

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

FORM 10-K

(Mark One)

- ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2020
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: 000-21467

ALTO INGREDIENTS, INC.
(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

41-2170618

(I.R.S. Employer
Identification No.)

1300 South Second Street, Pekin, Illinois

(Address of principal executive offices)

61554

(Zip Code)

Registrant's telephone number, including area code: (916) 403-2123

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

Title of each Class	Trading Symbol	Name of Exchange on Which Registered
Common Stock, \$0.001 par value	ALTO	The Nasdaq Stock Market LLC (Nasdaq Capital 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 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.

Large accelerated filer

Non-accelerated filer

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 Act). Yes No

The aggregate market value of the voting and non-voting common equity held by nonaffiliates of the registrant computed by reference to the closing sale price of such stock, was approximately \$37.7 million as of June 30, 2020, the last business day of the registrant's most recently completed second fiscal quarter.

As of March 25, 2021, there were 73,167,785 shares of the registrant's common stock, \$0.001 par value per share, and 896 shares of the registrant's non-voting common stock, \$0.001 par value per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE: Part III incorporates by reference certain information from the registrant's proxy statement (the "Proxy Statement") for the 2021 Annual Meeting of Stockholders to be filed on or before April 30, 2021.

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CAUTIONARY STATEMENT

All statements included or incorporated by reference in this Annual Report on Form 10-K, other than statements or characterizations of historical fact, are forward-looking statements. Examples of forward-looking statements include, but are not limited to, statements concerning projected net sales, costs and expenses and gross margins; our ability to timely and successfully implement our strategic initiatives; our ability to continue as a going concern; our accounting estimates, assumptions and judgments; the demand for ethanol and its co-products; the competitive nature of and anticipated growth in our industry; production capacity and goals; our ability to consummate acquisitions and integrate their operations successfully; and our prospective needs for additional capital. These forward-looking statements are based on our current expectations, estimates, approximations and projections about our industry and business, management’s beliefs, and certain assumptions made by us, all of which are subject to change. Forward-looking statements can often be identified by words such as “anticipates,” “expects,” “intends,” “plans,” “predicts,” “believes,” “seeks,” “estimates,” “may,” “will,” “should,” “would,” “could,” “potential,” “continue,” “ongoing,” similar expressions and variations or negatives of these words. These statements are not guarantees of future performance and are subject to risks, uncertainties and assumptions that are difficult to predict. Therefore, our actual results could differ materially and adversely from those expressed in any forward-looking statements as a result of various factors, some of which are listed under “Risk Factors” in Item 1A of this report. These forward-looking statements speak only as of the date of this report. We undertake no obligation to revise or update publicly any forward-looking statement for any reason, except as otherwise required by law.

PART I

Item 1. Business.

Business Overview

We are a leading producer and marketer of specialty alcohols and essential ingredients, and the largest producer of specialty alcohols in the United States based on annualized volumes.

We operate seven alcohol production facilities. Three of our production facilities are located in the Midwestern state of Illinois and four of our facilities are located in the Western states of California, Oregon and Idaho. We have an annual alcohol production capacity of 450 million gallons. We market all of the alcohols produced at our

facilities as well as fuel-grade ethanol produced by third parties. In 2020, we marketed over 500 million gallons combined of our own alcohols as well as fuel-grade ethanol produced by third parties, and nearly 1.5 million tons of essential ingredients on a dry matter basis. Our business consists of three reportable segments: two production segments and a marketing segment.

Our mission is to expand our business as a leading producer and marketer of specialty alcohols and essential ingredients. We intend to accomplish this goal in part by investing in our specialized and higher value specialty alcohol production and distribution infrastructure, expanding production in high-demand essential ingredients, expanding and extending the sale of our products into new regional and international markets, building efficiencies and economies of scale and by capturing a greater portion of the value stream.

Production Segments

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on four key markets: *Health, Home & Beauty*; *Food & Beverage*; *Essential Ingredients*; and *Renewable Fuels*. Products for the Health, Home & Beauty market include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the Food & Beverage markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for Essential Ingredients markets include yeast, corn gluten and distillers grains used in commercial animal feed and pet foods. Our Renewable Fuels products include fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel fuel.

We produce our alcohols and essential ingredients at our production facilities described below. Our production facilities located in the Midwest are in the heart of the Corn Belt, benefit from low-cost and abundant feedstock and enjoy logistical advantages that enable us to provide our products to both domestic and international markets via truck, rail or barge. Our production facilities located on the West Coast are near their respective fuel and feed customers, offering significant timing, transportation cost and logistical advantages.

We are currently operating at approximately 64% of our estimated maximum annual production capacity. Our Magic Valley, Stockton and Madera facilities are currently idled. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Production Facility	Location	Annual Production Capacity (estimated, in gallons)	
		Fuel-Grade Ethanol	Specialty Alcohol
Pekin Campus	Pekin, IL	110,000,000	140,000,000
Magic Valley	Burley, ID	60,000,000	—
Columbia	Boardman, OR	40,000,000	—
Stockton	Stockton, CA	60,000,000	—
Madera	Madera, CA	40,000,000	—

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Marketing Segment

We market all of the alcohols and essential ingredients we produce at our facilities. We also market fuel-grade ethanol produced by third parties.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our fuel-grade ethanol customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery with very little effort on their part. Our customers collectively require fuel-grade ethanol volumes in excess of the supplies we produce at our facilities. We secure additional fuel-grade ethanol supplies from third-party fuel-grade ethanol plants in California and other third-party suppliers in the Midwest where a majority of fuel-grade ethanol producers are located. We arrange for transportation, storage and delivery of fuel-grade ethanol purchased by our customers through our agreements with third-party service providers in the Western United States as well as in the Midwest from a variety of sources.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry and biodiesel customers. We do not market essential ingredients from other producers.

See “Note 4 – Segments” to our Notes to Consolidated Financial Statements included elsewhere in this report for financial information about our business segments.

Company History

We are a Delaware corporation formed in February 2005. Our common stock trades on The Nasdaq Capital Market under the symbol “ALTO”. Our Internet website address is <http://www.altoingredients.com>. Information contained on our website is not part of this Annual Report on Form 10-K. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to such reports filed with or furnished to the Securities and Exchange Commission and other Securities and Exchange Commission filings are available free of charge through our website as soon as reasonably practicable after the reports are electronically filed with, or furnished to, the Securities and Exchange Commission.

Business Strategy

Our goal is to expand our business as a leading producer and marketer of specialty alcohols and essential ingredients. The key elements of our business and growth strategy to achieve this objective include:

- *Focus on our customer relationships.* We have repositioned our business to focus on specialty alcohols and essential ingredients. As a result, our business is service-oriented and focused on specialty products compared to a price-oriented business focused on commodity products. We strive to make our business ever more customer-centric to enable our premium services to support premium prices and new differentiated and higher-margin products.

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- *Expand product offerings.* We are pursuing initiatives to broaden our product offerings to appeal to a wider range of customers and uses in our key markets. For example, we have secured ISO 9001, ICH Q7 and EXCiPACT certifications. These certifications appeal to customers with stringent quality demands and enable us to offer alcohol certified for use as an active pharmaceutical ingredient, or API, and as an excipient—an inactive component of a drug or medication, such as solvents, carriers or tinctures—in the pharmaceutical industry. We are reviewing additional certifications and product positioning within our key markets to expand the range of customers we serve and the uses our products support.
- *Implement new equipment and technologies.* We are evaluating and plan to implement new equipment and technologies to increase our production yields, improve our operating efficiencies and reliability, reduce our overall carbon footprint, diversify our products and revenues, and increase our profitability as financial resources and market conditions justify these investments.
- *Sell or repurpose underperforming production assets.* We are pursuing the sale of our production facilities located in Stockton and Madera, California. We are also evaluating the sale or repurposing of other underperforming fuel-grade ethanol production assets. We have idled certain underperforming production facilities and intend to restart production at those facilities only when economic prospects indicate a level of production margins sufficient to justify resuming production. We may repurpose one or more underperforming production facilities to shift production to specialty alcohols if market demand justifies the expense. We are also exploring other potential repositioning activities, including an expansion into new markets such as essential oils and CBD oils, high protein development and protein pelletizing.
- *Evaluate and pursue strategic opportunities.* We are examining opportunities to expand our business such as joint ventures, strategic partnerships, synergistic acquisitions and other opportunities. We intend to pursue these opportunities as financial resources and business prospects make these opportunities desirable.

Competitive Strengths

We are the largest producer of specialty alcohols in the United States based on annualized volumes. We believe that our competitive strengths include:

- *Our customer and supplier relationships.* We have extensive and long-standing close customer and supplier relationships, both domestic and international, for our specialty alcohols and essential ingredients. We have an excellent reputation for developing specialty alcohols under stringent quality control standards, particularly at our Pekin, Illinois campus, or Pekin Campus. Our quality management systems are supported by ISO 9001, ICH Q7 and EXCiPACT certifications which are viewed by our customers as important attestations of our quality control standards.
- *Barriers to entry.* Our production facilities use specialized equipment, technologies and processes to achieve stringent quality controls, lower operating costs, higher yields, and efficient production of alcohols and essential ingredients. Our specialized equipment, technologies and processes, together with our quality management certifications, strict regulatory requirements, and close customer and supplier relationships create significant barriers to entry to new market participants.

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- *Our experienced management.* Our senior management team has a proven track record with significant operational and financial expertise and many years of experience in the alcohol production industry. Our senior executives have successfully navigated a wide variety of business and industry-specific challenges and deeply understand the business of successfully producing and marketing specialty alcohols and essential ingredients.
- *The strategic location of our Midwest production facilities.* We operate three distinct but integrated production facilities at our Pekin Campus in the Midwest. We are able to participate from that location in the largest regional specialty alcohol market in the United States as well as international markets. In addition:
 - Our Midwest location enhances our overall hedging opportunities with a greater correlation to the highly-liquid physical and paper markets in Chicago.
 - Our Midwest location provides excellent logistical access via rail, truck and barge. In particular, barge access via the Illinois River to the Mississippi River enables us to efficiently bring our products to international markets.
 - The relatively unique wet milling process at one of our production facilities at our Pekin Campus allows us to extract the highest use and value from each component of the corn kernel. As a result, the wet milling process generates a higher level of cost recovery from corn than that produced at a dry mill.
 - Our Midwest location allows us deep market insight and engagement in major fuel-grade ethanol and feed markets, thereby improving pricing opportunities.

We believe that these competitive strengths will help us attain our goal of expanding our business as a leading producer and marketer of specialty alcohols and essential ingredients.

Overview of Our Key Markets and Market Opportunity

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on four key markets: *Health, Home & Beauty; Food & Beverage; Essential Ingredients; and Renewable Fuels.*

Health, Home & Beauty

Our products for the health, home and beauty markets include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. We offer a variety of specialty alcohols for the health, home and beauty markets, depending on usage and regulatory requirements, including API-grade, United States Pharmacopeia, or USP, -grade ethyl alcohols, and industrial-grade ethyl alcohol.

In 2020 we expanded our range of available product offerings within the health, home and beauty markets through quality management systems certifications. We have ISO 9001, ICH Q7 and EXCiPACT certifications at a key production facility at our Pekin Campus, all of which are viewed as important attestations of quality control standards. In particular, our ICH Q7 certification qualifies our specialty alcohols for use as an API, and our EXCiPACT certification qualifies our specialty alcohols for use as an excipient in the pharmaceutical industry. These certifications enable us to offer products to a wider group of customers and generally at more profitable margins.

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Food & Beverage

Our products for the food and beverage market include specialty alcohols used in alcoholic beverages, flavor extracts and vinegar as well as corn germ used for corn

oils and carbon dioxide, or CO₂, used for beverage carbonation and dry ice. The principal specialty alcohol we offer for alcoholic beverages and vinegar is our grain neutral spirits, or GNS, alcohol.

We believe the key drivers in the food and beverage market include consumer preferences for the social currency of brand authenticity and heritage; consumers seeking unique and personalized experiences; younger adults drawn to the caché of luxury brands, including super-premium spirits; improved consumer access to spirits products; the growth of craft distillers; and the ability to meet wide-ranging consumer preferences through a broad diversity of spirits categories and cocktails.

Essential Ingredients

Our essential ingredients products include dried yeast, corn gluten meal, corn gluten feed, and distillers grains and liquid feed used in commercial animal feed and pet foods. The raw materials for our essential ingredients products are generated as co-products from our production of alcohols. These co-products are further manufactured, altered and refined into our essential ingredients products, including for special customer applications.

Many of our essential ingredients are used in a variety of food products to affect their nutrition, including protein and fat content, as well as other product attributes such as taste, texture, palatability and stability. Our high quality and high purity manufacturing enable our customers to use some of our essential ingredients in human foods while others are used in pet foods and animal feed. See “—Overview of Distillers Grains Market”.

We expect the essential ingredients market to grow significantly due to global demand for higher-grade protein feed, such as feed used in fisheries and other applications.

Renewable Fuels

Our renewable fuels products include fuel-grade ethanol used as transportation fuel and distillers corn oil used as a biodiesel feedstock. Our renewable fuels business is supported by our own production of fuel-grade ethanol as well as fuel-grade ethanol produced by third parties.

Renewable fuels, primarily fuel-grade ethanol, are used for a variety of purposes, including as octane enhancers for premium gasoline and to enable refiners to produce greater quantities of lower octane blend stock; for fuel blending to extend fuel supplies and reduce reliance on crude oil and refined products; and to comply with a variety of governmental programs, in particular, the national Renewable Fuel Standard, or RFS, which was enacted to promote alternatives to fossil fuels. Under the RFS, the mandated use of all renewable fuels rises incrementally and peaks at 36.0 billion gallons by 2022, of which 15.0 billion gallons are required from conventional, or corn-based, ethanol. The RFS allows the Environmental Protection Agency, or EPA, to adjust the annual requirement based on certain facts and circumstances. See “—Governmental Regulation”.

According to the Renewable Fuels Association, the domestic fuel-grade ethanol industry produced 13.8 billion gallons of ethanol in 2020. According to the United States Department of Energy, total annual gasoline consumption in the United States is approximately 123.5 billion gallons and total annual fuel-grade ethanol consumption represented approximately 11% of this amount in 2020. We anticipate that increased transportation and economic activity as the coronavirus pandemic subsides together with continued limited opportunities for gasoline refinery expansions and the growing importance of reducing CO₂ emissions through the use of renewable fuels will generate additional growth in the demand for fuel-grade ethanol.

Overview of Alcohol Production Process

Alcohol production from starch- or sugar-based feedstock is a highly-efficient process. Modern alcohol production requires large amounts of corn, or other high-starch grains, and water as well as chemicals, enzymes and yeast, and denaturants including unleaded gasoline or liquid natural gas, in addition to natural gas and electricity.

Dry Milling Process

In the dry milling process, corn or other high-starch grain is first ground into meal, then slurried with water to form a mash. Enzymes are added to the mash to convert the starch into dextrose, a simple sugar. Ammonia is added for acidic (pH) control and as a nutrient for the yeast. The mash is processed through a high temperature cooking procedure, which reduces bacteria levels prior to fermentation. The mash is then cooled and transferred to fermenters, where yeast is added and the conversion of sugar to alcohol and CO₂ begins.

After fermentation, the resulting “beer” is transferred to distillation, where the alcohol is separated from the residual “stillage”. The resulting alcohol is concentrated to 190 proof using conventional distillation methods and then is dehydrated to approximately 200 proof, representing 100% alcohol levels, in a molecular sieve system. For fuel-grade ethanol, the resulting anhydrous alcohol is then blended with approximately 2.5% denaturant, which is usually gasoline, and is then ready for shipment to renewable fuels markets.

The residual stillage is separated into a coarse grain portion and a liquid portion through a centrifugation process. The soluble liquid portion is concentrated to about 40% dissolved solids by an evaporation process. This intermediate state is called condensed distillers solubles, or syrup. The coarse grain and syrup portions are then mixed to produce wet distillers grains, or WDG, or can be mixed and dried to produce dried distillers grains with solubles, or DDGS. Both WDG and DDGS are high-protein animal feed products.

Wet Milling Process

In the wet milling process, corn or other high-starch grain is first soaked or “steeped” in water for 24 – 48 hours to separate the grain into its many components. After steeping, the grain slurry is processed first to separate the grain germ, from which the grain oil can be further separated. The remaining fiber, gluten and starch components are further separated and sold.

The steeping liquor is concentrated in an evaporator. The concentrated product, called heavy steep water, is co-dried with the fiber component and is then sold as gluten feed. The gluten component is filtered and dried to produce gluten meal.

The starch and any remaining water from the mash is then processed into alcohol or dried and processed into corn syrup. The fermentation process for alcohol at this stage is similar to the dry milling process.

Overview of Distillers Grains Market

Distillers grains are produced as a co-product of alcohol production and are valuable components of feed rations primarily to dairies and beef cattle markets, both nationally and internationally. Our plants produce both WDG and DDGS. WDG is sold to customers proximate to the plants and DDGS is delivered by truck, rail and barge to customers in domestic and international markets. Producing WDG also allows us to use up to one-third less process energy, thus reducing production costs and lowering the carbon footprint of our production facilities.

Historically, the market price for distillers grains has generally tracked the value of corn. We believe that the market price of WDG and DDGS is determined by a number of factors, including the market value of corn, soybean meal and other competitive ingredients, the performance or value of WDG and DDGS in a particular feed formulation and general market forces of supply and demand, including export markets for these co-products. The market price of distillers grains is also often influenced by nutritional models that calculate the feed value of distillers grains by nutritional content, as well as reliability of consistent supply.

Customers

We market and sell through our wholly-owned subsidiary, Kinergy Marketing LLC, or Kinergy, all of the alcohols we produce. Kinergy also markets fuel-grade ethanol produced by third parties. We market and sell through our wholly-owned subsidiary, Alto Nutrients, LLC, all of the essential ingredients we produce.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our fuel-grade ethanol customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery with very little effort on their part. Our customers collectively require fuel-grade ethanol volumes in excess of the supplies we produce at our facilities. We secure additional fuel-grade ethanol supplies from third-party fuel-grade ethanol plants in California and other third-party suppliers in the Midwest where a majority of fuel-grade ethanol producers are located. We arrange for transportation, storage and delivery of fuel-grade ethanol purchased by our customers through our agreements with third-party service providers in the Western United States as well as in the Midwest from a variety of sources.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry and biodiesel customers. We do not market essential ingredients from other producers.

Our Pekin Campus production segment generated \$330.4 million and \$343.6 million in net sales for the years ended December 31, 2020 and 2019, respectively, from the sale of alcohols. Our Pekin Campus production segment generated \$130.3 million and \$139.0 million in net sales for the years ended December 31, 2020 and 2019, respectively, from the sale of essential ingredients.

During 2020 and 2019, our Pekin Campus production segment sold an aggregate of approximately 193.9 million and 218.5 million gallons of alcohols and 829,000 and 913,000 tons of essential ingredients, respectively, on a dry matter basis.

Our other production segment generated \$137.7 million and \$455.3 million in net sales for the years ended December 31, 2020 and 2019, respectively, from the sale of alcohols. Our other production segment generated \$40.9 million and \$130.0 million in net sales for the years ended December 31, 2020 and 2019, respectively, from the sale of essential ingredients.

During 2020 and 2019, our other production segment sold an aggregate of approximately 78.0 million and 272.5 million gallons of alcohols and 619,000 and 1,908,000 tons of essential ingredients, respectively, on a dry matter basis.

Our marketing segment generated \$257.7 million and \$356.9 million in net sales for the years ended December 31, 2020 and 2019, respectively, from the sale of alcohols.

During 2020 and 2019, we produced or purchased from third parties and resold an aggregate of 536.3 million and 819.4 million gallons of alcohols to approximately 65 and 109 customers, respectively. For 2020 and 2019, sales to our two largest customers, Chevron Products USA and Valero Energy Corporation represented an aggregate of approximately 14% and 24%, of our net sales, respectively. For 2020 and 2019, sales to each of our other customers represented less than 10% of our net sales.

Suppliers

Production Segments

Our production operations depend upon various raw materials suppliers, including suppliers of corn, natural gas, electricity and water. The cost of corn is the most important variable cost associated with our alcohol production. We source corn for our plants using standard contracts, including spot purchase, forward purchase and basis contracts. When resources are available, we seek to limit the exposure of our production operations to raw material price fluctuations by purchasing forward a portion of our corn requirements on a fixed price basis and by purchasing corn and other raw materials futures contracts.

During 2020 and 2019, purchases of corn from our two largest suppliers represented an aggregate of approximately 25% and 40% of our total corn purchases, respectively, for those periods. Purchases from each of our other corn suppliers represented less than 10% of total corn purchases in each of 2020 and 2019.

Marketing Segment

Our marketing operations cover alcohols and essential ingredients we produce but also depend upon various third-party producers of fuel-grade ethanol. In addition, we provide transportation, storage and delivery services through third-party service providers with whom we have contracted to receive fuel-grade ethanol at agreed upon locations from our third-party suppliers and to store and/or deliver the ethanol to agreed-upon locations on behalf of our customers. These contracts generally run from year-to-year, subject to termination by either party upon advance written notice before the end of the then current annual term.

During 2020 and 2019, we purchased and resold from third parties an aggregate of approximately 163 million and 213 million gallons, respectively, of fuel-grade ethanol.

During 2020 and 2019, purchases of fuel-grade ethanol from our two largest third-party suppliers represented 54% and 35%, respectively, of our total third-party ethanol purchases for each of those periods. Purchases from each of our other third-party ethanol suppliers represented less than 10% of total third-party ethanol purchases in each of 2020 and 2019.

Production Facilities

We operate seven production facilities. Three of our production facilities are located in the Midwestern state of Illinois and four of our facilities are located in the Western states of California, Oregon and Idaho. We have a combined annual alcohol production capacity of 450 million gallons. Our Magic Valley, Stockton and Madera facilities are currently idled. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility. The tables below provide an overview of our seven production facilities.

Pekin Campus Production Facilities

	Pekin Wet Facility	Pekin Dry Facility	Pekin ICP Facility
Location	Pekin, IL	Pekin, IL	Pekin, IL
Operating status	Operating	Operating	Operating
Approximate maximum annual alcohol production capacity (in millions of gallons)	100	60	90
Approximate maximum annual specialty alcohol production capacity (in millions of gallons)*	74	—	66
Production milling process	Wet	Dry	Dry
Primary energy source	Natural Gas	Natural Gas	Natural Gas

* Included in approximate maximum annual alcohol production capacity.

Western Production Facilities

	Madera Facility	Columbia Facility	Magic Valley Facility	Stockton Facility
Location	Madera, CA	Boardman, OR	Burley, ID	Stockton, CA
Operating status	Idled	Operating	Idled	Idled
Approximate maximum annual fuel-grade ethanol production capacity (in millions of gallons)	40	40	60	60
Production milling process	Dry	Dry	Dry	Dry
Primary energy source	Natural Gas	Natural Gas	Natural Gas	Natural Gas

Commodity Risk Management

We employ various risk mitigation techniques. For example, we may seek to mitigate our exposure to commodity price fluctuations by purchasing forward a portion of our corn and natural gas requirements through fixed-price or variable-price contracts with our suppliers, as well as entering into derivative contracts for fuel-grade ethanol, corn and natural gas. To mitigate fuel-grade ethanol inventory price risks, we may sell a portion of our production forward under fixed- or index-price contracts, or both. We may hedge a portion of the price risks by selling exchange-traded futures contracts. Proper execution of these risk mitigation strategies can reduce the volatility of our gross profit margins.

Specialty alcohols have relatively low price volatility and are usually priced at significant premiums to fuel-grade ethanol. The market price of fuel-grade ethanol is volatile, however, and subject to large fluctuations. Given the nature of our business, we cannot effectively hedge against extreme volatility or certain market conditions. For example, fuel-grade ethanol prices, as reported by the Chicago Board of Trade, or CBOT, ranged from \$0.81 to \$1.62 per gallon during 2020 and from \$1.25 to \$1.70 per gallon during 2019; and corn prices, as reported by the CBOT, ranged from \$3.03 to \$4.84 per bushel during 2020 and from \$3.41 to \$4.55 per bushel during 2019.

Marketing Arrangements

We market all the alcohols and essential ingredients produced at our facilities. In addition, we have exclusive fuel-grade ethanol marketing arrangements with two third-party ethanol producers, Calgren Renewable Fuels, LLC and Aemetis Advanced Fuels Keyes, Inc., to market and sell their entire fuel-grade ethanol production volumes. Calgren Renewable Fuels, LLC owns and operates a fuel-grade ethanol production facility in Pixley, California with annual production capacity of 55 million gallons. Aemetis Advanced Fuels Keyes, Inc. owns and operates a fuel-grade ethanol production facility in Keyes, California with annual production capacity of 60 million gallons.

Competition

We are the largest producer of specialty alcohols in the United States based on annualized volumes.

Other significant producers of specialty alcohols in the United States are Archer-Daniels-Midland Company, MGP Ingredients, Inc., Grain Processing Corporation, CIE and Greenfield Global Inc., which collectively make up a significant majority of the total installed specialty alcohol production capacity in the United States along with many smaller producers.

The largest producers of fuel-grade ethanol in the United States are POET, LLC, Valero Renewable Fuels Company, LLC, Archer-Daniels-Midland Company, Green Plains Inc. and Flint Hills Resources, collectively with approximately 41% of the total installed fuel-grade ethanol production capacity in the United States. In addition, there are many mid-sized fuel-grade ethanol producers with several plants under ownership, smaller producers with one or two plants, and several fuel-grade ethanol marketers that create significant competition. Overall, we believe there are over 200 fuel-grade ethanol production facilities in the United States with a total installed production capacity of approximately 17.4 billion gallons and many brokers and marketers with whom we compete for sales of fuel-grade ethanol and its co-products.

Our fuel-grade ethanol also competes on a global market against production from other countries, such as Brazil, which may have lower production costs than United States producers. Lower feedstock input costs such as sugarcane used in Brazil as compared to corn used in the United States may give foreign producers a competitive advantage. In addition, fuel-grade ethanol from sugarcane feedstock qualifies as an advanced biofuel, unlike corn ethanol, allowing required parties to economically satisfy an advanced biofuel standard. Moreover, new products and production technologies are under continuous development, many of which, if adopted by competitors, could harm ability to compete.

We believe that our competitive strengths include our customer and supplier relationships, the barriers to entry to our most profitable lines of business—including our modern technologies at our production facilities—our experienced management, and the strategic location of our Midwest production facilities. We believe that these advantages will help us to attain our goal to expand our business as a leading producer and marketer of specialty alcohols and essential ingredients. See “—Competitive

Strengths”.

Governmental Regulation

Our business is subject to a wide range of federal, state and local laws and regulations directed at protecting public health and the environment, including those promulgated by the Occupational Safety and Health Administration, or OSHA, the U.S. Food and Drug Administration, or FDA, the EPA, and numerous state and local authorities. These laws, their underlying regulatory requirements and their potential enforcement, some of which are described below, impact, or may impact, nearly every aspect of our operations, including our production of alcohols (including distillation), our production of essential ingredients, our storage facilities, and our water usage, waste water discharge, disposal of hazardous wastes and emissions, and other matters pertaining to our existing and proposed business by imposing:

- restrictions on our existing and proposed operations and/or the need to install enhanced or additional controls;
- special requirements applicable to food and drug additives;

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- the need to obtain and comply with permits and authorizations;
- liability for exceeding applicable permit limits or legal requirements, in some cases for the remediation of contaminated soil and groundwater at our production facilities, contiguous and adjacent properties and other properties owned and/or operated by third parties; and
- other specifications for the specialty alcohols and essential ingredients we produce and market.

In addition, some governmental regulations are helpful to our production and marketing business. The fuel-grade ethanol industry in particular is supported by federal and state mandates and environmental regulations that favor the use of fuel-grade ethanol in motor fuel blends in North America. Some of the governmental regulations applicable to our production and marketing business are briefly described below.

Food and Drug Regulation

Our products for the Health, Home & Beauty, Food & Beverage and some Essential Ingredients markets are subject to regulation by the FDA as well as similar state agencies. Under the Federal Food, Drug, and Cosmetic Act, or FDCA, the FDA regulates the processing, formulation, safety, manufacture, packaging, labeling and distribution of food ingredients, vitamins and cosmetics. Many of the FDA’s and FDCA’s rules and regulations apply directly to us as well as indirectly through their application in our customers’ products. To be properly marketed and sold in the United States, a relevant product must be generally recognized as safe, approved and not adulterated or misbranded under the FDCA and relevant regulations issued under the FDCA. The FDA has broad authority to enforce the provisions of the FDCA. Failure to comply with the laws and regulations of the FDA or similar state agencies could prevent us from selling certain of our products or subject us to liability.

Renewable Fuels Energy Legislation

Under the RFS, the mandated use of all renewable fuels, including fuel-grade ethanol, rises incrementally and peaks at 36.0 billion gallons by 2022, of which 15.0 billion gallons are required from conventional, or corn-based, ethanol. Under the provisions of the Energy Independence and Security Act of 2007, the EPA has the authority to waive the mandated RFS requirements in whole or in part. To grant a waiver, the EPA administrator must determine, in consultation with the Secretaries of Agriculture and Energy, that there is inadequate domestic renewable fuel supply or implementation of the requirement would severely harm the economy or environment of a state, region or the United States as a whole.

Various bills in Congress introduced from time to time are also directed at altering existing renewable fuels energy legislation, but none has passed in recent years. Some legislative bills are directed at halting or reversing expansion of, or even eliminating, the renewable fuel program, while other bills are directed at bolstering the program or enacting further mandates or grants that would support the renewable fuels industry.

The EPA has allowed fuel and fuel-additive manufacturers to introduce into commercial gasoline that contains greater than 10% fuel-grade ethanol by volume, up to 15% fuel-grade ethanol by volume, or E15, for vehicles from model year 2001 and beyond. Commercial sale of E15 has begun in a majority of states, and the EPA has enacted a rule allowing for year-round use of E15.

Various states including California, Oregon and Washington, and other regions such as the Canadian province of British Columbia, have implemented low-carbon fuel standards focused on reducing the carbon intensity of transportation fuels. Blending fuel-grade ethanol into gasoline is one of the primary means of attaining these goals.

Additional Environmental Regulations

In addition to the governmental regulations applicable to the alcohol production and marketing industry described above, our business is subject to additional federal, state and local environmental regulations, including regulations established by the EPA and state regulatory agencies related to water quality and air pollution control. We cannot predict the manner or extent to which these regulations will harm or help our business or the alcohol production and marketing industry in general.

Employees

As of March 25, 2021, we had approximately 370 employees, including 369 full-time employees. We believe that our employees are highly-skilled, and our success will depend in part upon our ability to retain our employees and attract new qualified employees, many of whom are in great demand. Approximately 51% of our employees are presently represented by a labor union and covered by a collective bargaining agreement. We have never had a work stoppage or strike and we consider our relations with our employees to be good.

