financial assurance we are required to provide represents the aggregate undiscounted estimated amount to be paid by us in the normal course of our Phosphates business over a period that may not end until three decades or more after the Gypstack has been closed, whereas the ARO included in our Consolidated Balance Sheet reflects the discounted present value of those estimated amounts.

14. DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES

We periodically enter into derivatives to mitigate our exposure to foreign currency risks, interest rate movements and the effects of changing commodity prices. We record all derivatives on the Consolidated Balance Sheets at fair value. The fair value of these instruments is determined by using quoted market prices, third-party comparables, or internal estimates. We net our derivative asset and liability positions when we have a master netting arrangement in place. Changes in the fair value of the foreign currency, commodity and freight derivatives are immediately recognized in earnings. As of December 31, 2021

and 2020, the gross asset position of our derivative instruments was $45.3 million and $65.3 million, respectively, and the gross liability position of our liability instruments was $45.5 million and $49.9 million, respectively.

We do not apply hedge accounting treatments to our foreign currency exchange contracts, commodities contracts, or freight contracts. Unrealized gains and (losses) on foreign currency exchange contracts used to hedge cash flows related to the production of our products are included in cost of goods sold in the Consolidated Statements of Earnings. Unrealized gains and (losses) on commodities contracts and certain forward freight agreements are also recorded in cost of goods sold in the Consolidated Statements of Earnings. Unrealized gains or (losses) on foreign currency exchange contracts used to hedge cash flows that are not related to the production of our products are included in the foreign currency transaction gain/(loss) caption in the Consolidated Statements of Earnings.

From time to time, we enter into fixed-to-floating interest rate contracts. We apply fair value hedge accounting treatment to these contracts. Under these arrangements, we agree to exchange, at specified intervals, the difference between fixed and floating interest amounts calculated by reference to an agreed-upon notional principal amount. The mark-to-market of these fair value hedges is recorded as gains or losses in interest expense. We had no fixed-to-floating interest rate swap agreements in effect as of December 31, 2021 and 2020.

The following is the total absolute notional volume associated with our outstanding derivative instruments:

(in millions of Units)

Instrument	Derivative Category	Unit of Measure	December 31, 2021	December 31, 2020
Foreign currency derivatives	Foreign Currency	US Dollars	3,185.8	2,912.3
Natural gas derivatives	Commodity	MM Btu	23.6	27.3

Credit-Risk-Related Contingent Features

Certain of our derivative instruments contain provisions that are governed by International Swap and Derivatives Association agreements with the counterparties. These agreements contain provisions that allow us to settle for the net amount between payments and receipts, and also state that if our debt were to be rated below investment grade, certain counterparties to the derivative instruments could request full collateralization on derivative instruments in net liability positions. The aggregate fair value of all derivative instruments with credit-risk-related contingent features that were in a liability position as of December 31, 2021 and 2020 was $8.6 million and $11.3 million, respectively. We have no cash collateral posted in association with these contracts. If the credit-risk-related contingent features underlying these agreements were triggered on December 31, 2021, we would have been required to post an additional $4.5 million of collateral assets, which are either cash or U.S. Treasury instruments, to the counterparties.

Counterparty Credit Risk

We enter into foreign exchange, certain commodity and interest rate derivatives, primarily with a diversified group of highly rated counterparties. We continually monitor our positions and the credit ratings of the counterparties involved and limit the amount of credit exposure to any one party. While we may be exposed to potential losses due to the credit risk of non-performance by these counterparties, material losses are not anticipated. We closely monitor the credit risk associated with our counterparties and customers and to date have not experienced material losses.

15. FAIR VALUE MEASUREMENTS

Following is a summary of the valuation techniques for assets and liabilities recorded in our Consolidated Balance Sheets at fair value on a recurring basis:

Foreign Currency Derivatives–The foreign currency derivative instruments that we currently use are forward contracts and zero-cost collars, which typically expire within eighteen months. Derivative instruments that we used to hedge anticipated cash flows related to our Esterhazy K3 expansion project expire within a period of thirty-six months. Most of the valuations are adjusted by a forward yield curve or interest rates. In such cases, these derivative contracts are classified within Level 2. Some valuations are based on exchange-quoted prices, which are classified as Level 1. Changes in the fair market values of these contracts are recognized in the Consolidated Financial Statements as a component of cost of goods sold in our Corporate, Eliminations and Other segment or foreign currency transaction (gain) loss. As of December 31, 2021, and 2020, the gross asset position of our foreign currency derivative instruments was $27.0 million and $58.6 million,

respectively, and the gross liability position of our foreign currency derivative instruments was $45.4 million and $48.7 million, respectively.

Commodity Derivatives–The commodity contracts primarily relate to natural gas. The commodity derivative instruments that we currently use are forward purchase contracts, swaps and three-way collars. The natural gas contracts settle using NYMEX futures or AECO price indexes, which represent fair value at any given time. The contracts' maturities and settlements are scheduled for future months and settlements are scheduled to coincide with anticipated gas purchases during those future periods. Quoted market prices from NYMEX and AECO are used to determine the fair value of these instruments. These market prices are adjusted by a forward yield curve and are classified within Level 2. Changes in the fair market values of these contracts are recognized in the Consolidated Financial Statements as a component of cost of goods sold in our Corporate, Eliminations and Other segment. As of December 31, 2021 and 2020, the gross asset position of our commodity derivative instruments was $18.3 million and $6.7 million, respectively, and the gross liability position of our commodity derivative instruments was $0.1 million and $1.2 million, respectively.

Interest Rate Derivatives–We manage interest expense through interest rate contracts to convert a portion of our fixed-rate debt into floating-rate debt. From time to time, we also enter into interest rate swap agreements to hedge our exposure to changes in future interest rates related to anticipated debt issuances. Valuations are based on external pricing sources and are classified as Level 2. Changes in the fair market values of these contracts are recognized in the Condensed Consolidated Financial Statements as a component of interest expense. In April 2020, we terminated our outstanding interest rate swap contracts which resulted in an immaterial impact to our Condensed Consolidated Statement of Earnings (Loss).

Financial Instruments

The carrying amounts and estimated fair values of our financial instruments are as follows:

	December 31,			
	2021		2020	
(in millions)	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Cash and cash equivalents	$ 769.5	$ 769.5	$ 574.0	$ 574.0
Accounts receivable	1,531.9	1,531.9	881.1	881.1
Accounts payable	1,260.7	1,260.7	769.1	769.1
Structured accounts payable arrangements	743.7	743.7	640.0	640.0
Short-term debt	302.8	302.8	0.1	0.1
Long-term debt, including current portion	3,978.8	4,516.1	4,578.0	5,172.1

For cash and cash equivalents, accounts receivable, net, accounts payable, structured accounts payable arrangements and short-term debt, the carrying amount approximates fair value because of the short-term maturity of those instruments. The fair value of long-term debt, including the current portion, is estimated using quoted market prices for the publicly registered notes and debentures, classified as Level 1 and Level 2, respectively, within the fair value hierarchy, depending on the market liquidity of the debt. For information regarding the fair value of our marketable securities held in trusts, see Note 11 of our Notes to Consolidated Financial Statements.

16. GUARANTEES AND INDEMNITIES

We enter into various contracts that include indemnification and guarantee provisions as a routine part of our business activities. Examples of these contracts include asset purchase and sale agreements, surety bonds, financial assurances to regulatory agencies in connection with reclamation and closure obligations, commodity sale and purchase agreements, and other types of contractual agreements with vendors and other third parties. These agreements indemnify counterparties for matters such as reclamation and closure obligations, tax liabilities, environmental liabilities, litigation and other matters, as well as breaches by Mosaic of representations, warranties and covenants set forth in these agreements. In many cases, we are essentially guaranteeing our own performance, in which case the guarantees do not fall within the scope of the accounting and disclosures requirements under U.S. GAAP.

