Green Plains Inc.
Form 10-K
February 22, 2017

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 fiscal year ended December 31, 2016

or

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 001-32924

Green Plains Inc.

(Exact name of registrant as specified in its charter)

Iowa (State or other jurisdiction of incorporation or organization)	84-1652107 (I.R.S. Employer Identification No.)
1811 Aksarben Drive, Omaha, NE 68106 (Address of principal executive offices, including zip code)	(402) 884-8700 (Registrant’s telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act: Common Stock, $.001 par value

Name of exchanges on which registered: Nasdaq Global Market

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files).

Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. .

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer . Accelerated filer . Non-accelerated filer Smaller reporting company

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

The aggregate market value of the company's voting common stock held by non-affiliates of the registrant as of June 30, 2016 (the last business day of the second quarter), based on the last sale price of the common stock on that date of $19.72, was approximately $694.7 million. For purposes of this calculation, executive officers and directors are deemed to be affiliates of the registrant.

As of February 14, 2017, there were 38,181,626 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the 2017 Annual Meeting of Shareholders are incorporated by reference in Part III herein. The company intends to file such Proxy Statement with the Securities and Exchange Commission no later than 120 days after the end of the period covered by this report on Form 10-K.

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Commonly Used Defined Terms

Green Plains Inc. and Subsidiaries:

Green Plains; the company	Green Plains Inc. and its subsidiaries
BioProcess Algae	BioProcess Algae LLC
Fleischmann’s Vinegar	Fleischmann’s Vinegar Company, Inc.
Green Plains Cattle	Green Plains Cattle Company LLC
Green Plains Grain	Green Plains Grain Company LLC
Green Plains Partners; the partnership	Green Plains Partners LP and its subsidiaries
Green Plains Processing	Green Plains Processing LLC and its subsidiaries
Green Plains Trade	Green Plains Trade Group LLC
SCI Ingredients	SCI Ingredients Holdings, Inc.

Accounting Defined Terms:

ASC	Accounting Standards Codification
EBITDA	Earnings before interest, income taxes, depreciation and amortization
EPS	Earnings per share
Exchange Act	Securities Exchange Act of 1934, as amended
GAAP	U.S. Generally Accepted Accounting Principles
IPO	Initial public offering of Green Plains Partners LP
LIBOR	London Interbank Offered Rate
LTIP	Green Plains Partners LP 2015 Long-Term Incentive Plan
Nasdaq	The Nasdaq Global Market
SEC	Securities and Exchange Commission
Securities Act	Securities Act of 1933, as amended

Industry Defined Terms:

Bgy	Billion gallons per year
BTU	British Thermal Units
CAFE	Corporate Average Fuel Economy
CARB	California Air Resources Board
CBOB	Conventional blendstock for oxygenate blending, an 84 octane sub-grade gasoline
CFTC	Commodity Futures Trading Commission
DOT	U.S. Department of Transportation
E15	Gasoline blended with up to 15% ethanol by volume
E85	Gasoline blended with up to 85% ethanol by volume
EIA	U.S. Energy Information Administration
EISA	Energy Independence and Security Act of 2007, as amended
EPA	U.S. Environmental Protection Agency
EU	European Union
FDA	U.S. Food and Drug Administration
FSMA	Food Safety Modernization Act of 2011
ILUC	Indirect land usage charge
LCFS	Low Carbon Fuel Standard
MMBTU	Million British Thermal Units
Mmg	Million gallons
Mmgy	Million gallons per year
MTBE	Methyl tertiary-butyl ether
RFS II	Renewable Fuels Standard II
RIN	Renewable identification number
U.S.	United States
USDA	U.S. Department of Agriculture

Cautionary Statement Regarding Forward-Looking Statements

The SEC encourages companies to disclose forward-looking information so investors can better understand future prospects and make informed investment decisions. As such, forward-looking statements are included in this report or incorporated by reference to other documents filed with the SEC.

Forward-looking statements are made in accordance with safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are based on current expectations which involve a number of risks and uncertainties and do not relate strictly to historical or current facts, but rather to plans and objectives for future operations. These statements include words such as “anticipate,” “believe,” “continue,” “estimate,” “expect,” “intend,” “outloo “plan,” “predict,” “may,” “could,” “should,” “will” and similar words and phrases as well as statements regarding future operat or financial performance or guidance, business strategy, environment, key trends and benefits of actual or planned acquisitions.

Factors that could cause actual results to differ from those expressed or implied are discussed in this report under “Risk Factors” or incorporated by reference. Specifically, we may experience fluctuations in future operating results due to a number of economic conditions, including: competition in the ethanol industry and other industries in which we operate; commodity market risks, including those that may result from weather conditions; financial market risks; counterparty risks; risks associated with changes to government policy or regulation; risks related to acquisitions and achieving anticipated results; risks associated with merchant trading, cattle feeding operations, vinegar production and other factors detailed in reports filed with the SEC. Additional risks related to Green Plains Partners LP include compliance with commercial contractual obligations, potential tax consequences related to our investment in the partnership and risks disclosed in the partnership’s SEC filings associated with the operation of the partnership as a separate, publicly traded entity.

We believe our expectations regarding future events are based on reasonable assumptions; however, these assumptions may not be accurate or account for all risks and uncertainties. Consequently, forward-looking statements are not guaranteed. Actual results may vary materially from those expressed or implied in our forward-looking statements. In addition, we are not obligated and do not intend to update our forward-looking statements as a result of new information unless it is required by applicable securities laws. We caution investors not to place undue reliance on forward-looking statements, which represent management’s views as of the date of this report or documents incorporated by reference.

PART I

Item 1. Business.

References to “we,” “us,” “our,” “Green Plains,” or the “company” refer to Green Plains Inc. and its subsidiaries.

Overview

Green Plains is an Iowa corporation, founded in June 2004 as an ethanol producer. We have grown through acquisitions of operationally efficient ethanol production facilities and adjacent commodity processing businesses. We are focused on generating stable operating margins through our diversified business segments and risk management strategy. We own and operate assets throughout the ethanol value chain: upstream, with grain handling and storage; through our ethanol production facilities; and downstream, with marketing and distribution services to mitigate commodity price volatility, which differentiates us from companies focused only on ethanol production. Our other businesses leverage our supply chain, production platform and expertise.

We formed Green Plains Partners LP, a master limited partnership, to be our primary downstream storage and logistics provider since its assets are the principal method of storing and delivering the ethanol we produce. The partnership completed its IPO on July 1, 2015. We own a 62.5% limited partner interest, a 2.0% general partner interest and all of the partnership’s incentive distribution rights. The public owns the remaining 35.5% limited partner interest. The partnership is consolidated in our financial statements.

As a result of acquisitions during the year, we implemented organizational segment changes during the fourth quarter of 2016. We now group our business activities into the following four operating segments to manage performance:

· Ethanol Production. Our ethanol production segment includes the production of ethanol, distillers grains and corn oil at 17 ethanol plants in Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, Tennessee, Texas and Virginia. At capacity, we expect to process approximately 524 million bushels of corn per year and produce approximately

1.5 billion gallons of ethanol, 4.1 million tons of distillers grains and 340 million pounds of industrial grade corn oil, making us the second largest consolidated owner of ethanol plants in North America.

- Agribusiness and Energy Services. Our agribusiness and energy services segment includes grain procurement, with approximately 60.3 million bushels of grain storage capacity, and our commodity marketing business, which markets, sells and distributes ethanol, distillers grains and corn oil produced at our ethanol plants. We also market ethanol for a third-party producer as well as buy and sell ethanol, distillers grains, corn oil, crude oil, grain, natural gas and other commodities in various markets.