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Item 1A. Risk Factors.

Before deciding to purchase, hold or sell our common stock, you should carefully consider the risks described below in addition to the other information contained in this Report and in our other filings with the Securities and Exchange Commission, including subsequent reports on Forms 10-Q and 8-K. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business. If any of these known or unknown risks or uncertainties actually occurs with material adverse effects on Alto Ingredients, our business, financial condition, results of operations and/or liquidity could be seriously harmed. In that event, the market price for our common stock will likely decline, and you may lose all or part of your investment.

Risks Related to our Business

The effects of the coronavirus pandemic, or its abatement, may materially and adversely affect our business, results of operations and liquidity.

The coronavirus pandemic has resulted in businesses suspending or substantially curtailing operations and travel, quarantines, and an overall substantial slowdown of economic activity. Federal, state and foreign governments have implemented measures to contain the virus, including social distancing requirements, travel restrictions, border closures, limitations on public gatherings, work-from-home orders, and closure of non-essential businesses. Many of these measures remain or have been curtailed only partially. Transportation fuels in particular, including fuel-grade ethanol, experienced significant price declines and reduced demand. A further or extended ongoing downturn in global economic activity, or recessionary conditions in general, would likely lead to poor demand for, and negatively affect the prices of, fuel-grade ethanol, materially and adversely affecting our business, results of operations and liquidity.

Furthermore, to protect the health and well-being of our employees and customers, we have implemented work-from-home requirements, made substantial modifications to employee travel policies, and cancelled or shifted marketing and other corporate events to virtual-only formats for the foreseeable future. While we continue to monitor our circumstances and may adjust our current policies as more information and public health guidance become available, these precautionary measures could negatively affect our sales and marketing efforts, delay and lengthen our sales cycles, or create operational or other challenges, any of which could harm our business and results of operations.

In addition, if one or more of our employees or customers becomes ill from coronavirus and attributes their infection to us, including through exposure at one of our offices or production facilities, we could be subject to allegations of failure to adequately mitigate the risk of exposure. Such allegations could harm our reputation and expose us to the risks of litigation and liability.

Our specialty alcohols business has benefitted significantly from the coronavirus pandemic due to a substantial increase in demand for alcohol-based sanitizers and disinfectants. As the coronavirus pandemic abates, demand for alcohol-based sanitizers and disinfectants may decline, ultimately exerting downward pressure on prices for our specialty alcohols used in those products. In addition, higher industry production levels in response to the coronavirus pandemic and any resulting oversupply of specialty alcohols for sanitizers and disinfectants would also exert downward pressure on prices. Reduced demand and prices for our specialty alcohols used in sanitizers and disinfectants, or industry oversupply of those specialty alcohols, may materially and adversely affect our business, results of operations and liquidity.

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Our results of operations and our ability to operate at a profit are largely dependent on our ability to manage the costs of corn, natural gas and other production inputs, with the prices of our alcohols and essential ingredients, all of which are subject to volatility and uncertainty.

Our results of operations are highly impacted by commodity prices, including the cost of corn, natural gas and other production inputs that we must purchase, and the prices of alcohols and essential ingredients that we sell. Prices and supplies are subject to and determined by market and other forces over which we have no control, such as weather, domestic and global demand, supply shortages, export prices and various governmental policies in the United States and throughout the world.

Price volatility of corn, natural gas and other production inputs, and alcohols and essential ingredients, may cause our results of operations to fluctuate substantially. We may fail to generate expected levels of net sales and profits even under fixed-price and other contracts for the sale of specialty alcohols used in consumer products. Our customers may not pay us timely or at all, even under longer-term, fixed-price contracts for our specialty alcohols, and may seek to renegotiate prices under those contracts during periods of falling prices or high price volatility.

Over the past several years, for example, the spread between corn and fuel-grade ethanol prices has fluctuated significantly. Fluctuations are likely to continue to occur. A sustained narrow spread, whether as a result of sustained high or increased corn prices or sustained low or decreased alcohol or essential ingredient prices, would adversely affect our results of operations and financial position. Revenues from sales of alcohols, particularly fuel-grade ethanol, and essential ingredients could decline below the marginal cost of production, which may force us to further suspend production, particularly fuel-grade ethanol production, at some or all of our facilities.

In addition, some of our fuel-grade ethanol marketing activities will likely be unprofitable in a market of generally declining prices due to the nature of our business. For example, to satisfy customer demands, we maintain certain quantities of fuel-grade ethanol inventory for subsequent resale. Moreover, we procure much of our fuel-grade ethanol inventory outside of third-party marketing arrangements and therefore must buy fuel-grade ethanol at a price established at the time of purchase and sell fuel-grade ethanol at an index price established later at the time of sale that is generally reflective of movements in the market price of fuel-grade ethanol. As a result, our margins for fuel-grade ethanol sold in these transactions generally decline and may turn negative as the market price of fuel-grade ethanol declines.

We can provide no assurance that corn, natural gas or other production inputs can be purchased at or near current or any particular prices, or that our alcohols or essential ingredients will sell at or near current or any particular prices. Consequently, our results of operations and financial position may be adversely affected by increases in the prices of corn, natural gas and other production inputs or decreases in the prices of our alcohols and essential ingredients.

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Increased alcohol or essential ingredient production or higher inventory levels may cause a decline in prices for those products, and may have other negative effects, adversely impacting our results of operations, cash flows and financial condition.

The prices of our alcohols and essential ingredients are impacted by competing third-party supplies of those products. For example, we believe that the most significant factor influencing the price of fuel-grade ethanol has been the substantial increase in production. According to the Renewable Fuels Association, domestic fuel-grade ethanol production capacity increased from an annualized rate of 1.5 billion gallons per year in January 1999 to a record 16.1 billion gallons in 2018. In addition, if fuel-grade ethanol production margins improve, we anticipate that owners of production facilities operating at below capacity, or owners of idled production facilities, will increase production levels, thereby resulting in more abundant fuel-grade ethanol supplies and inventories. Increases in the supply of alcohols and essential ingredients may not be commensurate with increases in demand for alcohols and essential ingredients, thus leading to lower prices. Moreover, higher industry production levels in response to the coronavirus pandemic and any resulting oversupply of alcohols for sanitizers and disinfectants, and corresponding oversupply of essential ingredient co-products, may also exert downward pressure on prices. Any of these outcomes could have a material adverse effect on our results of operations, cash flows and financial condition.

The prices of our products are volatile and subject to large fluctuations, which may cause our results of operations to fluctuate significantly.

The prices of our products are volatile and subject to large fluctuations. For example, the market price of fuel-grade ethanol is dependent upon many factors, including the supply of ethanol and the price of gasoline, which is in turn dependent upon the price of petroleum which itself is highly volatile and difficult to forecast. Our fuel-grade ethanol sales are tied to prevailing spot market prices rather than long-term, fixed-price contracts. Fuel-grade ethanol prices, as reported by the CBOT, ranged from \$0.81 to \$1.62 per gallon in 2020 and from \$1.25 to \$1.70 per gallon in 2019. In addition, even under longer-term, fixed-price contracts for our specialty alcohols, our customers may

seek to renegotiate prices under those contracts during periods of falling prices or high price volatility. Fluctuations in the prices of our products may cause our results of operations to fluctuate significantly.

Disruptions in our production or distribution may adversely affect our business, results of operations and financial condition.

Our business depends on the continuing availability of rail, road, port, storage and distribution infrastructure. In particular, due to limited storage capacity at our production facilities and other considerations related to production efficiencies, our facilities depend on just-in-time delivery of corn. The production of alcohols also requires a significant and uninterrupted supply of other raw materials and energy, primarily water, electricity and natural gas. Local water, electricity and gas utilities may fail to reliably supply the water, electricity and natural gas that our production facilities need or may fail to supply those resources on acceptable terms. In the past, poor weather has caused disruptions in rail transportation, which slowed the delivery of fuel-grade ethanol by rail, the principle manner by which fuel-grade ethanol from our facilities located in the Midwest is transported to market. In addition, we recently experienced closure of the Illinois River for lock repairs which required greater use of less cost-effective modes of product transport such as via rail and truck, which resulted in higher costs and negatively affected our results of operations.

Disruptions in production or distribution, whether caused by labor difficulties, unscheduled downtimes and other operational hazards inherent in the alcohol production industry, including equipment failures, fires, explosions, abnormal pressures, blowouts, pipeline ruptures, transportation accidents and natural disasters such as earthquakes, floods and storms, or human error or malfeasance or other reasons, could prevent timely deliveries of corn or other raw materials and energy, and could delay transport of our products to market, and may require us to halt production at one or more production facilities, any of which could have a material adverse effect on our business, results of operations and financial condition.

Some of these operational hazards may also cause personal injury or loss of life, severe damage to or destruction of property and equipment or environmental damage, and may result in suspension of operations and the imposition of civil or criminal penalties. Our insurance may not fully cover the potential hazards described above or we may be unable to renew our insurance on commercially reasonable terms or at all.

We may engage in hedging transactions and other risk mitigation strategies that could harm our results of operations and financial condition.

In an attempt to partially offset the effects of volatility of our product prices, in particular fuel-grade ethanol, corn and natural gas costs, we may enter into contracts to fix the price of a portion of our production or purchase a portion of our corn or natural gas requirements on a forward basis. In addition, we may engage in other hedging transactions involving exchange-traded futures contracts for corn, natural gas and unleaded gasoline from time to time. The financial statement impact of these activities is dependent upon, among other things, the prices involved and our ability to sell sufficient products to use all of the corn and natural gas for which forward commitments have been made. Hedging arrangements also expose us to the risk of financial loss in situations where the other party to the hedging contract defaults on its contract or, in the case of exchange-traded contracts, where there is a change in the expected differential between the underlying price in the hedging agreement and the actual prices paid or received by us. In addition, our open contract positions may require cash deposits to cover margin calls, negatively impacting our liquidity. As a result, our hedging activities and fluctuations in the price of corn, natural gas, fuel-grade ethanol and unleaded gasoline may adversely affect our results of operations, financial condition and liquidity.

The industries in which we operate are extremely competitive. Many of our significant competitors have greater production and financial resources and could use their greater resources to gain market share at our expense.

The industries in which we operate are extremely competitive. Many of our significant competitors have substantially greater production and financial resources than we do. As a result, our competitors may be able to compete more aggressively and sustain that competition over a longer period of time. Successful competition will require a continued high level of investment in facility maintenance. We may fail to anticipate or respond adequately to new industry developments and other competitive pressures due to our limited resources relative to many significant competitors. This failure could reduce our competitiveness and cause a decline in market share, sales and profitability. Even if sufficient funds are available, we may not be able to make the modifications and improvements necessary to compete successfully.

We also face competition from international suppliers, particularly of fuel-grade ethanol, many of whom have cost structures substantially lower than ours. An increase in domestic or foreign competition could force us to reduce our prices and take other steps to compete effectively, which could adversely affect our business, financial condition and results of operations.

We incur significant expenses to maintain and upgrade our production facilities and operating equipment, and any interruption in our operations would harm our operating performance.

We regularly incur significant expenses to maintain and upgrade our production facilities and operating equipment. The machines and equipment we use to produce our alcohols and manufacture our essential ingredients are complex, have many parts, and some operate on a continuous basis. We must perform routine equipment maintenance and must periodically replace a variety of parts such as motors, pumps, pipes and electrical parts. In addition, our production facilities require periodic shutdowns to perform major maintenance and upgrades. These scheduled shutdowns result in lower sales and increased costs in the periods during which a shutdown occurs and could result in unexpected operational issues in future periods as a result of changes to equipment and operational and mechanical processes made during shutdown.

Risks Related to our Finances

We have incurred significant losses and negative operating cash flow in the past and we may incur losses and negative operating cash flow in the future, which may hamper our operations and impede us from expanding our business.

We have incurred significant losses and negative operating cash flow in the past. For the years ended December 31, 2020 and 2019, we incurred consolidated net losses of approximately \$17.3 million and \$101.3 million, respectively. For the year ended December 31, 2019, we incurred negative operating cash flow of approximately \$23.4 million. We may incur losses and negative operating cash flow in the future. We expect to rely on cash on hand, cash, if any, generated from our operations, borrowing availability under our lines of credit and proceeds from our future financing activities, if any, to fund all of the cash requirements of our business. Additional losses and negative operating cash flow may hamper our operations and impede us from expanding our business.

Our indebtedness exposes us to many risks that could negatively impact our business, our business prospects, our liquidity and our cash flows and results of operations.

Our production facilities located in the Midwest have significant indebtedness. In addition, we have significant indebtedness under our senior secured notes issued at the parent-company level. The terms of our loans require amortizing payments of principal over the lives of the loans and our borrowing availability under our revolving credit facilities periodically and automatically declines through the maturity dates of those facilities. Our indebtedness could:

- make it more difficult to pay or refinance our debts as they become due during adverse economic and industry conditions because those conditions could result in insufficient cash flows from operations to make our scheduled debt payments;
- limit our flexibility to pursue strategic opportunities or react to changes in our business and the industry in which we operate and, consequently, place us at a competitive disadvantage to our competitors who have less debt;
- require a substantial portion of our cash flow from operations, if any, to be used for debt service payments, thereby reducing our ability to fund working capital, capital expenditures, new business ventures, dividend payments and other general corporate purposes; and/or
- limit our ability to procure additional financing for working capital or other purposes.

Our term loans and credit facilities also require compliance with numerous financial and other covenants, the violation of which could result in an acceleration of our indebtedness.

Much of our indebtedness bears interest at variable rates. An increase in prevailing interest rates would likewise increase our debt service obligations and could materially and adversely affect our cash flows and results of operations.

Our ability to generate sufficient cash to make all principal and interest payments when due depends on our business performance, which is subject to a variety of factors beyond our control, including the supply of and demand for our alcohols and other products, product prices, the cost of key production inputs, and many other factors incident to the alcohol production and marketing industry. We cannot provide any assurance that we will be able to timely satisfy such obligations.

Our ability to utilize net operating loss carryforwards and certain other tax attributes may be limited.

Federal and state income tax laws impose restrictions on our use of net operating loss, or NOL, and tax credit carryforwards in the event that an “ownership change” occurs for tax purposes, as defined by Section 382 of the Internal Revenue Code, or Code. In general, an ownership change occurs when stockholders owning 5% or more of a corporation entitled to use NOL or other loss carryforwards have increased their ownership by more than 50 percentage points during any three-year period. The annual base limitation under Section 382 of the Code is calculated by multiplying the corporation’s value at the time of the ownership change by the greater of the long-term tax-exempt rate determined by the Internal Revenue Service in the month of the ownership change or the two preceding months. Our ability to utilize our NOL and other loss carryforwards may be substantially limited. These limitations could result in increased future tax obligations, which could have a material adverse effect on our financial condition and results of operations.

Risks Related to Legal and Regulatory Matters

Future demand for fuel-grade ethanol is uncertain and may be affected by changes to federal mandates, public perception, consumer acceptance and overall consumer demand for transportation fuel, any of which could negatively affect demand for fuel-grade ethanol and our results of operations.

Although many trade groups, academics and governmental agencies have supported fuel-grade ethanol as a fuel additive that promotes a cleaner environment, others have criticized fuel-grade ethanol production as consuming considerably more energy and emitting more greenhouse gases than other biofuels and potentially depleting water resources. Some studies have suggested that corn-based ethanol is less efficient than ethanol produced from other feedstock and that it negatively impacts consumers by causing increased prices for dairy, meat and other food generated from livestock that consume corn. Additionally, critics of fuel-grade ethanol contend that corn supplies are redirected from international food markets to domestic fuel markets. If negative views of corn-based ethanol production gain acceptance, support for existing measures promoting use and domestic production of corn-based ethanol as a fuel additive could decline, leading to reduction or repeal of federal ethanol usage mandates, which would materially and adversely affect the demand for fuel-grade ethanol. These views could also negatively impact public perception of the fuel-grade ethanol industry and acceptance of ethanol as an alternative fuel.

There are limited markets for fuel-grade ethanol beyond those established by federal mandates. Discretionary blending and E85 blending (i.e., gasoline blended with up to 85% fuel-grade ethanol by volume) are important secondary markets. Discretionary blending is often determined by the price of fuel-grade ethanol versus the price of gasoline. In periods when discretionary blending is financially unattractive, the demand for fuel-grade ethanol may decline. Also, the demand for fuel-grade ethanol is affected by the overall demand for transportation fuel. Demand for transportation fuel is affected by the number of miles traveled by consumers and vehicle fuel economy. Lower demand for fuel-grade ethanol and co-products would reduce the value of our ethanol and related products, erode our overall margins and diminish our ability to generate revenue or to operate profitably. In addition, we believe that consumer acceptance of E15 and E85 fuels is necessary before fuel-grade ethanol can achieve any significant growth in market share relative to other transportation fuels.

The United States fuel-grade ethanol industry is highly dependent upon various federal and state laws and any changes in those laws could have a material adverse effect on our results of operations, cash flows and financial condition.

The EPA has implemented the RFS under the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007. The RFS program sets annual quotas for the quantity of renewable fuels (such as fuel-grade ethanol) that must be blended into motor fuels consumed in the United States. The domestic market for fuel-grade ethanol is significantly impacted by federal mandates under the RFS program for volumes of renewable fuels (such as ethanol) required to be blended with gasoline. Future demand for fuel-grade ethanol will largely depend on incentives to blend ethanol into motor fuels, including the price of ethanol relative to the price of gasoline, the relative octane value of ethanol, constraints in the ability of vehicles to use higher ethanol blends, the RFS, and other applicable environmental requirements.

Under the provisions of the Clean Air Act, as amended by the Energy Independence and Security Act of 2007, the EPA has limited authority to waive or reduce the mandated RFS requirements, which authority is subject to consultation with the Secretaries of Agriculture and Energy, and based on a determination that there is inadequate domestic renewable fuel supply or implementation of the applicable requirements would severely harm the economy or environment of a state, region or the United States in general. Our results of operations, cash flows and financial condition could be adversely impacted if the EPA reduces the RFS requirements from the statutory levels specified in the RFS.

Various bills in Congress introduced from time to time are also directed at altering existing renewable fuels energy legislation, but none has passed in recent years. Some legislative bills are directed at halting or reversing expansion of, or even eliminating, the renewable fuel program, while other bills are directed at bolstering the program or enacting further mandates or grants that would support the renewable fuels industry. Our results of operations, cash flows and financial condition could be adversely impacted if any legislation is enacted that reduces the RFS volume requirements.

We may be adversely affected by environmental, health and safety laws, regulations and liabilities

We are subject to various federal, state and local environmental laws and regulations, including those relating to the discharge of materials into the air, water and ground, the generation, storage, handling, use, transportation and disposal of hazardous materials and wastes, and the health and safety of our employees. In addition, some of these laws and regulations require us to operate under permits that are subject to renewal or modification. These laws, regulations and permits often require expensive pollution control equipment or operational changes to limit actual or potential impacts to the environment. A violation of these laws and regulations or permit conditions can result in substantial fines, natural resource damages, criminal sanctions, permit revocations and/or production facility shutdowns. In addition, we have made, and expect to make, significant capital expenditures on an ongoing basis to comply with increasingly stringent environmental laws, regulations and permits.

We may be liable for the investigation and cleanup of environmental contamination at each of our production facilities and at off-site locations where we arrange for the disposal of hazardous substances or wastes. If these substances or wastes have been or are disposed of or released at sites that undergo investigation and/or remediation by regulatory agencies, we may be responsible under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or other environmental laws for all or part of the costs of investigation and/or remediation, and for damages to natural resources. We may also be subject to related claims by private parties alleging property damage and personal injury due to exposure to hazardous or other materials at or from those properties. Some of these matters may require us to expend significant amounts for investigation, cleanup or other costs.

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In addition, new laws, new interpretations of existing laws, increased governmental enforcement of environmental laws or other developments could require us to make significant additional expenditures. Continued government and public emphasis on environmental issues will likely result in increased future investments for environmental controls at our production facilities. Present and future environmental laws and regulations, and interpretations of those laws and regulations, applicable to our operations, more vigorous enforcement policies and discovery of currently unknown conditions may require substantial expenditures that could have a material adverse effect on our results of operations and financial condition.

The hazards and risks associated with producing and transporting our products (including fires, natural disasters, explosions and abnormal pressures and blowouts) may also result in personal injury claims or damage to property and third parties. As protection against operating hazards, we maintain insurance coverage against some, but not all, potential losses. However, we could sustain losses for uninsurable or uninsured risks, or in amounts in excess of existing insurance coverages. Events that result in significant personal injury or damage to our property or third parties or other losses that are not fully covered by insurance could have a material adverse effect on our results of operations and financial condition.

Risks Related to Ownership of our Common Stock

Future sales of substantial amounts of our common stock, or perceptions that those sales could occur, could adversely affect the market price of our common stock and our ability to raise capital.

Future sales of substantial amounts of our common stock into the public market, including up to 8.9 million shares of our common stock that may be issued upon the exercise of outstanding warrants, or perceptions that those sales could occur, could adversely affect the prevailing market price of our common stock and our ability to raise capital.

Our stock price is highly volatile, which could result in substantial losses for investors purchasing shares of our common stock and in litigation against us.

The market price of our common stock has fluctuated significantly in the past and may continue to fluctuate significantly in the future. The market price of our common stock may continue to fluctuate in response to one or more of the following factors, many of which are beyond our control:

- fluctuations in the market prices of our products;
- fluctuations in the costs of key production input commodities such as corn and natural gas;
- the volume and timing of the receipt of orders for our products from major customers;
- the coronavirus pandemic, including governmental and public response to the pandemic;
- competitive pricing pressures;
- anticipated trends in our financial condition and results of operations;
- changes in market valuations of companies similar to us;
- stock market price and volume fluctuations generally;
- regulatory developments or increased enforcement;

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- fluctuations in our quarterly or annual operating results;
- additions or departures of key personnel;
- our ability to obtain any necessary financing;
- our financing activities and future sales of our common stock or other securities; and
- our ability to maintain contracts that are critical to our operations.

The price at which you purchase shares of our common stock may not be indicative of the price that will prevail in the trading market. You may be unable to sell your shares of common stock at or above your purchase price, which may result in substantial losses to you and which may include the complete loss of your investment. In the past, securities class action litigation has often been brought against a company following periods of high stock price volatility. We may be the target of similar litigation in the

future. Securities litigation could result in substantial costs and divert management's attention and our resources away from our business.

Any of the risks described above could have a material adverse effect on our results of operations, the price of our common stock, or both.

Because we do not intend to pay any cash dividends on our shares of common stock in the near future, our stockholders will not be able to receive a return on their shares unless and until they sell them.

We intend to retain a significant portion of any future earnings to finance the development, operation and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the near future. The declaration, payment, and amount of any future dividends will be made at the discretion of our board of directors, and will depend upon, among other things, our results of operations, cash flows, and financial condition, operating and capital requirements, and other factors as our board of directors considers relevant. There is no assurance that future dividends will be paid, and, if dividends are paid, there is no assurance with respect to the amount of any such dividend. Unless our board of directors determines to pay dividends, our stockholders will be required to look to appreciation of our common stock to realize a gain on their investment. There can be no assurance that this appreciation will occur. See "Market For Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities—Dividend Policy".

Our bylaws contain an exclusive forum provision, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Our bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Delaware Court of Chancery shall be the sole and exclusive forum for (a) any derivative action or proceeding brought on behalf of us, (b) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of us to us or our stockholders, (c) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, or (d) any action asserting a claim governed by the internal affairs doctrine.

For the avoidance of doubt, the exclusive forum provision described above does not apply to any claims arising under the Securities Act of 1933, as amended, or the Securities Act, or the Securities Exchange Act of 1934, as amended, or the Exchange Act. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder, and Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder.

The choice of forum provision in our bylaws may limit our stockholders' ability to bring a claim in a judicial forum that they find favorable for disputes with us or our directors, officers, employees or agents, which may discourage such lawsuits against us and our directors, officers, employees and agents even though an action, if successful, might benefit our stockholders. The applicable courts may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. With respect to the provision making the Delaware Court of Chancery the sole and exclusive forum for certain types of actions, stockholders who do bring a claim in the Delaware Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near Delaware. Finally, if a court were to find this provision of our bylaws inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could have a material adverse effect on us.

General Risk Factors

Cyberattacks through security vulnerabilities could lead to disruption of business, reduced revenue, increased costs, liability claims, or harm to our reputation or competitive position.

Security vulnerabilities may arise from our hardware, software, employees, contractors or policies we have deployed, which may result in external parties gaining access to our networks, data centers, cloud data centers, corporate computers, manufacturing systems, and/or access to accounts we have at our suppliers, vendors, and customers. External parties may gain access to our data or our customers' data, or attack the networks causing denial of service or attempt to hold our data or systems in ransom. The vulnerability could be caused by inadequate account security practices such as failure to timely remove employee access when terminated. To mitigate these security issues, we have implemented measures throughout our organization, including firewalls, backups, encryption, employee information technology policies and user account policies. However, there can be no assurance these measures will be sufficient to avoid cyberattacks. If any of these types of security breaches were to occur and we were unable to protect sensitive data, our relationships with our business partners and customers could be materially damaged, our reputation could be materially harmed, and we could be exposed to a risk of litigation and possible significant liability.

Further, if we fail to adequately maintain our information technology infrastructure, we may have outages and data loss. Excessive outages may affect our ability to timely and efficiently deliver products to customers or develop new products. Such disruptions and data loss may adversely impact our ability to fulfill orders and interrupt other processes. Delayed sales or lost customers resulting from these disruptions could adversely affect our financial results, stock price and reputation.

The State of California enacted the California Consumer Privacy Act of 2018, or CCPA, effective on January 1, 2020. Our and our business partners' or contractors' failure to fully comply with the CCPA and other laws could lead to significant fines and require onerous corrective action. In addition, data security breaches experienced by us or our business partners or contractors could result in the loss of trade secrets or other intellectual property, public disclosure of sensitive commercial data, and the exposure of personally identifiable information (including sensitive personal information) of our employees, customers, suppliers, contractors and others.

Unauthorized use or disclosure of, or access to, any personal information maintained by us or on our behalf, whether through breach of our systems, breach of the systems of our suppliers or vendors by an unauthorized party, or through employee or contractor error, theft or misuse, or otherwise, could harm our business. If any such unauthorized use or disclosure of, or access to, such personal information was to occur, our operations could be seriously disrupted, and we could be subject to demands, claims and litigation by private parties, and investigations, related actions, and penalties by regulatory authorities. In addition, we could incur significant costs in notifying affected persons and entities and otherwise complying with the multitude of foreign, federal, state and local laws and regulations relating to the unauthorized access to, or use or disclosure of, personal information. Finally, any perceived or actual unauthorized access to, or use or disclosure of, such information could harm our reputation, substantially impair our ability to attract and retain customers and have an adverse impact on our business, financial condition and results of operations.

Item 1B. Unresolved Staff Comments.

We have received no written comments regarding our periodic or current reports from the staff of the Securities and Exchange Commission that were issued 180 days or more preceding the end of our 2020 fiscal year and that remain unresolved.

Item 2. Properties.

Our corporate headquarters, located in Pekin, Illinois, consists of plants and facilities totaling 145 acres on land we own. In Sacramento, California, we lease office space totaling 10,000 square feet under a lease expiring in 2029. We have plants located in Madera, California, at a 137 acre facility; Boardman, Oregon, at a 25 acre facility; Burley, Idaho, at a 25 acre facility; and Stockton, California, at a 30 acre facility. We own the land in Madera, California and Burley, Idaho. The land in Boardman, Oregon and Stockton, California are leased under leases expiring in 2026 and 2022, respectively. We also own an idled ethanol production facility in Canton, Illinois on a 110 acre facility, of which a significant portion is farmland. Our production segments include our ethanol production facilities. See “Business—Production Facilities”.

Item 3. Legal Proceedings.

We are subject to legal proceedings, claims and litigation arising in the ordinary course of business. While the amounts claimed may be substantial, the ultimate liability cannot presently be determined because of considerable uncertainties that exist. Therefore, it is possible that the outcome of those legal proceedings, claims and litigation could adversely affect our quarterly or annual operating results or cash flows when resolved in a future period. However, based on facts currently available, management believes such matters will not adversely affect in any material respect our financial position, results of operations or cash flows.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

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

Market Information

Our common stock trades on The Nasdaq Capital Market under the symbol “ALTO”. Prior to February 1, 2021, our common stock traded on The Nasdaq Capital Market under the symbol “PEIX”. We also have non-voting common stock outstanding which is not listed on an exchange.

Security Holders

As of March 25, 2021, we had 73,167,785 shares of common stock outstanding held of record by approximately 290 stockholders and 896 shares of non-voting common stock outstanding held of record by one stockholder. These holders of record include depositories that hold shares of stock for brokerage firms which, in turn, hold shares of stock for numerous beneficial owners. On March 25, 2021, the closing sales price of our common stock on The Nasdaq Capital Market was \$5.36 per share.

Dividend Policy

We have never paid cash dividends on our common stock and do not intend to pay cash dividends on our common stock in the foreseeable future. We anticipate that we will retain any earnings for use in the continued development of our business.

Our current and future debt financing arrangements may limit or prevent cash distributions from our subsidiaries to us, depending upon the achievement of specified financial and other operating conditions and our ability to properly service our debt, thereby limiting or preventing us from paying cash dividends. Further, the holders of our outstanding Series B Preferred Stock are entitled to dividends of 7% per annum, payable quarterly in arrears. For the first nine months of 2019, we declared and paid in cash dividends on our outstanding shares of Series B Preferred Stock as they became due; however, for the fourth quarter of 2019, and for all of 2020, we accrued but did not declare or pay cash dividends under an agreement with the holders of our Series B Preferred Stock in an effort to preserve liquidity. Accrued and unpaid dividends in respect of our Series B Preferred Stock must be paid prior to the payment of any dividends in respect of shares of our common stock.

Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 6. Selected Financial Data.

Not Applicable.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and notes to consolidated financial statements included elsewhere in this report. This discussion contains forward-looking statements, reflecting our plans and objectives that involve risks and uncertainties. Actual results and the timing of events may differ materially from those contained in these forward-looking statements due to a number of factors, including those discussed in the section entitled “Risk Factors” and elsewhere in this report.

Overview

We are a leading producer and marketer of specialty alcohols and essential ingredients, and the largest producer of specialty alcohols in the United States based on annualized volumes.

We operate seven alcohol production facilities. Three of our production facilities are located in the Midwestern state of Illinois and four of our facilities are located in the Western states of California, Oregon and Idaho. We have an annual alcohol production capacity of 450 million gallons. We market all of the alcohols produced at our facilities as well as fuel-grade ethanol produced by third parties. In 2020, we marketed over 500 million gallons combined of our own alcohols as well as fuel-grade ethanol

produced by third parties, and nearly 1.5 million tons of essential ingredients on a dry matter basis. Our business consists of three reportable segments: two production segments and a marketing segment.