Our more significant guarantees and indemnities are as follows:

Guarantees to Brazilian Financial Parties. From time to time, we issue guarantees to financial parties in Brazil for certain amounts owed the institutions by certain customers of Mosaic. The guarantees are for all or part of the customers' obligations. In the event that the customers default on their payments to the institutions and we would be required to perform under the guarantees, we have in most instances obtained collateral from the customers. We monitor the nonperformance risk of the counterparties and have noted no material concerns regarding their ability to perform on their obligations. The guarantees generally have a one-year term, but may extend up to two years or longer depending on the crop cycle, and we expect to renew many of these guarantees on a rolling twelve-month basis. As of December 31, 2021, we have estimated the maximum potential future payment under the guarantees to be $67.7 million. The fair value of our guarantees is immaterial to the Consolidated Financial Statements as of December 31, 2021 and 2020.

Other Indemnities. Our maximum potential exposure under other indemnification arrangements can range from a specified dollar amount to an unlimited amount, depending on the nature of the transaction. Total maximum potential exposure under these indemnification arrangements is not estimable due to uncertainty as to whether claims will be made or how they will be resolved. We do not believe that we will be required to make any material payments under these indemnity provisions.

Because many of the guarantees and indemnities we issue to third parties do not limit the amount or duration of our obligations to perform under them, there exists a risk that we may have obligations in excess of the amounts described above. For those guarantees and indemnities that do not limit our liability exposure, we may not be able to estimate what our liability would be until a claim is made for payment or performance due to the contingent nature of these arrangements.

17. PENSION PLANS AND OTHER BENEFITS

We sponsor pension and postretirement benefits through a variety of plans including defined benefit plans, defined contribution plans and postretirement benefit plans in North America and certain of our international locations. We reserve the right to amend, modify or terminate the Mosaic sponsored plans at any time, subject to provisions of the Employee Retirement Income Security Act of 1974 ("***ERISA***"), prior agreements and our collective bargaining agreements.

Defined Benefit

We sponsor various defined benefit pension plans in the U.S. and in Canada. Benefits are based on different combinations of years of service and compensation levels, depending on the plan. Generally, contributions to the U.S. plans are made to meet minimum funding requirements of ERISA, while contributions to Canadian plans are made in accordance with Pension Benefits Acts instituted by the provinces of Saskatchewan and Ontario. Certain employees in the U.S. and Canada, whose pension benefits exceed Internal Revenue Code and Canada Revenue Agency limitations, respectively, are covered by supplementary non-qualified, unfunded pension plans.

We sponsor various defined benefit pension plans in Brazil, and we acquired through the Acquisition multi-employer pension plans for certain of our Brazil associates. All our pension plans are governed by the Brazilian pension plans regulatory agency, National Superintendence of Supplementary Pensions. Our Brazil plans are not individually significant to the Company's consolidated financial statements after factoring in the multi-employer pension plan indemnification that we acquired through the Acquisition. We made contributions to these plans, net of indemnification, of $0.2 million and $0.4 million during the years ended December 31, 2021 and 2020, respectively.

Accounting for Pension Plans

The year-end status of the North American pension plans was as follows:

(in millions)	Pension Plans Years Ended December 31, 2021	2020
Change in projected benefit obligation:		
Benefit obligation at beginning of period	$ 796.6	$ 755.5
Service cost	4.4	4.2
Interest cost	14.6	20.9
Actuarial loss	(31.1)	49.8
Currency fluctuations	0.3	10.9
Benefits paid	(45.2)	(44.7)
Projected benefit obligation at end of period	$ 739.6	$ 796.6
Change in plan assets:		
Fair value at beginning of period	$ 845.2	$ 790.6
Currency fluctuations	0.4	11.0
Actual return	1.1	82.4
Company contribution	5.5	5.9
Benefits paid	(45.2)	(44.7)
Fair value at end of period	$ 807.0	$ 845.2
Funded status of the plans as of the end of period	$ 67.4	$ 48.6
Amounts recognized in the consolidated balance sheets:		
Noncurrent assets	$ 78.1	$ 59.7
Current liabilities	(0.9)	(0.6)
Noncurrent liabilities	(9.8)	(10.5)
Amounts recognized in accumulated other comprehensive (income) loss		
Prior service costs	$ 13.7	$ 15.8
Actuarial loss	83.1	88.7

The accumulated benefit obligation for the defined benefit pension plans was $739.1 million and $796.1 million as of December 31, 2021 and 2020, respectively.

The components of net annual periodic benefit costs and other amounts recognized in other comprehensive income include the following components:

(in millions)	Pension Plans Years Ended December 31, 2021	2020	2019
Net Periodic Benefit Cost			
Service cost	$ 4.4	$ 4.2	$ 4.8
Interest cost	14.6	20.9	25.0
Expected return on plan assets	(30.4)	(34.2)	(33.8)
Amortization of:			
Prior service cost	2.1	2.3	2.3
Actuarial loss	3.8	9.2	9.2
Preliminary net periodic benefit cost	$ (5.5)	$ 2.4	$ 7.5
Curtailment/settlement expense	—	1.0	—
Total net periodic benefit cost	$ (5.5)	$ 3.4	$ 7.5
Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive Income			
Prior service (credit) cost recognized in other comprehensive income	$ (2.1)	$ (2.3)	$ 5.5
Net actuarial gain recognized in other comprehensive income	(5.6)	(8.6)	(13.9)
Total recognized in other comprehensive income (loss)	$ (7.7)	$ (10.9)	$ (8.4)
Total recognized in net periodic benefit income and other comprehensive income	$ (13.2)	$ (7.5)	$ (0.9)

The estimated net actuarial (gain) loss and prior service cost (credit) for the pension plans and postretirement plans that will be amortized from accumulated other comprehensive income into net periodic benefit cost in 2022 is $3.9 million.

The following estimated benefit payments, which reflect estimated future service are expected to be paid by the related plans in the years ending December 31:

(in millions)	Pension Plans Benefit Payments	Other Postretirement Plans Benefit Payments	Medicare Part D Adjustments
2022	$ 46.9	$ 2.9	$ 0.1
2023	44.5	2.7	0.1
2024	44.2	2.5	0.1
2025	44.1	2.2	0.1
2026	44.0	2.0	0.1
2027-2031	212.0	7.8	0.2

In 2022, we expect to contribute cash of at least $5.6 million to the pension plans to meet minimum funding requirements.

Plan Assets and Investment Strategies

The Company's overall investment strategy is to obtain sufficient return and provide adequate liquidity to meet the benefit obligations of our pension plans. Investments are made in public securities to ensure adequate liquidity to support benefit payments. Domestic and international stocks and bonds provide diversification to the portfolio.

For the U.S. plans, we utilize an asset allocation policy that seeks to reduce funded status volatility over time. As such, the primary investment objective beyond accumulating sufficient assets to meet future benefit obligations is to monitor and manage the assets of the plan to better insulate the asset portfolio from changes in interest rates that impact the liabilities. This requires an interest rate management strategy to reduce the sensitivity in the plan's funded status and having a portion of the plan's assets invested in return-seeking strategies. Currently, our policy includes a 100% allocation to fixed income strategies.