- Food and Food Ingredients. Our food and food ingredients segment includes a cattle feedlot operation with the capacity to support 73,000 head of cattle and grain storage capacity of approximately 2.8 million bushels, and Fleischmann's Vinegar, one of the world's largest producers of food-grade industrial vinegar.

- Partnership. Our master limited partnership provides fuel storage and transportation services by owning, operating, developing and acquiring ethanol and fuel storage tanks, terminals, transportation assets and other related assets and businesses. The partnership's assets include 39 ethanol storage facilities, 8 fuel terminal facilities and approximately 3,100 leased railcars.

Risk Management and Hedging Activities

Our profitability is highly dependent on commodity prices, particularly for ethanol, distillers grains, corn oil, corn, natural gas and cattle. Since market price fluctuations among these commodities are not always correlated, ethanol production or our cattle feedlot operation may be unprofitable at times. We use a variety of risk management tools and hedging strategies to monitor real-time operating price risk exposure at each of our operations to obtain favorable margins, when available, or temporarily reduce production levels during periods of compressed margins. Our multiple businesses and revenue streams also help to diversify our operations and profitability.

We use forward contracts to sell a portion of our ethanol, distillers grains, corn oil and vinegar production or buy some of the corn, natural gas, cattle, or ethanol we need to partially offset commodity price volatility. We also engage in other hedging transactions involving exchange-traded futures contracts for corn, natural gas, ethanol, cattle and other commodities. The financial impact of these activities depends on price of the commodities involved and our ability to physically receive or deliver those commodities. We do not speculate on general price movements by taking significant unhedged positions on commodities.

Hedging arrangements expose us to risk of financial loss when the counterparty defaults on its contract or, in the case of exchange-traded contracts, when the expected differential between the price of the underlying commodity and

physical commodity changes. Hedging activities can result in losses when a position is purchased in a declining market or sold in a rising market. Hedging losses may be offset by a decreased cash price for corn and natural gas and an increased cash price for ethanol, distillers grains and corn oil. We vary the amount of hedging or other risk mitigation strategies we undertake and sometimes choose not to engage in hedging transactions at all.

Competitive Strengths

We are focused on managing commodity price risks, improving operational efficiencies and optimizing market opportunities to create an efficient platform with diversified income streams. Our competitive strengths include:

Disciplined Risk Management. Risk management is our core competency and we use a variety of risk management tools and hedging strategies to maintain a disciplined approach. Our internally developed operating margin management system allows us to monitor commodity price risk exposure at each of our operations and lock in favorable margins or temporarily reduce production levels during periods of compressed margins.

Acquisition and Integration Capabilities. We have the ability to acquire assets that create synergies and enhance our ability to mitigate risks. Our balance sheet allows us to be opportunistic in that process. Since inception, we built or acquired 17 ethanol plants and installed corn oil extraction technology at each of our ethanol plants to generate incremental returns. In addition, we purchased or built a grain handling and storage business, a cattle feedlot operation, a vinegar production business, and terminal and distribution facilities. Successful integration of these operations has enhanced our overall returns.

Operational Excellence. Our operations are staffed by experienced industry personnel who share operational knowledge and expertise. We focus on making incremental operational improvements to enhance performance using real-time production data and systems to monitor our operations and optimize performance. Our operational expertise provides us a cost advantage over most of our competitors and helps us improve the operating margins of acquired facilities.

Vertical Integration. Our vertically integrated platform reduces commodity and operational risk and increases pricing visibility in key markets. Combined, our ethanol production, agribusiness and energy services, food and food ingredients, and partnership segments provide efficiencies, which extend both within and outside the ethanol value chain.

Proven Management Team. Our senior management team averages more than 25 years of commodity risk management and related industry experience. We have specific expertise across all of our businesses, including plant operations and management, commodity markets and risk management, and ethanol marketing and distribution. Our management team's level of operational and financial expertise is essential to successfully executing our business strategies.

Business Strategy

We believe ethanol could become an increasingly larger portion of the global fuel supply due to factors described below driven by volatile oil prices, heightened environmental concerns, energy independence goals and national security concerns:

- Emissions Reduction. In the 1990's, federal law required the use of oxygenates in reformulated gasoline to reduce vehicle emissions in cities with unhealthy levels of air pollution, on a seasonal or year-round basis. Oxygenated gasoline is used to meet separate federal and state air emission standards. At the time, these oxygenates included ethanol and MTBE. However, the U.S. refining industry has since abandoned the use of MTBE, making ethanol the primary clean air oxygenate used.
- Octane Enhancer. Ethanol has an octane value of 113 and is the primary additive used by refiners to increase octane levels, producing regular grade gasoline from lower octane blend stocks and upgrading regular gasoline to premium grades, to improve engine performance. Refiners are producing more conventional blendstocks for oxygenate blending, or CBOB, which is an 84 octane sub-grade gasoline that requires ethanol or another octane source to meet the minimum octane requirements for the U.S. gasoline market. CBOB represented approximately 80% of total conventional gasoline sold in 2015.
- Fuel Stock Extender. Ethanol is a valuable blend component used by U.S. refiners to extend fuel supply. According to the EIA, ethanol comprised approximately 9.9% of the domestic gasoline supply, replacing nearly 750 million barrels of crude oil in 2016.

- E15 Blending Waiver. In October 2010, the EPA granted a waiver that permitted the use of E15 in model year 2001 and newer passenger vehicles, including cars, sport utility vehicles and light pickup trucks. In June 2012, the EPA approved the sale and use of E15 and in July 2012, the nation's first retail E15 was sold. On January 24, 2017, there were 627 retail fuel stations in 28 states offering E15 to consumers.
- Mandated Use of Renewable Fuels. In the United States, the federal government mandates the use of renewable fuels under RFS II, which has been a driving factor in the growth of domestic ethanol usage. The EPA assigns individual refiners, blenders and importers the volume of renewable fuels they are obligated to use based on their percentage of total fuel sales. In November 2016, the EPA announced the final 2017 renewable volume obligations for conventional ethanol of 15.0 billion gallons, which is currently on hold pending final review by the incoming presidential administration.
- Net Ethanol Exports. Prior to 2010, the United States had a long history as a net importer of ethanol. In 2010, according to the USDA, the United States became the largest exporter of ethanol to world markets and lowest-cost producer, surpassing Brazil. According to the EIA, U.S. ethanol exports, net of imports, were approximately 1.0 billion gallons in 2016 and 730 million gallons in 2015.

In light of our industry's environment, we intend to further develop and strengthen our business by pursuing the following growth strategies:

Grow Organically. We continually leverage our operational expertise to identify expansion projects that maximize our production capabilities at our ethanol and vinegar plants, and cattle feedlot operations. Owning grain storage at or near our ethanol plants allows us to develop relationships with local producers and originate corn more effectively at a lower average cost. We also seek organic growth projects in adjacent businesses and downstream distribution services that take advantage

of our existing assets' locations.

Acquire Strategic Assets. We maintain a disciplined evaluation process in pursuit of strategic assets, taking into consideration rigorous design, engineering, financial and geographic criteria, to ensure the assets will generate favorable returns. We seek acquisitions that leverage our core competencies in adjacent markets, products and services with attractive margins or more predictable revenue streams.