Our mission is to expand our business as a leading producer and marketer of specialty alcohols and essential ingredients. We intend to accomplish this goal in part by investing in our specialized and higher value specialty alcohol production and distribution infrastructure, expanding production in high-demand essential ingredients, expanding and extending the sale of our products into new regional and international markets, building efficiencies and economies of scale and by capturing a greater portion of the value stream.

Production Segments

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on four key markets: *Health, Home & Beauty, Food & Beverage, Essential Ingredients*; and *Renewable Fuels*. Products for the Health, Home & Beauty market include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the Food & Beverage markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for Essential Ingredients markets include yeast, corn gluten and distillers grains used in commercial animal feed and pet foods. Our Renewable Fuels products include fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel fuel.

We produce our alcohols and essential ingredients at our production facilities described below. Our production facilities located in the Midwest are in the heart of the Corn Belt, benefit from low-cost and abundant feedstock and enjoy logistical advantages that enable us to provide our products to both domestic and international markets via truck, rail or barge. Our production facilities located on the West Coast are near their respective fuel and feed customers, offering significant timing, transportation cost and logistical advantages.

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We are currently operating at approximately 64% of our estimated maximum annual production capacity. Our Magic Valley, Stockton and Madera facilities are currently idled. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Production Facility	Location	Annual Production Capacity (estimated, in gallons)	
		Fuel-Grade Ethanol	Specialty Alcohol
Pekin Campus	Pekin, IL	110,000,000	140,000,000
Magic Valley	Burley, ID	60,000,000	—
Columbia	Boardman, OR	40,000,000	—
Stockton	Stockton, CA	60,000,000	—
Madera	Madera, CA	40,000,000	—

Marketing Segment

We market all of the alcohols and essential ingredients we produce at our facilities. We also market fuel-grade ethanol produced by third parties.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our fuel-grade ethanol customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery with very little effort on their part. Our customers collectively require fuel-grade ethanol volumes in excess of the supplies we produce at our facilities. We secure additional fuel-grade ethanol supplies from third-party fuel-grade ethanol plants in California and other third-party suppliers in the Midwest where a majority of fuel-grade ethanol producers are located. We arrange for transportation, storage and delivery of fuel-grade ethanol purchased by our customers through our agreements with third-party service providers in the Western United States as well as in the Midwest from a variety of sources.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry and biodiesel customers. We do not market essential ingredients from other producers.

See “Note 4 – Segments” to our Notes to Consolidated Financial Statements included elsewhere in this report for financial information about our business segments.

Current Initiatives and Outlook

Last year was a transformative year. We started 2020 with 605 million gallons of annual production capacity, of which approximately 85 million gallons, or 14%, was specialty alcohols and the balance was fuel-grade ethanol. While our long-standing specialty alcohols business has been profitable, those favorable results were obscured in recent years by a challenging renewable fuels business environment and related operating losses. In 2020, we reduced fuel-grade ethanol production capacity by 55% through a combination of idling unprofitable facilities and selling underperforming production assets.

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We maximized production of specialty alcohols at our Pekin Campus where spot demand for those products grew rapidly due to the coronavirus pandemic. We first expanded specialty alcohol production capacity to 110 million gallons annually in 2020 and then, by refurbishing our grain neutral spirits system, further increased specialty alcohol production capacity to 140 million gallons annually in early 2021.

We are now the largest producer of specialty alcohols in the United States based on annualized volumes. We currently have 450 million gallons of annual production capacity, of which approximately 140 million gallons, or 31%, is specialty alcohols and the balance is fuel-grade ethanol. We are currently operating production facilities with 290 million gallons of annual capacity, of which nearly 50% is specialty alcohols. All of our operating facilities are running at break-even or better on an earnings before interest, taxes, depreciation and amortization basis.

In 2020, we sold assets and generated substantial cash flow from operations. We also completed an equity capital raise in the fourth quarter. These results provided funds for substantial repayments of debt, reducing our interest expense, strengthening our balance sheet and positioning us for growth opportunities. We also announced a

corporate rebranding and changed our name to Alto Ingredients, Inc., which reflects our goal to deliver the highest levels of integrity, purity, and quality to create greater value for our customers, partners and shareholders.

Strong demand for hand sanitizer contributed to our results for 2020, but in the fourth quarter, and through the first quarter of 2021, abundant supplies tempered prices. In response, we focused our efforts on strengthening our sales in product lines other than sanitizers by working with dominant, name brand consumer product leaders. Our product mix is well-diversified with over 90% of our contracted volumes sold to major producers of food and beverage and home and beauty products, while only 10% of our contracted volumes are for sanitizers. While demand for sanitizer has returned to pre-pandemic levels, we expect demand resurgence and firmer pricing as restaurants, arenas, theaters, offices, stadiums and other public places reopen. In addition, we expect that higher quality sanitizers utilizing USP-grade alcohol will replace low-quality sanitizer inventories. We believe we are well positioned to support customer needs for USP, API and beverage-grade specialty alcohols for 2021 and beyond and to provide quality products for consumer goods and sanitizers as needed.

We have contracted approximately 65% of the 110 million gallons of specialty alcohol production capacity available during last fall's contracting cycle, or 50% of our now expanded annual production capacity of 140 million gallons of specialty alcohols. This represents a significant increase in both total gallons contracted and our average price as compared to our 2020 contracts negotiated in the fall 2019 contracting cycle. This also reflects reductions we made to address the current dynamics in the market for sanitizers. We are working with our customers to facilitate the blending and extending of contracted volumes for sanitizer products into 2022 and 2023 if consumer demand is less than anticipated.

Aside from the many other variables in our business, including the sale of fuel-grade ethanol and our uncontracted specialty alcohols, we expect our existing contracted specialty alcohol sales to contribute at least \$60.0 million dollars in gross profit for 2021. Many variables could materially impact our results, including export conditions, the ability of our customers to take all of their contracted volumes for 2021, market demand for sanitizers and disinfectants, our ability to timely sell our Stockton and Madera, California production facilities, and fuel-grade ethanol crush margins, which year-to-date are running at negative 25 cents per gallon, compared to negative 11 cents per gallon in the first quarter of 2020. We expect that as businesses reopen and travel resumes, fuel-grade ethanol margins will improve, with each 5 cent increase in crush margins improving earnings before interest, taxes, depreciation and amortization by \$5.0 million.

We are producing a wide selection of essential ingredients products such as corn meal and feed, corn germ, and yeast for use in human and pet foods. We produce most of these higher value and higher margin ingredients at our Pekin Campus wet mill, generating co-product returns in excess of 54% and lifting our average co-product return across all operating facilities to around 44%. Some of our highest quality essential ingredients products are sold under fixed-price, one-year or longer contracts to name brand companies.

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We will continue to produce fuel-grade ethanol to support our specialty alcohol production and to capitalize on ethanol's beneficial low-carbon characteristics integral to the ultimate decarbonization of the environment. We remain optimistic over industry discussions around carbon reduction. That said, fuel-grade ethanol margins remain depressed, especially for our Western operations. In light of these conditions, we have decided to sell our Stockton and Madera, California fuel-grade ethanol production facilities, both of which are currently idled. We came to this decision after considering all reasonable alternatives and how and where to best deploy our resources. Sales of these production assets, if they occur, will further strengthen our balance sheet and improve profitability by eliminating the fixed carrying costs from idled assets.

We are focused on a number of longer term opportunities. As previously reported, we have worked diligently and collaboratively with key customers to obtain three critical certifications for specialty alcohol production at our ICP production facility at our Pekin Campus, specifically, ISO 9001, the world's most widely recognized quality management system certification; ICH Q7, which sets forth good manufacturing practices for active pharmaceutical ingredients; and EXCiPACT, which sets standards for excipient safety and quality. These certifications support further market penetration of our specialty alcohols, both domestically and internationally, for applications that require the highest quality products. Most of our specialty alcohol products for these applications are contracted under fixed terms each fall for the following year. We plan to continue to expand our market share within the health, home and beauty and food and beverage markets to sell our increased specialty alcohol production at favorable prices.

In addition, we are in the process of increasing our yeast facility's annual production capacity by approximately 15%. We remain on schedule and within budget to complete this expansion by the third quarter of 2021. This project entails a relatively low capital investment of \$5.5 million and we expect payback in less than two years, or over \$3.0 million annually in earnings before interest, taxes, depreciation and amortization. We will also have the ability to further expand production of even higher value yeast derivatives with similar payback profiles.

We have earmarked an additional \$14.0 million for various other projects we expect will expand revenue, increase efficiencies or improve plant reliability. For example, an upgrade of our feed dryers at our Pekin Campus, a \$3.5 million dollar enhancement, will produce even higher value feed, improve overall plant efficiency and reliability and increase annual earnings before interest, taxes, depreciation and amortization by an estimated \$1.4 million dollars beginning in the fourth quarter of 2021.

Finally, as recently mentioned in congressional subcommittee hearings on climate change, our Pekin Campus sits on the Mt. Simon sandstone formation, considered one of the most significant potential carbon storage resources in the United States. As a member of the Carbon Capture Coalition, we are actively engaged in discussions to develop a carbon capture and sequestration program at our Pekin site and expect to be an active player in the carbon capture space. We also have additional projects under development with attractive return profiles.

We have transformed our company to build a foundation based on consumer demand. We have suspended and sought to minimize the impact of unprofitable operations and reduced operating and overhead expenses. That said, our transformation is not yet complete. Given our significantly improved balance sheet we are actively exploring and developing new build or buy opportunities to grow and expand our business to further increase revenues and profitability while controlling expenses.

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2020 Financial Performance Summary

Summary

Our consolidated net sales declined to \$0.9 billion for 2020 compared to \$1.4 billion for 2019. Our net loss available to common stockholders decreased by \$73.8 million from \$90.2 million for 2019 to \$16.4 million for 2020.

Factors that contributed to our results of operations for 2020 include:

- *Net sales.* Our net sales for 2020 declined by \$0.5 billion, or 37%, to \$0.9 billion for 2020 from \$1.4 billion for 2019 as a result of a decrease in total alcohol gallons sold, partially offset by an increase in our average sales price per gallon. Our total gallons sold declined by 283 million gallons, or 35%, to 536 million gallons for 2020 from 819 million gallons for 2019. Our production sales volume declined by 219 million gallons, or 45%, to 272 million gallons for 2020 from 491 million gallons for 2019. These declines are due primarily to the negative effects of the coronavirus pandemic on the demand for transportation fuels and fuel-grade ethanol. In response, we reduced production and idled fuel-grade ethanol production facilities. Moreover, we completed the sale of our two fuel-grade ethanol production facilities in Nebraska in April 2020, resulting in no further sales volumes from those facilities. Our third-party sales volume declined by 64 million gallons, or 20%, to 264 million gallons for 2020 from 328 million gallons for 2019. We intentionally reduced sales of third-party fuel-grade ethanol to focus on sales of inventory from our own production. The above declines and challenges were partially offset by robust demand for our specialty alcohols used in sanitizers and disinfectants as a result of the coronavirus pandemic.
- *Gross Profit (loss).* Our gross profit (loss) improved by \$62.8 million to a gross profit of \$52.9 million for 2020 from a gross loss of \$9.9 million for 2019 as a result of substantially higher margins due to strong demand for our specialty alcohols used in sanitizers and disinfectants as a result of the coronavirus pandemic. We also idled or sold unprofitable fuel-grade ethanol production facilities, substantially reducing costs in a challenging market environment.
- *Asset impairments.* We have evaluated for impairment our production facilities located in the Western United States, including our plan to sell our Madera and Stockton facilities, and as such we recognized an aggregate impairment charge of \$24.4 million.

Sales and Margins

We generate sales by marketing all of the alcohols produced by our production facilities, all of the fuel-grade ethanol produced by two other production facilities in the Western United States and fuel-grade ethanol purchased from other third-party suppliers throughout the United States. We also market essential ingredients produced by our production facilities, including dried yeast, corn gluten meal, corn gluten feed, and distillers grains and liquid feed used in commercial animal feed and pet foods.

Our profitability is highly dependent on various commodity prices, including the market prices of corn, natural gas and fuel-grade ethanol.

Our consolidated average alcohol sales price increased by 1.2% to \$1.63 per gallon for 2020 compared to \$1.61 per gallon for 2019. The average price of fuel-grade ethanol as reported by the Chicago Board of Options Trade, or CBOT, decreased 10.1% to \$1.25 per gallon for 2020 compared to \$1.39 per gallon for 2019. Our average cost of corn decreased 9.9% to \$3.84 per bushel for 2020 from \$4.26 per bushel for 2019. The average price of corn as reported by the CBOT decreased 5.2% to \$3.63 per bushel for 2020 from \$3.83 per bushel for 2019.

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We believe that our gross profit margins depend primarily on six key factors:

- the prices of our specialty alcohols and the market price of fuel-grade ethanol, the latter of which is impacted by the price of gasoline and related petroleum products, and government regulation, including government ethanol mandates;
- the market price of key production input commodities, including corn and natural gas;
- the prices of our essential ingredients;
- our ability to anticipate trends in the prices of our alcohols, essential ingredients, and key input commodities, and our ability to implement appropriate risk management and opportunistic pricing strategies;
- the proportion of our sales of specialty alcohols to our sales of fuel-grade ethanol produced at our facilities; and
- the proportion of our sales of fuel-grade ethanol produced at our facilities to our sales of fuel-grade ethanol produced by unrelated third-parties.

We seek to optimize our gross profit margins by anticipating the factors above and, when resources are available, implementing hedging transactions and taking other actions designed to limit risk and address these factors. For example, we may seek to reduce inventory levels in anticipation of declining alcohol or essential ingredient prices and increase production and inventory levels in anticipation of rising alcohol or essential ingredient prices. We may also seek to alter our proportion or timing, or both, of purchase and sales commitments.

Our limited resources to act upon the anticipated factors described above and/or our inability to anticipate these factors or their relative importance, and adverse movements in the factors themselves, could result in declining or even negative gross profit margins over certain periods of time. Our ability to anticipate these factors or favorable movements in these factors may enable us to generate above-average gross profit margins. However, given the difficulty associated with successfully forecasting any of these factors, we are unable to estimate our future gross profit margins.

Results of Operations

Selected Financial Information

The following selected financial information should be read in conjunction with our consolidated financial statements and notes to our consolidated financial statements included elsewhere in this report, and the other sections of “Management’s Discussion and Analysis of Financial Condition and Results of Operations” contained in this report.

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Certain performance metrics that we believe are important indicators of our results of operations include:

	Years Ended December 31,		Percentage
	2020	2019	Change
			2020 vs 2019
Production gallons sold (in millions)	271.9	491.0	(44.6)%
Third-party gallons sold (in millions)	264.4	328.4	(19.5)%
Total gallons sold (in millions)	536.3	819.4	(34.5)%

Total gallons produced (in millions)		262.1		494.6	(47.0)%
Production capacity utilization		53%		82%	(35.4)%
Average sales price per gallon	\$	1.63	\$	1.61	1.2%
Corn cost per bushel—CBOT equivalent	\$	3.56	\$	3.83	(7.0)%
Average basis ⁽¹⁾	\$	0.28	\$	0.43	(34.9)%
Delivered cost of corn	\$	3.84	\$	4.26	(9.9)%
Total co-product tons sold (in thousands)		1,447.5		2,821.7	(48.7)%
Co-product revenues as % of delivered cost of corn ⁽²⁾		44.1%		35.1%	25.6%
Average CBOT ethanol price per gallon	\$	1.25	\$	1.39	(10.1)%
Average CBOT corn price per bushel	\$	3.63	\$	3.83	(5.2)%

(1) Corn basis represents the difference between the immediate cash price of delivered corn and the future price of corn for Chicago delivery.

(2) Co-product revenues as a percentage of delivered cost of corn shows our yield based on sales of co-products, including WDG and corn oil, generated from ethanol we produced.

Year Ended December 31, 2020 Compared to the Year Ended December 31, 2019

	Years Ended		Dollar	Percentage	Results as a Percentage	
	December 31,		Change	Change	of Net Sales for the	
	2020	2019	Favorable	Favorable	2020	2019
	(dollars in thousands)					
Net sales	\$ 897,023	\$ 1,424,881	\$ (527,858)	(37.0)%	100.0%	100.0%
Cost of goods sold	844,164	1,434,819	590,655	41.2%	94.1%	100.7%
Gross profit (loss)	52,859	(9,938)	62,797	NM	5.9%	(0.7)%
Selling, general and administrative expenses	(31,980)	(35,453)	3,473	9.8%	(3.6)%	(2.5)%
Gain on litigation settlement	11,750	—	11,750	NM	1.3%	—%
Gain on sale of assets	1,580	—	1,580	NM	0.2%	—%
Asset impairments	(24,356)	(29,292)	4,936	16.9%	(2.7)%	(2.1)%
Income (loss) from operations	9,853	(74,683)	84,536	NM	1.1%	(5.2)%
Fair value adjustments	(9,959)	—	(9,959)	NM	(1.1)%	—%
Loss on debt extinguishment	—	(6,517)	6,517	NM	—%	(0.5)%
Interest expense, net	(17,943)	(20,206)	2,263	11.2%	(2.0)%	(1.4)%
Other income, net	750	104	646	621.2%	0.1%	0.0%
Loss before benefit for income taxes	(17,299)	(101,302)	84,003	82.9%	(1.9)%	(7.1)%
Benefit for income taxes	17	20	(3)	(15.0)%	0.0%	0.0%
Consolidated net loss	(17,282)	(101,282)	84,000	82.9%	(1.9)%	(7.1)%
Net loss attributed to noncontrolling interests	2,166	12,333	(10,167)	(82.4)%	0.2%	0.9%
Net loss attributed to Alto Ingredients, Inc.	\$ (15,116)	\$ (88,949)	\$ 73,833	83.0%	(1.7)%	(6.2)%
Preferred stock dividends	(1,268)	(1,265)	(3)	(0.2)%	(0.1)%	(0.1)%
Loss available to common stockholders	\$ (16,384)	\$ (90,214)	\$ 73,830	81.8%	(1.8)%	(6.3)%

Net Sales

The decrease in our consolidated net sales for 2020 as compared to 2019 was primarily due to a decrease in our total gallons sold, partially offset by an increase in our average sales price per gallon.

Our production gallons sold and our volume of essential ingredients sold declined for 2020 as compared to 2019 in addition to declines in our third-party gallons sold. Our production gallons and essential ingredients sold declined primarily due to an intentional reduction in our production of fuel-grade ethanol at our facilities due to adverse market conditions as well as the sale of our Nebraska facilities.

Marketing Segment

Net sales of fuel-grade ethanol from our marketing segment, excluding intersegment sales, decreased by \$99.2 million, or 28%, to \$257.7 million for 2020 as compared to \$356.9 million for 2019.

Our volume of third party fuel-grade ethanol gallons sold reported gross by our marketing segment decreased by 48.9 million gallons, or 23%, to 163.9 million gallons for 2020 as compared to 212.8 million gallons for 2019. At our marketing segment's average sales price per gallon of \$1.55 for 2020, we generated \$75.8 million less in net sales from our marketing segment from the 48.9 million fewer gallons of third-party fuel-grade ethanol sold gross in 2020 as compared to 2019.

Our volume of third party fuel-grade ethanol gallons sold reported net by our marketing segment decreased by 15.1 million gallons, or 13%, to 100.5 million gallons for 2020 as compared to 115.6 million gallons for 2019. The decrease in third-party fuel-grade ethanol gallons sold reported net had an approximately \$0.3 million impact reducing net sales.

The decrease of \$0.11 per gallon, or 7%, in our marketing segment's average sales price per gallon in 2020 as compared to 2019 decreased our net sales from third-party fuel-grade ethanol sold by our marketing segment by \$23.1 million.

Pekin Campus Production Segment

Net sales of alcohol from our Pekin Campus production segment decreased by \$13.2 million, or 4%, to \$330.4 million for 2020 as compared to \$343.6 million for 2019. Our total volume of production gallons sold decreased by 24.6 million gallons, or 11%, to 193.9 million gallons for 2020 as compared to 218.5 million gallons for 2019. At our Pekin Campus production segment's average sales price per gallon of \$1.70 for 2020, we generated \$41.9 million less in net sales from our Pekin Campus production segment from the 24.6 million reduction in gallons of alcohol sold in 2020 as compared to 2019. The increase of \$0.13, or 8%, in our Pekin Campus production segment's average sales price per gallon in 2020 as compared to 2019 improved our net sales from our Pekin Campus production segment by \$28.7 million.

Net sales of essential ingredients decreased \$8.7 million, or 6%, to \$130.3 million for 2020 as compared to \$139.0 million for 2019. Our total volume of essential ingredients sold decreased by 84,000 tons, or 9%, to 829,000 tons for 2020 from 913,000 tons for 2019. At our average sales price per ton of \$157.19 for 2020, we generated \$13.3 million less in net sales from the 84,000 fewer tons of essential ingredients sold in 2020 as compared to 2019. The increase of \$5.01, or 3.3%, in our average sales price per ton in 2020 as compared to 2019 increased our net sales from our Pekin Campus production segment by \$4.6 million.

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Other Production Segment

Net sales of alcohol from our other production segment decreased by \$317.6 million, or 70%, to \$137.7 million for 2020 as compared to \$455.3 million for 2019. Our total volume of gallons sold decreased by 194.5 million gallons, or 71%, to 78.0 million gallons for 2020 as compared to 272.5 million gallons for 2019. At our other production segment's average sales price per gallon of \$1.77 for 2020, we generated \$343.3 million less in net sales from our other production segment from the 194.5 million fewer gallons of alcohol sold in 2020 as compared to 2019. The increase of \$0.09, or 5%, in our other production segment's average sales price per gallon in 2020 as compared to 2019 improved our net sales from our other production segment by \$25.7 million.

Net sales of essential ingredients decreased \$89.1 million, or 69%, to \$40.9 million for 2020 as compared to \$130.0 million for 2019. Our total volume of essential ingredients sold decreased by 1,289,000 tons, or 68%, to 619,000 tons for 2020 from 1,908,000 tons for 2019. At our average sales price per ton of \$66.07 for 2020, we generated \$85.2 million less in net sales from the 1,289,000 fewer tons of essential ingredients sold in 2020 as compared to 2019. The decrease of \$2.06, or 3.0%, in our average sales price per ton in 2020 as compared to 2019 decreased our net sales from our other production segment by \$3.9 million.

Cost of Goods Sold and Gross Profit (Loss)

Our consolidated gross profit (loss) improved to a gross profit of \$52.9 million for 2020 from a gross loss of \$9.9 million for 2019, representing a gross profit margin of 5.9% for 2020 compared to negative 0.7% for 2019. Our consolidated gross profit (loss) improved due to significantly higher margin sales of our specialty alcohols due to high demand for alcohols used in sanitizers and disinfectants and a substantial reduction in negative margin sales of fuel-grade ethanol as we idled a significant amount of our fuel-grade ethanol production capacity and sold unprofitable assets.

Marketing Segment

Our marketing segment's gross profit declined by \$5.0 million to \$5.9 million for 2020 as compared to \$10.9 million for 2019. Of this decline, \$3.2 million is attributable to lower margins from sales of third-party fuel-grade ethanol and \$1.8 million is attributable to lower marketing volumes of third-party fuel-grade ethanol in 2020 as compared to 2019.

Pekin Campus Production Segment

Our Pekin Campus production segment's gross profit improved by \$70.2 million to a gross profit of \$74.2 million for 2020 as compared to \$4.0 million for 2019. Of this improvement, \$80.0 million is attributable to increased margins from our specialty alcohols, partially offset by \$9.8 million less in gross profit attributable to decreased sales volumes in 2020 as compared to 2019.

Other Production Segment

Our other production segment's gross profit declined by \$2.4 million to a gross loss of \$27.2 million for 2020 as compared to a gross loss of \$24.8 million for 2019. Of this decline, \$70.3 million is attributable to a negative margin environment for fuel-grade ethanol, offset by a \$67.9 million improvement in gross profit attributable to lower sales volumes at negative margins in 2020 as compared to 2019.

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Selling, General and Administrative Expenses

Our selling, general and administrative, or SG&A, expenses decreased \$3.5 million to \$32.0 million for 2020 as compared to \$35.5 million for the same period in 2019. SG&A expenses declined primarily due to reduced legal and consulting expenses. We expect to reduce SG&A expenses by \$7.0 million to \$12.0 million year over year in 2021.

Asset Impairments

We assess the impairment of long-lived assets, including property and equipment, when events or changes in circumstances indicate that the fair value of an asset could be less than the net book value of the asset. In addition, with the anticipated sale of our Madera and Stockton, California production facilities, we also reviewed their fair values compared to their estimated sales prices, less estimated selling costs. As a result, we recorded an aggregate impairment charge of \$24.4 million for 2020. Further, in connection with the anticipated sales, we classified those facilities as held-for-sale on the accompanying consolidated balance sheets. As of December 31, 2019, in connection with the sale of our ownership interest in two fuel-grade ethanol production facilities in Nebraska, we recorded the related long-lived assets to fair value, less estimated selling costs, and classified them as held-for-sale on the accompanying consolidated balance sheets. As a result, we recorded an aggregate impairment charge of \$29.3 million for 2019.

Interest Expense, net

Interest expense decreased \$2.3 million to \$17.9 million for 2020 from \$20.2 million for 2019. The decrease in interest expense is primarily due to principal payments on our outstanding indebtedness during the year, resulting in lower average debt balances. We expect to reduce interest expense by as much as \$14.0 million year over year in 2021.

Liquidity and Capital Resources

During the year ended December 31, 2020, we funded our operations primarily from cash generated by our operations, sales of common stock and warrants, and cash on hand. These funds were also used to make payments on our term debt and our other credit facilities, for capital expenditures and to make lease payments.

During 2020, we experienced significant adverse conditions in the fuel-grade ethanol market as demand and pricing reached record lows due to reduced domestic transportation and resulting lower gasoline demand resulting from stay-at-home orders issued in response to the coronavirus pandemic. In response, we reduced fuel-grade ethanol production by more than 50% in an effort to conserve capital. We continued producing and selling our specialty alcohols, and also converted a portion of our fuel-grade ethanol production to specialty alcohol production to respond to substantial increased demand from the sanitizer and disinfectant markets. Sales of specialty alcohols were at a mix of fixed and spot prices, both of which resulted in significant cash flow from operations during the year. We expect continued demand for our specialty alcohols for at least the next twelve months and, as appropriate, will endeavor to sign fixed-price contracts and hedge corn input costs to lock in profit margins.

As of December 31, 2020, we had \$47.7 million in cash and \$16.0 million available for borrowing under Kinergy's operating line of credit. During 2020, we generated \$71.8 million in cash from our operations. We also realized \$19.9 million in net cash proceeds from the sale of our interest in two production facilities in Nebraska and \$10.0 million from the sale of certain real property and related assets at our Magic Valley production facility. In addition, we received net proceeds of approximately \$75.8 million from issuances of common stock and warrants and \$5.5 million from warrant exercises. These sources of cash enabled us to make principal payments totaling \$157.6 million on our debt during 2020, resulting in our return to compliance with our lenders. As a result, we believe we have sufficient liquidity to meet our anticipated working capital, debt service and other liquidity needs for the next twelve months from the date of this report.

Quantitative Year-End Liquidity Status

We believe that the following amounts provide insight into our liquidity and capital resources. The following selected financial information should be read in conjunction with our consolidated financial statements and notes to consolidated financial statements included elsewhere in this report, and the other sections of "Management's Discussion and Analysis of Financial Condition and Results of Operations" contained in this report (dollars in thousands).

	December 31,		Change
	2020	2019	
Cash and cash equivalents	\$ 47,667	\$ 18,997	150.9%
Current assets	\$ 214,046	\$ 232,064	(7.8)%
Property and equipment, net	\$ 229,486	\$ 332,526	(31.0)%
Current liabilities	\$ 86,927	\$ 160,398	(45.8)%
Long-term debt, noncurrent portion	\$ 71,807	\$ 180,795	(60.3)%
Working capital	\$ 127,119	\$ 71,666	77.4%
Working capital ratio	2.46	1.45	69.7%

Restricted Net Assets

At December 31, 2020, we had approximately \$262.1 million of net assets at our subsidiaries that were not available to be transferred to Alto Ingredients, Inc. in the form of dividends, distributions, loans or advances due to restrictions contained in the credit facilities of the subsidiaries.

Changes in Working Capital and Cash Flows

Working capital improved to \$127.1 million at December 31, 2020 from \$71.7 million at December 31, 2019 as a result of a decrease of \$73.4 million in current liabilities, partially offset by a decrease in current assets of \$18.0 million.

Current assets decreased primarily due to a decrease in assets held-for-sale associated with the completed sale of our interests in two fuel-grade ethanol production facilities in Nebraska, and decreases in accounts receivable and inventories due to lower sales volumes and the timing of collections, partially offset by an increase in cash and cash equivalents.

Our current liabilities declined primarily due to a decrease in liabilities held-for-sale associated with the completed sale of our interests in two fuel-grade ethanol production facilities in Nebraska and reductions in our current portion of long-term debt as we paid down indebtedness during the year.

Our cash and cash equivalents increased by \$28.7 million primarily due to \$71.8 million in cash provided by our operating activities and \$23.3 million in cash provided by our investing activities, partially offset by \$66.4 million in cash used in our financing activities.

Cash provided by our Operating Activities

Cash provided by our operating activities increased by \$95.1 million for the year ended December 31, 2020, as compared to the same period in 2019. We generated \$71.8 million in cash from our operating activities during the year. Specific factors that contributed to the increase in cash provided by our operating activities include:

- a decrease of \$84.0 million in our consolidated net loss due to higher margins from our sales of specialty alcohols;
- a decrease of \$37.3 million related to accounts receivable primarily due to lower sales volumes and the timing of collections;

- a decrease of \$21.9 million related to lower inventory levels as we reduced fuel-grade ethanol production during the period;
- an increase of \$10.0 million related to noncash fair value adjustments associated with outstanding warrants to purchase common stock; and
- an increase of \$9.1 million related to liabilities held-for-sale in connection with the sale of our interests in two fuel-grade ethanol production facilities in Nebraska.

These amounts were partially offset by:

- a decrease of \$17.6 million in noncash depreciation expense resulting from the sale of two fuel-grade ethanol production facilities in Nebraska;

- a decrease of \$17.2 million in accounts payable and accrued expenses, primarily due to increased payments of past due amounts;
- an increase of \$14.2 million in derivative instruments due to the recent rise in corn prices; and
- a decrease of \$9.2 million related to prepaid expenses and other assets due to the timing of payments.

Cash provided by our Investing Activities

Cash provided by our investing activities was \$23.3 million for the year, which included \$19.9 million in net proceeds from the sale of two fuel-grade ethanol production facilities in Nebraska and \$10.0 million from the sale of certain real property and related assets at our Magic Valley production facility, partially offset by \$6.6 million of additions to property and equipment resulting from our capital expenditure projects, such as the expansion of our grain neutral spirits system capacity completed at the end of 2020 and the expansion of our yeast production capacity still in process.