For the Canadian pension plans the primary investment objective is to secure the promised pension benefits through capital preservation and appreciation to better manage the asset/liability gap and interest rate risk. A secondary investment objective is to most effectively manage investment volatility to reduce the variability of the Company's required contributions. The plans are expected to achieve an annual overall return, over a five-year rolling period, consistent with or in excess of total fund benchmarks that reflect each plan's strategic allocations and respective market benchmarks at the individual asset class level. Management of the asset/liability gap of the plans and performance results are reviewed quarterly. Until September 2018, Mosaic had the four Canadian pension plans, two salaried and two hourly plans, managed in one master trust. In order to better match the assets with the liabilities of each plan, Mosaic decided to split the master trust into one trust for each plan. Currently, our policy includes an 80% allocation to fixed income and 20% to return-seeking strategies for the salaried and hourly plans. Actual allocations may experience temporary fluctuations based on market movements and investment strategies.

A significant amount of the assets are invested in funds that are managed by a group of professional investment managers through Mosaic's investment advisor. These funds are mainly commingled funds. Performance is reviewed by Mosaic management monthly by comparing each fund's return to a benchmark with an in-depth quarterly review presented by Mosaic's investment advisor to the Global Pension Investment Committee. We do not have significant concentrations of credit risk or industry sectors within the plan assets. Assets may be indirectly invested in Mosaic stock, but any risk related to this investment would be immaterial due to the insignificant percentage of the total pension assets that would be invested in Mosaic stock.

Fair Value Measurements of Plan Assets

The following tables provide fair value measurement, by asset class, of the Company's defined benefit plan assets for both the U.S. and Canadian plans:

(in millions)	December 31, 2021			
Pension Plan Asset Category	**Total**	**Level 1**	**Level 2**	**Level 3**
Cash	$ 5.2	$ 5.2	$ —	$ —
Equity securities[(a)]	71.3	—	71.3	—
Fixed income[(b)]	720.0	—	720.0	—
Private equity funds	10.5	—	—	10.5
Total assets at fair value	$ 807.0	$ 5.2	$ 791.3	$ 10.5

(in millions)	December 31, 2020			
Pension Plan Asset Category	**Total**	**Level 1**	**Level 2**	**Level 3**
Cash	$ 4.6	$ 4.6	$ —	$ —
Equity securities[(a)]	198.5	—	198.5	—
Fixed income[(b)]	641.0	—	641.0	—
Private equity funds	1.1	—	—	1.1
Total assets at fair value	$ 845.2	$ 4.6	$ 839.5	$ 1.1

(a) This class, which includes several funds, was invested approximately 44% in U.S. equity securities, 1% in Canadian equity securities and 55% in other international equity securities as of December 31, 2021, and 43% in U.S. equity securities, 0% in Canadian equity securities and 57% in other international equity securities as of December 31, 2020.

(b) This class, which includes several funds, was invested approximately 44% in corporate debt securities, 49% in governmental securities in the U.S. and Canada and 7% in other foreign entity debt securities as of December 31, 2021, and 48% in corporate debt securities, 45% in governmental securities in the U.S. and Canada and 7% in other foreign entity debt securities as of December 31, 2020.

Rates and Assumptions

The approach used to develop the discount rate for the pension and postretirement plans is commonly referred to as the yield curve approach. Under this approach, we use a hypothetical curve formed by the average yields of available corporate bonds rated AA and above and match it against the projected benefit payment stream. Each category of cash flow of the projected benefit payment stream is discounted back using the respective interest rate on the yield curve. Using the present value of projected benefit payments, a weighted-average discount rate is derived.

The approach used to develop the expected long-term rate of return on plan assets combines an analysis of historical performance, the drivers of investment performance by asset class and current economic fundamentals. For returns, we utilized a building block approach starting with inflation expectations and added an expected real return to arrive at a long-term nominal expected return for each asset class. Long-term expected real returns are derived from future expectations of the U.S. Treasury real yield curve.

Weighted average assumptions used to determine benefit obligations were as follows:

	Pension Plans		
	Years Ended December 31,		
	2021	2020	2019
Discount rate	2.84 %	2.40 %	3.12 %
Expected return on plan assets	3.25 %	3.89 %	5.13 %
Rate of compensation increase	3.00 %	3.00 %	3.00 %

Weighted-average assumptions used to determine net benefit cost were as follows:

	Pension Plans		
	Years Ended December 31,		
	2021	2020	2019
Discount rate	2.44 %	3.12 %	4.09 %
Service cost discount rate	2.64 %	3.15 %	4.00 %
Interest cost discount rate	1.90 %	2.83 %	3.77 %
Expected return on plan assets	3.89 %	4.88 %	5.14 %
Rate of compensation increase	3.00 %	3.00 %	3.50 %

Defined Contribution Plans

Eligible salaried and non-union hourly employees in the U.S. participate in a defined contribution investment plan which permits employees to defer a portion of their compensation through payroll deductions and provides matching contributions. We match 100% of the first 3% of the participant's contributed pay plus 50% of the next 3% of the participant's contributed pay, subject to Internal Revenue Service limits. Participant contributions, matching contributions and the related earnings immediately vest. Mosaic also provides an annual non-elective employer contribution feature for eligible salaried and non-union hourly employees based on the employee's age and eligible pay. Participants are generally vested in the non-elective employer contributions after three years of service. In addition, a discretionary feature of the plan allows the Company to make additional contributions to employees. Certain union employees participate in a defined contribution retirement plan based on collective bargaining agreements.

Canadian salaried and non-union hourly employees participate in an employer funded plan with employer contributions similar to the U.S. plan. The plan provides a profit sharing component which is paid each year. We also sponsor one mandatory union plan in Canada. Benefits in these plans vest after two years of consecutive service.

The expense attributable to defined contribution plans in the U.S. and Canada was $55.8 million, $48.0 million and $56.4 million for 2021, 2020 and 2019, respectively.

Postretirement Medical Benefit Plans

We provide certain health care benefit plans for certain retired employees ("***Retiree Health Plans***") which may be either contributory or non-contributory and contain certain other cost-sharing features such as deductibles and coinsurance.

The North American Retiree Health Plans are unfunded and the projected benefit obligation was $31.1 million and $35.0 million as of December 31, 2021 and 2020, respectively. This liability should continue to decrease due to our limited exposure. The related income statement effects of the Retiree Health Plans are not material to the Company. We anticipate contributing cash of at least $2.9 million in 2022 to the postretirement medical benefit plans to fund anticipated benefit payments.

The year-end status of the Brazil postretirement medical benefit plans with a discount rate of 7.69% and 7.45% on each of December 31, 2021 and December 31, 2020, respectively was as follows:

	Postretirement Medical Benefits	
	Years Ended December 31,	
(in millions)	2021	2020
Change in accumulated postretirement benefit obligation ("APBO"):		
APBO at beginning of year	$ 96.8	$ 109.4
Service cost	0.3	1.0
Interest cost	6.6	7.9
Actuarial loss	(22.8)	7.9
Currency fluctuations	(3.9)	(27.7)
Benefits paid	(1.7)	(1.7)
Plan Amendments	(17.3)	—
APBO at end of year	$ 58.0	$ 96.8
Change in plan assets:		
Company contribution	$ 1.7	$ 1.7
Benefits paid	(1.7)	(1.7)
Fair value at end of year	$ —	$ —
Unfunded status of the plans as of the end of the year	$ (58.0)	$ (96.8)
Amounts recognized in the consolidated balance sheets:		
Current liabilities	$ —	$ (1.7)
Noncurrent liabilities	(58.0)	(95.1)
Amounts recognized in accumulated other comprehensive (income) loss		
Prior service costs (credits)	$ (14.8)	$ —
Actuarial loss	$ 16.1	$ 42.6

18. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS) ("*AOCI*")

The following table sets forth the changes in AOCI by component during the years ended December 31, 2021, 2020 and 2019:

(in millions)	Foreign Currency Translation Gain (Loss)	Net Actuarial Gain and Prior Service Cost	Amortization of Gain on Interest Rate Swap	Net Gain (Loss) on Marketable Securities Held in Trust	Total
Balance at December 31, 2018	$ (1,547.4)	$ (105.3)	$ 0.4	$ (4.8)	(1,657.1)
Other comprehensive income (loss)	74.1	(26.2)	2.2	14.0	64.1
Tax (expense) or benefit	(4.7)	1.9	(0.5)	(3.1)	(6.4)
Other comprehensive income (loss), net of tax	69.4	(24.3)	1.7	10.9	57.7
Addback: loss attributable to noncontrolling interest	1.2	—	—	—	1.2
Balance at December 31, 2019	$ (1,476.8)	$ (129.6)	$ 2.1	$ 6.1	$ (1,598.2)
Other comprehensive income (loss)	(246.1)	12.2	2.0	16.6	(215.3)
Tax (expense) or benefit	(3.4)	7.7	(0.4)	(3.8)	0.1
Other comprehensive income (loss), net of tax	(249.5)	19.9	1.6	12.8	(215.2)
Addback: loss attributable to noncontrolling interest	7.2	—	—	—	7.2
Balance at December 31, 2020	$ (1,719.1)	$ (109.7)	$ 3.7	$ 18.9	$ (1,806.2)
Other comprehensive income (loss)	(117.0)	56.5	2.0	(22.7)	(81.2)
Tax (expense) or benefit	8.8	(19.6)	(0.5)	5.1	(6.2)
Other comprehensive income (loss), net of tax	(108.2)	36.9	1.5	(17.6)	(87.4)
Addback: loss attributable to noncontrolling interest	1.8	—	—	—	1.8
Balance at December 31, 2021	$ (1,825.5)	$ (72.8)	$ 5.2	$ 1.3	$ (1,891.8)

19. SHARE REPURCHASES

In August 2021, our Board of Directors authorized a new $1.0 billion share repurchase program (the "***2021 Repurchase Program***"), replacing our 2015 Repurchase Program. The 2021 Repurchase Program allows the Company to repurchase shares of our Common Stock, through open market purchases, accelerated share repurchase arrangements, privately negotiated transactions or otherwise and has no set expiration date. In connection with this authorization, the remaining amount of $700 million authorized under 2015 Repurchase Program was terminated.

During the year ended December 31, 2021, under the 2021 Repurchase Program, we repurchased 11,200,371 shares of Common Stock for a total of approximately $410.9 million. This includes 8,544,144 shares we purchased in an underwritten secondary offering by Vale S.A. when they fully divested their interest in Mosaic.

The extent to which we repurchase our shares and the timing of any such repurchases depend on a number of factors, including market and business conditions, the price of our shares, and corporate, regulatory and other considerations.

20. SHARE-BASED PAYMENTS

The Mosaic Company 2014 Stock and Incentive Plan (the "***2014 Stock and Incentive Plan***") was approved by our stockholders and became effective on May 15, 2014. It permits up to 25 million shares of common stock to be issued under share-based awards granted under the plan. The 2014 Stock and Incentive Plan provides for grants of stock options, restricted stock, restricted stock units, performance units and a variety of other share-based and non-share-based awards. Our employees, officers, directors, consultants, agents, advisors and independent contractors, as well as other designated individuals, are eligible to participate in the 2014 Stock and Incentive Plan.

The Mosaic Company 2004 Omnibus Stock and Incentive Plan (the "***Omnibus Plan***"), which was approved by our stockholders and became effective in 2004 and subsequently amended, provided for the grant of shares and share options to employees for up to 25 million shares of common stock. While awards may no longer be made under the Omnibus Plan, it will remain in effect with respect to the awards that had been granted thereunder prior to its termination.

Mosaic settles stock option exercises, restricted stock units and certain performance units and performance shares with newly issued common shares. The Compensation Committee of the Board of Directors administers the 2014 Stock and Incentive Plan and the Omnibus Plan subject to their respective provisions and applicable law.

Stock Options

Stock options are granted with an exercise price equal to the market price of our stock at the date of grant and have a ten-year contractual term. The fair value of each option award is estimated on the date of the grant using the Black-Scholes option valuation model. Stock options vest in equal annual installments in the first three years following the date of grant (graded vesting). Stock options are expensed on a straight-line basis over the required service period, based on the estimated fair value of the award on the date of grant, net of estimated forfeitures.

Valuation Assumptions

Assumptions used to calculate the fair value of stock options awarded in 2017 are noted in the following table. There were no stock options granted or issued in 2021, 2020, or 2019. Expected volatility is based on the simple average of implied and historical volatility using the daily closing prices of the Company's stock for a period equal to the expected term of the option. The risk-free interest rate is based on the U.S. Treasury rate at the time of the grant for instruments of comparable life.

	Year Ended December 31, 2017
Weighted average assumptions used in option valuations:	
Expected volatility	35.35 %
Expected dividend yield	1.97 %
Expected term (in years)	7
Risk-free interest rate	2.34 %

A summary of the status of our stock options as of December 31, 2021, and activity during 2021, is as follows:

	Shares (in millions)	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2020	1.8	$ 43.89		
Granted	—	—		
Exercised	(0.1)	$ 29.21		
Cancelled	(0.6)	$ 58.56		
Outstanding as of December 31, 2021	1.1	$ 38.47	3.4	$ 6.5
Exercisable as of December 31, 2021	1.1	$ 38.47	3.4	$ 6.5

The weighted-average grant date fair value of options granted during 2017 was $9.91. There were no options exercised during 2020 or 2019.

Restricted Stock Units

Restricted stock units are issued to various employees, officers and directors at a value equal to the market price of our stock at the date of grant. The fair value of restricted stock units is equal to the market price of our stock at the date of grant. Restricted stock units generally cliff vest after three years of continuous service and are expensed on a straight-line basis over the required service period, based on the estimated grant date fair value, net of estimated forfeitures.

A summary of the status of our restricted stock units as of December 31, 2021, and activity during 2021, is as follows:

	Shares (in millions)	Weighted Average Grant Date Fair Value Per Share
Restricted stock units as of December 31, 2020	2.5	$ 21.48
Granted	0.7	29.88
Issued and cancelled	(0.8)	$ 26.15
Restricted stock units as of December 31, 2021	2.4	$ 22.44

Performance Units

During the years ended December 31, 2021, 2020 and 2019, 717,952, 1,309,170 and 603,856 total shareholder return ("***TSR***") performance units were granted, respectively. Final performance units are awarded based on the increase or decrease, subject to certain limitations, in Mosaic's share price from the grant date to the third anniversary of the award, plus dividends (a measure of total shareholder return or TSR). The beginning and ending stock prices are based on a 30 trading-day average stock price. Holders of the awards must be employed at the end of the performance period in order for any units to vest, except in the event of death, disability or retirement at or after age 60, certain changes in control or the exercise of Committee or Board discretion as provided in the related award agreements.

The fair value of each TSR performance unit is determined using a Monte Carlo simulation. This valuation methodology utilizes assumptions consistent with those of our other share-based awards and a range of ending stock prices; however, the expected term of the awards is three years, which impacts the assumptions used to calculate the fair value of performance units as shown in the table below. 262,308 of the TSR performance awards issued in 2021 are to be settled in cash, and are therefore accounted for as a liability with changes in value recorded through earnings during the service period. The remaining TSR performance units issued in 2021, and all of the 2020 and 2019 TSR performance units, are considered equity-classified fixed awards measured at grant-date fair value and not subsequently re-measured. All of the TSR performance units cliff vest after three years of continuous service and are expensed on a straight-line basis over the required service period, based on the estimated grant date fair value of the award net of estimated forfeitures.