Conduct Safe, Reliable, Efficient Operations and Improve Operational Efficiency. We are committed to maintaining safe, reliable and environmentally compliant operations and employ an extensive production control system at each ethanol plant to continuously monitor performance. We use the performance data to develop strategies that can be applied across our platform. In addition, we research operational processes that may enhance our efficiency by increasing yields, lowering processing cost per gallon and growing production volumes.

Recent Developments

The following is a summary of our significant developments during 2016. Additional information about these items can be found elsewhere in this report or in previous reports filed with the SEC.

Effective January 1, 2016, we sold the storage and transportation assets of the Hereford, Texas and Hopewell, Virginia ethanol production facilities to the partnership for $62.3 million. The partnership used its revolving credit facility and cash on hand to fund the purchase of the assets, which included three ethanol storage facilities that support the plants' combined production capacity of 160 mmgy and 224 leased railcars. In connection with this transaction, Green Plains and the partnership amended the omnibus agreement, operational services agreement, and ethanol storage and throughput agreement.

Effective April 1, 2016, the company increased its ownership of BioProcess Algae to 82.8% and began consolidating the joint venture in its consolidated financial statements. Our ownership in BioProcess Algae is currently at 90.0% as of December 31, 2016. The joint venture is focused on growing algae in commercially viable quantities using feedstocks that are created as part of the ethanol production process.

On June 14, 2016, we announced the formation of a 50/50 joint venture with Jefferson Gulf Coast Energy Partners, a subsidiary of Fortress Transportation and Infrastructure Investors LLC, to construct and operate an intermodal export and import fuels terminal at Jefferson's existing Beaumont, Texas terminal. The joint venture is expected to invest approximately $55 million in its Phase I development, which will initially focus on storage and throughput capabilities for multiple grades of ethanol. The terminal will have direct access to multiple transportation options, including Aframax vessels, inland and coastwise barges, trucks, and unit trains with direct mainline service from the Union Pacific, BNSF and Kansas City Southern railroads. Commercial development is expected to be complete during the second half of 2017, at which time we will offer our interest in the joint venture to the partnership.

On August 15, 2016, we completed a private offering of 4.125% convertible senior notes for an aggregate principal amount of $170 million that will mature on September 1, 2022. The net proceeds from the offering were used to finance subsequent acquisitions.

On August 25, 2016, the partnership filed a shelf registration statement on Form S-3 with the SEC, which was declared effective September 2, 2016, registering an indeterminate number of debt and equity securities with a total offering price not to exceed $500,000,250. The partnership also registered 13,513,500 common units, consisting of 4,389,642 common units and 9,123,858 common units that may be issued upon conversion of subordinated units, in each case, currently held by Green Plains.

On September 23, 2016, we acquired three ethanol plants located in Madison, Illinois; Mount Vernon, Indiana; and York, Nebraska, from subsidiaries of Abengoa S.A. for approximately $234.9 million in cash, plus certain working capital adjustments. The plants have combined production capacity of approximately 230 mmgy. Concurrently, the partnership acquired the ethanol storage assets related to these production facilities from us for $90 million. The partnership used its revolving credit facility to fund the purchase of the assets. In connection with this transaction, Green Plains and the partnership amended the omnibus agreement, operational services agreement, and ethanol storage and throughput agreement.

On October 3, 2016, we acquired Fleischmann's Vinegar, one of the world's largest producers of food-grade industrial vinegar, for $258.3 million in cash, including certain post-closing adjustments. A portion of the purchase price was used to repay existing debt. The transaction was partially financed using $135 million of debt under a new credit agreement,

consisting of a $130 million term loan and $5 million borrowed under a $15 million revolving credit facility. The balance of the transaction was paid from cash on hand.

We filed a shelf registration statement on Form S-3 with the SEC effective December 22, 2016, registering an indeterminate number of shares of common stock, warrants and debt securities.

Operating Segments

Ethanol Production Segment

Industry Overview. Ethanol, also known as ethyl alcohol or grain alcohol, is a colorless liquid produced by fermenting carbohydrates found in a number of different types of grains, such as corn, wheat and sorghum, and other cellulosic matter found in plants. Most of the ethanol produced in the United States is made from corn because it contains large quantities of carbohydrates that convert into glucose more easily than most other kinds of biomass, can be handled efficiently and is in greater supply than other grains. According to the USDA, one bushel, or 56 pounds, of corn, produces approximately 2.8 gallons of ethanol, 15.5 pounds of distillers grains and 0.7 pounds of corn oil, on average. Outside of the Unites States, sugarcane is the primary feedstock used to produce ethanol.

Ethanol is a significant component of the biofuels industry, which includes all transportation fuels derived from renewable biological materials. Biofuels are an excellent oxygenate and source of octane. When added to petroleum-based transportation fuels, oxygenates reduce vehicle emissions. Ethanol is the most economical oxygenate and source of octanes available on the market and its production costs are competitive with gasoline.

Ethanol Plants. We operate 17 dry mill ethanol production plants, located in nine states, that produce ethanol, distillers grains and corn oil:

Plant	Initial Operation or Acquisition Date	Technology	Plant Production Capacity (mmgy)
Atkinson, Nebraska	June 2013	Delta-T	55
Bluffton, Indiana (1)	Sept. 2008	ICM	120
Central City, Nebraska	July 2009	ICM	110
Fairmont, Minnesota	Nov. 2013	Delta-T	119

Hereford, Texas	Nov. 2015	ICM/Lurgi	100
Hopewell, Virginia (2)	Oct. 2015	Katzen	60
Lakota, Iowa	Oct. 2010	ICM/Lurgi	124
Madison, Illinois	Sept. 2016	Vogelbusch	90
Mount Vernon, Indiana	Sept. 2016	Vogelbusch	90
Obion, Tennessee (1)	Nov. 2008	ICM	120
Ord, Nebraska	July 2009	ICM	61
Otter Tail, Minnesota	Mar. 2011	Delta-T	55
Riga, Michigan	Oct. 2010	Delta-T	60
Shenandoah, Iowa (1)	Aug. 2007	ICM	75
Superior, Iowa (1)	July 2008	Delta-T	60
Wood River, Nebraska	Nov. 2013	Delta-T	121
York, Nebraska	Sept. 2016	Katzen	50
Total			1,470

(1) We constructed these four plants; all other ethanol plants were acquired.
(2) The Hopewell plant resumed ethanol production on February 8, 2016.

Our business is directly affected by the supply and demand for ethanol and other fuels in the markets served by our assets. Miles traveled typically increases during the spring and summer months related to vacation travel, followed closely behind the fall season due to holiday travel.

The majority of our plants are equipped with industry-leading ICM or Delta-T ethanol processing technology. Our years of experience building, acquiring and operating these technologies provides us with a deep understanding of how to effectively and efficiently manage both platforms for maximum performance.

Corn Feedstock and Ethanol Production. Our plants use corn as feedstock in a dry mill ethanol production process. Each of our plants requires approximately 20 million to 44 million bushels of corn annually, depending on its production capacity. The price and availability of corn are subject to significant fluctuations driven by a number of factors that affect commodity prices in general, including crop conditions, weather, governmental programs, freight costs and global demand. Ethanol producers are generally unable to pass increased corn costs to customers since ethanol competes with other fuels.

Our corn supply is obtained primarily from local markets. We use cash and forward purchase contracts with grain producers and elevators to buy corn. We maintain direct relationships with local farmers, grain elevators and cooperatives, which serve as our primary sources of grain feedstock, at 14 of our ethanol plants. Most farmers in close proximity of our plants store corn in their own storage facilities. This allows us to purchase much of the corn we need directly from farmers throughout the year. At three of our ethanol plants, we contract with a third-party grain originator to supply the corn necessary for ethanol production. These contracts terminate between August 2019 and November 2023. Each of our plants is also situated on rail lines or has other logistical solutions to access corn supplies from other regions of the country should local supplies become insufficient.