Cash used in our Financing Activities

Cash used in our financing activities was \$66.4 million for the year. The increase in cash used in our financing activities was primarily due to \$45.8 million in net payments on Kinergy's operating line of credit and \$111.8 million in principal payments on our other indebtedness, partially offset by \$75.8 million in proceeds from the sale of common stock and warrants, \$9.9 million in proceeds under our CARES Act loans and \$5.5 million in proceeds from warrant exercises.

Kinergy's Operating Line of Credit

Kinergy maintains an operating line of credit for an aggregate amount of up to \$100.0 million. The credit facility matures on August 2, 2022. Interest accrues under the credit facility at a rate equal to (i) the three-month London Interbank Offered Rate ("LIBOR"), plus (ii) a specified applicable margin ranging from 1.50% to 2.00%. The credit facility's monthly unused line fee is 0.25% to 0.375% of the amount by which the maximum credit under the facility exceeds the average daily principal balance during the immediately preceding month. Payments that may be made by Kinergy to Alto Ingredients, Inc. as reimbursement for management and other services provided by Alto Ingredients, Inc. to Kinergy are limited under the terms of the credit facility to \$1.5 million per fiscal quarter. The credit facility also includes the accounts receivable of our wholly-owned subsidiary, Alto Nutrients, LLC, or Alto Nutrients, as additional collateral. Payments that may be made by Alto Nutrients to Alto Ingredients, Inc. as reimbursement for management and other services provided by Alto Ingredients, Inc. to Alto Nutrients are limited under the terms of the credit facility to \$0.5 million per fiscal quarter. Alto Nutrients, one of our indirect wholly-owned subsidiaries, markets our essential ingredients and also provides raw material procurement services to our subsidiaries.

For all monthly periods in which excess borrowing availability falls below a specified level, Kinergy and Alto Nutrients must collectively maintain a fixed-charge coverage ratio (calculated as a twelve-month rolling earnings before interest, taxes, depreciation and amortization divided by the sum of interest expense, capital expenditures, principal payments of indebtedness, indebtedness from capital leases and taxes paid during such twelve-month rolling period) of at least 2.0 and are prohibited from incurring certain additional indebtedness (other than specific intercompany indebtedness). The obligations of Kinergy and Alto Nutrients under the credit facility are secured by a first-priority security interest in all of their respective assets in favor of the lender.

We believe Kinergy and Alto Nutrients are in compliance with the fixed-charge coverage ratio covenant as of the filing of this report. The following table sets forth the fixed-charge coverage ratio financial covenant and the actual results for the periods presented:

	Years Ended December 31,	
	2020	2019
Fixed Charge Coverage Ratio Requirement	2.00	2.00
Actual	5.35	5.71
Excess	3.35	3.71

Alto Ingredients, Inc. has guaranteed all of Kinergy's obligations under the credit facility. As of December 31, 2020, Kinergy had an outstanding balance of \$32.5 million and \$16.0 million of unused borrowing availability under the credit facility.

Alto Pekin Credit Facilities

On December 15, 2016, Alto Pekin, LLC, or Alto Pekin, one of our indirect wholly-owned subsidiaries and the entity that holds two of our production facilities in Pekin, Illinois, entered into a Credit Agreement, or the Pekin Credit Agreement, with 1st Farm Credit Services, PCA and CoBank, ACB, or CoBank. Under the terms of the Pekin Credit Agreement, Alto Pekin borrowed from 1st Farm Credit Services \$64.0 million under a term loan facility that matures on August 20, 2021, or the Pekin Term Loan, and up to \$32.0 million under a revolving term loan facility that matures on February 1, 2022, or the Pekin Revolving Loan, and together with the Pekin Term Loan, the Pekin Credit Facility. The Pekin Credit Facility is secured by a first-priority security interest in all of Alto Pekin's assets.

The Pekin Credit Facility and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers among Alto Pekin, its lenders and their agent, certain terms of the agreements are as follows:

- Interest accrues under the Pekin Credit Facility at an annual rate equal to the 30-day LIBOR plus 5.00%.
- Alto Pekin is required to pay a monthly fee on any unused portion of the Pekin Revolving Loan at a rate of 0.75% per annum.
- Alto Pekin and Alto ICP, LLC, or ICP, one of our indirect wholly-owned subsidiaries and the entity that holds one of our production facilities in Pekin, Illinois, are collectively required to maintain working capital of not less than 50% of the combined outstanding revolving lines of credit, which was \$30.0 million at December 31, 2020; and an annual debt service coverage ratio of not less than 1.25 to 1.00, in addition to various other affirmative and negative covenants.

Alto Pekin and ICP collectively agreed to pay Alto Pekin's and ICP's lenders an aggregate of \$40.0 million on or before September 30, 2020, or the September Paydown Amount, to reduce the outstanding balances of Alto Pekin's and ICP's respective term loans, to be allocated between them. Alto Pekin, ICP and their lenders

contemplated funding the September Paydown Amount through asset sales, proceeds of any award, judgment or settlement of litigation, or, at our election, from funds contributed by us to Alto Pekin or ICP.

In March 2020, we granted to Alto Pekin's lender a security interest in all of our equity interests in Alto Op Co., the entity which indirectly owns our western production facilities. We and certain subsidiaries also entered into intercreditor agreements with the Alto Pekin's and ICP's lenders, and the agent for our senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

On December 18, 2020, Alto Pekin and its lender further amended the Pekin Credit Facility to waive certain covenant defaults, including the covenant requiring Alto Pekin and ICP to pay the September Paydown Amount from an approved source of funds on or before September 30, 2020. The effect of this amendment was, in part, to deem the September Paydown Amount to have been timely paid. The parties also agreed to amend the Pekin Credit Facility to provide for a payment to Alto Pekin's and ICP's lenders of an aggregate of \$24.9 million, or the December Paydown Amount, on or prior to December 21, 2020, with \$19.9 million allocated to Alto Pekin's lenders and \$5.0 million allocated to ICP's lenders. On December 18, 2020, Alto Pekin and ICP paid the December Paydown Amount in full.

Following receipt of the December Paydown Amount, any additional proceeds arising from the sale of any of our midwestern production facility assets will be allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, our senior secured noteholders, and us, respectively; and any additional proceeds arising from the sale of any of our western production facility assets will be allocated first to the senior secured noteholders up to \$20.0 million and then allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, our senior secured noteholders, and us, respectively.

As of the filing of this report, we believe we are in compliance with the terms and conditions of our Pekin Credit Facility.

ICP Credit Facilities

On September 15, 2017, ICP, Compeer Financial, PCA, or Compeer, and CoBank as agent, entered into a Credit Agreement, or the ICP Credit Agreement. Under the terms of the ICP Credit Agreement, ICP borrowed from Compeer \$24.0 million under a term loan facility that matures on September 20, 2021, or the ICP Term Loan, and up to \$18.0 million under a revolving term loan facility that matures on September 1, 2022, or the ICP Revolving Loan, and together with the ICP Term Loan, the ICP Credit Facility. The ICP Credit Facility is secured by a first-priority security interest in all of ICP's assets.

The ICP Credit Facility and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers among ICP, its lenders and their agent, certain terms of the agreements are as follows:

- Interest accrues under the ICP Credit Facility at an annual rate equal to the 30-day LIBOR plus 3.75%.
- ICP is required to pay an annual nonrefundable commitment fee, calculated as 0.75% multiplied by the average daily positive difference between (i) the ICP Revolving Loan commitment (which may be reduced by ICP from time to time in increments of \$0.5 million), minus (ii) the aggregate principal amounts outstanding under the ICP Revolving Loan.
- ICP and Alto Pekin are collectively required to maintain working capital of not less than 50% of the combined outstanding revolving lines of credit, which was \$30.0 million at December 31, 2020; and an annual debt service coverage ratio of not less than 1.50 to 1.00, in addition to various other affirmative and negative covenants.

ICP and Alto Pekin collectively agreed to pay ICP's and Alto Pekin's lenders an aggregate of \$40.0 million on or before September 30, 2020, the same amount referred to above as the September Paydown Amount, to reduce the outstanding balances of ICP's and Alto Pekin's respective term loans, to be allocated between them. ICP, Alto Pekin, and their lenders contemplated funding the September Paydown Amount through asset sales, proceeds of any award, judgment or settlement of litigation, or, at our election, from funds contributed by us to ICP or Alto Pekin.

In March 2020, we granted to Alto Pekin's lender a security interest in all of our equity interests in Alto Op Co. We and certain subsidiaries also entered into intercreditor agreements with the ICP's and Alto Pekin's lenders, and the agent for our senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

On December 18, 2020, ICP and its lender further amended the ICP Credit Facility to waive certain covenant defaults, including the covenant requiring ICP and Alto Pekin to pay the September Paydown Amount from an approved source of funds on or before September 30, 2020. The effect of this amendment was, in part, to deem the September Paydown Amount to have been timely paid. The parties also agreed to amend the ICP Credit Facility to provide for a payment to ICP's and Alto Pekin's lenders of an aggregate of \$24.9 million, the same amount referred to above as the December Paydown Amount, on or prior to December 21, 2020, with \$5.0 million allocated to ICP's lenders and \$19.9 million allocated to Alto Pekin's lenders. On December 18, 2020, ICP and Alto Pekin paid the December Paydown Amount in full.

Following receipt of the December Paydown Amount, any additional proceeds arising from the sale of any of our midwestern production facility assets will be allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, our senior secured noteholders, and us, respectively; and any additional proceeds arising from the sale of any of our western production facility assets will be allocated first to the senior secured noteholders up to \$20.0 million and then allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, our senior secured noteholders, and us, respectively.

As of the filing of this report, we believe we are in compliance with the terms and conditions of our ICP Credit Facility.

Senior Secured Notes

On December 12, 2016, we entered into a Note Purchase Agreement with five accredited investors and sold \$55.0 million in aggregate principal amount of senior secured notes to the investors in a private offering for aggregate gross proceeds of 97% of the principal amount of the notes sold. On June 26, 2017, we entered into a second Note Purchase Agreement with five accredited investors and sold an additional \$13.9 million in aggregate principal amount of senior secured notes to the investors in a private offering for aggregate gross proceeds of 97% of the principal amount of the notes sold, and collectively with the notes previously sold, the Notes. The Notes are secured by a first-priority security interest in all of our equity interests in Alto Op Co.

The Notes and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers with the senior secured note holders and their agent, certain terms of the agreements are as follows:

- The Notes mature on December 15, 2021.
- Payments due under the Notes rank senior to all other indebtedness of Alto Ingredients, Inc. other than permitted senior indebtedness.
- Interest on the Notes accrues at a rate of 15% per annum.

- Any voluntary prepayments must be made at 102% of the principal amount prepaid.

The Notes also contain a variety of limitations, including a prohibition on parent company indebtedness; restrictions on redemption, repurchase or payment of any dividend or distribution in respect of our or our subsidiaries' equity interests; restrictions on asset sales and other dispositions; and restrictions on our or our subsidiaries' ability to issue equity for purposes other than to pay down a portion of the outstanding balance of the Notes.

In March 2020, ICP granted to the senior secured noteholders a security interest in certain of its personal property. In addition, Alto Central granted to the senior secured noteholders a security interest in certain of its personal property. Alto Central also pledged its equity interests in Alto Pekin and ICP in favor of the senior secured noteholders as additional collateral securing our obligations to the noteholders. Alto Op. Co also granted to the senior secured noteholders a security interest in certain of its personal property. We and certain subsidiaries also entered into intercreditor agreements with the ICP's and Alto Pekin's lenders, and the agent for our senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

In November 2020, we repaid \$35.3 million in principal under the Notes using a portion of the net proceeds of our then-recent offerings of common stock and warrants and the sale of certain real property assets at our Magic Valley production facility.

As of the filing of this report, we believe we are in compliance with the terms and conditions of the Notes.

CARES Act Loans

On May 4, 2020, Alto Ingredients, Inc. and Alto Pekin received loan proceeds from Bank of America, NA under the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"), through the Paycheck Protection Program administered by the U.S. Small Business Administration. Alto Ingredients, Inc. received \$6.0 million and Alto Pekin received \$3.9 million in loan proceeds. The loans mature in two years and bear interest at a rate of 1.00% per annum. Under the terms of the loans, certain amounts may be forgiven if they are used for qualifying expenses as described in the CARES Act, but we can provide no assurance that we will be able to obtain forgiveness of all or any portion of the loans. We are in the process of applying for loan forgiveness.

Effects of Inflation

The impact of inflation was not significant to our financial condition or results of operations for 2020 or 2019.

Critical Accounting Policies

Our discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires us to make estimates and judgments 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 amount of net sales and expenses for each period. The following represents a summary of our critical accounting policies, defined as those policies that we believe are the most important to the portrayal of our financial condition and results of operations and that require management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effects of matters that are inherently uncertain.

Revenue Recognition

We recognize revenue primarily from sales of alcohols and essential ingredients.

We have seven alcohol production facilities from which we produce and sell alcohols to our customers through our subsidiary Kinergy. Kinergy enters into sales contracts with customers under exclusive intercompany sales agreements with each of our seven production facilities. Kinergy also acts as a principal when it purchases third party fuel-grade ethanol which it resells to its customers. Finally, Kinergy has exclusive sales agreements with other third-party owned fuel-grade ethanol plants under which it sells their fuel-grade ethanol production for a fee plus the costs to deliver the ethanol to Kinergy's customers. These sales are referred to as third-party agent sales. Revenue from these third-party agent sales is recorded on a net basis, with Kinergy recognizing its predetermined fees and any associated delivery costs.

We have seven production facilities from which we produce and sell essential ingredients to our customers through our subsidiary Alto Nutrients. Alto Nutrients enters into sales contracts with essential ingredient customers under exclusive intercompany sales agreements with each of our seven production facilities.

We recognize revenue from sales of alcohols and essential ingredients at the point in time when the customer obtains control of the products, which typically occurs upon delivery depending on the terms of the underlying contracts. In some instances, we enter into contracts with customers that contain multiple performance obligations to deliver volumes of alcohols or essential ingredients over a contractual period of less than 12 months. We allocate the transaction price to each performance obligation identified in the contract based on relative standalone selling prices and recognize the related revenue as control of each individual product is transferred to the customer in satisfaction of the corresponding performance obligations.

When we are the agent, the supplier controls the products before they are transferred to the customer because the supplier is primarily responsible for fulfilling the promise to provide the product, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product. When we are the principal, we control the products before they are transferred to the customer because we are primarily responsible for fulfilling the promise to provide the products, we have inventory risk before the product has been transferred to a customer and we have discretion in establishing the price for the product.

See "Note 4 – Segments" of the Notes to Consolidated Financial Statements commencing on page F-21 of this report for our revenue-breakdown by type of contract.

Impairment of Long-Lived Assets and Held-for-Sale Classification

Our long-lived assets have been primarily associated with our production facilities, reflecting their original cost, adjusted for depreciation and any subsequent impairment.

We assess the impairment of long-lived assets, including property and equipment, when events or changes in circumstances indicate that the fair value of an asset could be less than the net book value of the asset. Generally, we assess long-lived assets for impairment by first determining the forecasted, undiscounted cash flows each asset is expected to generate plus the net proceeds expected from the sale of the asset. If the total amount of the undiscounted cash flows is less than the carrying value of the asset, we

then determine the fair value of the asset. An impairment loss would be recognized when the fair value is less than the related net book value, and an impairment expense would be recorded in the amount of the difference. Forecasts of future cash flows are judgments based on our experience and knowledge of our operations and the industry in which we operate. These forecasts could be significantly affected by future changes in market conditions, the economic environment, including inflation, and the purchasing decisions of our customers.

We review our intangible assets with indefinite lives at least annually or more frequently if impairment indicators arise. In our review, we determine the fair value of these assets using market multiples and discounted cash flow modeling and compare it to the net book value of the acquired assets.

Assets held-for-sale are assessed for impairment by comparing the carrying value to their expected net sales proceeds. We entered into a term sheet dated December 19, 2019 with Aurora Cooperative Elevator Company for the sale of our interest in two fuel-grade ethanol production facilities in Nebraska. We reviewed the criteria for held-for-sale classification of the long-lived assets associated with the pending transaction. Our analysis concluded that these long-lived assets should be classified as held-for-sale with a related impairment of \$29.3 million to fair value. We did not recognize any other asset impairment charges in 2019.

In October 2020, our Board of Directors approved a plan to sell our fuel-grade ethanol production facilities in Madera and Stockton, California. Consequently, we determined the long-lived asset groups should be classified as held-for-sale at December 31, 2020. The analysis of these potential sales resulted in an aggregate asset impairment of \$22.3 million. We further reviewed indicators of impairment for our other production facilities, resulting in an additional asset impairment of \$2.1 million in 2020.

Valuation Allowance for Deferred Taxes

We account for income taxes under the asset and liability approach, where deferred tax assets and liabilities are determined based on differences between financial reporting and tax bases of assets and liabilities, and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

We evaluate our deferred tax asset balance for realizability. To the extent we believe it is more likely than not that some portion or all of our deferred tax assets will not be realized, we will establish a valuation allowance against the deferred tax assets. Realization of our deferred tax assets is dependent upon future taxable income during the periods in which the associated temporary differences become deductible. We consider the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment. These changes, if any, may require possible material adjustments to these deferred tax assets, resulting in a reduction in net income or an increase in net loss in the period when such determinations are made.

Our pre-tax consolidated losses were \$17.3 million and \$101.3 million for the years ended December 31, 2020 and 2019, respectively. Based on our current and prior results, we do not have significant evidence to support a conclusion that we will more likely than not be able to benefit from our remaining deferred tax assets. As such, we have recorded a valuation allowance against our net deferred tax assets.

Derivative Instruments

We evaluate our contracts to determine whether the contracts are derivative instruments. Management may elect to exempt certain forward contracts that meet the definition of a derivative from derivative accounting as normal purchases or normal sales. Normal purchases and normal sales are contracts that provide for the purchase or sale of something other than a financial instrument or derivative instrument that will be delivered in quantities expected to be used or sold over a reasonable period in the normal course of business. Contracts that meet the requirements of normal purchases or sales are documented as normal and exempted from the fair value accounting and reporting requirements of derivative accounting.

We enter into short-term cash, option and futures contracts as a means of securing purchases of corn, natural gas and sales of fuel-grade ethanol and managing exposure to changes in commodity prices. All of our exchange-traded derivatives are designated as non-hedge derivatives for accounting purposes, with changes in fair value recognized in net income. Although the contracts are economic hedges of specified risks, they are not designated or accounted for as hedging instruments.

Realized and unrealized gains and losses related to exchange-traded derivative contracts are included as a component of cost of goods sold in the accompanying financial statements. The fair values of contracts entered through commodity exchanges are presented on the accompanying balance sheet as derivative assets or liabilities. The selection of normal purchase or sales contracts, and use of hedge accounting, are accounting policies that can change the timing of recognition of gains and losses in the statement of operations.

Impact of New Accounting Pronouncements

Not applicable.

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

Not applicable.

Item 8. Financial Statements and Supplementary Data.

Reference is made to the financial statements, which begin at page F-1 of this report.

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

None.

Item 9A. Controls and Procedures.

We conducted an evaluation under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities and Exchange Act of 1934, as amended, or Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by the company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time

periods specified in the Securities and Exchange Commission's rules and forms. Disclosure controls and procedures also include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2020 that our disclosure controls and procedures were effective at a reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control over financial reporting is 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. Our internal control over financial reporting includes those policies and procedures that:

- (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;
- (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our 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.

A material weakness is defined by the Public Company Accounting Oversight Board's Audit Standards AS 2201 as being a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis by the company's internal controls.

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework set forth in *Internal Control — Integrated Framework (2013)*, our management concluded that our internal control over financial reporting was effective as of December 31, 2020.

Inherent Limitations on the Effectiveness of Controls

Management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent or detect all errors and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control systems are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in a cost-effective control system, no evaluation of internal control over financial reporting can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been or will be detected.

These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of a simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Projections of any evaluation of controls effectiveness to future periods are subject to risks. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the most recently completed fiscal quarter that has materially affected, or is 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 under the captions "Information about our Board of Directors, Board Committees and Related Matters" appearing in the Proxy Statement, is hereby incorporated by reference.

Item 11. Executive Compensation.

The information under the caption “Executive Compensation and Related Information,” appearing in the Proxy Statement, is hereby incorporated by reference.

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

The information under the captions “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information,” appearing in the Proxy Statement, is hereby incorporated by reference.

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

The information under the captions “Certain Relationships and Related Transactions” and “Information about our Board of Directors, Board Committees and Related Matters—Director Independence” appearing in the Proxy Statement, is hereby incorporated by reference.

Item 14. Principal Accounting Fees and Services.

The information under the caption “Audit Matters—Principal Accountant Fees and Services,” appearing in the Proxy Statement, is hereby incorporated by reference.

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PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a)(1) Financial Statements

Reference is made to the financial statements listed on and attached following the Index to Consolidated Financial Statements contained on page F-1 of this report.

(a)(2) Financial Statement Schedules

None.

(a)(3) Exhibits

Reference is made to the exhibits listed on the Index to Exhibits.

Item 16. Form 10-K Summary.

None.

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F-1

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

**To the Stockholders and the Board of Directors of
Alto Ingredients, Inc.**

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Alto Ingredients, Inc. and its subsidiaries (the Company) as of December 31, 2020 and 2019, the related consolidated statements of operations, comprehensive loss, stockholders’ equity and cash flows for the years then ended, and the related notes to the consolidated financial statements (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with

respect to the Company in accordance with 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 financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Long-Lived Asset Impairment

As discussed in Note 1 to the financial statements, the Company assesses the impairment of long-lived assets, including property and equipment, internally developed software and purchased intangibles subject to amortization, when events or circumstances exist that indicate that the fair value of assets may be less than their net book value. The Company's model includes forecasted undiscounted cash flows and estimated net proceeds expected from the sale of the asset group used for the determination of any impairment of the Company's long-lived assets. The projections used for analysis are judgmental and based on circumstances and future plans as determined by management.

We identified the assessment of the Company's impairment of long-lived assets as a critical audit matter because auditor judgment was required in evaluating significant assumptions related to the Company's estimate, including the estimated residual value of the asset group.

Our audit procedures related to the Company's long-lived asset impairment assessment included the following, among others:

- We compared plant efficiency and profitability at the asset group to comparable asset groups that have been sold by the Company and others in the industry, to determine the reasonableness of the estimated residual value of the asset group.
- For the asset group with an indicator of impairment, we obtained the third-party valuation report for the asset group and evaluated the reasonableness of the sales approach by evaluating market data, used in the valuation, for plants that have been sold recently by the Company and others in the industry.

/s/ RSM US LLP

We have served as the Company's auditor since 2015.

Rochester, Minnesota
March 26, 2021

ALTO INGREDIENTS, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except shares and par value)

<u>ASSETS</u>	<u>December 31,</u>	
	<u>2020</u>	<u>2019</u>
Current Assets:		
Cash and cash equivalents	\$ 47,667	\$ 18,997
Accounts receivable, net of allowance for doubtful accounts of \$260 and \$39, respectively	43,491	74,307
Inventories	41,767	60,600
Prepaid inventory	891	1,528
Derivative assets	17,149	2,438
Assets held-for-sale	58,295	69,764
Other current assets	4,786	4,430
Total current assets	214,046	232,064
Property and equipment, net	229,486	332,526
Other Assets:		
Right of use operating lease assets, net	11,046	24,346
Notes receivable	14,337	—
Assets held-for-sale	—	16,500
Intangible asset	2,678	2,678
Other assets	5,225	4,381
Total other assets	33,286	47,905
Total Assets	\$ 476,818	\$ 612,495

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED BALANCE SHEETS (CONTINUED)
(in thousands, except shares and par value)

	December 31,	
	2020	2019
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities:		
Accounts payable – trade	\$ 13,047	\$ 29,277
Accrued liabilities	11,101	22,331
Current portion – operating leases	2,180	3,457
Current portion – long-term debt, net	25,533	63,000
Derivative liabilities	—	1,860
Liabilities held-for-sale	19,542	34,413
Other current liabilities	15,524	6,060
Total current liabilities	<u>86,927</u>	<u>160,398</u>
Long-term debt, net of current portion	71,807	180,795
Operating leases, net of current portion	8,715	21,171
Other liabilities	13,134	23,086
Total Liabilities	<u>180,583</u>	<u>385,450</u>
Commitments and contingencies (Notes 1, 8, 9, 10 and 15)		
Stockholders' Equity:		
Preferred stock, \$0.001 par value; 10,000,000 shares authorized:		
Series A: 1,684,375 shares authorized; no shares issued and outstanding as of December 31, 2020 and 2019	—	—
Series B: 1,580,790 shares authorized; 926,942 shares issued and outstanding as of December 31, 2020 and 2019; liquidation preference of \$19,663 as of December 31, 2020	1	1
Common stock, \$0.001 par value; 300,000,000 shares authorized; 72,486,962 and 55,508,314 shares issued and outstanding as of December 31, 2020 and 2019, respectively	72	56
Non-voting common stock, \$0.001 par value; 3,553,000 shares authorized; 896 shares issued and outstanding as of December 31, 2020 and 2019	—	—
Additional paid-in capital	1,036,638	942,307
Accumulated other comprehensive loss	(3,878)	(2,370)
Accumulated deficit	(736,598)	(720,214)
Total Alto Ingredients, Inc. stockholders' equity	<u>296,235</u>	<u>219,780</u>
Noncontrolling interests	—	7,265
Total stockholders' equity	<u>296,235</u>	<u>227,045</u>
Total Liabilities and Stockholders' Equity	<u>\$ 476,818</u>	<u>\$ 612,495</u>

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years Ended December 31,	
	2020	2019
Net sales	\$ 897,023	\$ 1,424,881
Cost of goods sold	844,164	1,434,819
Gross profit (loss)	52,859	(9,938)
Selling, general and administrative expenses	(31,980)	(35,453)
Gain on litigation settlement	11,750	—
Gain on sale of assets	1,580	—
Asset impairments	(24,356)	(29,292)
Income (loss) from operations	9,853	(74,683)
Interest expense, net	(17,943)	(20,206)
Loss on debt extinguishment	—	(6,517)
Fair value adjustments	(9,959)	—
Other income, net	750	104
Loss before benefit for income taxes	(17,299)	(101,302)
Benefit for income taxes	17	20
Consolidated net loss	(17,282)	(101,282)
Net loss attributed to noncontrolling interests	2,166	12,333
Net loss attributed to Alto Ingredients, Inc.	<u>\$ (15,116)</u>	<u>\$ (88,949)</u>
Preferred stock dividends	\$ (1,268)	\$ (1,265)
Loss available to common stockholders	<u>\$ (16,384)</u>	<u>\$ (90,214)</u>
Loss per share, basic and diluted	<u>\$ (0.28)</u>	<u>\$ (1.90)</u>
Weighted-average shares outstanding, basic and diluted	<u>58,609</u>	<u>47,384</u>

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(in thousands)

	Years Ended December 31,	
	2020	2019
Consolidated net loss	\$ (17,282)	\$ (101,282)
Other comprehensive income (expense) – net gain (loss) arising during the period on defined benefit pension plans	(1,508)	89
Total comprehensive loss	(18,790)	(101,193)
Comprehensive loss attributed to noncontrolling interests	2,166	12,333
Comprehensive loss attributed to Alto Ingredients, Inc.	\$ (16,624)	\$ (88,860)

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Preferred Stock		Common Stock and Non-Voting Common		Additional Paid-In Capital	Accumulated Deficit	Accum. Other Comprehensive Loss	Non-Controlling Interests	Total
	Shares	Amount	Shares	Amount	Capital	Deficit	Loss	Interests	Total
Balances, December 31, 2018	927	\$ 1	45,771	\$ 46	\$ 932,179	\$ (630,000)	\$ (2,459)	\$ 19,598	\$ 319,365
Stock-based compensation expense – restricted stock and options to employees and directors, net of cancellations and tax	—	—	1,069	1	2,650	—	—	—	2,651
Common stock issuances ATM	—	—	3,137	3	3,667	—	—	—	3,670
Common stock issuances senior notes	—	—	5,531	6	3,811	—	—	—	3,817
Pension plan adjustment	—	—	—	—	—	—	89	—	89
Preferred stock dividends	—	—	—	—	—	(1,265)	—	—	(1,265)
Net loss	—	—	—	—	—	(88,949)	—	(12,333)	(101,282)
Balances, December 31, 2019	927	\$ 1	55,508	\$ 56	\$ 942,307	\$ (720,214)	\$ (2,370)	\$ 7,265	\$ 227,045
Stock-based compensation expense – restricted stock and options to employees and directors, net of cancellations and tax	—	—	1,137	1	2,077	—	—	—	2,078
Common stock issuances	—	—	5,075	5	70,528	—	—	—	70,533
Warrant exercises	—	—	9,346	9	16,431	—	—	—	16,440
Common stock issuances ATM	—	—	1,421	1	5,295	—	—	—	5,296
Sale of interests in PAL	—	—	—	—	—	—	—	(5,099)	(5,099)
Pension plan adjustment	—	—	—	—	—	—	(1,508)	—	(1,508)
Preferred stock dividends	—	—	—	—	—	(1,268)	—	—	(1,268)
Net loss	—	—	—	—	—	(15,116)	—	(2,166)	(17,282)
Balances, December 31, 2020	927	\$ 1	72,487	\$ 72	\$ 1,036,638	\$ (736,598)	\$ (3,878)	\$ —	\$ 296,235

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	For the Years Ended December 31,	
	2020	2019
Operating Activities:		
Consolidated net loss	\$ (17,282)	\$ (101,282)
Adjustments to reconcile consolidated net loss to cash provided by (used in) operating activities:		
Depreciation and amortization of intangibles	30,268	47,909
Asset impairments	24,356	29,292
Fair value adjustments	9,959	—
Gain on sale of assets	(1,580)	—
Loss on debt extinguishment	—	6,517
Inventory valuation	(257)	—
Gain on derivative instruments	(14,780)	(555)
Amortization of deferred financing costs	1,394	511
Amortization of debt discounts (premiums)	(230)	689
Noncash compensation	2,679	2,809
Bad debt expense	245	27

Interest expense added to senior notes	133	1,185
Changes in operating assets and liabilities:		
Accounts receivable	30,571	(6,698)
Inventories	19,090	(2,780)
Prepaid expenses and other assets	965	10,197
Prepaid inventory	637	1,562
Operating leases	(4,751)	(10,161)
Assets held-for-sale	1,012	—
Liabilities held-for-sale	9,110	—
Accounts payable and accrued expenses	(19,763)	(2,585)
Net cash provided by (used in) operating activities	<u>\$ 71,776</u>	<u>\$ (23,363)</u>
Investing Activities:		
Proceeds from sale of interests in PAL	\$ 19,896	\$ —
Proceeds from Magic Valley asset sale	10,000	—
Additions to property and equipment	(6,580)	(3,281)
Net cash provided by (used in) investing activities	<u>\$ 23,316</u>	<u>\$ (3,281)</u>
Financing Activities:		
Proceeds from issuances of common stock and warrants	\$ 75,829	\$ 3,670
Proceeds from warrant exercises	5,500	—
Proceeds from CARES Act loans	9,860	—
Net proceeds (payments) on Kinergy's line of credit	(45,826)	21,282
Payments on plant borrowings	(71,536)	(8,000)
Payments on senior notes	(40,249)	(3,748)
Preferred stock dividend payments	—	(946)
Proceeds from CoGen contract amendment	—	8,036
Debt issuance costs	—	(1,280)
Net cash provided by (used in) financing activities	<u>\$ (66,422)</u>	<u>\$ 19,014</u>
Net increase (decrease) in cash and cash equivalents	28,670	(7,630)
Cash and cash equivalents at beginning of period	18,997	26,627
Cash and cash equivalents at end of period	<u>\$ 47,667</u>	<u>\$ 18,997</u>

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	For the Years Ended December 31,	
	2020	2019
Supplemental Information:		
Interest paid	\$ 17,469	\$ 18,763
Income tax refunds	\$ 641	\$ —
Noncash financing and investing activities:		
Initial right of use assets and liabilities recorded under ASC 842	\$ —	\$ 43,753
Issuance of common stock for senior note amendment	\$ —	\$ 3,817
Issuance of warrants for senior note amendment	\$ —	\$ 977
Accrued preferred stock dividends	\$ 1,268	\$ 319

The accompanying notes are an integral part of these consolidated financial statements.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES.