A summary of the assumptions used to estimate the fair value of TSR performance units is as follows:

	Years Ended December 31,		
	2021	2020	2019
Performance units granted	717,952	1,309,170	603,856
Average fair value of performance units on grant date	$ 27.91	$ 13.52	$ 25.87
Weighted average assumptions used in performance unit valuations:			
Expected volatility	58.26 %	43.49 %	33.70 %
Expected dividend yield	0.68 %	1.24 %	0.72 %
Expected term (in years)	3	3	3
Risk-free interest rate	0.32 %	0.61 %	2.43 %

A summary of our performance unit activity during 2021 is as follows:

	Shares (in millions)	Weighted Average Grant Date Fair Value Per Share
Outstanding as of December 31, 2020	2.6	$ 18.27
Granted	0.7	27.91
Issued and cancelled	(0.5)	$ 27.50
Outstanding as of December 31, 2021	2.8	$ 18.91

Share-Based Compensation Expense

We recorded share-based compensation expense of $63.5 million, $24.5 million and $31.6 million for 2021, 2020 and 2019, respectively. The tax benefit related to share exercises and lapses in the year was $6.5 million, $5.2 million and $6.7 million for 2021, 2020 and 2019, respectively.

As of December 31, 2021, there was $29.3 million of total unrecognized compensation cost related to options, restricted stock units and performance units and shares granted under the 2014 Stock and Incentive Plan and the Omnibus Plan. The unrecognized compensation cost is expected to be recognized over a weighted-average period of one year. No options vested in 2021, 2020 and 2019.

There was no cash received from exercises of share-based payment arrangements for 2021, 2020 or 2019. We received a tax benefit for tax deductions from options of $14.0 million, $3.3 million and $2.6 million in 2021, 2020 and 2019, respectively.

21. COMMITMENTS

We lease certain plants, warehouses, terminals, office facilities, railcars and various types of equipment under operating leases, some of which include rent payment escalation clauses, with lease terms ranging from one to 29 years. In addition to minimum lease payments, some of our office facility leases require payment of our proportionate share of real estate taxes and building operating expenses. Our future obligations under these leases are included in Note 3 of our Notes to Consolidated Financial Statements.

We also have purchase obligations to purchase goods and services, primarily for raw materials used in products sold to customers. In 2013, we entered into an ammonia supply agreement with CF (the "***CF Ammonia Supply Agreement***") that commenced in 2017, under which Mosaic agreed to purchase approximately 545,000 to 725,000 tonnes of ammonia per year at a price tied to the prevailing price of U.S. natural gas. The term of the contract may extend until December 31, 2032, although we have rights to terminate this contract at certain dates.

We have long-term agreements for the purchase of sulfur, which is used in the production of phosphoric acid, and natural gas, which is a significant raw material used primarily in the solution mining process in our Potash segment as well as in our phosphate concentrates plants. Also, we have agreements for capital expenditures primarily in our Potash segments related to our expansion projects.

A schedule of future minimum long-term purchase commitments, based on expected market prices as of December 31, 2021 is as follows:

(in millions)	Purchase Commitments
2022	$ 5,687.1
2023	966.5
2024	619.8
2025	354.9
2026	298.4
Subsequent years	1,174.0
	$ 9,100.7

Purchases made under long-term commitments in were $3.1 billion in 2021, and $1.9 billion in 2020 and 2019, respectively.

Most of our export sales of potash crop nutrients are marketed through a North American export association, Canpotex, which may fund its operations in part through third-party financing facilities. As a member, Mosaic or our subsidiaries are contractually obligated to reimburse Canpotex for their pro rata share of any operating expenses or other liabilities incurred. The reimbursements are made through reductions to members' cash receipts from Canpotex.

We incur liabilities for reclamation activities and Gypstack closures in our Florida and Louisiana operations where, in order to obtain necessary permits, we must either pass a test of financial strength or provide credit support, typically in the form of cash deposits, surety bonds or letters of credit. The surety bonds generally expire within one year or less but a substantial portion of these instruments provide financial assurance for continuing obligations and, therefore, in most cases, must be renewed on an annual basis. As of December 31, 2021, we had $645.7 million in surety bonds outstanding, of which $356.1 million is for reclamation obligations, primarily related to mining in Florida. In addition, included in the total amount is $249.7 million, reflecting our updated closure cost estimates, delivered to EPA as a substitute for the financial assurance provided through the Plant City Trust. The remaining balance in surety bonds outstanding of $39.9 million is for other matters.

22. CONTINGENCIES

We have described below the material judicial and administrative proceedings to which we are subject.

Environmental Matters

We have contingent environmental liabilities that arise principally from three sources: (i) facilities currently or formerly owned by our subsidiaries or their predecessors; (ii) facilities adjacent to currently or formerly owned facilities; and (iii) third-party Superfund or state equivalent sites. At facilities currently or formerly owned by our subsidiaries or their predecessors, the historical use and handling of regulated chemical substances, crop and animal nutrients and additives and by-product or process tailings have resulted in soil, surface water and/or groundwater contamination. Spills or other releases of regulated substances, subsidence from mining operations and other incidents arising out of operations, including accidents, have occurred previously at these facilities, and potentially could occur in the future, possibly requiring us to undertake or fund cleanup or result in monetary damage awards, fines, penalties, other liabilities, injunctions or other court or administrative rulings. In some instances, pursuant to consent orders or agreements with governmental agencies, we are undertaking certain remedial actions or investigations to determine whether remedial action may be required to address contamination. At other locations, we have entered into consent orders or agreements with appropriate governmental agencies to perform required remedial activities that will address identified site conditions. Taking into consideration established accruals of approximately $57.3 million and $61.4 million, as of December 31, 2021 and 2020, respectively, expenditures for these known conditions currently are not expected, individually or in the aggregate, to have a material effect on our business or financial condition. However, material expenditures could be required in the future to remediate the contamination at known sites or at other current or former sites or as a result of other environmental, health and safety matters. Below is a discussion of the more significant environmental matters.

New Wales Water Loss Incident. In August 2016, a sinkhole developed under one of the two cells of the Phase II Gypstack at our New Wales facility in Polk County, Florida, resulting in process water from the stack draining into the sinkhole. The incident was reported to the FDEP and EPA. In October 2016, our subsidiary, Mosaic Fertilizer, entered into a consent order

(the "***Order***") with the FDEP relating to the incident. Under the order, Mosaic Fertilizer agreed to, among other things: implement a remediation plan to close the sinkhole; perform additional monitoring of the groundwater quality and act to assess and remediate in the event monitored off-site water does not comply with applicable standards as a result of the incident; evaluate the risk of potential future sinkhole formation at the New Wales facility and at Mosaic Fertilizer's active Gypstack operations at the Bartow, Riverview and Plant City facilities with recommendations to address any identified issues; and provide financial assurance of no less than $40.0 million, which we have done without the need for any expenditure of corporate funds through satisfaction of a financial strength test and Mosaic parent guarantee. The Order did not require payment of civil penalties relating to the incident.

As of December 31, 2021, the sinkhole repairs were substantially complete. Additional expenditures could be required in the future for additional remediation or other measures in connection with the sinkhole including if, for example, FDEP or EPA were to request additional measures to address risks presented by the Gypstack. These expenditures could be material. In addition, we are unable to predict at this time what, if any, impact the New Wales water loss incident will have on future Florida permitting efforts.

EPA RCRA Initiative. We have certain financial assurance and other obligations under consent decrees and a separate financial assurance arrangement relating to our facilities in Florida and Louisiana. These obligations are discussed in Note 13 of our Notes to Consolidated Financial Statements.