Corn is received at the plant by truck or rail then weighed and unloaded into a receiving building. Grain storage facilities are used to inventory grain that is passed through a scalper to remove rocks and debris prior to processing. The corn is then transported to a hammer mill where it is ground into coarse flour and conveyed into a slurry tank for enzymatic processing. Water, heat and enzymes are added to convert the complex starch molecules into simpler carbohydrates. The slurry is heated to reduce the potential of microbial contamination and pumped into a liquefaction tank where additional enzymes are added. Next, the grain slurry is pumped into fermenters, where yeast, enzymes, and nutrients are added and the batch fermentation process is started. A beer column, within the distillation system, separates the alcohol from the spent grain mash. The alcohol is dehydrated to 200-proof alcohol and either pumped into a holding tank and blended with approximately 2% denaturant as it is pumped into finished product storage tanks, or marketed as undenatured ethanol.

Distillers Grains. The spent grain mash is pumped from the beer column into a decanter-type centrifuge for dewatering. The water, or thin stillage, is pumped from the centrifuge into an evaporator, where it is dried into a thick syrup. The solids, or wet cake, that exit the centrifuge are conveyed to the dryer system and dried at varying temperatures to produce distillers grains. Syrup may be reapplied to the wet cake prior to drying to provide additional nutrients. Distillers grains, the principal co-product of the ethanol production process, are used as high-protein, high-energy animal feed and marketed to the dairy, beef, swine and poultry industries.

We can produce three forms of distillers grains, depending on the number of times the solids are passed through the dryer system:

- wet distillers grains, which contain approximately 65% to 70% moisture, have a shelf life of approximately three days and is therefore sold to dairies or feedlots within the immediate vicinity;
- modified wet distillers grains, which is dried further to approximately 50% to 55% moisture, have a shelf life of approximately three weeks and are marketed to regional dairies and feedlots; and
- dried distillers grains, which have been dried more extensively to approximately 10% to 12% moisture, have an almost indefinite shelf life and may be stored, sold and shipped to any market.

Corn Oil. Corn oil systems extract non-edible corn oil from the thin stillage evaporation process immediately before the production of distillers grains. Corn oil is produced by processing the syrup and evaporated thin stillage through a decanter-style, or disk-stack, centrifuge. The centrifuges separate the relatively light corn oil from the heavier components of the syrup, eliminating the need for significant retention time. We extract approximately 0.7 pounds of corn oil per bushel of corn used to produce ethanol. Industrial uses for corn oil include feedstock for biodiesel, livestock feed additives, rubber substitutes, rust preventatives, inks, textiles, soaps and insecticides. The syrup is blended into wet, modified wet or dried distillers grains.

Natural Gas. Depending on production parameters, our ethanol plants use approximately 20,000 to 40,000 BTUs of natural gas per gallon of production. We have service agreements to acquire the natural gas we need and transport the gas through pipelines to our plants.

Electricity. Our plants require between 0.5 and 1.5 kilowatt hours of electricity per gallon of production. Local utilities supply the necessary electricity to all of our ethanol plants.

Water. While some of our plants satisfy a majority of their water requirements from wells located on their respective properties, each plant also obtains drinkable water from local municipal water sources. Each facility either uses city water or operates a filtration system to purify the well water that is used for its operations. Local municipalities supply all of the necessary water for our plants that do not have onsite wells. Much of the water used in an ethanol plant is recycled in the production process.

Agribusiness and Energy Services Segment

Our agribusiness and energy services segment includes five grain elevators in four states with combined grain storage capacity of approximately 11.6 million bushels, and grain storage at our ethanol plants of approximately 48.7 million bushels, detailed in the following table:

Facility Location	On-Site Grain Storage Capacity (thousands of bushels)
Grain Elevators	
Archer, Nebraska	1,246
Essex, Iowa	3,651
Hopkins, Missouri	2,713
Kismet, Kansas	1,928
St. Edward, Nebraska	2,110
Ethanol Plants	
Atkinson, Nebraska	5,109
Bluffton, Indiana	4,789
Central City, Nebraska	1,400
Fairmont, Minnesota	1,611

Hereford, Texas	4,913
Hopewell, Virginia	1,043
Lakota, Iowa	4,752
Madison, Illinois	1,015
Mount Vernon, Indiana	1,034
Obion, Tennessee	8,168
Ord, Nebraska	2,571
Otter Tail, Minnesota	2,504
Riga, Michigan	2,432
Shenandoah, Iowa	886
Superior, Iowa	2,804
Wood River, Nebraska	3,293
York, Nebraska	347
Total	60,319

We buy bulk grain, primarily corn and soybeans, from area producers, and provide grain drying and storage services to those producers. The grain is used as feedstock for our ethanol plants or sold to grain processing companies and area livestock producers. Bulk grain commodities are traded on commodity exchanges. Inventory values are affected by changes in these markets and spreads. To mitigate risks related to market fluctuations from purchase and sale commitments of grain, as well as grain held in inventory, we enter into exchange-traded futures and options contracts that function as economic hedges at times.

Seasonality is present within our agribusiness operations. The fall harvest period typically results in higher handling margins and stronger financial results during the fourth quarter of each year.

Through Green Plains Trade, we market the ethanol we and a third party produce to local, regional, national and international customers. We also purchase ethanol from independent producers for pricing arbitrage. We sell to various markets under sales agreements with integrated energy companies; retailers, traders and resellers in the United States and buyers for export to Brazil, Canada, Europe and other international markets. Under these agreements, ethanol is priced under fixed and indexed pricing arrangements.

Also through Green Plains Trade, we market wet, modified wet and dried distillers grains to local markets and dried distillers grains to local, national and international markets. The bulk of our demand is delivered to geographic regions that do not have significant local corn or distillers grains production.

Our markets can be further segmented by geographic region and livestock industry. Most of our modified wet distillers grains are sold to midwestern feedlot markets. Our dried distillers grains are shipped to feedlots and poultry markets, as well as Texas and West Coast rail markets. A substantial amount of dried distillers grains are shipped by barge and rail to regional and national markets. Some of our distillers grains are shipped by truck to dairy, beef, and poultry operations in the eastern United States. We also ship by railcar to eastern and southeastern feed mills, poultry and dairy operations, and domestic trade companies. We sell dried distillers grains directly to international markets and indirectly to exporters for shipment. In 2016, we exported approximately 10% of our distillers grains production, with the largest export markets for distillers grains being Vietnam and Thailand. Access to diversified markets allows us to sell product to customers offering the highest net price.

Our corn oil is sold primarily to biodiesel plants and, to a lesser extent, feedlot and poultry markets. We transport our corn oil by truck to locations in a close proximity to our ethanol plants primarily in the southeastern and midwestern regions of the United States. We also transport corn oil by rail and barges to national markets as well as to exporters for shipment on vessels to international markets.

Our railcar fleet for the agribusiness and energy services segment consists of approximately 950 leased hopper cars to transport distillers grains and approximately 180 leased tank cars to transport corn oil and crude oil. The initial terms of the lease contracts are for periods up to ten years.