Organization and Business – The consolidated financial statements include, for all periods presented, the accounts of Alto Ingredients, Inc. (formerly known as Pacific Ethanol, Inc.), a Delaware corporation (“Alto Ingredients”), and its direct and indirect subsidiaries (collectively, the “Company”), including its wholly-owned subsidiaries, Kinergy Marketing LLC, an Oregon limited liability company (“Kinergy”), Alto Nutrients, LLC (formerly known as Pacific Ag. Products, LLC), a California limited liability company (“Alto Nutrients”), Alto Op Co. (formerly known as PE Op Co.), a Delaware corporation (“Alto Op Co.”), Alto Pekin, LLC (formerly known as Pacific Ethanol Pekin, LLC), a Delaware limited liability company (“Alto Pekin”) and Alto ICP, LLC (formerly known as Illinois Corn Processing, LLC), a Delaware limited liability company (“ICP”).

On December 15, 2016, the Company and Aurora Cooperative Elevator Company, a Nebraska cooperative corporation (“ACEC”), closed a transaction under a contribution agreement under which the Company contributed its Aurora, Nebraska ethanol production facilities and ACEC contributed its Aurora grain elevator and related grain handling assets to Pacific Aurora, LLC (“Pacific Aurora”) in exchange for equity interests in Pacific Aurora. As a result, the Company owned 73.93% of Pacific Aurora and ACEC owned 26.07% of Pacific Aurora. As discussed further in Note 2, the Company sold its interest in Pacific Aurora on April 15, 2020. Therefore, from December 15, 2016 through April 15, 2020, the Company consolidated 100% of the results of Pacific Aurora and recorded ACEC’s 26.07% equity interest as noncontrolling interests in the accompanying financial statements.

The Company is a leading producer and marketer of specialty alcohols and essential ingredients. The Company also produces and markets fuel-grade ethanol. The Company's production facilities in Pekin, Illinois are located in the heart of the Corn Belt, benefit from low-cost and abundant feedstock and allow for access to many additional domestic markets. In addition, the Company's ability to load unit trains and barges from these facilities allows for greater access to international markets. The Company's four production facilities in California, Oregon and Idaho are located in close proximity to both feed and fuel-grade ethanol customers and thus enjoy unique advantages in efficiency, logistics and product pricing.

The Company has a combined production capacity of 450 million gallons per year, markets, on an annualized basis, over 500 million gallons of alcohols, and produces, on an annualized basis, nearly 1.5 million tons of essential ingredients on a dry matter basis, such as dried yeast, corn gluten meal, corn gluten feed, and distillers grains and liquid feed used in commercial animal feed and pet foods.

The Company focuses on four key markets: *Health, Home & Beauty*; *Food & Beverage*; *Essential Ingredients*; and *Renewable Fuels*. Products for the Health, Home & Beauty market include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the Food & Beverage markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for Essential Ingredients markets include yeast, corn gluten and distillers grains used in commercial animal feed and pet foods. Renewable Fuels includes fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel fuel.

As of December 31, 2020, the Company was operating at approximately 64% of its 450 million gallon annual production capacity. As market conditions change, the Company may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Basis of Presentation – The consolidated financial statements and related notes have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and include the accounts of the Company. All significant intercompany accounts and transactions have been eliminated in consolidation.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Liquidity – During the year ended December 31, 2020, the Company experienced significant adverse conditions in the fuel-grade ethanol market as demand and pricing reached record lows due to reduced domestic transportation and resulting lower gasoline demand resulting from stay-at-home orders issued in response to the coronavirus pandemic. In response, the Company reduced fuel-grade ethanol production at its production facilities by more than 50% in an effort to conserve capital. The Company continued producing and selling its specialty alcohols, but also converted a portion of its fuel-grade ethanol production to specialty alcohol production to respond to substantial increased demand from the sanitizer and disinfectant markets. Sales of specialty alcohols were at a mix of fixed and spot prices, both of which resulted in significant cash flow from operations during the year.

As of December 31, 2020, the Company had \$47.7 million in cash and \$16.0 million available for borrowing under Kinergy's operating line of credit. During 2020, the Company generated \$71.8 million in cash from its operations. The Company also realized \$19.9 million in net cash proceeds from the sale of its interest in Pacific Aurora and \$10.0 million from its sale of certain real property and related assets at its Magic Valley production facility. In addition, the Company received net proceeds of approximately \$75.8 million from issuances of common stock and warrants and \$5.5 million from warrant exercises. These sources of cash enabled the Company to make principal payments totaling \$157.6 million on its debt during 2020, resulting in the Company's return to compliance with its lenders. Given the Company's current liquidity and outlook for the rest of 2021, it believes it has sufficient liquidity to meet its anticipated working capital, debt service and other liquidity needs for the next twelve months from the date of this report.

Segments – A segment is a component of an enterprise whose operating results are regularly reviewed by the enterprise's chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance, and for which discrete financial information is available. The Company determines and discloses its segments in accordance with the Financial Accounting Standards Board's ("FASB") Accounting Standards Codification Section 280, *Segment Reporting*, which defines how to determine segments. In 2020, with the Company's strategic shift to an increased focus on specialty alcohol sales, the Company now reports financial and operating performance in three reportable segments (1) marketing and distribution, which includes marketing and merchant trading for Company-produced specialty alcohols, fuel-grade ethanol and essential ingredients, and third-party fuel-grade ethanol, (2) Pekin production, which includes the entire campus in Pekin, Illinois ("Pekin Campus"), and (3) other production, which includes all of the Company's other production facilities on an aggregated basis ("Other production").

Cash and Cash Equivalents – The Company considers all highly-liquid investments with an original maturity of three months or less to be cash equivalents. The Company maintains its accounts at several financial institutions. These cash balances regularly exceed amounts insured by the Federal Deposit Insurance Corporation; however, the Company does not believe it is exposed to any significant credit risk on these balances.

Accounts Receivable and Allowance for Doubtful Accounts – Trade accounts receivable are presented at face value, net of the allowance for doubtful accounts. The Company sells specialty alcohols to large consumer product companies, sells fuel-grade ethanol to gasoline refining and distribution companies, sells essential ingredients to animal feed customers, including distillers grains and other feed co-products to dairy operators and animal feedlots and corn oil to poultry and biodiesel customers, in each case generally without requiring collateral. Due to a limited number of customers, the Company had significant concentrations of credit risk from sales as of December 31, 2020 and 2019, as described below.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company maintains an allowance for doubtful accounts for balances that appear to have specific collection issues. The collection process is based on the age of the invoice and requires attempted contacts with the customer at specified intervals. If, after a specified number of days, the Company has been unsuccessful in its collection efforts, a bad debt allowance is recorded for the balance in question. Delinquent accounts receivable are charged against the allowance for doubtful accounts once uncollectibility has been determined. The factors considered in reaching this determination are the apparent financial condition of the customer and the Company's success in contacting and negotiating with the customer. If the financial condition of a Company customer deteriorates, resulting in an impairment of ability to make payments, additional allowances may be required.

Of the accounts receivable balance, approximately \$35,839,000 and \$63,736,000 at December 31, 2020 and 2019, respectively, were used as collateral under Kinergy's operating line of credit. The allowance for doubtful accounts was \$260,000 and \$39,000 as of December 31, 2020 and 2019, respectively. The Company recorded a bad debt expense of \$245,000 and \$27,000 for the years ended December 31, 2020 and 2019, respectively. The Company does not have any off-balance sheet credit exposure related to its customers.

Concentration Risks – Credit risk represents the accounting loss that would be recognized at the reporting date if counterparties failed completely to perform as contracted. Concentrations of credit risk, whether on- or off-balance sheet, that arise from financial instruments exist for groups of customers or counterparties when they have similar economic characteristics that would cause their ability to meet contractual obligations to be similarly affected by changes in economic or other conditions described below. Financial instruments that subject the Company to credit risk consist of cash balances maintained in excess of federal depository insurance limits and accounts receivable which have no collateral or security. The Company has not experienced any significant losses in such accounts and believes that it is not exposed to any significant risk of loss of cash.

The Company sells specialty alcohols to consumer product companies and fuel-grade ethanol to gasoline refining and distribution companies. The Company sold to customers representing 10% or more of the Company’s total net sales, as follows.

	Years Ended December 31,	
	2020	2019
Customer A	9%	11%
Customer B	5%	13%

The Company had accounts receivable due from these customers totaling \$4,421,000 and \$15,624,000, representing 10% and 21% of total accounts receivable, as of December 31, 2020 and 2019, respectively.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company purchases corn, its largest cost component in producing alcohols, from its suppliers. The Company purchased corn from suppliers representing 10% or more of the Company’s total corn purchases, as follows:

	Years Ended December 31,	
	2020	2019
Supplier A	9%	25%
Supplier B	16%	16%

As of December 31, 2020, approximately 51% of the Company’s employees were covered by a collective bargaining agreement.

Inventories – Inventories consisted primarily of alcohols, corn, essential ingredients, carbon and Renewable Identification Number (“RIN”) credits and unleaded fuel, and are valued at the lower of cost or net realizable value, with cost determined on a first-in, first-out basis. Inventory is net of a \$1,033,000 and \$1,290,000 valuation adjustment as of December 31, 2020 and 2019, respectively. Inventory balances consisted of the following (in thousands):

	December 31,	
	2020	2019
Finished goods	\$ 25,154	\$ 38,194
Work in progress	4,333	7,426
Raw materials	7,074	7,890
Carbon and RIN credits	3,842	5,690
Other	1,364	1,400
Total	\$ 41,767	\$ 60,600

Property and Equipment – Property and equipment are stated at cost. Depreciation is computed using the straight-line method over the following estimated useful lives:

Buildings	40 years
Facilities and plant equipment	10 – 25 years
Other equipment, vehicles and furniture	5 – 10 years

The cost of normal maintenance and repairs is charged to operations as incurred. Significant capital expenditures that increase the life of an asset are capitalized and depreciated over the estimated remaining useful life of the asset. The cost of property and equipment sold, or otherwise disposed of, and the related accumulated depreciation or amortization are removed from the accounts, and any resulting gains or losses are reflected in current operations.

Intangible Asset – The Company assesses indefinite-lived intangible assets for impairment annually, or more frequently if circumstances indicate impairment may have occurred. If the carrying value of an indefinite-lived intangible asset exceeds its fair value, an impairment loss is recognized in an amount equal to that excess. If the Company determines that an impairment charge is needed, the charge will be recorded as an asset impairment in the consolidated statements of operations.

Leases – The Company accounts for leases under ASC 842, whereby, lessees are required to recognize the following for all leases (with the exception of short-term leases) at the commencement date: (1) a lease liability, which is a lessee’s obligation to make lease payments arising from a lease, measured on a discounted cash flow basis; and (2) a “right of use” asset, which is an asset that represents the lessee’s right to use the specified asset for the lease term. See Note 9 for further information.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Derivative Instruments and Hedging Activities – Derivative transactions, which can include exchange-traded forward contracts and futures positions on the New York Mercantile Exchange or the Chicago Board of Trade, are recorded on the balance sheet as assets and liabilities based on the derivative’s fair value. Changes in the fair value of derivative contracts are recognized currently in income unless specific hedge accounting criteria are met. If derivatives meet those criteria, and hedge accounting is elected, effective gains and losses are deferred in accumulated other comprehensive income (loss) and later recorded together with the hedged item in consolidated income (loss). For derivatives designated as a cash flow hedge, the Company formally documents the hedge and assesses the effectiveness with associated transactions. The Company has designated and documented contracts for the physical delivery of commodity products to and from counterparties as normal purchases and normal sales.

Revenue Recognition – The Company recognizes revenue under ASC 606. The provisions of ASC 606 include a five-step process by which an entity will determine revenue

recognition, depicting the transfer of goods or services to customers in amounts reflecting the payment to which an entity expects to be entitled in exchange for those goods or services. ASC 606 requires the Company to apply the following steps: (1) identify the contract with the customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when, or as, the Company satisfies the performance obligation.

The Company recognizes revenue primarily from sales of alcohols and essential ingredients.

The Company has seven production facilities from which it produces and sells alcohols to its customers through Kinergy. Kinergy enters into sales contracts with its customers under exclusive intercompany sales agreements with each of the Company's seven production facilities. Kinergy also acts as a principal when it purchases third party fuel-grade ethanol which it resells to its customers. Finally, Kinergy has exclusive sales agreements with other third-party owned fuel-grade ethanol production facilities under which it sells their fuel-grade ethanol for a fee plus the costs to deliver the ethanol to Kinergy's customers. These sales are referred to as third-party agent sales. Revenue from these third-party agent sales is recorded on a net basis, with Kinergy recognizing its predetermined fees and any associated delivery costs.

The Company has seven production facilities from which it produces and sells essential ingredients to its customers through Alto Nutrients. Alto Nutrients enters into sales contracts with essential ingredient customers under exclusive intercompany sales agreements with each of the Company's seven production facilities.

The Company recognizes revenue from sales of alcohols and essential ingredients at the point in time when the customer obtains control of the products, which typically occurs upon delivery depending on the terms of the underlying contracts. In some instances, the Company enters into contracts with customers that contain multiple performance obligations to deliver volumes of alcohols or essential ingredients over a contractual period of less than 12 months. The Company allocates the transaction price to each performance obligation identified in the contract based on relative standalone selling prices and recognizes the related revenue as control of each individual product is transferred to the customer in satisfaction of the corresponding performance obligations.

When the Company is the agent, the supplier controls the products before they are transferred to the customer because the supplier is primarily responsible for fulfilling the promise to provide the product, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product. When the Company is the principal, the Company controls the products before they are transferred to the customer because the Company is primarily responsible for fulfilling the promise to provide the products, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

See Note 4 for the Company's revenue by type of contracts.

Shipping and Handling Costs – The Company accounts for shipping and handling costs relating to contracts with customers as costs to fulfill its promise to transfer its products. Accordingly, the costs are classified as a component of cost of goods sold in the accompanying consolidated statements of operations.

Selling Costs – Selling costs associated with the Company's product sales are classified as a component of selling, general and administrative expenses in the accompanying consolidated statements of operations.

Stock-Based Compensation – The Company accounts for the cost of employee services received in exchange for the award of equity instruments based on the fair value of the award, determined on the date of grant. The expense is recognized over the period during which an employee is required to provide services in exchange for the award. The Company accounts for forfeitures as they occur. The Company recognizes stock-based compensation expense as a component of either cost of goods sold or selling, general and administrative expenses in the consolidated statements of operations.

Impairment of Long-Lived Assets – The Company assesses the impairment of long-lived assets, including property and equipment, internally developed software and purchased intangibles subject to amortization, when events or changes in circumstances indicate that the fair value of assets could be less than their net book value. In such event, the Company assesses long-lived assets for impairment by first determining the forecasted, undiscounted cash flows the asset group is expected to generate plus the net proceeds expected from the sale of the asset group. If this amount is less than the carrying value of the asset, the Company will then determine the fair value of the asset group. An impairment loss would be recognized when the fair value is less than the related asset group's net book value, and an impairment expense would be recorded in the amount of the difference. Forecasts of future cash flows are judgments based on the Company's experience and knowledge of its operations and the industries in which it operates. These forecasts could be significantly affected by future changes in market conditions, the economic environment, including inflation, and purchasing decisions of the Company's customers. The Company performed an undiscounted cash flow analysis for its long-lived assets held-for-use, exclusive of the Company's assets held-for-sale, and for those that failed step 1, the Company performed a further fair value assessment, resulting in an impairment of \$2.1 million for the year ended December 31, 2020.

Deferred Financing Costs – Deferred financing costs are costs incurred to obtain debt financing, including all related fees, and are amortized as interest expense over the term of the related financing using the straight-line method, which approximates the effective interest rate method. Amortization of deferred financing costs was approximately \$1,394,000 and \$511,000 for the years ended December 31, 2020 and 2019, respectively. Amortization was accelerated in 2020 to reflect increased payments of principal and the reduction of outstanding debt balances. Unamortized deferred financing costs were approximately \$759,000 and \$2,153,000 as of December 31, 2020 and 2019, respectively, and are recorded net of long-term debt in the consolidated balance sheets.

Provision for Income Taxes – Income taxes are accounted for under the asset and liability approach, where deferred tax assets and liabilities are determined based on differences between financial reporting and tax basis of assets and liabilities, and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company accounts for uncertainty in income taxes using a two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position for recognition by determining whether it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50% likely of being realized upon ultimate settlement. An uncertain tax position is considered effectively settled on completion of an examination by a taxing authority if certain other conditions are satisfied. Should the Company incur interest and penalties relating to tax uncertainties, such amounts would be classified as a component of interest expense and other income (expense), net, respectively. Deferred tax assets and liabilities are classified as noncurrent in the Company's consolidated balance sheets.

The Company files a consolidated federal income tax return. This return includes all wholly-owned subsidiaries as well as the Company's pro-rata share of taxable income

from pass-through entities in which the Company owns less than 100%. State tax returns are filed on a consolidated, combined or separate basis depending on the applicable laws relating to the Company and its subsidiaries.

Income (Loss) Per Share— Basic income (loss) per share is computed on the basis of the weighted-average number of shares of common stock outstanding during the period. Preferred dividends are deducted from net income (loss) attributed to Alto Ingredients, Inc. and are considered in the calculation of income (loss) available to common stockholders in computing basic income (loss) per share. Common stock equivalents to preferred stock are considered participating securities and are also included in this calculation when dilutive.

The following tables compute basic and diluted earnings per share (in thousands, except per share data):

	Year Ended December 31, 2020		
	Loss Numerator	Shares Denominator	Per-Share Amount
Net loss attributed to Alto Ingredients, Inc.	\$ (15,116)		
Less: Preferred stock dividends	(1,268)		
Basic and Diluted loss per share:			
Loss available to common stockholders	\$ (16,384)	58,609	\$ (0.28)

	Year Ended December 31, 2019		
	Loss Numerator	Shares Denominator	Per-Share Amount
Net loss attributed to Alto Ingredients, Inc.	\$ (88,949)		
Less: Preferred stock dividends	(1,265)		
Basic and Diluted loss per share:			
Loss available to common stockholders	\$ (90,214)	47,384	\$ (1.90)

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

There were an aggregate 2,463,000 and 635,000 potentially dilutive shares from convertible securities outstanding as of December 31, 2020 and 2019, respectively. These convertible securities were not considered in calculating diluted loss per common share for the years ended December 31, 2020 and 2019 as their effect would be anti-dilutive.

Financial Instruments – The carrying values of cash and cash equivalents, accounts receivable, derivative assets, accounts payable, accrued liabilities and derivative liabilities are reasonable estimates of their fair values because of the short maturity of these items. The carrying value of the Company’s senior secured notes are recorded at fair value and are considered Level 2 fair value measurements. The Company believes the carrying value of its notes receivable are not considered materially different than fair value due to their recent issuances, and other long-term debt instruments are not considered materially different than fair value because the interest rates on these instruments are variable, and are considered Level 2 fair value measurements.

Employment-related Benefits – Employment-related benefits associated with pensions and postretirement health care are expensed based on actuarial analysis. The recognition of expense is affected by estimates made by management, such as discount rates used to value certain liabilities, investment rates of return on plan assets, increases in future wage amounts and future health care costs. Discount rates are determined based on a spot yield curve that includes bonds with maturities that match expected benefit payments under the plan.

Estimates and Assumptions – The 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 revenues and expenses during the reporting period. Significant estimates are required as part of determining the allowance for doubtful accounts, net realizable value of inventory, estimated lives of property and equipment, long-lived asset impairments, fair value of warrants, valuation allowances on deferred income taxes and the potential outcome of future tax consequences of events recognized in the Company’s financial statements or tax returns, and the valuation of assets acquired and liabilities assumed as a result of business combinations. Actual results and outcomes may materially differ from management’s estimates and assumptions.

Uncertainty – As previously mentioned, the impact of the coronavirus pandemic has negatively impacted the Company’s operations and demand for fuel-grade ethanol. Any future quarantines, labor shortages or other disruptions to the Company’s operations, or those of its customers, may adversely impact the Company’s revenues, ability to provide its services and operating results. In addition, a significant outbreak of epidemic, pandemic or contagious diseases in the human population could result in a widespread health crisis that could adversely affect the economies and financial markets of many countries, including the geographical area in which the Company operates, resulting in an economic downturn that could further affect demand for its goods and services. The extent to which the coronavirus impacts the Company’s long-term results will depend on future developments, which are highly uncertain and cannot be predicted, including new information which may emerge concerning the severity of the coronavirus and actions taken to contain the coronavirus or its impact, among others.

Subsequent Events – Management evaluates, as of each reporting period, events or transactions that occur after the balance sheet date through the date that the financial statements are issued for either disclosure or adjustment to the consolidated financial results.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Reclassifications – Certain prior year amounts have been reclassified to conform to the current presentation. Such reclassifications had no effect on the consolidated net loss, working capital or stockholders’ equity reported in the consolidated statements of operations and consolidated balance sheets.

2. ASSET SALES AND HELD-FOR-SALE CLASSIFICATION.

Pacific Aurora

On December 19, 2019, the Company entered into a term sheet covering the proposed sale of its 73.93% ownership interest in Pacific Aurora to ACEC for \$52.8 million, and as

a result, the Company determined that as of December 31, 2019, the long-lived assets of Pacific Aurora should be classified as held-for-sale.

On April 15, 2020, the Company closed the sale of its ownership interest in Pacific Aurora and preliminarily received total consideration of \$52.8 million, subject to working capital adjustments of approximately \$35.3 million, resulting in cash proceeds of \$19.9 million and the balance of \$16.5 million in long-term ACEC promissory notes, resulting in a net loss on sale of approximately \$1.4 million, recorded as gain (loss) on sale of assets in the Company's consolidated statements of operations. Approximately \$14.5 million of the cash proceeds were used to repay a portion of the Company's term debt. In September 2020, the Company and ACEC agreed to certain post-closing adjustments to the purchase price, resulting in a decrease of \$0.9 million, and a corresponding reduction in the aggregate principal amount owed under the long-term ACEC promissory notes.

The Company received two promissory notes, as adjusted, in the amounts of \$8.6 million and \$7.0 million as part consideration for the sale, both maturing on April 15, 2025. The \$8.6 million note accrues interest at an annual rate of 5.00%. Interest payments are due quarterly beginning July 1, 2020 and principal payments of \$0.4 million are due quarterly beginning July 1, 2021. The \$7.0 million note accrues interest at an annual rate of 4.50%. Interest payments are due quarterly beginning July 1, 2020 and principal payments of \$0.4 million are due quarterly beginning January 3, 2022.

In addition, upon the sale, the Company no longer had noncontrolling interests on its balance sheet and no longer records income (loss) of noncontrolling interests for future periods.

For the years ended December 31, 2020 and 2019, Pacific Aurora contributed \$39.6 million and \$163.5 million in net sales, \$8.4 million and \$43.4 million in pre-tax loss, and \$2.2 million and \$12.3 million in net loss attributed to noncontrolling interests, respectively.

Magic Valley

On November 30, 2020, the Company sold 134 acres, the related rail loop and grain handling assets at its Magic Valley facility located in Burley, Idaho for \$10.0 million in cash. The Company retained the fuel-grade ethanol production facility and terminal on the remaining 25 acres and has entered into certain agreements with the buyer for delivery of grain to the plant. Upon the sale, the Company recognized a gain on sale of \$3.2 million in gain (loss) on sale of assets in the accompanying consolidated statements of operations.

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Stockton and Madera

In October 2020, the Company's Board of Directors approved a plan to sell the Company's fuel-grade ethanol production facilities located in Madera and Stockton, California. As a result, the Company determined the related long-lived asset groups should be classified as held-for-sale at December 31, 2020. The analysis of these potential sales resulted in an aggregate asset impairment of \$22.3 million in the Company's other production segment.

The Company classified the following assets and liabilities as held-for-sale as of December 31, 2020 (in thousands):

	<u>Stockton</u>	<u>Madera</u>
Property and equipment, net	\$ 19,535	\$ 29,013
Right of use operating lease assets, net	9,747	—
Assets held-for-sale	<u>\$ 29,282</u>	<u>\$ 29,013</u>
	<u>Stockton</u>	<u>Madera</u>
Operating lease obligations	\$ 10,435	\$ —
Assessment financing	—	9,107
Liabilities held-for-sale	<u>\$ 10,435</u>	<u>\$ 9,107</u>

For the year ended December 31, 2020, net sales attributed to the results of operations for Stockton and Madera were \$21.9 million and \$22.7 million, respectively. For the year ended December 31, 2019, net sales attributed to the results of operations for Stockton and Madera were \$132.9 million and \$82.7 million, respectively. For the year ended December 31, 2020, pre-tax loss attributed to the results of operations for Stockton and Madera was \$6.5 million and \$6.1 million, respectively. For the year ended December 31, 2019, pre-tax loss attributed to the results of operations for Stockton and Madera was \$3.9 million and \$2.7 million, respectively. In addition, asset impairments associated with Stockton and Madera recorded for the year ended December 31, 2020 were \$17.9 million and \$4.4 million, respectively.

3. INTERCOMPANY AGREEMENTS.

The Company, directly or through one of its subsidiaries, has entered into the following management and marketing agreements:

Affiliate Management Agreement – Alto Ingredients entered into an Affiliate Management Agreement (“AMA”) with its operating subsidiaries, under which Alto Ingredients agreed to provide operational and administrative and staff support services. These services generally include, but are not limited to, administering the subsidiaries' compliance with their credit agreements and performing billing, collection, record keeping and other administrative and ministerial tasks. Alto Ingredients agreed to supply all labor and personnel required to perform its services under the AMA, including the labor and personnel required to operate and maintain the production facilities and marketing activities. These services are billed at a predetermined amount per subsidiary each month plus out of pocket costs such as employee wages and benefits.

The AMAs have an initial term of one year and automatic successive one year renewal periods. Alto Ingredients may terminate the AMA, and any subsidiary may terminate the AMA, at any time by providing at least 90 days prior notice of such termination.

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ALTO INGREDIENTS, INC. NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Alto Ingredients recorded revenues of approximately \$11,724,000 and \$12,682,000 related to the AMAs in place for the years ended December 31, 2020 and 2019, respectively. These amounts have been eliminated upon consolidation.

Ethanol Marketing Agreements – Kinergy entered into separate marketing agreements with each of the Company’s production facilities, which granted it the exclusive right to purchase, market and sell the alcohols produced at those facilities. Under the terms of the marketing agreements, within ten days after delivering alcohol to Kinergy, an amount is paid to Kinergy equal to (i) the estimated purchase price payable by the third-party purchaser of the alcohol, minus (ii) the estimated amount of transportation costs to be incurred, minus (iii) the estimated incentive fee payable to Kinergy, which equals 1% of the aggregate third-party purchase price, provided that the marketing fee shall not be less than \$0.015 per gallon and not more than \$0.0225 per gallon. Each of the marketing agreements had an initial term of one year and successive one year renewal periods at the option of the individual plant.

Kinergy recorded revenues of approximately \$4,275,000 and \$7,900,800 related to the marketing agreements for the years ended December 31, 2020 and 2019, respectively. These amounts have been eliminated upon consolidation.

Corn Procurement and Handling Agreements – Alto Nutrients entered into separate corn procurement and handling agreements with each of the Company’s production facilities, with the exception of the Pacific Aurora facilities. Under the terms of the corn procurement and handling agreements, each facility appointed Alto Nutrients as its exclusive agent to solicit, negotiate, enter into and administer, on its behalf, corn supply arrangements to procure the corn necessary to operate the facility. Alto Nutrients also provides grain handling services including, but not limited to, receiving, unloading and conveying corn into the facility’s storage and, in the case of whole corn delivered, processing and hammering the whole corn.

Under these agreements, Alto Nutrients receives a fee of \$0.03 per bushel of corn delivered to each production facility as consideration for its procurement and handling services, payable monthly. Each corn procurement and handling agreement had an initial term of one year and successive one year renewal periods at the option of the individual facility. Alto Nutrients recorded revenues of approximately \$2,595,000 and \$4,288,000 related to the corn procurement and handling agreements for the years ended December 31, 2020 and 2019, respectively. These amounts have been eliminated upon consolidation.

Through April 15, 2020, each Pacific Aurora production facility operated under a grain procurement agreement with ACEC. Under this agreement, ACEC received a fee of \$0.03 per bushel of corn delivered to each facility as consideration for ACEC’s procurement and handling services, payable monthly. The grain procurement agreement had an initial term of one year and successive one year renewal periods at the option of the individual facility. Pacific Aurora recorded expenses of approximately \$210,000 and \$1,103,000 for the years ended December 31, 2020 and 2019, respectively, associated with these agreements. These amounts have not been eliminated upon consolidation as they were with a related but unconsolidated third-party.