Florida Sulfuric Acid Plants. On April 8, 2010, EPA Region 4 submitted an administrative subpoena to us under Section 114 of the Federal Clean Air Act (the "***CAA***") regarding compliance of our Florida sulfuric acid plants with the "New Source Review" requirements of the CAA. The request received by Mosaic appears to be part of a broader EPA national enforcement initiative focusing on sulfuric acid plants. On June 6, 2010, EPA issued a notice of violation to CF (the "***CF NOV***") with respect to "New Source Review" compliance at the Plant City Facility's sulfuric acid plants and the allegations in the CF NOV were not resolved before our 2014 acquisition of the Plant City Facility. CF has agreed to indemnify us with respect to any penalty EPA may assess as a result of the allegations in the CF NOV.

We have been engaged in settlement discussions with U.S. EPA and the DOJ, originating with the allegations of violations of Clean Air Act Prevention of Significant Deterioration ("***PSD***") permitting requirements at the Plant City sulfuric acid plants and encompassing injunctive relief regarding sulfur dioxide emissions across Mosaic's Florida sulfuric acid plant fleet. With the closure of Plant City fertilizer operations, there is no longer a need to reach resolution with the government on injunctive relief (i.e., reduction of sulfur dioxide emissions) at that facility. Furthermore, the DOJ has determined that there is no basis for proceeding with a settlement, as EPA and the Department have not currently alleged any violations of the Clean Air Act PSD permitting requirements at any other of Mosaic's Florida sulfuric acid plants. On July 24, 2020, the DOJ filed a complaint against CF and stipulation of settlement, including a $550,000 civil penalty, concluding enforcement against CF related to the CF NOV.

We cannot predict at this time whether EPA and DOJ will initiate an enforcement action in the future with respect to "New Source Review" compliance at our Florida sulfuric acid plants or what its scope would be, or what the range of outcomes might be with respect to such a potential enforcement action.

Uncle Sam Gypstack. In January 2019, we observed lateral movement of the north slope of the active phosphogypsum stack at the Uncle Sam facility in Louisiana, designated Stack 4. The observation was reported to the Louisiana Department of Environmental Quality and the U.S. EPA. We continue to provide updates to the agencies on the movement, which has slowed following actions we have taken, which include reducing process water volume stored atop the stack to reduce the active load causing the movement; constructing a stability berm at the base of the slope to increase resistance; and removing gypsum from the north side to the south side. These steps have improved slope stability, reduced slope movement and reduced our capacity to store process water. There has been no loss of containment resulting from the movement observed, and none is expected. Although continued lateral movement on the north slope could have a material effect on our future operations at that facility, we cannot predict the prospective impact on our results of operations at this time.

Other Environmental Matters. Superfund and equivalent state statutes impose liability without regard to fault or to the legality of a party's conduct on certain categories of persons who are considered to have contributed to the release of "hazardous substances" into the environment. Under Superfund, or its various state analogues, one party may, under certain circumstances, be required to bear more than its proportionate share of cleanup costs at a site where it has liability if payments cannot be obtained from other responsible parties. Currently, certain of our subsidiaries are involved or concluding involvement at several Superfund or equivalent state sites. Our remedial liability from these sites, alone or in the aggregate,

currently is not expected to have a material effect on our business or financial condition. As more information is obtained regarding these sites and the potentially responsible parties involved, this expectation could change.

We believe that, pursuant to several indemnification agreements, our subsidiaries are entitled to at least partial, and in many instances complete, indemnification for the costs that may be expended by us or our subsidiaries to remedy environmental issues at certain facilities. These agreements address issues that resulted from activities occurring prior to our acquisition of facilities or businesses from parties including, but not limited to, ARCO (BP); Beatrice Fund for Environmental Liabilities; Conoco; Conserv; Estech, Inc.; Kaiser Aluminum & Chemical Corporation; Kerr-McGee Inc.; PPG Industries, Inc.; The Williams Companies; CF; and certain other private parties. Our subsidiaries have already received and anticipate receiving amounts pursuant to the indemnification agreements for certain of their expenses incurred to date as well as future anticipated expenditures. We record potential indemnifications as an offset to the established accruals when they are realizable or realized. The failure of an indemnitor to fulfill its obligations could result in future costs that could be material.

Louisiana Parishes Coastal Zone Cases

Several Louisiana parishes and the City of New Orleans have filed lawsuits against hundreds of oil and gas companies seeking regulatory, restoration and compensatory damages in connection with historical oil, gas and sulfur mining and transportation operations in the coastal zone of Louisiana. Mosaic is the corporate successor to certain companies which performed these types of operations in the coastal zone of Louisiana. Mosaic has been named in two of the lawsuits filed to date. In addition, in several other cases, historical oil, gas and sulfur operations which may have been related to Mosaic's corporate predecessors have been identified in the complaints. Based upon information known to date, Mosaic has contractual indemnification rights against third parties for any loss or liability arising out of these claims pursuant to indemnification agreements entered into by Mosaic's corporate predecessor(s) with third parties. There may also be insurance contracts which may respond to some or all of the claims. However, the financial ability of the third-party indemnitors, the extent of potential insurance coverage and the extent of potential liability from these claims is currently unknown.

In September 2019, counsel for several of the parishes announced that an agreement had been reached to settle the claims against Mosaic and its corporate predecessors, subject to approval by the participating parishes and the State of Louisiana. In connection with that settlement agreement, the proposed settlement payment obligations would be paid by third-party indemnitors.

North America Phosphate Operations

Denial of the permits sought at any of our mines, issuance of the permits with cost-prohibitive conditions, substantial delays in issuing the permits, legal actions that prevent us from relying on permits or revocation of permits may create challenges for us to mine the phosphate rock required to operate our Florida and Louisiana phosphate plants at desired levels or increase our costs in the future.

Brazil Legal Contingencies

Our Brazilian subsidiaries are engaged in a number of judicial and administrative proceedings regarding labor, environmental, mining and civil claims that allege aggregate damages and/or fines of approximately $706.2 million. We estimate that our probable aggregate loss with respect to these claims is approximately $56.7 million, which is included in our accrued liabilities in our Consolidated Balance Sheets at December 31, 2021.

Approximately $548.3 million of the maximum potential loss relates to labor claims, such as in-house and third-party employees' judicial proceedings alleging the right to receive overtime pay, additional payment due to work in hazardous conditions, risk premium, profit sharing, additional payment due to night work, salary parity and wage differences. We estimate that our probable aggregate loss regarding these claims is approximately $49.5 million, which is included in accrued liabilities in our Consolidated Balance Sheets at December 31, 2021.

Based on Brazil legislation and the current status of similar labor cases involving unrelated companies, we believe we have recorded adequate loss contingency reserves sufficient to cover our estimate of probable losses. If the status of similar cases involving unrelated companies were to adversely change in the future, our maximum exposure could increase and additional accruals could be required.

The environmental judicial and administrative proceedings claims allege aggregate damages and/or fines of approximately $19.0 million; however, we estimate that our probable aggregate loss regarding these claims is approximately $4.9 million, which has been accrued at December 31, 2021.

Our Brazilian subsidiaries also have certain other civil contingent liabilities with respect to judicial, administrative and arbitration proceedings and claims related to contract disputes, pension plan matters, real state disputes, regulatory issues and other civil matters arising in the ordinary course of business. These claims allege aggregate damages of approximately $138.8 million. We estimate that the probable aggregate loss with respect to these matters is approximately $2.3 million.