Food and Food Ingredients Segment

Our cattle feedlot operation has the capacity to support 73,000 head of cattle and 2.8 million bushels of grain storage capacity. We buy feeder cattle from producers, order buyers and livestock auctions, the majority of which are from Kansas, Missouri, Oklahoma and Texas. The finished cattle are then sold to meat processors. Bulk cattle commodities are traded on commodity exchanges. Inventory values are affected by changes in these markets and spreads. To mitigate risks related to market fluctuations from purchase and sale commitments of cattle and cattle held in inventory, we enter into exchange-traded futures and options contracts that function as economic hedges at times.

Our vinegar operation includes seven production facilities. Vinegar is sold primarily to major food industry participants, including leading branded food companies, private label food manufacturers and companies serving the foodservice channel. Products include white distilled vinegar and numerous specialty vinegars for retail and industrial uses. Vinegar is distributed primarily in bulk using 5,600 gallon tanker trailers. We also have four distribution warehouses located in California, Oregon, Texas and Quebec, Canada.

Partnership Segment

Our partnership segment provides fuel storage and transportation services through (i) 39 ethanol storage facilities located at or near our 17 ethanol production plants, (ii) eight fuel terminal facilities located near major rail lines, and (iii) a leased railcar fleet and other transportation assets.

Transportation and Delivery. Most of our ethanol plants are situated near major highways or rail lines to ensure efficient movement. We are able to move product from our ethanol plants to bulk terminals via truck, railcar or barge. We also manage the logistics and transportation requirements of our customers to improve our fleet’s efficiency and reduce operating costs.

Deliveries within 150 miles of our plants and the partnership's fuel terminal facilities are generally transported by truck. Deliveries to distant markets are shipped using major U.S. rail carriers that can switch cars to other major railroads, allowing our plants to ship product throughout the United States.

To meet the challenge of marketing ethanol and distillers grains to diverse market segments, several of our plants are capable of simultaneously handling more than 150 railcars. Some of our locations have large loop tracks with unit train loading capabilities for both ethanol and dried distillers grains and spurs to connect the loop to the mainline or allow the movement and storage of railcars on site.

The partnership's railcar fleet consists of approximately 3,100 leased tank cars for the transportation of ethanol. The initial terms of the lease contracts are for periods up to seven years.

To optimize the partnership's railcar assets, we transport products other than ethanol depending on market opportunities and have used a portion of our railcar fleet to transport crude oil for third parties and to lease railcars to other users.

Terminal and Distribution Services. Ethanol is transported from the partnership's terminals to third-party terminal racks where it is blended with gasoline and transferred to the loading rack for delivery by truck to retail gas stations. The partnership owns and operates fuel holding tanks and terminals, and provide terminal services and logistics solutions to markets that do not have efficient access to renewable fuels. The partnership operates fuel terminals at one owned and seven leased locations in seven states with combined storage capacity of approximately 7.4 mmg and throughput capacity of approximately 822 mmgy. We also have 39 ethanol storage facilities located at or near our 17 ethanol production plants with a combined storage capacity of approximately 38.6 mmg to support current ethanol production capacity of approximately 1.5 bgy.

Facility Location	Storage Capacity (thousands of gallons)
Fuel Terminals	
Birmingham, Alabama - Unit Train Terminal	6,542
Birmingham, Alabama - Other	120
Bossier City, Louisiana	180
Collins, Mississippi	180
Little Rock, Arkansas	30
Louisville, Kentucky	60

Nashville, Tennessee	160
Oklahoma City, Oklahoma	150
Ethanol Plants	
Atkinson, Nebraska (1)	2,074
Bluffton, Indiana	3,000
Central City, Nebraska	2,250
Fairmont, Minnesota	3,124
Hereford, Texas	4,406
Hopewell, Virginia	761
Lakota, Iowa	2,500
Madison, Illinois	2,855
Mount Vernon, Indiana	2,855
Obion, Tennessee	3,000
Ord, Nebraska	1,550
Otter Tail, Minnesota	2,000
Riga, Michigan	1,239
Shenandoah, Iowa	1,524
Superior, Iowa	1,238
Wood River, Nebraska	3,124
York, Nebraska	1,100
Total	46,022

(1) The ethanol storage facilities are located approximately 16 miles from the ethanol plant.

Our Competition

Domestic Ethanol Competitors

We are the second largest consolidated owner of ethanol plants in the United States. We compete with other domestic ethanol producers in a relatively fragmented industry. The top five producers account for approximately 45% of the domestic production capacity with production capacity ranging from 800 mmgy to 1,800 mmgy.

Our competitors also include plants owned by farmers, oil refiners and retail fuel operators. These competitors may continue to operate their plants even when market conditions are not favorable due to the benefits realized from their other operations.

Demand for corn from ethanol plants and other corn consumers exists in all areas and regions in which we operate. According to the Renewable Fuels Association, there were 127 operational plants in the states where we have production facilities, including Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, Tennessee, Texas and Virginia, as of December 1, 2016. The largest concentration of operational plants is located in Illinois, Iowa and Nebraska, where 50% of all operational production capacity is located.

Foreign Ethanol Competitors

We also complete globally with production from other countries. Brazil is the second largest ethanol producer in the world after the United States. Brazil produces ethanol made from sugarcane, which may be less expensive to produce than ethanol made from corn depending on feedstock prices. Under RFS II, certain parties are obligated to meet an advanced biofuel standard. In recent years, sugarcane ethanol imported from Brazil has been one of the most economical means for obligated parties to meet this standard. Any significant additional ethanol production capacity could create excess supply in world markets, resulting in lower ethanol prices throughout the world, including the United States.

Other Competition

Alternative fuels, gasoline oxygenates and ethanol production methods are continually under development. Ethanol production technologies also continue to evolve. We expect changes to occur primarily in the area of cellulosic ethanol, which is made from biomass such as switch grass or fast-growing poplar trees. Since all of our plants are designed as single-feedstock facilities, adapting our plants for a different feedstock or process system would require additional capital investments and retooling.

In addition, we compete with other cattle feedlots and vinegar producers in competitive markets.

Regulatory Matters

Government Ethanol Programs and Policies

In the United States, the federal government mandates the use of renewable fuels under RFS II. The EPA assigns individual refiners, blenders and importers the volume of renewable fuels they are obligated to use based on their percentage of total fuel sales. The EPA has the authority to waive the mandates in whole or in part if there is inadequate domestic renewable fuel supply or the requirement severely harms the economy or environment.

RFS II has been a driving factor in the growth of ethanol usage in the United States. When RFS II was established in October 2010, the required volume of renewable fuel to be blended with gasoline was to increase each year until it reached 15.0 billion gallons in 2015, which left the EPA to address existing limitations in both supply (ethanol production) and demand (usage of ethanol blends in older vehicles). On November 23, 2016, the EPA announced the final 2017 renewable volume obligations for conventional ethanol, which met the 15.0-billion-gallon congressional target for the first time, up from 14.50 billion gallons in 2016 and 14.05 billion gallons in 2015.

In January 2017, the Trump administration imposed a government-wide freeze on new and pending regulations, which included the 2017 renewable volume obligations that was originally intended to go into effect on February 10, 2017. Regulatory freezes are a common practice during a change in administration and we currently believe the new presidential administration will continue to be supportive of ethanol in accordance with the current laws.

Obligated parties use RINs to show compliance with RFS-mandated volumes. RINs are attached to renewable fuels by producers and detached when the renewable fuel is blended with transportation fuel or traded in the open market. The market price of detached RINs affects the price of ethanol in certain markets and influences the purchasing decisions by obligated parties. In November 2016, the EPA proposed denying a petition to change the point of obligation under RFS II to the parties that own the gasoline before it is sold. In December 2016, the EPA extended the comment period to February 2017. The point of obligation does not directly impact ethanol producers; however, moving the point of obligation could indirectly affect ethanol producers.