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**ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

Essential Ingredients Marketing Agreements – Alto Nutrients entered into separate marketing agreements with each of the Company’s production facilities which grant Alto Nutrients the exclusive right to market, purchase and sell the various essential ingredients produced at each facility. Under the terms of the marketing agreements, within ten days after a facility delivers essential ingredients to Alto Nutrients, the production facility is paid an amount equal to (i) the estimated purchase price payable by the third-party purchaser of the essential ingredients, minus (ii) the estimated amount of transportation costs to be incurred, minus (iii) the estimated amount of fees and taxes payable to governmental authorities in connection with the tonnage of the essential ingredients produced or marketed, minus (iv) the estimated incentive fee payable to the Company, which equals (a) 5% of the aggregate third-party purchase price for wet corn gluten feed, wet distillers grains, corn condensed distillers solubles and distillers grains with solubles, or (b) 1% of the aggregate third-party purchase price for corn gluten meal, dry corn gluten feed, dry distillers grains, corn germ and corn oil. Each marketing agreement had an initial term of one year and successive one year renewal periods at the option of the individual facility.

Alto Nutrients recorded revenues of approximately \$2,778,000 and \$6,029,000 related to the marketing agreements for the years ended December 31, 2020 and 2019, respectively. These amounts have been eliminated upon consolidation.

4. SEGMENTS.

The Company reports its financial and operating performance in three segments: (1) marketing and distribution, which includes marketing and merchant trading for Company-produced alcohols and essential ingredients, on an aggregated basis, and third-party fuel-grade ethanol (2) Pekin Campus production, which includes the production and sale of alcohols and essential ingredients produced at the Company’s Pekin, Illinois campus, and (3) Other production, which includes the production and sale of fuel-grade ethanol and essential ingredients produced at all of the Company’s other production facilities on an aggregated basis, none of which are individually significant to be considered a reportable segment.

Income before provision for income taxes includes management fees charged by Alto Ingredients to the segments. The Pekin Campus production segment incurred \$4,344,000 and \$4,014,000 in management fees for the years ended December 31, 2020 and 2019, respectively. The marketing and distribution segment incurred \$3,480,000 in management fees for each of the years ended December 31, 2020 and 2019, respectively. The Other production segment incurred \$3,893,000 and \$5,188,000 in management fees for the years ended December 31, 2020 and 2019, respectively. Corporate activities include selling, general and administrative expenses, consisting primarily of corporate employee compensation, professional fees and overhead costs not directly related to a specific operating segment.

During the normal course of business, the segments do business with each other. The preponderance of this activity occurs when the Company’s marketing segment markets alcohol produced by the production segments for a marketing fee, as discussed in Note 3. These intersegment activities are considered arms’-length transactions. Consequently, although these transactions impact segment performance, they do not impact the Company’s consolidated results since all revenues and corresponding costs are eliminated in consolidation.

Capital expenditures are substantially all incurred at the Company’s Pekin Campus production segment.

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**ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

The following tables set forth certain financial data for the Company’s operating segments (in thousands):

	Years Ended December 31,	
	2020	2019
<i>Net Sales</i>		
Marketing and distribution:		

Alcohol sales, gross	\$ 256,209	\$ 355,101
Alcohol sales, net	1,529	1,831
Intersegment sales	9,648	18,219
Total marketing and distribution sales	267,386	375,151
Pekin Campus production, recorded as gross:		
Alcohol sales	\$ 330,432	\$ 343,610
Essential ingredient sales	130,270	138,987
Intersegment sales	645	1,110
Total Pekin Campus sales	461,347	483,707
Other Production, recorded as gross:		
Alcohol sales	\$ 137,703	\$ 455,343
Essential ingredient sales	40,880	130,009
Intersegment sales	1,309	509
Total Other production sales	179,892	585,861
Intersegment eliminations	(11,602)	(19,838)
Net sales as reported	\$ 897,023	\$ 1,424,881
<i>Cost of goods sold:</i>		
Marketing and distribution	\$ 253,465	\$ 347,185
Pekin Campus production	389,125	481,262
Other production	206,412	612,040
Intersegment eliminations	(4,838)	(5,668)
Cost of goods sold as reported	\$ 844,164	\$ 1,434,819
<i>Income (loss) before benefit for income taxes:</i>		
Marketing and distribution	\$ 4,889	\$ 12,533
Pekin Campus production	53,898	(21,441)
Other production	(54,677)	(77,019)
Corporate activities	(21,409)	(15,375)
	\$ (17,299)	\$ (101,302)
<i>Depreciation:</i>		
Pekin Campus production	\$ 17,450	\$ 17,535
Other production	12,691	30,107
Corporate activities	127	267
	\$ 30,268	\$ 47,909
<i>Interest expense:</i>		
Marketing and distribution	\$ 1,574	\$ 3,053
Pekin Campus production	6,038	7,556
Other production	334	13
Corporate activities	9,997	9,584
	\$ 17,943	\$ 20,206

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**ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

The following table sets forth the Company's total assets by operating segment (in thousands):

	December 31,	
	2020	2019
<i>Total assets:</i>		
Marketing and distribution	\$ 89,337	\$ 129,664
Pekin Campus production	234,439	229,050
Other production	102,409	229,748
Corporate assets	50,633	24,033
	\$ 476,818	\$ 612,495

5. PROPERTY AND EQUIPMENT.

Property and equipment consisted of the following (in thousands):

	December 31,	
	2020	2019
Facilities and plant equipment	\$ 357,740	\$ 495,513
Land	4,837	7,219
Other equipment, vehicles and furniture	7,858	11,229
Construction in progress	11,828	15,793
	382,263	529,754
Accumulated depreciation	(152,777)	(197,228)

Depreciation expense was \$30,268,000 and \$40,931,000 for the years ended December 31, 2020 and 2019, respectively.

For the years ended December 31, 2020 and 2019, the Company capitalized interest of \$224,000 and \$563,000, respectively, related to its capital investment activities.

ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

6. INTANGIBLE ASSET.

The Company recorded a tradename valued at \$2,678,000 in 2006 as part of its acquisition of Kinergy. The Company determined that the Kinergy tradename has an indefinite life and, therefore, rather than being amortized, will be tested annually for impairment. The Company did not record any impairment of the Kinergy tradename for the years ended December 31, 2020 and 2019.

7. DERIVATIVES.

The business and activities of the Company expose it to a variety of market risks, including risks related to changes in commodity prices. The Company monitors and manages these financial exposures as an integral part of its risk management program. This program recognizes the unpredictability of financial markets and seeks to reduce the potentially adverse effects that market volatility could have on operating results.

Commodity Risk – Cash Flow Hedges – The Company uses derivative instruments to protect cash flows from fluctuations caused by volatility in commodity prices for periods of up to twelve months in order to protect gross profit margins from potentially adverse effects of market and price volatility on alcohol sales and purchase commitments where the prices are set at a future date and/or if the contracts specify a floating or index-based price. In addition, the Company hedges anticipated sales of alcohol to minimize its exposure to the potentially adverse effects of price volatility. These derivatives may be designated and documented as cash flow hedges and effectiveness is evaluated by assessing the probability of the anticipated transactions and regressing commodity futures prices against the Company’s purchase and sales prices. Ineffectiveness, which is defined as the degree to which the derivative does not offset the underlying exposure, is recognized immediately in cost of goods sold. For the years ended December 31, 2020 and 2019, the Company did not designate any of its derivatives as cash flow hedges.

Commodity Risk – Non-Designated Hedges – The Company uses derivative instruments to lock in prices for certain amounts of corn and alcohols by entering into exchange-traded forward contracts or options for those commodities. These derivatives are not designated for hedge accounting treatment. The changes in fair value of these contracts are recorded on the balance sheet and recognized immediately in cost of goods sold. The Company recognized net gains of \$14,780,000 and \$555,000 as the change in the fair value of these contracts for the years ended December 31, 2020 and 2019, respectively.

Non Designated Derivative Instruments – The classification and amounts of the Company’s derivatives not designated as hedging instruments, and related cash collateral balances, are as follows (in thousands):

ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

As of December 31, 2020				
Type of Instrument	Assets		Liabilities	
	Balance Sheet Location	Fair Value	Balance Sheet Location	Fair Value
Cash collateral balance	Other current assets	\$ 520		
Commodity contracts	Derivative assets	\$ 17,149	Derivative liabilities	\$ —
As of December 31, 2019				
Type of Instrument	Assets		Liabilities	
	Balance Sheet Location	Fair Value	Balance Sheet Location	Fair Value
Cash collateral balance	Other current assets	\$ 615		
Commodity contracts	Derivative assets	\$ 2,438	Derivative liabilities	\$ 1,860

The above amounts represent the gross balances of the contracts, however, the Company does have a right of offset with each of its derivative brokers.

The classification and amounts of the Company’s recognized gains (losses) for its derivatives not designated as hedging instruments are as follows (in thousands):

Type of Instrument	Statements of Operations Location	Realized Gains (Losses)	
		For the Years Ended December 31,	
		2020	2019
Commodity contracts	Cost of goods sold	\$ 2,102	\$ (4,568)
		\$ 2,102	\$ (4,568)
		Unrealized Gains	
		For the Years Ended December 31,	

Type of Instrument	Statements of Operations Location	December 31,	
		2020	2019
Commodity contracts	Cost of goods sold	\$ 12,678	\$ 5,123
		\$ 12,679	\$ 5,123

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

8. DEBT.

Long-term borrowings are summarized as follows (in thousands):

	December 31,	
	2020	2019
Kinergy line of credit	\$ 32,512	\$ 78,338
Pekin term loan	—	39,500
Pekin revolving loan	20,580	32,000
ICP term loan	—	12,000
ICP revolving loan	9,384	18,000
CARES Act loans	9,860	—
Parent notes payable	25,533	65,649
	97,869	245,487
Less unamortized debt premium	230	461
Less unamortized debt financing costs	(759)	(2,153)
Less short-term portion	(25,533)	(63,000)
Long-term debt	\$ 71,807	\$ 180,795

Kinergy Line of Credit – Kinergy has an operating line of credit for an aggregate amount of up to \$100,000,000. The line of credit matures on August 2, 2022. The credit facility is based on Kinergy’s eligible accounts receivable and inventory levels, subject to certain concentration reserves. The credit facility is subject to certain other sublimits, including inventory loan limits. Interest accrues under the line of credit at a rate equal to (i) the three-month London Interbank Offered Rate (“LIBOR”), plus (ii) a specified applicable margin ranging between 1.50% and 2.00%. The applicable margin was 2.00%, for a total rate of 2.24% at December 31, 2020. The credit facility’s monthly unused line fee is an annual rate equal to 0.25% to 0.375% depending on the average daily principal balance during the immediately preceding month. Payments that may be made by Kinergy to the Company as reimbursement for management and other services provided by the Company to Kinergy are limited under the terms of the credit facility to \$1,500,000 per fiscal quarter. The credit facility also includes the accounts receivable of Alto Nutrients as additional collateral. Payments that may be made by Alto Nutrients to the Company as reimbursement for management and other services provided by the Company to Alto Nutrients are limited under the terms of the credit facility to \$500,000 per fiscal quarter.

If the monthly excess borrowing availability of Kinergy and Alto Nutrients falls below certain thresholds, they are collectively required to maintain a fixed-charge coverage ratio (calculated as a twelve-month rolling earnings before interest, taxes, depreciation and amortization divided by the sum of interest expense, capital expenditures, principal payments of indebtedness, indebtedness from capital leases and taxes paid during such twelve-month rolling period) of at least 2.0 and are prohibited from incurring certain additional indebtedness (other than specific intercompany indebtedness).

The obligations of Kinergy and Alto Nutrients under the credit facility are secured by a first-priority security interest in all of their assets in favor of the lender. Alto Ingredients has guaranteed all of Kinergy’s obligations under the line of credit. As of December 31, 2020, Kinergy had \$16.0 million in unused borrowing availability under the credit facility.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Pekin Credit Facilities – On December 15, 2016, Alto Pekin entered into a Credit Agreement (“Pekin Credit Agreement”) with f¹ Farm Credit Services, PCA and CoBank, ACB, (“CoBank”). Under the terms of the Pekin Credit Agreement, Alto Pekin borrowed from f¹ Farm Credit Services \$64.0 million under a term loan facility that matures on August 20, 2021 (the “Pekin Term Loan”) and up to \$32.0 million under a revolving term loan facility that matures on February 1, 2022 (the “Pekin Revolving Loan”), and together with the Pekin Term Loan (the “Pekin Credit Facility”). The Pekin Credit Facility is secured by a first-priority security interest in all of Alto Pekin’s assets.

The Pekin Credit Facility and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers among Alto Pekin, its lenders and their agent, certain terms of the agreements are as follows:

- Interest accrues under the Pekin Credit Facility at an annual rate equal to the 30-day LIBOR plus 5.00%.
- Alto Pekin is required to pay a monthly fee on any unused portion of the Pekin Revolving Loan at a rate of 0.75% per annum.
- Alto Pekin and ICP are collectively required to maintain working capital of not less than 50% of the combined outstanding revolving lines of credit, which was \$30.0 million at December 31, 2020; and an annual debt service coverage ratio of not less than 1.25 to 1.00, in addition to various other affirmative and negative covenants.

Alto Pekin and ICP collectively agreed to pay Alto Pekin’s and ICP’s lenders an aggregate of \$40.0 million on or before September 30, 2020 (the “September Paydown Amount”) to reduce the outstanding balances of Alto Pekin’s and ICP’s respective term loans, to be allocated between them. Alto Pekin, ICP and their lenders contemplated funding the September Paydown Amount through asset sales, proceeds of any award, judgment or settlement of litigation, or, at our election, from funds contributed by Alto Ingredients to Alto Pekin or ICP.

In March 2020, the Company granted to Alto Pekin’s lender a security interest in all of its equity interests in Alto Op Co. The Company and certain subsidiaries also entered into intercreditor agreements with the Alto Pekin’s and ICP’s lenders, and the agent for the Company’s senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

On December 18, 2020, Alto Pekin and its lender further amended the Pekin Credit Facility to waive certain covenant defaults, including the covenant requiring Alto Pekin and ICP to pay the September Paydown Amount from an approved source of funds on or before September 30, 2020. The effect of this amendment was, in part, to deem the September Paydown Amount to have been timely paid. The parties also agreed to amend the Pekin Credit Facility to provide for a payment to Alto Pekin's and ICP's lenders of an aggregate of \$24.9 million (the "December Paydown Amount"), on or prior to December 21, 2020, with \$19.9 million allocated to Alto Pekin's lenders and \$5.0 million allocated to ICP's lenders. On December 18, 2020, Alto Pekin and ICP paid the December Paydown Amount in full.

Following receipt of the December Paydown Amount, any additional proceeds arising from the sale of any of the Company's midwestern production facility assets will be allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, the Company's senior secured noteholders, and the Company, respectively; and any additional proceeds arising from the sale of any of the Company's western production facility assets will be allocated first to the senior secured noteholders up to \$20.0 million and then allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, the Company's senior secured noteholders, and the Company, respectively.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

As of the filing of this report, the Company believes it is in compliance with the terms and conditions of the Pekin Credit Facility.

ICP Credit Facilities — On September 15, 2017, ICP, Compeer Financial, PCA, or Compeer, and CoBank as agent, entered into a Credit Agreement (the "ICP Credit Agreement"). Under the terms of the ICP Credit Agreement, ICP borrowed from Compeer \$24.0 million under a term loan facility that matures on September 20, 2021 (the "ICP Term Loan"), and up to \$18.0 million under a revolving term loan facility that matures on September 1, 2022 (the "ICP Revolving Loan"), and together with the ICP Term Loan (the "ICP Credit Facility"). The ICP Credit Facility is secured by a first-priority security interest in all of ICP's assets.

The ICP Credit Facility and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers among ICP, its lenders and their agent, certain terms of the agreements are as follows:

- Interest accrues under the ICP Credit Facility at an annual rate equal to the 30-day LIBOR plus 3.75%.
- ICP is required to pay an annual nonrefundable commitment fee, calculated as 0.75% multiplied by the average daily positive difference between (i) the ICP Revolving Loan commitment (which may be reduced by ICP from time to time in increments of \$0.5 million), minus (ii) the aggregate principal amounts outstanding under the ICP Revolving Loan.
- ICP and Alto Pekin are collectively required to maintain working capital of not less than 50% of the combined outstanding revolving lines of credit, which was \$30.0 million at December 31, 2020; and an annual debt service coverage ratio of not less than 1.50 to 1.00, in addition to various other affirmative and negative covenants.

ICP and Alto Pekin collectively agreed to pay ICP's and Alto Pekin's lenders an aggregate of \$40.0 million on or before September 30, 2020, the same amount referred to above as the September Paydown Amount, to reduce the outstanding balances of ICP's and Alto Pekin's respective term loans, to be allocated between them. ICP, Alto Pekin, and their lenders contemplated funding the September Paydown Amount through asset sales, proceeds of any award, judgment or settlement of litigation, or, at our election, from funds contributed by the Company to ICP or Alto Pekin.

In March 2020, the Company granted to Alto Pekin's lender a security interest in all of its equity interests in Alto Op Co. The Company and certain subsidiaries also entered into intercreditor agreements with the ICP's and Alto Pekin's lenders, and the agent for the Company's senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

On December 18, 2020, ICP and its lender further amended the ICP Credit Facility to waive certain covenant defaults, including the covenant requiring ICP and Alto Pekin to pay the September Paydown Amount from an approved source of funds on or before September 30, 2020. The effect of this amendment was, in part, to deem the September Paydown Amount to have been timely paid. The parties also agreed to amend the ICP Credit Facility to provide for a payment to ICP's and Alto Pekin's lenders of an aggregate of \$24.9 million, the same amount referred to above as the December Paydown Amount, on or prior to December 21, 2020, with \$5.0 million allocated to ICP's lenders and \$19.9 million allocated to Alto Pekin's lenders. On December 18, 2020, ICP and Alto Pekin paid the December Paydown Amount in full.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Following receipt of the December Paydown Amount, any additional proceeds arising from the sale of any of the Company's midwestern production facility assets will be allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, the Company's senior secured noteholders, and the Company, respectively; and any additional proceeds arising from the sale of any of the Company's western production facility assets will be allocated first to the senior secured noteholders up to \$20.0 million and then allocated 33/34/33% among Alto Pekin's and ICP's lenders, collectively, the Company's senior secured noteholders, and the Company, respectively.

As of the filing of this report, the Company believes it is in compliance with the terms and conditions of the ICP Credit Facility.

Alto Ingredients, Inc. Senior Secured Notes — On December 12, 2016, the Company entered into a Note Purchase Agreement with five accredited investors and sold \$55.0 million in aggregate principal amount of senior secured notes to the investors in a private offering for aggregate gross proceeds of 97% of the principal amount of the notes sold. On June 26, 2017, the Company entered into a second Note Purchase Agreement with five accredited investors and sold an additional \$13.9 million in aggregate principal amount of senior secured notes to the investors in a private offering for aggregate gross proceeds of 97% of the principal amount of the notes sold, and collectively with the notes previously sold, (the "Notes"). The Notes are secured by a first-priority security interest in all of the Company's equity interests in Alto Op Co.

The Notes and related agreements contain a variety of representations, warranties, covenants and events of default. Following a series of amendments and waivers with the senior secured note holders and their agent, certain terms of the agreements are as follows:

- The Notes mature on December 15, 2021.
- Payments due under the Notes rank senior to all other indebtedness of Alto Ingredients, Inc. other than permitted senior indebtedness.
- Interest on the Notes accrues at a rate of 15% per annum.

- Any voluntary prepayments must be made at 102% of the principal amount prepaid.

The Notes also contain a variety of limitations, including a prohibition on parent company indebtedness; restrictions on redemption, repurchase or payment of any dividend or distribution in respect of our or our subsidiaries' equity interests; restrictions on asset sales and other dispositions; and restrictions on our or our subsidiaries' ability to issue equity for purposes other than to pay down a portion of the outstanding balance of the Notes.

In March 2020, ICP granted to the senior secured noteholders a security interest in certain of its personal property. In addition, Alto Central granted to the senior secured noteholders a security interest in certain of its personal property. Alto Central also pledged its equity interests in Alto Pekin and ICP in favor of the senior secured noteholders as additional collateral securing our obligations to the noteholders. Alto Op. Co also granted to the senior secured noteholders a security interest in certain of its personal property. The Company and certain subsidiaries also entered into intercreditor agreements with the ICP's and Alto Pekin's lenders, and the agent for the Company's senior secured noteholders, to address issues of priority and the allocation of proceeds from asset sales.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

In November 2020, the Company repaid \$35.3 million in principal under the Notes using a portion of the net proceeds of its then-recent offerings of common stock and warrants and the sale of certain real property assets at our Magic Valley production facility.

As of the filing of this report, the Company believes it is in compliance with the terms and conditions of the Notes.

CARES Act Loans – On May 4, 2020, Alto Ingredients and Alto Pekin received loan proceeds from Bank of America, NA under the Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”), through the Paycheck Protection Program administered by the U.S. Small Business Administration. Alto Ingredients received \$6.0 million and Alto Pekin received \$3.9 million in loan proceeds. The loans mature in two years and bear interest at a rate of 1.00% per annum. Under the terms of the loans, certain amounts may be forgiven if they are used for qualifying expenses as described in the CARES Act, but the Company can provide no assurance that it will be able to obtain forgiveness of all or any portion of the loans. The Company is in the process of applying for loan forgiveness.

Maturities of Long-term Debt – The Company's long-term debt matures as follows (in thousands):

December 31:		
2021	\$	25,533
2022		72,336
	\$	97,869

9. LEASES.

The Company leases railcar equipment, office equipment and land for certain of its facilities. Operating lease right of use assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. The Company uses its estimated incremental borrowing rate, unless an implicit rate is readily determinable, as the discount rate for each lease in determining the present value of lease payments. For the years ended December 31, 2020 and 2019, the Company's weighted average discount rate was 6.00%. Operating lease expense is recognized on a straight-line basis over the lease term.

Upon the adoption of ASC 842, the Company elected the following practical expedients allowable under the guidance: not to reassess whether any expired or existing contracts are or contain leases; not to reassess the lease classification for any expired or existing leases; not to reassess initial direct costs for any existing leases; not to separately identify lease and non-lease components; and not to evaluate historical land easements. Additionally, the Company elected the short-term lease exemption policy, applying the requirements of ASC 842 to only long-term (greater than 1 year) leases.

The Company determines if an arrangement is a lease or contains a lease at inception. The Company's leases have remaining lease terms of approximately 1 year to 55 years, which may include options to extend the lease when it is reasonably certain the Company will exercise those options. For the year ended December 31, 2020, the weighted average remaining lease terms of equipment and land-related leases were 1.10 years and 4.73 years, respectively. The Company does not have lease arrangements with residual value guarantees, sale leaseback terms or material restrictive covenants. The Company does not have any material finance lease obligations nor sublease agreements.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The following table summarizes the remaining maturities of the Company's operating lease liabilities, assuming all land lease extensions are taken, as of December 31, 2020 (in thousands):

Year Ended:	Equipment	Land Related
2021	\$ 2,263	\$ 547
2022	2,144	559
2023	1,504	461
2024	858	436
2025	578	436
2026-76	315	6,150
Less Interest	(1,171)	(4,185)
	\$ 6,491	\$ 4,404

For the years ended December 31, 2020 and 2019, the Company recorded operating lease costs of \$5,461,000 and \$9,948,000, respectively, in cost of goods sold and \$482,000 and \$472,000, respectively, in selling, general and administrative expenses, in the Company's statements of operations.

10. PENSION PLANS.

Retirement Plan - The Company sponsors a defined benefit pension plan (the “Retirement Plan”) that is noncontributory, and covers only “grandfathered” unionized employees

at its Alto Pekin production facilities. Benefits are based on a prescribed formula based upon the employee's years of service. Employees hired after November 1, 2010, are not eligible to participate in the Retirement Plan. The Company uses a December 31st measurement date for its Retirement Plan. The Company's funding policy is to make the minimum annual contribution required by applicable regulations.

Information related to the Retirement Plan as of and for the years ended December 31, 2020 and 2019 is presented below (dollars in thousands):

	<u>2020</u>	<u>2019</u>
Changes in plan assets:		
Fair value of plan assets, beginning	\$ 15,654	\$ 13,257
Actual gains	1,969	2,692
Benefits paid	(721)	(698)
Company contributions	686	403
Participant contributions	—	—
Fair value of plan assets, ending	\$ 17,588	\$ 15,654
Less: projected accumulated benefit obligation	\$ 24,629	\$ 21,643
Funded status, (underfunded)/overfunded	<u>\$ (7,041)</u>	<u>\$ (5,989)</u>
Amounts recognized in the consolidated balance sheets:		
Other liabilities	\$ (7,041)	\$ (5,989)
Accumulated other comprehensive loss	\$ 3,199	\$ 1,654
Components of net periodic benefit costs are as follows:		
Service cost	\$ 405	\$ 374
Interest cost	690	760
Expected return on plan assets	(903)	(760)
Net periodic benefit cost	<u>\$ 192</u>	<u>\$ 374</u>
Loss recognized in other comprehensive expense	<u>\$ 1,545</u>	<u>\$ 585</u>
Assumptions used in computation of benefit obligations:		
Discount rate	2.50%	3.25%
Expected long-term return on plan assets	6.25%	6.25%
Rate of compensation increase	—	—

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company expects to make contributions in the year ending December 31, 2021 of approximately \$0.8 million. Net periodic benefit cost for 2021 is estimated at approximately \$0.2 million.

The following table summarizes the expected benefit payments for the Company's Retirement Plan for each of the next five fiscal years and in the aggregate for the five fiscal years thereafter (in thousands):

<u>December 31:</u>	
2021	\$ 830
2022	860
2023	900
2024	930
2025	990
2026-30	5,510
	<u>\$ 10,020</u>

See Note 15 for discussion of the Retirement Plan's fair value disclosures.

Historical and future expected returns of multiple asset classes were analyzed to develop a risk-free real rate of return and risk premiums for each asset class. The overall rate for each asset class was developed by combining a long-term inflation component, the risk-free real rate of return, and the associated risk premium. A weighted average rate was developed based on those overall rates and the target asset allocation of the Retirement Plan.

The Company's pension committee is responsible for overseeing the investment of pension plan assets. The pension committee is responsible for determining and monitoring the appropriate asset allocations and for selecting or replacing investment managers, trustees, and custodians. The Retirement Plan's current investment target allocations are 50% equities and 50% debt. The pension committee reviews the actual asset allocation in light of these targets periodically and rebalances investments as necessary. The pension committee also evaluates the performance of investment managers as compared to the performance of specified benchmarks and peers and monitors the investment managers to ensure adherence to their stated investment style and to the Retirement Plan's investment guidelines.

Postretirement Plan - The Company also sponsors a health care plan and life insurance plan (the "Postretirement Plan") that provides postretirement medical benefits and life insurance to certain "grandfathered" unionized employees at its Alto Pekin production facilities. Employees hired after December 31, 2000, are not eligible to participate in the Postretirement Plan. The plan is contributory, with contributions required at the same rate as active employees. Benefit eligibility under the plan reduces at age 65 from a defined benefit to a defined dollar cap based upon years of service.

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Information related to the Postretirement Plan as of December 31, 2020 and 2019 is presented below (dollars in thousands):

	December 31,	
	2020	2019
Amounts at the end of the year:		
Accumulated/projected benefit obligation	\$ 5,296	\$ 5,274
Fair value of plan assets	—	—
Funded status, (underfunded)/overfunded	<u>\$ (5,296)</u>	<u>\$ (5,274)</u>
Amounts recognized in the consolidated balance sheets:		
Accrued liabilities	\$ (300)	\$ (280)
Other liabilities	\$ (4,996)	\$ (4,994)
Accumulated other comprehensive loss	\$ 679	\$ 716

Information related to the Postretirement Plan for the years ended December 31, 2020 and 2019 is presented below (dollars in thousands):

	Years Ended December 31,	
	2020	2019
Amounts recognized in the plan for the year:		
Participant contributions	\$ 174	\$ 171
Benefits paid	\$ (200)	\$ (195)
Components of net periodic benefit costs are as follows:		
Service cost	\$ 54	\$ 67
Interest cost	151	219
Amortization of prior service costs	30	122
Net periodic benefit cost	<u>\$ 235</u>	<u>\$ 408</u>
Gain recognized in other comprehensive income	<u>\$ (37)</u>	<u>\$ (674)</u>

Discount rate used in computation of benefit obligations	2.05%	2.95%
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The Company does not expect to recognize any amortization of net actuarial loss during the year ended December 31, 2021.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The following table summarizes the expected benefit payments for the Company's Postretirement Plan for each of the next five fiscal years and in the aggregate for the five fiscal years thereafter (in thousands):

December 31:	
2021	\$ 300
2022	270
2023	290
2024	330
2025	330
2026-2030	2,040
	<u>\$ 3,560</u>

For purposes of determining the cost and obligation for pre-Medicare postretirement medical benefits, a 7.00% annual rate of increase in the per capita cost of covered benefits (i.e., health care trend rate) was assumed for the Postretirement Plan in 2022, adjusted to a rate of 4.50% in 2031. Assumed health care cost trend rates have a significant effect on the amounts reported for health care plans.

11. INCOME TAXES.

The Company recorded a provision (benefit) for income taxes as follows (in thousands):

	Years Ended December 31,	
	2020	2019
Current provision (benefit)	\$ —	\$ (22)
Deferred provision (benefit)	(17)	2
Total	<u>\$ (17)</u>	<u>\$ (20)</u>

A reconciliation of the differences between the United States statutory federal income tax rate and the effective tax rate as provided in the consolidated statements of operations is as follows:

	Years Ended December 31,	
	2020	2019
Statutory rate	21.0%	21.0%
State income taxes, net of federal benefit	5.7	5.7
Change in valuation allowance	(9.4)	(22.4)
Fair value adjustments	(12.7)	—
Noncontrolling interest	(3.4)	(3.3)
Non-deductible items	(0.4)	(0.1)

Other	(0.8)	(1.0)
Effective rate	(0.0)%	(0.1)%

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Deferred income taxes are provided using the asset and liability method to reflect temporary differences between the financial statement carrying amounts and the tax bases of assets and liabilities using presently enacted tax rates and laws. The components of deferred income taxes included in the consolidated balance sheets were as follows (in thousands):

	December 31,	
	2020	2019
Deferred tax assets:		
Net operating loss carryforwards	\$ 61,208	\$ 61,775
Capital loss	29,684	—
Disallowed interest	6,255	8,242
R&D, Energy and AMT credits	3,864	3,864
Pension liability	3,235	2,979
Railcar contracts	302	379
Stock-based compensation	441	551
Allowance for doubtful accounts and other assets	461	578
Property and equipment	—	3,325
Other	1,963	3,458
Total deferred tax assets	107,413	85,151
Deferred tax liabilities:		
Property and equipment	(16,243)	—
Intangibles	(749)	(749)
Derivatives	(4,497)	(153)
Other	(472)	(437)
Total deferred tax liabilities	(21,961)	(1,339)
Valuation allowance	(85,688)	(84,065)
Net deferred tax liabilities, included in other liabilities	\$ (236)	\$ (253)

A portion of the Company's net operating loss carryforwards are subject to provisions of the tax law that limit the use of losses incurred by a corporation prior to the date certain ownership changes occur. These limitations also apply to certain depreciation deductions associated with assets on hand at the time of the ownership change and otherwise allowable during the five-year period following the ownership change. As the five-year limitation period lapsed in 2019, these disallowed deductions are reflected in property and equipment in the schedule above but continue to be subject to the annual limitation that applies to the pre-change net operating losses. Due to the limitation on the use of net operating losses and depreciation deductions, a significant portion of these carryforwards will expire regardless of whether the Company generates future taxable income. After reducing these net operating loss carryforwards for the amount which will expire due to this limitation, the Company had remaining federal net operating loss carryforwards of approximately \$227,817,000 and state net operating loss carryforwards of approximately \$211,681,000 at December 31, 2020. These net operating loss carryforwards expire as follows (in thousands):

Tax Years	Federal	State
2021–2025	\$ 4,103	\$ —
2026–2030	9,678	56,174
2031–2035	106,886	57,567
2036 and after*	107,150	97,940
Total NOLs	\$ 227,817	\$ 211,681

* Includes indefinite life federal net operating losses of \$77.5 million generated after 2017.