Uberaba Judicial Settlement

In 2013, the Federal Public Prosecutor filed a public civil action requesting that the Company adopt several measures to mitigate soil and water contamination related to the Gypstack at our Uberaba facility, located in the State of Minas Gerais, including compensation for the alleged social and environmental damages. In 2014, our predecessor subsidiary in Brazil entered into a judicial settlement with the Federal Public Prosecutor, the State of Minas Gerais public prosecutor and the federal environmental agency. Under this agreement, we agreed to implement remediation measures such as: constructing a liner under the Gypstack water ponds and lagoons, and monitoring the groundwater and soil quality. We also agreed to create a private reserve of natural heritage and to pay compensation in the amount of approximately $0.3 million, which was paid in July 2018. We are currently acting in compliance with our obligations under the judicial settlement and expect them to be completed by December 31, 2025.

Brazil Tax Contingencies

Our Brazilian subsidiaries are engaged in a number of judicial and administrative proceedings relating to various non-income tax matters. We estimate that our maximum potential liability with respect to these matters is approximately $380.0 million, of which $182.7 million is subject to an indemnification agreement entered into with Vale S.A in connection with the Acquisition.

Approximately $236.8 million of the maximum potential liability relates to a Brazilian federal value added tax, PIS and COFINS, and tax credit cases, while the majority of the remaining amount relates to various other non-income tax cases. The maximum potential liability can increase with new audits. Based on Brazil legislation and the current status of similar tax cases involving unrelated taxpayers, we believe we have recorded adequate loss contingency reserves sufficient to cover our estimate of probable losses, which are immaterial. If the status of similar tax cases involving unrelated taxpayer changes in the future, additional accruals could be required.

Other Claims

We also have certain other contingent liabilities with respect to judicial, administrative and arbitration proceedings and claims of third parties, including tax matters, arising in the ordinary course of business. We do not believe that any of these contingent liabilities will have a material adverse impact on our business or financial condition, results of operations, and cash flows.

23. RELATED PARTY TRANSACTIONS

We enter into transactions and agreements with certain of our non-consolidated companies and other related parties from time to time. As of December 31, 2021 and December 31, 2020, the net amount due from our non-consolidated companies totaled $63.0 million and $55.9 million, respectively. These amounts include a long-term indemnification asset of approximately $21.0 million from Vale S.A. for reimbursement of pension plan obligations.

The Consolidated Statements of Earnings included the following transactions with our non-consolidated companies:

	Years Ended December 31,		
(in millions)	**2021**	**2020**	**2019**
Transactions with non-consolidated companies included in net sales	$ 1,120.9	$ 819.6	$ 969.5
Transactions with non-consolidated companies included in cost of goods sold	$ 1,483.8	$ 950.1	$ 1,057.7

As part of the MWSPC joint venture, we market approximately 25% of the MWSPC production, for which approximately $12.2 million, $8.5 million and $8.3 million is included in revenue for the years ended December 31, 2021, 2020 and 2019, respectively.

In November 2015, we agreed to provide funds to finance the purchase and construction of two articulated tug and barge units, intended to transport anhydrous ammonia for our operations, through a bridge loan agreement with Gulf Marine Solutions, LLC (“***GMS***”). GMS is a wholly owned subsidiary of Gulf Sulphur Services Ltd., LLLP (“***Gulf Sulphur***

Services"), an entity in which we and a joint venture partner, Savage Companies ("***Savage***"), each indirectly own a 50% equity interest and for which a subsidiary of Savage provides operating and management services. GMS provided these funds through draws on the Mosaic bridge loan and through additional loans from Gulf Sulphur Services. We are the primary beneficiary of GMS, a variable interest entity, and consolidate GMS's operations in our Phosphates segment.

On October 24, 2017, a lease financing transaction was completed with respect to the completed tug and barge unit, and, following the application of proceeds from the transaction, all outstanding loans made by Gulf Sulphur Services to GMS, together with accrued interest, were repaid, and the bridge loans related to the first unit's construction were repaid. As of December 31, 2021 and December 31, 2020, there were outstanding bridge loans of $74.7 million relating to the cancelled second barge and the remaining tug, which bridge loans are eliminated in consolidation. Reserves against the bridge loans of approximately $54.2 million were established in 2018 and remain unchanged. The construction of the remaining tug, funded by the bridge loan advances in excess of the reserves, is recorded within construction in-progress within our consolidated balance sheet. Several subsidiaries of Savage operate vessels utilized by Mosaic under time charter arrangements, including the ammonia tug and barge unit.

24. BUSINESS SEGMENTS

The reportable segments are determined by management based upon factors such as products and services, production processes, technologies, market dynamics, and for which segment financial information is available for our chief operating decision maker.

For a description of our business segments see Note 1 of our Notes to Consolidated Financial Statements. We evaluate performance based on the operating earnings of the respective business segments, which includes certain allocations of corporate selling, general and administrative expenses. The segment results may not represent the actual results that would be expected if they were independent, stand-alone businesses. Intersegment eliminations, including profit on intersegment sales, mark-to-market gains/losses on derivatives, debt expenses, Streamsong Resort® results of operations and the results of the China and India distribution business are included within Corporate, Eliminations and Other. As of January 1, 2019, certain selling, general and administrative costs that are not controllable by the business segments are no longer allocated to segments and are included within Corporate, Eliminations and Other.

Segment information for the years 2021, 2020 and 2019 is as follows:

(in millions)	Phosphates	Potash	Mosaic Fertilizantes	Corporate, Eliminations and Other (a)	Total
Year Ended December 31, 2021					
Net sales to external customers	$ 3,889.7	$ 2,587.9	$ 5,088.5	$ 791.3	$ 12,357.4
Intersegment net sales	1,033.2	38.9	—	(1,072.1)	—
Net sales	4,922.9	2,626.8	5,088.5	(280.8)	12,357.4
Gross margin	1,305.4	1,057.5	842.7	(5.3)	3,200.3
Canadian resource taxes	—	259.5	—	—	259.5
Gross margin (excluding Canadian resource taxes)	1,305.4	1,317.0	842.7	(5.3)	3,459.8
Impairment, restructuring and other expenses	—	158.1	—	—	158.1
Operating earnings	1,179.8	836.6	745.9	(293.8)	2,468.5
Capital expenditures	649.9	410.1	216.1	12.5	1,288.6
Depreciation, depletion and amortization expense	428.7	267.8	101.2	15.2	812.9
Equity in net earnings of nonconsolidated companies	5.4	—	—	2.4	7.8
Year Ended December 31, 2020					
Net sales to external customers	$ 2,543.5	$ 1,988.6	$ 3,481.6	$ 668.0	$ 8,681.7
Intersegment net sales	572.9	30.7	—	(603.6)	—
Net sales	3,116.4	2,019.3	3,481.6	64.4	8,681.7
Gross margin	125.5	468.3	419.6	51.5	1,064.9
Canadian resource taxes	—	146.1	—	—	146.1
Gross margin (excluding Canadian resource taxes)	125.5	614.4	419.6	51.5	1,211.0
Operating earnings	(147.1)	401.5	346.5	(188.0)	412.9
Capital expenditures	538.1	478.2	144.9	9.4	1,170.6
Depreciation, depletion and amortization expense	443.4	282.4	105.7	16.1	847.6
Equity in net (loss) earnings of nonconsolidated companies	(94.1)	—	—	0.3	(93.8)
Year Ended December 31, 2019					
Net sales to external customers	$ 2,416.6	$ 2,081.7	$ 3,782.8	$ 625.2	$ 8,906.3
Intersegment net sales	824.7	32.1	—	(856.8)	—
Net sales	3,241.3	2,113.8	3,782.8	(231.6)	8,906.3
Gross margin	(82.3)	616.8	290.1	72.7	897.3
Canadian resource taxes	—	174.6	—	—	174.6
Gross margin (excluding Canadian resource taxes)	(82.3)	791.4	290.1	72.7	1,071.9
Impairment, restructuring and other expenses	931.6	530.5	—	—	1,462.1
Operating earnings	(1,131.1)	45.8	132.5	(142.1)	(1,094.9)
Capital expenditures	545.2	540.1	182.3	4.6	1,272.2
Depreciation, depletion and amortization expense	430.1	296.3	135.8	20.5	882.7
Equity in net (loss) earnings of nonconsolidated companies	(60.1)	—	—	0.7	(59.4)
Total assets as of December 31, 2021	$ 8,776.4	$ 8,312.8	$ 4,908.2	$ 39.0	$ 22,036.4
Total assets as of December 31, 2020	7,022.1	7,614.8	4,127.7	1,025.2	19,789.8
Total assets as of December 31, 2019 [(b)]	7,183.5	7,219.2	3,974.9	920.9	19,298.5

(a) The "Corporate, Eliminations and Other" category includes the results of our ancillary distribution operations in India and China. For the years ended December 31, 2021, 2020 and 2019, distribution operations in India and China had revenues of $730.1 million, $639.4 million, and $575.6 million, respectively and gross margins of $141.6 million, $58.7 million, and $27.3 million, respectively.