On January 18, 2017, Valero Energy Corporation filed an action against the EPA, seeking to compel the EPA to perform certain non-discretionary duties required by the RFS program under the Clean Air Act. Within the filed action, Valero claims the EPA has failed to perform these duties, namely periodic reviews of the feasibility of achieving compliance with the requirements and the impact of the requirements on each individual and entity regulated under the program, i.e, point of obligation, since 2010. Valero has requested an injunction, which if granted would require the EPA to promptly conduct rulemaking to ensure the requirements of the program are met.

Several amendments to the Energy Policy Modernization Act were introduced in the U.S. Senate that were removed from consideration in early February 2016, including amendments to repeal RFS II, eliminate the corn ethanol mandate in RFS II and prohibit the U.S. Secretary of Agriculture from using Commodity Credit Corporation or other funds to construct blender pumps.

CAFE was first enacted by Congress in 1975 to reduce energy consumption by increasing the fuel economy of cars and light trucks. CAFE has helped the ethanol industry by encouraging the use of E85. CAFE provides a 54% efficiency bonus to flexible-fuel vehicles running on E85. According to HIS Automotive, there are nearly 20 million flexible fuel vehicles on U.S. roads today. In addition, E85 is sold at more than 3,100 fuel stations in 46 states.

Demand for cleaner, more sustainable transportation fuel is growing worldwide. Ethanol has become a crucial component of the global fuel supply as an economical oxygenate and source of octanes. According to the Global Renewable Fuels Alliance, 35 countries, including the EU which is regulated by a single policy with specific national targets for each country, have mandates or planned targets in place for blending ethanol and biodiesel with transportation fuels to reduce harmful emissions.

Government actions abroad can have significant impact on the ethanol industry. For example, China raised its 5% tariff on U.S. and Brazil fuel ethanol to 30%, effective January 1, 2017.

Environmental and Other Regulation

Our ethanol production, agribusiness and energy services, and food and food ingredients segment activities are subject to environmental and other regulations. We obtain environmental permits to construct and operate our ethanol plants and other facilities.

Ethanol production involves the emission of various airborne pollutants, including particulate, carbon dioxide, oxides of nitrogen, hazardous air pollutants and volatile organic compounds. In 2007, the U.S. Supreme Court classified carbon dioxide as an air pollutant under the Clean Air Act in a case seeking to require the EPA to regulate carbon dioxide in vehicle emissions, which the EPA later addressed in RFS II.

While some of our plants operate as grandfathered at their current authorized capacity under the RFS II mandate, expansion above these capacities will require a 20% reduction in greenhouse gas emissions from a 2005 baseline measurement. This may require us to obtain additional permits, achieve the EPA's efficient producer status under the pathway petition program for our grandfathered plants, install advanced technology or reduce drying distillers grains.

CARB adopted LCFS requiring a 10% reduction in average carbon intensity of gasoline and diesel transportation fuels from 2010 to 2020. After a series of rulings that temporarily prevented CARB from enforcing these regulations, the State of California Office of Administrative Law approved the LCFS in November 2012, and revised LCFS regulations took effect in January 2013.

In January 2017, the USDA released a report providing evidence that greenhouse gas emissions associated with corn-based ethanol are 43% lower than gasoline. Numerous factors have led to improvements over the past ten years, including conservation practices by farmers, higher corn yields and advances in production technologies, which are expected to

continue and has the potential to further reduce greenhouse gas emissions up to a 76% as compared with gasoline.

The U.S. ethanol industry relies heavily on tank cars to deliver its product to market. As of December 31, 2016, the company leases approximately 3,300 tank cars, including 3,100 leased by our partnership to transport ethanol. On May 1, 2015, the DOT finalized the Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, or DOT specification 117, which established a schedule to retrofit or replace older tank cars that carry crude oil and ethanol, braking standards intended to reduce the severity of accidents and new operational protocols. We intend to strategically manage our leased railcar fleet to comply with these regulations. Currently, all of our railcar leases expire prior to the retrofit deadline of May 1, 2023.

Parts of our business are regulated by environmental laws and regulations governing the labeling, use, storage, discharge and disposal of hazardous materials. Our agribusiness operations are also subject to government regulation. Our production levels are indirectly affected by federal government programs, which include the USDA, acreage control and price support programs. In addition, the grain we sell must conform to official grade standards imposed by the USDA. Other examples of government policies that may impact our business include tariffs, duties, subsidies, import and export restrictions and outright embargos.

In September 2015, the FDA issued rules for Current Good Manufacturing Practice, Hazard Analysis and Risk-Based Preventative Controls for food for animals in response to FSMA. The rules require FDA-registered food facilities to address safety concerns for sourcing, manufacturing and shipping food products and food for animals through food safety programs and plans, which includes conducting hazard analyses, developing risk-based preventative controls and monitoring, and addressing intentional adulteration, recalls, sanitary transportation and supplier verification. We believe we have taken sufficient measures to comply with these regulations.

On January 1, 2017, all medically important antimicrobials intended for use in animal feed that were once available over-the-counter became veterinary feed directive drugs, requiring written orders from a licensed veterinarian to purchase and use on or in livestock feed under the October 2015 revised Veterinary Feed Directive rule. Our cattle feedlot operation obtained all necessary prescriptions from a licensed veterinarian to use certain veterinary feed directive drugs, as appropriate.

We employ maintenance and operations personnel at each of our plants. In addition to the attention we place on the health and safety of our employees, the operations of our facilities are regulated by the Occupational Safety and Health Administration.

BioProcess Algae Joint Venture

We are the majority owner of the BioProcess Algae joint venture, which was formed in 2008. The joint venture is focused on growing algae in commercially viable quantities using feedstocks that are created as part of our ethanol production process. The joint venture continues to take steps towards commercialization. We are currently focused on human and animal nutrition, using proprietary technology to customize specific products, based on proven benefits, for relevant markets.

Employees

On December 31, 2016, we had 1,294 full-time, part-time, temporary and seasonal employees, including 177 employees at our corporate office in Omaha, Nebraska.

Available Information

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports are available on our website at www.gpreinc.com shortly after we file or furnish the information with the SEC. You can also find the charters of our audit, compensation and nominating committees, as well as our code of ethics in the corporate governance section of our website. The information found on our website is not part of this or any other report we file with or furnish to the SEC. For more information on our partnership, please visit www.greenplainspartners.com. Alternatively, investors may read and copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549 or visit the SEC website at www.sec.gov to access our reports, proxy and information statements filed with the SEC.

Item 1A. Risk Factors.

We operate in an industry that has numerous risks, many of which are beyond our control or are driven by factors that cannot always be predicted. Investors should carefully consider all of the risk factors in conjunction with the other information included in this report as our financial results and condition or market value could be adversely affected if any of these risks were to occur.

Risks Related to our Business and Industry

Our profitability is dependent on managing the spread between the price of corn, natural gas, ethanol, distillers grains, corn oil, cattle and vinegar.