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Certain of these net operating losses are not immediately available, but become available to be utilized in each of the years ended December 31, as follows (in thousands):

Year	Federal	State
2021	\$ 152,026	\$ 135,458
2022	6,308	5,318
2023	6,308	5,318
2024	6,308	5,135
2025	6,308	5,089
Beyond 2025	50,559	55,363
Total	\$ 227,817	\$ 211,681

To the extent amounts are not utilized in any year, they may be carried forward to the next year until expiration. These amounts may change if there are future additional limitations on their utilization.

Federal capital loss of \$113,928,000 may be carried forward for 5 years and will expire in 2025. State capital loss of \$110,279,000 may be carried forward for 5 years for most of the states in which the Company files returns and will expire in 2025.

In assessing whether the deferred tax assets are realizable, a more likely than not standard is applied. If it is determined that it is more likely than not that deferred tax assets will not be realized, a valuation allowance must be established against the deferred tax assets. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which the associated temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment.

A valuation allowance was established in the amount of \$85,688,000 and \$84,065,000 as of December 31, 2020 and 2019, respectively, based on the Company's assessment of the future realizability of certain deferred tax assets. The valuation allowance on deferred tax assets is related to future deductible temporary differences and net operating loss carryforwards for which the Company has concluded it is more likely than not that these items will not be realized in the ordinary course of operations.

For the year ended December 31, 2020, the Company recorded an increase in valuation allowance of \$1,623,000. This was primarily the offsetting impact of an increase in deferred tax assets associated with the capital loss carryforward offset by changes in depreciation and other adjustments associated with property plant and equipment, and mark-to-market adjustment related to derivatives in 2020. For the year ended December 31, 2019, the Company recorded an increase in the valuation allowance of \$43,477,000. Of this increase, \$22,641,000 was primarily the offsetting impact of an increase in deferred tax assets associated with additional net operating losses in 2019. The remaining increase of \$20,836,000 relates to a deferred asset related to previously disallowed depreciation discussed above.

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The Company is subject to income tax in the United States federal jurisdiction and various state jurisdictions and has identified its federal tax return and tax returns in state jurisdictions below as "major" tax filings. These jurisdictions, along with the years still open to audit under the applicable statutes of limitation, are as follows:

Jurisdiction	Tax Years
Federal	2017 – 2019
Alabama	2017 – 2019
Arizona	2016 – 2019
Arkansas	2017 – 2019
California	2016 – 2019
Colorado	2015 – 2019
Connecticut	2017 – 2019
Georgia	2017 – 2019
Idaho	2017 – 2019
Illinois	2017 – 2019
Indiana	2017 – 2019
Iowa	2017 – 2019
Kansas	2017 – 2019
Louisiana	2017 – 2019
Michigan	2017 – 2019
Minnesota	2017 – 2019
Mississippi	2017 – 2019
Missouri	2017 – 2019
Nebraska	2017 – 2019
New Mexico	2017 – 2019
Oklahoma	2017 – 2019
Oregon	2017 – 2019
Pennsylvania	2017 – 2019
Rhode Island	2017 – 2019
South Carolina	2017 – 2019
Tennessee	2017 – 2019
Texas	2016 – 2019

However, because the Company had net operating losses and credits carried forward in several of the jurisdictions, including the United States federal and California jurisdictions, certain items attributable to closed tax years are still subject to adjustment by applicable taxing authorities through an adjustment to tax attributes carried forward to open years.

12. PREFERRED STOCK.

The Company has 6,734,835 undesignated shares of authorized and unissued preferred stock, which may be designated and issued in the future on the authority of the Company's Board of Directors. As of December 31, 2020, the Company had the following designated classes of preferred stock:

Series A Preferred Stock – The Company has authorized 1,684,375 shares of Series A Cumulative Redeemable Convertible Preferred Stock ("Series A Preferred Stock"), with none outstanding at December 31, 2020 and 2019. Shares of Series A Preferred Stock that are converted into shares of the Company's common stock revert to undesignated shares of authorized and unissued preferred stock.

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Upon any issuance, the Series A Preferred Stock would rank senior in liquidation and dividend preferences to the Company's common stock. Holders of Series A Preferred Stock would be entitled to quarterly cumulative dividends payable in arrears in cash in an amount equal to 5% per annum of the purchase price per share of the Series A Preferred Stock. The holders of the Series A Preferred Stock would have conversion rights initially equivalent to two shares of common stock for each share of Series A Preferred Stock, subject to customary antidilution adjustments. Certain specified issuances will not result in antidilution adjustments. The shares of Series A Preferred Stock

would also be subject to forced conversion upon the occurrence of a transaction that would result in an internal rate of return to the holders of the Series A Preferred Stock of 25% or more. Accrued but unpaid dividends on the Series A Preferred Stock are to be paid in cash upon any conversion of the Series A Preferred Stock.

The holders of Series A Preferred Stock would have a liquidation preference over the holders of the Company's common stock equivalent to the purchase price per share of the Series A Preferred Stock plus any accrued and unpaid dividends on the Series A Preferred Stock. A liquidation would be deemed to occur upon the happening of customary events, including transfer of all or substantially all of the Company's capital stock or assets or a merger, consolidation, share exchange, reorganization or other transaction or series of related transactions, unless holders of 66 2/3% of the Series A Preferred Stock vote affirmatively in favor of or otherwise consent to such transaction.

Series B Preferred Stock— The Company has authorized 1,580,790 shares of Series B Cumulative Convertible Preferred Stock ("Series B Preferred Stock"), with 926,942 shares outstanding at December 31, 2020 and 2019. Shares of Series B Preferred Stock that are converted into shares of the Company's common stock revert to undesignated shares of authorized and unissued preferred stock.

The Series B Preferred Stock ranks senior in liquidation and dividend preferences to the Company's common stock. Holders of Series B Preferred Stock are entitled to quarterly cumulative dividends payable in arrears in cash in an amount equal to 7.00% per annum of the purchase price per share of the Series B Preferred Stock; however, subject to the provisions of the Letter Agreement described below, such dividends may, at the option of the Company, be paid in additional shares of Series B Preferred Stock based initially on the liquidation value of the Series B Preferred Stock. In addition to the quarterly cumulative dividends, holders of the Series B Preferred Stock are entitled to participate in any common stock dividends declared by the Company to its common stockholders. The holders of Series B Preferred Stock have a liquidation preference over the holders of the Company's common stock initially equivalent to \$19.50 per share of the Series B Preferred Stock plus any accrued and unpaid dividends on the Series B Preferred Stock. A liquidation will be deemed to occur upon the happening of customary events, including the transfer of all or substantially all of the capital stock or assets of the Company or a merger, consolidation, share exchange, reorganization or other transaction or series of related transaction, unless holders of 66 2/3% of the Series B Preferred Stock vote affirmatively in favor of or otherwise consent that such transaction shall not be treated as a liquidation. The Company believes that such liquidation events are within its control and therefore has classified the Series B Preferred Stock in stockholders' equity.

As of December 31, 2020, the Series B Preferred Stock was convertible into 964,230 shares of the Company's common stock. The conversion ratio is subject to customary antidilution adjustments. In addition, antidilution adjustments are to occur in the event that the Company issues equity securities, including derivative securities convertible into equity securities (on an as-converted or as-exercised basis), at a price less than the conversion price then in effect. The shares of Series B Preferred Stock are also subject to forced conversion upon the occurrence of a transaction that would result in an internal rate of return to the holders of the Series B Preferred Stock of 25% or more. The forced conversion is to be based upon the conversion ratio as last adjusted. Accrued but unpaid dividends on the Series B Preferred Stock are to be paid in cash upon any conversion of the Series B Preferred Stock.

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The holders of Series B Preferred Stock vote together as a single class with the holders of the Company's common stock on all actions to be taken by the Company's stockholders. Each share of Series B Preferred Stock entitles the holder to approximately 0.03 votes per share on all matters to be voted on by the stockholders of the Company. Notwithstanding the foregoing, the holders of Series B Preferred Stock are afforded numerous customary protective provisions with respect to certain actions that may only be approved by holders of a majority of the shares of Series B Preferred Stock.

In 2008, the Company entered into Letter Agreements with Lyles United LLC ("Lyles United") and other purchasers under which the Company expressly waived its rights under the Certificate of Designations relating to the Series B Preferred Stock to make dividend payments in additional shares of Series B Preferred Stock in lieu of cash dividend payments without the prior written consent of Lyles United and the other purchasers.

On or about December 19, 2019, the Company and the holders of its Series B Preferred Stock entered into letter agreements under which the holders agreed that until the earlier of (i) the Company's repayment of its obligations in respect of its senior secured notes and thereafter until the next scheduled quarterly installment of Series B Preferred Stock dividends, or (ii) the occurrence of a specified event of default under the letter agreement, or (iii) two years from the date of the letter agreement (collectively, the "Waiver Period"), the holders waive any rights and remedies against the Company with respect to any unpaid dividends. Cumulative dividends on the Series B Preferred Stock will continue to accrue during the Waiver Period and remain owing to the holders of the Series B Preferred Stock.

Registration Rights Agreement— In connection with the sale of its Series B Preferred Stock, the Company entered into a registration rights agreement with Lyles United. The registration rights agreement is to be effective until the holders of the Series B Preferred Stock, and their affiliates, as a group, own less than 10% for each of the series issued, including common stock into which such Series B Preferred Stock has been converted. The registration rights agreement provides that holders of a majority of the Series B Preferred Stock, including common stock into which such Series B Preferred Stock has been converted, may demand and cause the Company to register on their behalf the shares of common stock issued, issuable or that may be issuable upon conversion of the Preferred Stock and as payment of dividends thereon, and upon exercise of the related warrants (collectively, the "Registrable Securities"). The Company is required to keep such registration statement effective until such time as all of the Registrable Securities are sold or until such holders may avail themselves of Rule 144 for sales of Registrable Securities without registration under the Securities Act of 1933, as amended. The holders are entitled to two demand registrations on Form S-1 and unlimited demand registrations on Form S-3; provided, however, that the Company is not obligated to effect more than one demand registration on Form S-3 in any calendar year. In addition to the demand registration rights afforded the holders under the registration rights agreement, the holders are entitled to unlimited "piggyback" registration rights. These rights entitle the holders who so elect to be included in registration statements to be filed by the Company with respect to other registrations of equity securities. The Company is responsible for all costs of registration, plus reasonable fees of one legal counsel for the holders, which fees are not to exceed \$25,000 per registration. The registration rights agreement includes customary representations and warranties on the part of both the Company and the holders and other customary terms and conditions.

The Company accrued and paid in cash preferred stock dividends of \$946,000 for the year ended December 31, 2019. The Company accrued but did not pay in cash preferred stock dividends of \$1,268,000 and \$319,000 for the years ended December 31, 2020 and 2019, respectively.

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13. COMMON STOCK AND WARRANTS.

Warrants issued to Senior Noteholders— On December 22, 2019, in connection with an extension of the Company's Notes, the Company issued warrants to purchase an aggregate of 5,500,000 shares of the Company's common stock. The warrants had an exercise price of \$1.00 per share and were exercisable commencing June 22, 2020 and were to expire on December 22, 2020. The Company had determined that the warrants issued in this transaction did not meet the conditions for classification in stockholders' equity and as such, the Company recorded them as a liability at fair value. In August 2020, these warrants were fully exercised for \$1.00 per share. For the period they were

outstanding in 2020, the Company revalued them at each reporting period. These warrants were valued at \$977,000 as of December 31, 2019 and are included in other assets on the accompanying consolidated balance sheets. See Note 16 for the Company's fair value assumptions.

Warrants issued in Equity Offering— On October 28, 2020, the Company closed an underwritten public offering of 5,075,000 shares of its common stock at a public offering price of \$8.42 per share and 5-year pre-funded warrants to purchase 3,825,493 shares of common stock at a public offering price of \$8.42 per pre-funded warrant. The Company had determined that the warrants issued in this transaction did not meet the conditions for classification in stockholders' equity and as such, the Company recorded them as a liability at fair value. In November 2020, these warrants were fully exercised. For the period they were outstanding in 2020, the Company revalued them at each reporting period. See Note 16 for the Company's fair value assumptions.

In addition, in a concurrent private placement, the Company also issued to the investor, for a nominal price, warrants to purchase an additional 8,900,493 shares of common stock at an exercise price of \$9.757 per share. The warrants became exercisable after the six-month anniversary of the offering and will expire on the 18-month anniversary of the offering. The Company had determined that when initially issued, these warrants did not meet the conditions for classification in stockholders' equity, however, in November 2020, the Company amended these warrants which then met the conditions of classification in stockholders' equity and as such, the Company recorded them initially as a liability at fair value and upon their amendment, reclassified their then fair value to equity. See Note 16 for the Company's fair value assumptions.

The aggregate gross proceeds from the offerings of common stock, pre-funded warrants and warrants was approximately \$75.0 million. The net offering proceeds were approximately \$70.5 million after deducting underwriting discounts and commissions and other estimated offering expenses.

The following table summarizes warrant activity for the years ended December 31, 2020 and 2019 (number of shares in thousands):

	Number of Shares	Price per Share	Weighted Average Exercise Price
Balance at December 31, 2018	—	\$ —	\$ —
Warrants issued	5,500	\$ 1.00	\$ 1.00
Balance at December 31, 2019	5,500	\$ 1.00	\$ 1.00
Warrants exercised	(5,500)	\$ 1.00	\$ 1.00
Pre-funded warrants issued	3,825	\$ 0.00	\$ 0.00
Pre-funded warrants exercised	(3,825)	\$ 0.00	\$ 0.00
Series A warrants issued	8,900	\$ 9.76	\$ 9.76
Balance at December 31, 2020	8,900	\$ 9.76	\$ 9.76

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Nonvoting Common Stock— In 2015, the Company issued nonvoting common shares exercisable at the holders' election. As of December 31, 2020, an aggregate of 3,539,236 shares of nonvoting common stock had been exchanged for an equal number of shares of the Company's common stock upon the holders' request. As of December 31, 2020, 896 shares of nonvoting common stock were outstanding.

At-the-Market Program— In October 2018, the Company established an "at-the-market" equity distribution program under which it could offer and sell shares of common stock to, or through, sales agents by means of ordinary brokers' transactions on The Nasdaq Stock Market, in block transactions, or as otherwise agreed to between the Company and its sales agent at prices deemed appropriate. For the years ended December 31, 2020 and 2019, the Company issued 1,421,000 and 3,137,000 shares of common stock through its "at-the-market" equity program that resulted in net proceeds of \$5,296,000 and \$3,670,000 and fees paid to its sales agent of \$171,000 and \$66,000, respectively. The Company terminated its "at-the-market" program in October 2020.

14. STOCK-BASED COMPENSATION.

The Company has two equity incentive compensation plans: a 2006 Stock Incentive Plan and a 2016 Stock Incentive Plan.

2006 Stock Incentive Plan— The 2006 Stock Incentive Plan authorized the issuance of incentive stock options ("ISOs") and non-qualified stock options ("NQOs"), restricted stock, restricted stock units, stock appreciation rights, direct stock issuances and other stock-based awards to the Company's officers, directors or key employees or to consultants that do business with the Company for up to an aggregate of 1,715,000 shares of common stock. In June 2016, the 2006 Stock Incentive plan was terminated, except to the extent of issued and outstanding unvested stock awards and options.

2016 Stock Incentive Plan— On June 16, 2016, the Company's shareholders approved the 2016 Stock Incentive Plan, which authorizes the issuance of ISOs, NQOs, restricted stock, restricted stock units, stock appreciation rights, direct stock issuances and other stock-based awards to the Company's officers, directors or key employees or to consultants that do business with the Company initially for up to an aggregate of 1,150,000 shares of common stock. On June 14, 2018, the Company's shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 3,650,000 shares. On November 7, 2019, the Company's shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 5,650,000 shares. On November 18, 2020, the Company's shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 7,400,000 shares.

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Stock Options— Summaries of the status of Company's stock option plans as of December 31, 2020 and 2019 and of changes in options outstanding under the Company's plans during those years are as follows (number of shares in thousands):

	Years Ended December 31,	
	2020	2019

	Number of Shares	Weighted Average Exercise Price	Number of Shares	Weighted Average Exercise Price
Outstanding at beginning of year	229	\$ 4.15	229	\$ 4.15
Options exercised	(22)	3.74	—	—
Outstanding at end of year	207	\$ 4.16	229	\$ 4.15
Options exercisable at end of year	207	\$ 4.16	229	\$ 4.15

Stock options outstanding as of December 31, 2020 were as follows (number of shares in thousands):

Range of Exercise Prices	Options Outstanding			Options Exercisable		
	Number Outstanding	Weighted Average Remaining Contractual Life (yrs.)	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price	
\$ 3.74	197	2.47	\$ 3.74	197	\$ 3.74	
\$ 12.90	10	0.59	\$ 12.90	10	\$ 12.90	

The aggregate intrinsic value of the options outstanding was \$262,000 and \$0 as of December 31, 2020 and 2019, respectively.

Restricted Stock – A summary of unvested restricted stock activity is as follows (shares in thousands):

	Number of Shares	Weighted Average Grant Date Fair Value Per Share
Unvested at December 31, 2019	2,201	\$ 1.84
Issued	1,663	\$ 1.25
Vested	(1,290)	\$ 2.08
Canceled	(314)	\$ 1.33
Unvested at December 31, 2020	2,260	\$ 1.34

The fair value of the common stock at vesting aggregated \$1,639,000 and \$599,000 for the years ended December 31, 2020 and 2019, respectively. Stock-based compensation expense related to employee and non-employee restricted stock and option grants recognized in the accompanying consolidated statements of operations, was as follows (in thousands):

	Years Ended December 31,	
	2020	2019
Employees	\$ 2,025	\$ 2,422
Non-employees	654	387
Total stock-based compensation expense	\$ 2,679	\$ 2,809

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Employee grants typically have a two or three-year vesting schedule, while non-employee grants have a one-year vesting schedule. At December 31, 2020, the total compensation expense related to unvested awards which had not been recognized was \$865,000 and the associated weighted-average period over which the compensation expense attributable to those unvested awards will be recognized was approximately 1.37 years.

15. COMMITMENTS AND CONTINGENCIES.

Commitments – The following is a description of significant commitments at December 31, 2020:

Sales Commitments – The Company had open fuel-grade ethanol indexed-price contracts for 84,722,000 gallons as of December 31, 2020 and open fixed-price fuel-grade ethanol and specialty alcohol sales contracts totaling \$257,310,000 as of December 31, 2020. The Company had open fixed-price essential ingredient contracts totaling \$16,722,000 as of December 31, 2020 and open indexed-price essential ingredient sales contracts for 161,000 tons as of December 31, 2020. These sales contracts are scheduled to be completed throughout 2021.

Purchase Commitments – At December 31, 2020, the Company had indexed-price purchase contracts to purchase 5,814,000 gallons of fuel-grade ethanol and fixed-price purchase contracts to purchase \$4,043,000 of fuel-grade ethanol from its suppliers. The Company had fixed-price purchase contracts to purchase \$22,809,000 of corn from its suppliers. These purchase commitments are scheduled to be satisfied throughout 2021.

Assessment Financing – In September 2016, the Company signed an agreement to finance and construct a 5-megawatt solar project at its Madera, California production facility. The amount financed is for up to \$10.0 million, to be amortized over twenty years as part of the facility's property tax assessments. As of December 31, 2020 and 2019, the Company had outstanding \$9,108,000 and \$9,342,000, respectively, in the accompanying consolidated balance sheets attributable to this financing, reflected in liabilities held-for-sale. To the extent the Company retains this financing, it expects to pay approximately \$0.9 million per year in connection with its property tax payments, which includes an interest component based upon a 5.6% interest rate on the outstanding balance of the assessment.

Contingencies – The following is a description of significant contingencies at December 31, 2020:

Litigation – The Company is subject to various claims and contingencies in the ordinary course of its business, including those related to litigation, business transactions, employee-related matters, and others. When the Company is aware of a claim or potential claim, it assesses the likelihood of any loss or exposure. If it is probable that a loss will

result and the amount of the loss can be reasonably estimated, the Company will record a liability for the loss. If the loss is not probable or the amount of the loss cannot be reasonably estimated, the Company discloses the claim if the likelihood of a potential loss is reasonably possible and the amount involved could be material. While there can be no assurances, the Company does not expect that any of its pending legal proceedings will have a material financial impact on the Company's operating results.

The Company has evaluated its pending cases and has not recorded a litigation contingency liability with respect to the cases.

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16. FAIR VALUE MEASUREMENTS.

The fair value hierarchy prioritizes the inputs used in valuation techniques into three levels, as follows:

- Level 1 – Observable inputs – unadjusted quoted prices in active markets for identical assets and liabilities;
- Level 2 – Observable inputs other than quoted prices included in Level 1 that are observable for the asset or liability through corroboration with market data; and
- Level 3 – Unobservable inputs – includes amounts derived from valuation models where one or more significant inputs are unobservable. For fair value measurements using significant unobservable inputs, a description of the inputs and the information used to develop the inputs is required along with a reconciliation of Level 3 values from the prior reporting period.

Pooled separate accounts – Pooled separate accounts invest primarily in domestic and international stocks, commercial paper or single mutual funds. The net asset value is used as a practical expedient to determine fair value for these accounts. Each pooled separate account provides for redemptions by the Retirement Plan at reported net asset values per share, with little to no advance notice requirement, therefore these funds are classified within Level 2 of the valuation hierarchy.

Long-Lived Assets Held-for-Sale – The Company recorded its long-lived assets associated with its property and equipment held-for-sale at fair value at December 31, 2020 and 2019 of \$48,548,000 and \$70,400,000, respectively. The fair values of these assets are based on observable values for the assets through corroboration with market data and are designated as Level 3 inputs.

Warrants issued to Senior Noteholders – The Company's warrants issued December 22, 2019, were valued using the Black-Scholes Valuation Model and adjusted for quarterly. On August 5, 2020, these warrants were exercised in full and prior to exercise, the Company adjusted their fair value using the following assumptions (fair value dollars in thousands):

Original Issuance	Exercise Price	Volatility	Risk Free Interest Rate	Term (years)	Fair Value
12/22/19	\$ 1.00	178.0%	0.08%	0.10	\$ 8,474

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The assumptions used and related fair value for these warrants as of December 31, 2019 were as follows (fair value dollars in thousands):

Original Issuance	Exercise Price	Volatility	Risk Free Interest Rate	Term (years)	Fair Value
12/22/19	\$ 1.00	76.0%	1.66%	3.00	\$ 977

Warrants issued in Equity Offering – The Company issued pre-funded warrants and other warrants with exercise prices of \$0.001 and \$9.757, respectively. The Company valued these warrants upon issuance using the Binomial valuation methodology. On November 16, 2020, the pre-funded warrants were exercised, and as a result, were revalued immediately prior to their exercise. Further, the other warrants were amended on November 24, 2020, resulting in equity accounting, and accordingly were revalued immediately prior to their amendment. The assumptions used were as follows (fair value dollars in thousands):

Warrant Type	Valuation Date	Exercise Price	Volatility	Risk Free Interest Rate	Term (years)	Fair Value
Pre-funded	10/28/2020	\$ 0.01	97.0%	0.34%	5.00	\$ 23,638
Other	10/28/2020	\$ 9.76	134.0%	0.14%	1.50	\$ 27,048
Pre-funded	11/16/2020	\$ 0.01	97.0%	0.40%	4.95	\$ 21,916
Other	11/24/2020	\$ 9.76	135.0%	0.13%	1.45	\$ 31,231

The fair values of the warrants are based on unobservable inputs and are designated as Level 3 inputs. The changes in the Company's fair value of its Level 3 inputs with respect to its warrants were as follows (in thousands):

	Warrants to Senior Noteholders	Pre-funded Warrants	Other Warrants
Balance, December 31, 2019	\$ 977	\$ —	\$ —
Issuance of warrants in October offering	—	23,638	27,048
Exercise of warrants/reclass to equity	(8,474)	(21,917)	(31,231)
Adjustments to fair value for the period	7,497	(1,721)	4,183
Balance, December 31, 2020	\$ —	\$ —	\$ —

Other Derivative Instruments – The Company’s other derivative instruments consist of commodity positions. The fair values of the commodity positions are based on quoted prices on the commodity exchanges and are designated as Level 1 inputs.

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The following table summarizes recurring and nonrecurring fair value measurements by level at December 31, 2020 (in thousands):

	<u>Fair Value</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Benefit Plan Percentage Allocation</u>
Assets:					
Derivative financial instruments	\$ 17,149	\$ 17,149	\$ —	\$ —	
Long-lived assets held-for-sale	58,295	—	—	58,295	
Defined benefit plan assets(1) (pooled separate accounts):					
Large U.S. Equity(2)	5,470	—	5,470	—	31%
Small/Mid U.S. Equity(3)	2,605	—	2,605	—	15%
International Equity(4)	2,921	—	2,921	—	17%
Fixed Income(5)	6,592	—	6,592	—	37%
	<u>\$ 93,032</u>	<u>\$ 17,149</u>	<u>\$ 17,588</u>	<u>\$ 58,295</u>	
Liabilities:					
	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>	

The following table summarizes recurring and nonrecurring fair value measurements by level at December 31, 2019 (in thousands):

	<u>Fair Value</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Benefit Plan Percentage Allocation</u>
Assets:					
Derivative financial instruments	\$ 2,438	\$ 2,438	\$ —	\$ —	
Long-lived assets held-for-sale	70,400	—	—	70,400	
Defined benefit plan assets(1) (pooled separate accounts):					
Large U.S. Equity(2)	4,654	—	4,654	—	30%
Small/Mid U.S. Equity(3)	2,348	—	2,348	—	15%
International Equity(4)	2,596	—	2,596	—	17%
Fixed Income(5)	6,056	—	6,056	—	38%
	<u>\$ 88,492</u>	<u>\$ 2,438</u>	<u>\$ 15,654</u>	<u>\$ 70,400</u>	
Liabilities:					
Derivative financial instruments	\$ (1,860)	\$ (1,860)	\$ —	\$ —	
Warrants	(977)	—	—	(977)	
	<u>\$ (2,837)</u>	<u>\$ (1,860)</u>	<u>\$ —</u>	<u>\$ (977)</u>	

(1) See Note 10 for accounting discussion.

(2) This category includes investments in funds comprised of equity securities of large U.S. companies. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.

(3) This category includes investments in funds comprised of equity securities of small- and medium-sized U.S. companies. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.

(4) This category includes investments in funds comprised of equity securities of foreign companies including emerging markets. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.

(5) This category includes investments in funds comprised of U.S. and foreign investment-grade fixed income securities, high-yield fixed income securities that are rated below investment-grade, U.S. treasury securities, mortgage-backed securities, and other asset-backed securities. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

17. PARENT COMPANY FINANCIALS.

Restricted Net Assets – At December 31, 2020, the Company had approximately \$262,200,000 of net assets at its subsidiaries that were not available to be transferred to Alto Ingredients in the form of dividends, distributions, loans or advances due to restrictions contained in the credit facilities of these subsidiaries.

Parent company financial statements for the periods covered in this report are set forth below.