(b) In 2019, we recorded an impairment of goodwill in Phosphates of $588.6 million, which reduced the total asset balance.

Financial information relating to our operations by geographic area is as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
Net sales[(a)]:			
Brazil	$ 5,002.2	$ 3,377.1	$ 3,675.1
Canpotex[(b)]	1,089.6	795.2	952.5
Canada	794.9	547.5	602.0
China	396.0	334.2	225.3
India	340.3	318.4	347.1
Colombia	135.1	93.4	82.8
Paraguay	113.8	94.3	102.9
Japan	112.4	58.8	33.0
Argentina	101.3	121.0	116.3
Mexico	93.6	77.1	117.8
Australia	64.8	85.1	91.3
Peru	40.0	62.0	89.3
Dominican Republic	29.8	17.1	17.3
Honduras	22.3	31.0	11.7
Thailand	18.1	21.2	24.8
Other	73.9	75.0	84.3
Total international countries	8,428.1	6,108.4	6,573.5
United States	3,929.3	2,573.3	2,332.8
Consolidated	$ 12,357.4	$ 8,681.7	$ 8,906.3

(a) Revenues are attributed to countries based on location of customer.
(b) Canpotex is the export association of two Saskatchewan potash producers. The net sales of potash from Mosaic to Canpotex included in our consolidated financial statements in the Net Sales line represent Mosaic's sales of potash to Canpotex, and are recognized upon delivery to the unrelated third-party customer. Canpotex sales to the ultimate third-party customers are approximately: 30% to customers based in Brazil, 14% to customers based in Indonesia, 11% to customers based in China, 6% to customers based in India, and 39% to customers based in the rest of the world.

(in millions)	December 31, 2021	2020
Long-lived assets:		
Canada	$ 5,012.2	$ 4,998.5
Brazil	2,011.0	1,904.1
Other	1,285.0	1,324.8
Total international countries	8,308.2	8,227.4
United States	6,233.6	5,688.8
Consolidated	$ 14,541.8	$ 13,916.2

Excluded from the table above as of December 31, 2021 and 2020, are goodwill of $1,172.2 million and $1,173.0 million and deferred income taxes of $997.1 million and $1,179.4 million, respectively.

Net sales by product type for the years 2021, 2020 and 2019 are as follows:

(in millions)	Years Ended December 31, 2021	2020	2019
Sales by product type:			
Phosphate Crop Nutrients	$ 3,552.7	$ 2,477.0	$ 2,541.3
Potash Crop Nutrients	3,367.9	2,566.7	2,716.8
Crop Nutrient Blends	1,800.0	1,232.7	1,415.7
Performance Products[(a)]	1,973.6	1,370.8	1,193.6
Phosphate Rock	75.5	42.0	53.6
Other[(b)]	1,587.7	992.5	985.3
	$ 12,357.4	$ 8,681.7	$ 8,906.3

(a) Includes sales of MicroEssentials®, K-Mag®, Aspire® and Sus-Terra™
(b) Includes sales of industrial potash, feed products, nitrogen and other products.

25. MINE CLOSURE COSTS

Due to increased brine inflows, on June 4, 2021, the Company made the decision to accelerate the timing of the shutdown of our K1 and K2 mine shafts at our Esterhazy, Saskatchewan potash mine. Closing the K1 and K2 shafts are key pieces of the transition to the K3 shaft, but the timeline for the closure was accelerated by approximately nine months. In 2021, we had pre-tax costs of $158.1 million related to the permanent closure of these facilities. These costs consisted of $109.9 million related to the write-off of fixed assets, $37.1 million related to AROs, and $11.1 million related to inventory and other reserves. In the third quarter of 2021, we resumed production at our previously idled Colonsay potash mine to offset a portion of the production lost by the early closure of the K1 and K2 shafts at Esterhazy.

On January 28, 2020, we announced that we intend to keep our Colonsay, Saskatchewan potash mine idled for the foreseeable future. The mine was placed in care and maintenance mode, employing minimal staff and allowing for resumption of operations when needed to meet customers' needs. For the year ended December 31, 2019, we recorded pre-tax costs of approximately $529.7 million in impairment, restructuring and other expenses in our Consolidated Statement of Earnings (Loss), related to this idling. These costs consisted of approximately $493 million related to the write-off of fixed assets, $27 million related to severance and other employee costs, and $10 million related to the write-off of maintenance, repair, and operating inventories. The write-off is principally the carrying value of the 2013 expansion project, which increased Colonsay's operating capacity to 2.1 million tonnes. Colonsay had been operating with a modified 1.5 million tonnes capacity since 2016.

On June 18, 2019, we announced the permanent closure of the Plant City Facility. We temporarily idled the Plant City Facility in the fourth quarter of 2017, as it was one of our higher cost phosphate facilities. For the year ended December 31, 2019, we recognized pre-tax costs of $341.3 million in impairment, restructuring and other expenses in our Consolidated Statement of Earnings (Loss), related to the permanent closure of this facility. These costs consisted of approximately $210 million related to the write-off of fixed assets, $110 million related to asset retirement obligations and $21 million related to inventory and other reserves.

26. SUBSEQUENT EVENTS

Subsequent to December 31, 2021, our Board of Directors approved an accelerated share repurchase ("***ASR***") of $400 million which is expected to be initiated in February 2022. This ASR will exhaust most of the remaining share repurchase authorization established in the 2021 Repurchase Program. Following the completion of the current authorization, our Board of Directors also approved the establishment of a new $1.0 billion share repurchase authorization, which will go into effect following completion of this ASR. The Board of Directors has also approved a regular dividend increase to $0.60 per share annually from $0.45, beginning with the second quarter 2022 payment.

Management's Report on Internal Control Over Financial Reporting

The Company's management is responsible for establishing and maintaining effective internal control over financial reporting, as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934. The Company's internal control system is a process designed to provide reasonable assurance to our management, Board of Directors and stockholders regarding the reliability of financial reporting and the preparation and fair presentation of our consolidated financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles (U.S. GAAP), and includes those policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in conformity with U.S. GAAP, and that receipts and expenditures are being made only in accordance with authorizations from our management and Board of Directors; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2021. In assessing the effectiveness of our internal control over financial reporting as of December 31, 2021 management used the control criteria framework of the Committee of Sponsoring Organizations (COSO) of the Treadway Commission published in its report entitled *Internal Control—Integrated Framework (2013).* Based on their evaluation, management concluded that the Company's internal control over financial reporting was effective as of December 31, 2021. KPMG LLP, the independent registered public accounting firm that audited the financial statements included in this annual report, has issued an auditors' report on the Company's internal control over financial reporting as of December 31, 2021.