Our operating results are highly sensitive to commodity prices, including the spread between the corn, natural gas, cattle and ethanol we purchase, and the ethanol, distillers grains, corn oil and vinegar we sell. Price and supply are subject to market forces, such as weather, domestic and global demand, shortages, export prices, crude oil prices, currency valuations and government policies in the United States and around the world, over which we have no control. Price volatility of these commodities may cause our operating results to fluctuate substantially. Increases in corn or natural gas prices or decreases in ethanol, distillers grains and corn oil prices may make it unprofitable to operate our ethanol plants. No assurance can be given that we will purchase corn and natural gas or sell ethanol, distillers grains, corn oil and cattle at or near current prices. Consequently, our results of operations and financial position may be adversely affected by increases in corn or natural gas prices or decreases in ethanol, distillers grains, corn oil and cattle prices.

We continuously monitor the profitability of our ethanol plants using a variety of risk management tools and hedging strategies, when appropriate. In recent years, the spread between ethanol and corn prices has fluctuated widely and narrowed significantly. Fluctuations are likely to continue. A sustained narrow spread or further reduction in the spread between ethanol and corn prices as a result of increased corn prices or decreased ethanol prices, would adversely affect our results of operations and financial position. Should our combined revenue from ethanol, distillers grains and corn oil fall below our cost of production, we could decide to slow or suspend production at some or all of our ethanol plants.

The commodities we buy and sell are subject to price volatility and uncertainty.

Corn. We are generally unable to pass increased corn costs to our customers since ethanol competes with other fuels. At certain corn prices, ethanol may be uneconomical to produce. Ethanol plants, livestock industries and other corn-consuming enterprises put significant price pressure on local corn markets. In addition, local corn supplies and prices could be adversely affected by prices for alternative crops, increasing input costs, changes in government policies, shifts in global markets or damaging growing conditions, such as plant disease or adverse weather, including drought.

Natural Gas. The price and availability of natural gas are subject to volatile market conditions. These market conditions are often affected by factors beyond our control, such as weather, drilling economics, overall economic conditions and government regulations. Significant disruptions in natural gas supply could impair our ability to produce ethanol. Furthermore, increases in natural gas price or changes in our cost relative to our competitors may adversely affect our results of operations and financial position.

Ethanol. Our revenues are dependent on market prices for ethanol which can be volatile as a result of a number of factors, including: the price and availability of competing fuels; the overall supply and demand for ethanol and corn; the price of gasoline, crude oil and corn; and government policies.

Ethanol is marketed as a fuel additive that reduces vehicle emissions, an economical source of octanes and, to a lesser extent, a gasoline substitute. Consequently, gasoline supply and demand affect the price of ethanol. Should gasoline prices or demand decrease significantly, our results of operations could be materially harmed.

Ethanol imports also affect domestic supply and demand. Imported ethanol is not subject to an import tariff and, under RFS II, sugarcane ethanol from Brazil is one of the most economical means for obligated parties to meet the advanced biofuel standard.

Distillers Grains. Increased U.S. dry mill ethanol production has resulted in increased distillers grains production. Should this trend continue, distillers grains prices could fall unless demand increases or other market sources are found. The price of distillers grains has historically been correlated with the price of corn. Occasionally, the price of distillers grains will

lag behind fluctuations in corn or other feedstock prices, lowering our cost recovery percentage.

Distillers grains compete with other protein-based animal feed products. Downward pressure on commodity prices, such as soybeans, will generally cause the price of competing animal feed products to decline, resulting in downward pressure on the price of distillers grains.

Corn Oil. Industrial corn oil is generally marketed as a biodiesel feedstock; therefore, the price of corn oil is affected by demand for biodiesel. In general, corn oil prices follow the prices of heating oil and soybean oil. Decreases in the price of corn oil could have an unfavorable impact on our business.

Cattle. The price and availability of feeder cattle are subject to volatile market conditions. These market conditions are often affected by factors beyond our control, such as weather, overall economic conditions and government regulations. Significant disruptions in feeder cattle supply could impair our ability to produce consistent results. Furthermore, increases in feeder cattle price or changes in our cost relative to our competitors may adversely affect our results of operations and financial position. In addition, a significant disruption in cattle processing capacity could impair our ability to market cattle at favorable prices which would affect our profitability.

Our risk management strategies could be ineffective and expose us to decreased liquidity.

As market conditions warrant, we use forward contracts to sell some of our ethanol, distillers grains, corn oil and vinegar production or buy some of the corn, natural gas, cattle or ethanol we need to partially offset commodity price volatility. We also engage in other hedging transactions involving exchange-traded futures contracts for corn, natural gas and ethanol. The financial impact of these activities depends on the price of the commodities involved and our ability to physically receive or deliver the commodities.

Hedging arrangements expose us to risk of financial loss when the counterparty defaults on its contract or, in the case of exchange-traded contracts, when the expected differential between the price of the underlying and physical commodity changes. Hedging activities can result in losses when a position is purchased in a declining market or sold in a rising market. Hedging losses may be offset by a decreased cash price for corn and natural gas and an increased cash price for ethanol, distillers grains and corn oil. We vary the amount of hedging and other risk mitigation strategies we undertake and sometimes choose not to engage in hedging transactions at all. We cannot provide assurance that our risk management strategies effectively offset commodity price volatility. If we fail to offset such volatility, our results of operations and financial position may be adversely affected.

The use of derivative financial instruments frequently involves cash deposits with brokers, or margin calls. Sudden changes in commodity prices may require additional cash deposits immediately. Depending on our open derivative positions, we may need additional liquidity with little advance notice to cover margin calls. While we continuously monitor our exposure to margin calls, we cannot guarantee we will be able to maintain adequate liquidity to cover margin calls in the future.

Government mandates affecting ethanol usage could change and impact the ethanol market.

Under the provisions of the EISA, the EPA established a mandate setting the minimum volume of ethanol that must be blended with gasoline under the RFS II, which affects the domestic market for ethanol. The EPA has the authority to waive the requirements, in whole or in part, if there is inadequate domestic renewable fuel supply or the requirement severely harms the economy or the environment.

In January 2017, the Trump administration imposed a government-wide freeze on new and pending regulations, which included the 2017 renewable volume obligations that was originally intended to go into effect on February 10, 2017. Our operations could be adversely impacted by legislation that reduces the RFS II mandate. Similarly, should federal mandates regarding oxygenated gasoline be repealed, the market for domestic ethanol could be adversely impacted.

Future demand will be influenced by economic incentives to blend based on the relative value of gasoline versus ethanol, taking into consideration the octane value of ethanol, environmental requirements and the RFS II mandate. A significant increase in supply beyond the RFS II mandate could have an adverse impact on ethanol prices. Moreover, changes to RFS II which could significantly affect the market price of RINs could in turn negatively impact the price of ethanol or cause imported sugarcane ethanol to become more economical than domestic ethanol.

Flexible-fuel vehicles, which are designed to run on a mixture of fuels such as E85, receive preferential treatment to meet corporate average fuel economy standards. Absent CAFE preferences, auto manufacturers may not be willing to build flexible-fuel vehicles, reducing the growth of E85 markets and resulting in lower ethanol prices.

While we currently believe the new presidential administration will support the environmental laws that are currently in place, to the extent federal or state laws or regulations are modified, the demand for ethanol may be reduced, which could negatively and materially affect our ability to operate profitably.

Future demand for ethanol is uncertain and changes in public perception, consumer acceptance and overall consumer demand for transportation fuel could affect demand.

While many trade groups, academics and government agencies support ethanol as a fuel additive that promotes a cleaner environment, others claim ethanol production consumes considerably more energy, emits more greenhouse gases than other biofuels and depletes water resources. Some studies suggest ethanol produced from corn is less efficient than ethanol produced from switch grass or wheat grain. Others claim corn-based ethanol negatively impacts consumers by causing the prices of dairy, meat and other food derived from corn-consuming livestock to increase. Ethanol critics also contend the industry redirects corn supplies from international food markets to domestic fuel markets.

There are limited markets for ethanol beyond the federal mandates. Further consumer acceptance of E15 and E85 fuels may be necessary before ethanol can achieve significant market share growth. Discretionary and E85 blending are important secondary markets. Discretionary blending is often determined by the price of ethanol relative to gasoline. When discretionary blending is financially unattractive, the demand for ethanol may be reduced.

Demand for ethanol is also affected by overall demand for transportation fuel, which is affected by cost, number of miles traveled and vehicle fuel economy. Consumer demand for gasoline may be impacted by emerging transportation trends, such as electric vehicles or ride sharing. Reduced demand for ethanol may depress the value of our products, erode our margins, and reduce our ability to generate revenue or operate profitably.

Our business is directly affected by the supply and demand for ethanol and other fuels in the markets served by our assets. Miles traveled typically increases during the spring and summer months related to vacation travel, followed closely behind the fall season due to holiday travel. Reduced demand for ethanol may erode our margins and reduce our ability to generate revenue and operate profitably.

We may fail to realize the anticipated benefits of mergers, acquisitions, joint ventures or partnerships.

We have increased the size and diversity of our operations significantly through mergers and acquisitions and intend to continue exploring potential growth opportunities. Acquisitions involve numerous risks that could harm our business, including:

- difficulties integrating the operations, technologies, products, existing contracts, accounting processes and personnel and realizing anticipated synergies of the combined business;
- risks relating to environmental hazards on purchased sites;
- risks relating to developing the necessary infrastructure for facilities or acquired sites, including access to rail networks;
- difficulties supporting and transitioning customers;
- diversion of financial and management resources from existing operations;
- the purchase price exceeding the value realized;
- risks of entering new markets or areas outside of our core competencies;
- potential loss of key employees, customers and strategic alliances from our existing or acquired business;
- unanticipated problems or underlying liabilities; and
- inability to generate sufficient revenue to offset acquisition and development costs.

The anticipated benefits of these transactions may not be fully realized or take longer to realize than expected.

We may also pursue growth through joint ventures or partnerships, which typically involve restrictions on actions that the partnership or joint venture may take without the approval of the partners. These provisions could limit our ability to manage the partnership or joint venture in a manner that serves our best interests.

Future acquisitions may involve issuing equity as payment or to finance the business or assets, which could dilute your ownership interest. Furthermore, additional debt may be necessary to complete these transactions, which could have a material adverse effect on our financial condition. Failure to adequately address the risks associated with acquisitions or joint ventures could have a material adverse effect on our business, results of operations and financial condition.

Our debt exposes us to numerous risks that could have significant consequences to our shareholders.

Risks related to the level of debt we have include:

- requiring a substantial portion of cash to be dedicated for debt payments, reducing the availability of cash flow for working capital, capital expenditures and other general business activities;
- requiring a substantial portion of cash reserves to be held for debt service, limiting our ability to invest in new growth opportunities;
- limiting our ability to obtain additional financing for working capital, capital expenditures, acquisitions and other activities;
- limiting our flexibility to plan for or react to changes in the businesses and industries in which we operate;
- increasing our vulnerability to general and industry-specific adverse economic conditions;
- being at a competitive disadvantage against less leveraged competitors;
- being vulnerable to increases in prevailing interest rates;
- subjecting all or substantially all of our assets to liens, which means there may be no assets left for shareholders in the event of a liquidation; and
- limiting our ability to make operational decisions regarding our business, including limiting our ability to pay dividends, make capital improvements, sell or purchase assets or engage in transactions deemed appropriate and in our best interest.

Most of our debt bears interest at variable rates, which creates exposure to interest rate risk. If interest rates increase, our debt service obligations at variable rates would increase even though the amount borrowed remained the same, decreasing net income.

Our ability to make scheduled payments of principal and interest, to make additional payments required under financial covenants, or to refinance our debt depends on our future performance, which is subject to economic,

financial, competitive and other factors beyond our control. Our business may not continue generating cash flow sufficient to service our debt because of such factors, including the spread between corn prices and ethanol, corn oil and distillers grains prices. If we are unable to generate sufficient cash flows, we may be required to sell assets, restructure debt or obtain additional equity capital on terms that are onerous or highly dilutive. Our ability to refinance our debt will depend on capital markets and our financial condition at that time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in default on our debt obligations.

We are not restricted from incurring additional debt, pledging assets, recapitalizing our debt or taking a number of other actions that could diminish our ability to make payments.

Increased federal support of cellulosic ethanol could result in increased competition to corn-based ethanol producers.

Legislation, including the American Recovery and Reinvestment Act of 2009 and EISA, provides numerous funding opportunities supporting cellulosic ethanol production. In addition, RFS II mandates an increasing level of biofuel production that is not derived from corn. Federal policies suggest a long-term political preference for cellulosic processing using feedstocks such as switch grass, silage, wood chips or other forms of biomass. Cellulosic ethanol may be viewed more favorably since the feedstock is not diverted from food production. In addition, cellulosic ethanol may have a smaller carbon footprint because the feedstock does not require energy-intensive fertilizers or industrial production processes. Several cellulosic ethanol plants are currently under development. While these have had limited success to date, as research and

development programs persist, there is risk that cellulosic ethanol could displace corn ethanol.

Any changes in federal mandates from corn-based to cellulosic-based ethanol production may reduce our profitability. Our plants are designed as single-feedstock facilities and would require significant additional investments to convert production to cellulosic ethanol. Furthermore, our plants are strategically located in high-yield, low-cost corn production areas. At present, there is limited supply of alternative feedstocks near our facilities. As a result, the adoption of cellulosic ethanol and its use as the preferred form of ethanol could have a significant adverse impact on our business.

Our ability to maintain the required regulatory permits or manage changes in environmental and safety regulations is essential to successfully operating our plants.

Our ethanol production and agribusiness and energy services segments are subject to extensive air, water and other environmental regulations. Ethanol production involves the emission of various airborne pollutants, including particulate, carbon dioxide, nitrogen oxides, hazardous air pollutants and volatile organic compounds, which requires numerous environmental permits to operate our plants. Governing state agencies could impose costly conditions or restrictions that are detrimental to our profitability and have a material adverse effect on our operations, cash flows and financial position.

Environmental laws and regulations at the federal and state level are subject to change, particularly following a change in the presidential administration. These changes can also be made retroactively. It is possible that more stringent federal or state environmental rules or regulations could be adopted, which could increase our operating costs and expenses. Consequently, even though we currently have the proper permits, we may be required to invest or spend considerable resources in order to comply with future environmental regulations. Furthermore, ongoing plant operations, which are governed by the Occupational Safety and Health Administration, may change in a way that increases the cost of plant operations. Any of these events could have a material adverse effect on our operations, cash flows and financial position.

Part of our business is regulated by environmental laws and regulations governing the labeling, use, storage, discharge and disposal of hazardous materials. Since we handle and use hazardous substances, changes in environmental requirements or an unanticipated significant adverse environmental event could have a negative impact on our business. While we strive to comply with all environmental requirements, we cannot provide assurance that we have been in compliance at all times or will not incur material costs or liabilities in connection with these requirements. Private parties, including current and former employees, could bring personal injury or other claims against us due to the presence of hazardous substances. We are also exposed to residual risk by our land and facilities which may have

environmental liabilities from prior use. Changes in environmental regulations may require us to modify existing plant and processing facilities, whi