<u>ASSETS</u>	<u>December 31,</u>	
	<u>2020</u>	<u>2019</u>
Current Assets:		
Cash and cash equivalents	\$ 25,632	\$ 4,985
Receivables from subsidiaries	15,548	13,057

Other current assets	1,836	2,349
Total current assets	<u>43,016</u>	<u>20,391</u>
Property and equipment, net	<u>142</u>	<u>269</u>
Other Assets:		
Investments in subsidiaries	246,518	218,464
Right of use lease assets	2,985	3,253
Alto West LLC receivable	42,649	55,750
Other assets	1,088	1,452
Total other assets	<u>293,240</u>	<u>278,919</u>
Total Assets	<u>\$ 336,398</u>	<u>\$ 299,579</u>
Current Liabilities:		
Accounts payable and accrued liabilities	\$ 2,001	\$ 5,907
Accrued Alto Op Co. purchase	3,829	3,829
Current portion of long-term debt	25,533	10,000
Other current liabilities	473	659
Total current liabilities	<u>31,836</u>	<u>20,395</u>
Long-term debt, net	5,564	56,110
Other liabilities	2,763	3,294
Total Liabilities	<u>40,163</u>	<u>79,799</u>
Stockholders' Equity:		
Preferred stock	1	1
Common and non-voting common stock	72	56
Additional paid-in capital	1,036,638	942,307
Accumulated other comprehensive loss	(3,878)	(2,370)
Accumulated deficit	(736,598)	(720,214)
Total Alto Ingredients, Inc. stockholders' equity	<u>296,235</u>	<u>219,780</u>
Total Liabilities and Stockholders' Equity	<u>\$ 336,398</u>	<u>\$ 299,579</u>

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Years Ended December 31,	
	2020	2019
Management fees from subsidiaries	\$ 11,724	\$ 12,682
Selling, general and administrative expenses	16,990	16,007
Loss from operations	(5,266)	(3,325)
Fair value adjustments	(9,959)	—
Loss on debt extinguishment	—	(6,517)
Interest income	4,011	4,600
Interest expense	(10,095)	(9,637)
Other expense, net	(220)	(86)
Loss before benefit for income taxes	(21,529)	(14,965)
Benefit for income taxes	17	20
Loss before equity in earnings of subsidiaries	(21,512)	(14,945)
Equity in income (losses) of subsidiaries	6,396	(74,004)
Consolidated net loss	<u>\$ (15,116)</u>	<u>\$ (88,949)</u>

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ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	For the Years Ended December 31,	
	2020	2019
Operating Activities:		
Net loss	\$ (15,116)	\$ (88,949)
Adjustments to reconcile net loss to cash provided by (used in) operating activities:		
Equity in (income) losses of subsidiaries	(6,396)	74,004
Depreciation	127	267
Fair value adjustments	9,959	—
Loss on debt extinguishment	—	6,517
Amortization of debt discounts	(230)	689
Changes in operating assets and liabilities:		

Other assets		883	3,277
Accounts payable and accrued expenses		(5,378)	2,673
Accounts receivable with subsidiaries		(2,491)	2,115
Accounts payable with subsidiaries		—	(49)
Net cash provided by (used in) operating activities		<u>\$ (18,642)</u>	<u>\$ 544</u>
Investing Activities:			
Additions to property and equipment		\$ —	\$ (14)
Investments in subsidiaries		(20,865)	—
Net cash used in investing activities		<u>\$ (20,865)</u>	<u>\$ (14)</u>
Financing Activities:			
Proceeds from issuance of common stock		\$ 75,829	\$ 3,670
Proceeds from warrant exercises		5,500	—
Proceeds from CARES Act loans		5,973	—
Proceeds from West receivable		13,101	—
Debt issuances costs		—	(1,280)
Payments on senior notes		(40,249)	(3,748)
Preferred stock dividend payments		—	(946)
Net cash provided by (used in) financing activities		<u>\$ 60,154</u>	<u>\$ (2,304)</u>
Net increase (decrease) in cash and cash equivalents		20,647	(1,774)
Cash and cash equivalents at beginning of period		4,985	6,759
Cash and cash equivalents at end of period		<u>\$ 25,632</u>	<u>\$ 4,985</u>

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INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
3.1	Certificate of Incorporation	10-Q	000-21467	3.1	11/06/2015	
3.2	Certificate of Designations, Powers, Preferences and Rights of the Series A Cumulative Redeemable Convertible Preferred Stock	10-Q	000-21467	3.2	11/06/2015	
3.3	Certificate of Designations, Powers, Preferences and Rights of the Series B Cumulative Convertible Preferred Stock	10-Q	000-21467	3.3	11/06/2015	
3.4	Certificate of Amendment to Certificate of Incorporation dated June 3, 2010	10-Q	000-21467	3.4	11/06/2015	
3.5	Certificate of Amendment to Certificate of Incorporation effective June 8, 2011	10-Q	000-21467	3.5	11/06/2015	
3.6	Certificate of Amendment to Certificate of Incorporation effective May 14, 2013	10-Q	000-21467	3.6	11/06/2015	
3.7	Certificate of Amendment to Certificate of Incorporation effective July 1, 2015	10-Q	000-21467	3.7	11/06/2015	
3.8	Certificate of Amendment to Certificate of Incorporation effective January 12, 2021	8-K	000-21467	3.1	01/13/2021	
3.9	Second Amended and Restated Bylaws	8-K	000-21467	3.2	01/13/2021	
4.1	Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934	10-K	000-21467	4.1	03/30/2020	
10.1	2006 Stock Incentive Plan, as amended#	S-8	333-196876	4.1	06/18/2014	
10.2	2016 Stock Incentive Plan, as amended#	S-8	333-250180	4.10	11/18/2020	
10.3	Form of Employee Restricted Stock Agreement under 2016 Stock Incentive Plan#	10-K	000-21467	10.5	03/15/2018	
10.4	Form of Non-Employee Director Restricted Stock Agreement under 2016 Stock Incentive Plan#	10-K	000-21467	10.6	03/15/2017	
10.5	Amended and Restated Executive Employment Agreement dated November 7, 2016 between the Registrant and Christopher W. Wright#	10-K	000-21467	10.8	03/15/2017	
10.6	Amended and Restated Executive Employment Agreement dated November 7, 2016 between the Registrant and Bryon T. McGregor#	10-K	000-21467	10.9	03/15/2017	
10.7	Amended and Restated Executive Employment Agreement dated November 7, 2016 between the Registrant and James R. Sneed#	10-K	000-21467	10.12	03/15/2017	

INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.8	Second Amended and Restated Employment Agreement dated July 26, 2018 between the Registrant and Michael D. Kandris#	8-K	000-21467	10.1	08/07/2020	
10.9	Form of Indemnity Agreement between the Registrant and each of its Executive Officers and Directors#	10-K	000-21467	10.46	03/31/2010	
10.10	Policy for Recoupment of Incentive Compensation dated March 29, 2018#	10-K	000-21467	10.17	03/18/2019	
10.11	Form of Clawback Policy Acknowledgement and Agreement#	10-K	000-21467	10.18	03/18/2019	
10.12	Registration Rights Agreement dated March 27, 2008 between the Registrant and Lyles United, LLC	8-K	000-21467	10.4	03/27/2008	
10.13	Letter Agreement dated March 27, 2008 between the Registrant and Lyles United, LLC	8-K	000-21467	10.5	03/27/2008	
10.14	Letter Agreement dated May 22, 2008 among the Registrant, Neil M. Koehler, Bill Jones, Paul P. Koehler and Thomas D. Koehler#	8-K	000-21467	10.3	05/23/2008	
10.15	Senior Secured Note Amendment Agreement dated as of December 22, 2019 among the Registrant and the noteholders named therein	8-K	000-21467	10.1	12/26/2019	
10.16	Form of Amended and Restated Senior Secured Note for an aggregate original principal amount of \$65,649,177.91 issued on December 22, 2019 pursuant to the Senior Secured Note Amendment Agreement dated December 22, 2019 among the Registrant and the noteholders named therein	8-K	000-21467	10.2	12/26/2019	
10.17	Note Amendment dated as of March 20, 2020 by and among the Registrant and the noteholders named therein	8-K	000-21467	10.3	03/26/2020	
10.18	Note Amendment dated as of May 26, 2020 by and among the Registrant and the noteholders named therein	8-K	000-21467	10.1	05/29/2020	
10.19	Security Agreement dated December 15, 2016 among the Registrant, Capital Market Services LLC and the holders of the Registrant's Senior Secured Notes	8-K	000-21467	10.4	12/20/2016	

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.20	First Amendment to Security Agreement dated June 30, 2017 among the Registrant, Cortland Capital Market Services LLC and the holders of the Registrant's Senior Secured Notes	8-K	000-21467	10.5	07/05/2017	
10.21	Second Amendment to Security Agreement dated as of December 22, 2019 among the Registrant, the holders named therein and Cortland Capital Market Services LLC	8-K	000-21467	10.5	12/26/2019	
10.22	Third Amendment to Security Agreement effective as of March 20, 2020 by and among the Registrant, each of the holders and new holders named therein, Cortland Products Corp. as successor agent and Cortland Capital Market Services LLC as existing collateral agent	8-K	000-21467	10.10	03/26/2020	
10.23	Security Agreement dated May 5, 2020 by Pacific Ethanol Pekin, LLC in favor of Cortland Products Corp.	8-K	000-21467	10.1	05/11/2020	
10.24	Credit Agreement dated December 15, 2016 among Pacific Ethanol Pekin, Inc., 1st Farm Credit Services, PCA and CoBank, ACB	8-K	000-21467	10.5	12/20/2016	
10.25	Amendment No. 1 to Credit Agreement dated March 1, 2017 among Pacific Ethanol Pekin, LLC, 1st Farm Credit Services, PCA and CoBank, ACB	10-K	000-21467	10.31	03/15/2018	

10.26	Amendment No. 2 to Credit Agreement dated August 7, 2017 among Pacific Ethanol Pekin, LLC, 1st Farm Credit Services, PCA and CoBank, ACB	8-K	000-21467	10.1	08/11/2017
10.27	Amendment No. 3 to Credit Agreement dated March 30, 2018 among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA, as successor by merger to 1st Farm Credit Services, PCA, and CoBank, ACB	8-K	000-21467	10.1	04/05/2018
10.28	Amendment No. 4 to Credit Agreement dated March 20, 2019 among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA, as successor by merger to 1st Farm Credit Services, PCA, and CoBank, ACB	10-Q	000-21467	10.1	05/03/2019
10.29	Amendment No. 5 to Credit Agreement dated July 15, 2019 among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA, as successor by merger to 1st Farm Credit Services, PCA, and CoBank, ACB	8-K	000-21467	10.1	07/19/2019

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.30	Amendment No. 6 to Credit Agreement dated November 15, 2019 by and among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.1	11/19/2019	
10.31	First Amendment to Amendment No. 6 to Credit Agreement and Other Loan Documents dated as of December 15, 2019 by and among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA, and CoBank, ACB	8-K	000-21467	10.1	12/26/2019	
10.32	Amendment No. 7 to Credit Agreement and Waiver dated December 20, 2019 among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA and CoBank, ACB	S-1	333-235990	10.50	01/21/2020	
10.33	Amendment No. 8 to Credit Agreement dated as of March 20, 2020 by and among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.2	03/26/2020	
10.34	Amendment No. 9 to Credit Agreement and Waiver dated as of December 18, 2020 by and among Pacific Ethanol Pekin, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.1	12/23/2020	
10.35	Fourth Amended and Restated Revolving Term Note dated December 18, 2020 by Pacific Ethanol Pekin, LLC in favor of Compeer Financial, PCA	8-K	000-21467	10.1	12/23/2020	
10.36	Fourth Amended and Restated Term Note dated December 20, 2019 by Pacific Ethanol Pekin, LLC in favor of Compeer Financial, PCA	S-1	333-235990	10.65	01/21/2020	
10.37	Security Agreement dated December 15, 2016 between Pacific Ethanol Pekin, Inc. and CoBank, ACB	8-K	000-21467	10.6	12/20/2016	
10.38	Amendment to Security Agreement dated December 20, 2019 by and between Pacific Ethanol Pekin, LLC and CoBank, ACB for the benefit of Compeer Financial, PCA	S-1	333-235990	10.53	01/21/2020	
10.39	Amendment to Illinois Future Advance Real Estate Mortgage dated December 20, 2019 by and between Pacific Ethanol Pekin, LLC and Compeer Financial, PCA	S-1	333-235990	10.61	01/21/2020	

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.40	Guaranty and Contribution Agreement by Pacific Ethanol Pekin, LLC dated March 20, 2019 in favor of Compeer Financial, PCA and CoBank, ACB	10-Q	000-21467	10.5	05/03/2019	

10.41	Guaranty by Pacific Ethanol Pekin, LLC dated December 20, 2019 in favor of Compeer Financial, PCA and CoBank, ACB	S-1	333-235990	10.56	01/21/2020
10.42	First Amendment to Guaranty dated as of December 18, 2020 by Pacific Ethanol Pekin, LLC in favor of Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.1	12/23/2020
10.43	Amended and Restated Guaranty and Contribution Agreement dated December 20, 2019 by Pacific Ethanol Central, LLC for the benefit of Compeer Financial, PCA and CoBank, ACB	S-1	333-235990	10.55	01/21/2020
10.44	Pledge Agreement dated December 20, 2019 by and among Pacific Ethanol Central, LLC, Pacific Ethanol Pekin, LLC and CoBank, ACB	S-1	333-235990	10.57	01/21/2020
10.45	Security Agreement dated March 20, 2019 by and among Pacific Ethanol Pekin, LLC, Compeer Financial PCA and CoBank ACB	10-Q	000-21467	10.4	05/03/2019
10.46	First Amendment to Security Agreement dated December 20, 2019 by and between Pacific Ethanol Central, LLC and CoBank, ACB for the benefit of Compeer Financial, PCA	S-1	333-235990	10.52	01/21/2020
10.47	Second Amendment to Security Agreement dated as of December 18, 2020 by and between Pacific Ethanol Central, LLC and CoBank, ACB	8-K	000-21467	10.9	12/23/2020
10.48	Working Capital Maintenance Agreement dated December 15, 2016 between the Registrant and CoBank, ACB	8-K	000-21467	10.9	12/20/2016
10.49	Pledge Agreement dated March 20, 2019 by and among Pacific Ethanol Central, LLC, Pacific Aurora, LLC and CoBank, ACB	10-Q	000-21467	10.6	05/03/2019
10.50	First Amendment to Pledge Agreement dated December 20, 2019 by and among Pacific Ethanol Central, LLC, Pacific Aurora, LLC and CoBank, ACB	S-1	333-235990	10.59	01/21/2020

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.51	Security Agreement dated March 20, 2020 by and between Pacific Ethanol Central, LLC and Cortland Products Corp.	8-K	000-21467	10.5	03/26/2020	
10.52	Pledge Agreement dated March 20, 2020 by and among Pacific Ethanol Central, LLC, Illinois Corn Processing, LLC and Cortland Products Corp.	8-K	000-21467	10.6	03/26/2020	
10.53	Pledge Agreement dated March 20, 2020 by and among Pacific Ethanol Central, LLC, Pacific Ethanol Pekin, LLC and Cortland Products Corp.	8-K	000-21467	10.7	03/26/2020	
10.54	Pledge Agreement dated March 20, 2020 by and among Pacific Ethanol Central, LLC, Pacific Aurora, LLC and Cortland Products Corp.	8-K	000-21467	10.8	03/26/2020	
10.55	Security Agreement dated March 20, 2020 by and among Pacific Ethanol West, LLC, PE Op Co. and Cortland Products Corp.	8-K	000-21467	10.9	03/26/2020	
10.56	Second Amended and Restated Credit Agreement dated August 2, 2017 among Kinergy Marketing LLC, Pacific Ag. Products, LLC, Wells Fargo Bank, National Association, and the parties thereto from time to time as lenders	8-K	000-21467	10.1	08/08/2017	
10.57	Amendment No. 1 to Second Amended and Restated Credit Agreement dated March 27, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC and Wells Fargo Bank, National Association	10-Q	000-21467	10.7	05/03/2019	
10.58	Amendment No. 2 to Second Amended and Restated Credit Agreement dated July 31, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC, the parties thereto from time to time as lenders and Wells Fargo Bank, National Association	8-K	000-21467	10.1	08/06/2019	
10.59	Amendment No. 3 to Second Amended and Restated Credit Agreement dated November 19, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC, the parties thereto from time to time as lenders and Wells Fargo Bank, National Association	10-K	000-21467	10.61	03/30/2020	

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.60	Second Amended and Restated Guarantee dated August 2, 2017 by the Registrant in favor of Wells Fargo Bank, National Association, for and on behalf of the lenders	8-K	000-21467	10.2	08/08/2017	
10.61	Credit Agreement dated September 15, 2017 between Illinois Corn Processing, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.1	09/21/2017	
10.62	Amendment No. 1 to Credit Agreement and Waiver dated December 20, 2019 among Illinois Corn Processing, LLC, Compeer Financial, PCA and CoBank, ACB	S-1	333-235990	10.49	01/21/2020	
10.63	Amendment No. 2 to Credit Agreement dated as of March 20, 2020 by and among Illinois Corn Processing, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.1	03/26/2020	
10.64	Amendment No. 3 to Credit Agreement and Waiver dated as of December 18, 2020 by and among Illinois Corn Processing, LLC, Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.5	12/23/2020	
10.65	Amended and Restated Term Note dated December 20, 2019 by Illinois Corn Processing, LLC in favor of Compeer Financial, PCA	S-1	333-235990	10.62	01/21/2020	
10.66	Second Amended and Restated Revolving Term Note dated December 18, 2020 by Illinois Corn Processing, LLC in favor of Compeer Financial, PCA	8-K	000-21467	10.6	12/23/2020	
10.67	Illinois Future Advance Real Estate Mortgage dated September 15, 2017 by Illinois Corn Processing, LLC in favor of CoBank, ACB	8-K	000-21467	10.4	09/21/2017	
10.68	Amendment to Illinois Future Advance Real Estate Mortgage dated December 20, 2019 by and between Illinois Corn Processing, LLC and Compeer Financial, PCA	S-1	333-235990	10.60	01/21/2020	
10.69	Security Agreement dated September 15, 2017 by Illinois Corn Processing, LLC in favor of CoBank, ACB	8-K	000-21467	10.5	09/21/2017	

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Exhibit Number	Description*	Where Located				
		Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.70	First Amendment to Security Agreement dated December 20, 2019 by and between Illinois Corn Processing, LLC and CoBank, ACB for the benefit of Compeer Financial, PCA	S-1	333-235990	10.51	01/21/2020	
10.71	Guaranty by Illinois Corn Processing, LLC dated December 20, 2019 in favor of Compeer Financial, PCA and CoBank, ACB	S-1	333-235990	10.54	01/21/2020	
10.72	First Amendment to Guaranty dated as of December 18, 2020 by Illinois Corn Processing, LLC in favor of Compeer Financial, PCA and CoBank, ACB	8-K	000-21467	10.7	12/23/2020	
10.73	Pledge Agreement dated December 20, 2019 by and among Pacific Ethanol Central, LLC, Illinois Corn Processing, LLC and CoBank, ACB	S-1	333-235990	10.58	01/21/2020	
10.74	Security Agreement dated March 20, 2020 by Illinois Corn Processing, LLC in favor of Cortland Products Corp.	8-K	000-21467	10.4	03/26/2020	
10.75	Security Agreement effective as of March 20, 2020 by and between the Registrant and CoBank, ACB	8-K	000-21467	10.11	03/26/2020	
10.76	Intercreditor Agreement dated as of March 20, 2020 by and among Cortland Products Corp., CoBank, ACB, the Registrant and the grantors named therein	8-K	000-21467	10.12	03/26/2020	

10.77	Intercreditor Agreement dated as of March 20, 2020 between the Pekin Lenders and the ICP Lenders named therein	8-K	000-21467	10.13	03/26/2020
10.78	First Amendment to Intercreditor Agreement dated as of December 18, 2020 by and among the Pekin Lenders and the ICP Lenders named therein	8-K	000-21467	10.10	12/23/2020
10.79	Secured Promissory Note (Negotiable) dated April 15, 2020 in the amount of \$8,580,000 by Pacific Aurora, LLC in favor of Pacific Ethanol Central, LLC	8-K	000-21467	10.4	04/21/2020
10.80	Secured Promissory Note (Non-Negotiable) dated April 15, 2020 in the amount of \$7,920,000 by Pacific Aurora, LLC in favor of Pacific Ethanol Central, LLC	8-K	000-21467	10.5	04/21/2020

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Exhibit Number	Description*	Where Located				Filed Herewith
		Form	File Number	Exhibit Number	Filing Date	
10.81	Assignment of Notes and Deeds of Trust dated April 15, 2020 by Pacific Aurora, LLC and Pacific Ethanol Central, LLC in favor of CoBank, ACB	8-K	000-21467	10.6	04/21/2020	
10.82	First Amendment to Assignment of Notes and Deeds of Trust dated as of December 18, 2020 by and between Pacific Ethanol Central, LLC and CoBank, ACB	8-K	000-21467	10.11	12/23/2020	
10.83	Promissory Note dated April 29, 2020 in the amount of \$5,973,138 by the Registrant in favor of Bank of America, NA	8-K	000-21467	10.1	04/21/2020	
10.84	Promissory Note dated April 29, 2020 in the amount of \$3,886,729 by the Registrant in favor of Bank of America, NA	8-K	000-21467	10.2	04/21/2020	
10.85	Series A Warrant to Purchase Common Stock dated October 28, 2020 for 8,900,493 shares by and between the Registrant and CVI Investments, Inc.					X
10.86	Registration Rights Agreement dated October 28, 2020 by and between the Registrant and CVI Investments, Inc.					X
21.1	Subsidiaries of the Registrant					X
23.1	Consent of Independent Registered Public Accounting Firm					X
31.1	Certification Required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
31.2	Certification Required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
32.1	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					X
101.INS	Inline XBRL Instance Document					X
101.SCH	Inline XBRL Taxonomy Extension Schema					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase					X

(#) A contract, compensatory plan or arrangement to which a director or executive officer is a party or in which one or more directors or executive officers are eligible to participate.

(*) Certain of the agreements filed as exhibits contain representations and warranties made by the parties thereto. The assertions embodied in such representations and warranties are not necessarily assertions of fact, but a mechanism for the parties to allocate risk. Accordingly, investors should not rely on the representations and warranties as characterizations of the actual state of facts or for any other purpose at the time they were made or otherwise.

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 on this 26th day of March, 2021.

ALTO INGREDIENTS, INC.

/s/ MICHAEL D. KANDRIS

Michel D. Kandris
President and Chief Executive Officer

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.

Signature	Title	Date
<u>/s/ WILLIAM L. JONES</u> William L. Jones	Chairman of the Board and Director	March 26, 2021
<u>/s/ MICHAEL D. KANDRIS</u> Michael D. Kandris	President, Chief Executive Officer (Principal Executive Officer), Chief Operating Officer and Director	March 26, 2021
<u>/s/ BRYON T. MCGREGOR</u> Bryon T. McGregor	Chief Financial Officer (Principal Financial and Accounting Officer)	March 26, 2021
<u>/s/ TERRY L. STONE</u> Terry L. Stone	Director	March 26, 2021
<u>/s/ JOHN L. PRINCE</u> John L. Prince	Director	March 26, 2021
<u>/s/ DOUGLAS L. KIETA</u> Douglas L. Kieta	Director	March 26, 2021
<u>/s/ GILBERT E. NATHAN</u> Gilbert E. Nathan	Director	March 26, 2021
<u>/s/ DIANNE S. NURY</u> Dianne S. Nury	Director	March 26, 2021

NEITHER THIS SECURITY NOR THE SECURITIES FOR WHICH THIS SECURITY IS EXERCISABLE HAVE BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND IN ACCORDANCE WITH APPLICABLE STATE SECURITIES LAWS. THIS SECURITY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS SECURITY MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN SECURED BY SUCH SECURITIES.

THE NUMBER OF SHARES OF COMMON STOCK ISSUABLE UPON EXERCISE OF THIS WARRANT MAY BE LESS THAN THE AMOUNTS SET FORTH ON THE FACE HEREOF PURSUANT TO SECTION 1(a) OF THIS WARRANT.

PACIFIC ETHANOL, INC.

Series A Warrant To Purchase Common Stock

Warrant No.: A-1

Date of Issuance: October 28, 2020 ("**Issuance Date**")

PACIFIC ETHANOL, INC., a Delaware corporation (the "**Company**"), hereby certifies that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, CVI INVESTMENTS, INC., the registered holder hereof or its permitted assigns (the "**Holder**"), is entitled, subject to the terms set forth below, to purchase from the Company, at the Exercise Price (as defined below) then in effect, upon exercise of this Warrant to Purchase Common Stock (including any Warrants to Purchase Common Stock issued in exchange, transfer or replacement hereof, the "**Warrant**"), at any time or times on or after the date six (6) months after the date hereof (the "**Exercisability Date**"), but not after 11:59 p.m., New York time, on the Expiration Date (as defined below), 8,900,493 (subject to adjustment as provided herein) fully paid and non-assessable shares of Common Stock (as defined below) (the "**Warrant Shares**", and such number of Warrant Shares, the "**Warrant Number**"). Except as otherwise defined herein, capitalized terms in this Warrant shall have the meanings set forth in Section 19.

This Warrant is one of the Warrants to Purchase Common Stock (the "**SPA Warrants**") issued pursuant to Section 1 of that certain Securities Purchase Agreement, dated as of October 26, 2020 (the "**Subscription Date**"), by and among the Company and the investors (the "**Buyers**") referred to therein, as amended from time to time (the "**Securities Purchase Agreement**").

1. EXERCISE OF WARRANT.

(a) Mechanics of Exercise. Subject to the terms and conditions hereof (including, without limitation, the limitations set forth in Section 1(f)), this Warrant may be exercised by the Holder on any day on or after the Exercisability Date (an "**Exercise Date**"), in whole or in part, by delivery (whether via facsimile, electronic mail or otherwise) of a written notice, in the form attached hereto as Exhibit A (the "**Exercise Notice**"), of the Holder's election to exercise this Warrant. Within one (1) Trading Day following an exercise of this Warrant as aforesaid, the Holder shall deliver payment to the Company of an amount equal to the Exercise Price in effect on the date of such exercise multiplied by the number of Warrant Shares as to which this Warrant was so exercised (the "**Aggregate Exercise Price**") in cash or via wire transfer of immediately available funds if the Holder did not notify the Company in such Exercise Notice that such exercise was made pursuant to a Cashless Exercise (as defined in Section 1(d)); provided, however, that upon thirty (30) days' prior written notice to the Holder, the Company may elect to require the Holder to make any portion of such future exercises pursuant to a Cashless Exercise until such time as the Company provides another thirty (30) days' prior written notice to the Holder requiring the Holder to make any portion of such future exercises on a cash exercise basis, subject to the provisions of Section 1(d). The Holder shall not be required to deliver the original of this Warrant in order to effect an exercise hereunder. Execution and delivery of an Exercise Notice with respect to less than all of the Warrant Shares shall have the same effect as cancellation of the original of this Warrant and issuance of a new Warrant evidencing the right to purchase the remaining number of Warrant Shares. Execution and delivery of an Exercise Notice for all of the then-remaining Warrant Shares shall have the same effect as cancellation of the original of this Warrant after delivery of the Warrant Shares in accordance with the terms hereof. On or before the first (1st) Trading Day following the date on which the Company has received an Exercise Notice, the Company shall transmit by facsimile or electronic mail an acknowledgment of confirmation of receipt of such Exercise Notice, in the form attached hereto as Exhibit B, to the Holder and the Company's transfer agent (the "**Transfer Agent**"), which confirmation shall constitute an instruction to the Transfer Agent to process such Exercise Notice in accordance with the terms herein. On or before the second (2nd) Trading Day following the date on which the Company has received such Exercise Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date), the Company shall (i) provided that the Transfer Agent is participating in The Depository Trust Company ("**DTC**") Fast Automated Securities Transfer Program, upon the request of the Holder, credit such aggregate number of shares of Common Stock to which the Holder is entitled pursuant to such exercise to the Holder's or its designee's balance account with DTC through its Deposit/Withdrawal at Custodian system, or (ii) if the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program, upon the request of the Holder, issue and deliver (via reputable overnight courier) to the address as specified in the Exercise Notice, a certificate, registered in the name of the Holder or its designee, for the number of shares of Common Stock to which the Holder shall be entitled pursuant to such exercise. Upon delivery of an Exercise Notice, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date such Warrant Shares are credited to the Holder's DTC account or the date of delivery of the certificates evidencing such Warrant Shares (as the case may be). If this Warrant is submitted in connection with any exercise pursuant to this Section 1(a) and the number of Warrant Shares represented by this Warrant submitted for exercise is greater than the number of Warrant Shares being acquired upon an exercise and upon surrender of this Warrant to the Company by the Holder, then, at the request of the Holder, the Company shall as soon as practicable and in no event later than two (2) Business Days after any exercise and at its own expense, issue and deliver to the Holder (or its designee) a new Warrant (in accordance with Section 7(d)) representing the right to purchase the number of Warrant Shares purchasable immediately prior to such exercise under this Warrant, less the number of Warrant Shares with respect to which this Warrant is exercised. No fractional shares of Common Stock are to be issued upon the exercise of this Warrant, but rather the number of shares of Common Stock to be issued shall be rounded up to the nearest whole number. The Company shall pay any and all transfer, stamp, issuance and similar taxes, costs and expenses (including, without limitation, fees and expenses of the Transfer Agent) that may be payable with respect to the issuance and delivery of Warrant Shares upon exercise of this Warrant. Notwithstanding the foregoing, except in the case where an exercise of this Warrant is validly made pursuant to a Cashless Exercise, the Company's failure to deliver Warrant Shares to the Holder on or prior to the later of (A) two (2) Trading Days after receipt of the applicable Exercise Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date) and (B) one (1) Trading Day after the Company's receipt of the Aggregate Exercise Price (or valid notice of a Cashless Exercise) (such later date, the "**Share Delivery Date**") shall not be deemed to be a breach of this Warrant. From the Issuance Date through and including the Expiration Date, the Company shall maintain a transfer agent that participates in the DTC's Fast Automated Securities Transfer Program.

(b) Exercise Price. For purposes of this Warrant, “**Exercise Price**” means \$9.757, subject to adjustment as provided herein.

(c) Company’s Failure to Timely Deliver Securities. If the Company shall fail, for any reason or for no reason, on or prior to the Share Delivery Date, either (I) if the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program, to issue and deliver to the Holder (or its designee) a certificate for the number of Warrant Shares to which the Holder is entitled and register such Warrant Shares on the Company’s share register or, if the Transfer Agent is participating in the DTC Fast Automated Securities Transfer Program, to credit the balance account of the Holder or the Holder’s designee with DTC for such number of Warrant Shares to which the Holder is entitled upon the Holder’s exercise of this Warrant (as the case may be) or (II) if a registration statement (or prospectus contained therein) covering the resale of the Warrant Shares that are the subject of the Exercise Notice (the “**Unavailable Warrant Shares**”) is not available for the resale of such Unavailable Warrant Shares and the Company fails to promptly (x) so notify the Holder and (y) deliver the Warrant Shares electronically without any restrictive legend by crediting such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder’s or its designee’s balance account with DTC through its Deposit/Withdrawal At Custodian system (the event described in the immediately foregoing clause (II) is hereinafter referred to as a “**Notice Failure**” and together with the event described in clause (I) above, a “**Delivery Failure**”), and if on or after such Share Delivery Date the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of all or any portion of the number of shares of Common Stock issuable upon such exercise that the Holder is entitled to receive from the Company (a “**Buy-In**”), then, in addition to all other remedies available to the Holder, the Company shall, within two (2) Business Days after the Holder’s request and in the Holder’s discretion, either (i) as an indemnity for loss hereunder, pay cash to the Holder in an amount equal to the Holder’s total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (including, without limitation, by any other Person in respect, or on behalf, of the Holder) (the “**Buy-In Price**”), at which point the Company’s obligation to so issue and deliver such certificate (and to issue such shares of Common Stock) or credit the balance account of such Holder or such Holder’s designee, as applicable, with DTC for the number of Warrant Shares to which the Holder is entitled upon the Holder’s exercise hereunder (as the case may be) and, as an indemnity for loss hereunder, pay cash to the Holder in an amount equal to the excess (if any) of the Holder’s total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (including, without limitation, by any other Person in respect, or on behalf, of the Holder) (the “**Buy-In Price**”) over the product of (A) such number of Warrant Shares multiplied by (B) the lowest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date of the applicable Exercise Notice and ending on the date of such issuance and payment under this clause (ii) (the “**Buy-In Payment Amount**”). Nothing shall limit the Holder’s right to pursue any other remedies available to it hereunder, at law or in equity, including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company’s failure to timely deliver certificates representing shares of Common Stock (or to electronically deliver such shares of Common Stock) upon the exercise of this Warrant as required pursuant to the terms hereof. While this Warrant is outstanding, the Company shall cause its transfer agent to participate in the DTC Fast Automated Securities Transfer Program. In addition to the foregoing rights, (i) if the Company fails to deliver the applicable number of Warrant Shares upon an exercise pursuant to Section 1 by the applicable Share Delivery Date, then the Holder shall have the right to rescind such exercise in whole or in part and retain and/or have the Company return, as the case may be, any portion of this Warrant that has not been exercised pursuant to such Exercise Notice; provided that the rescission of an exercise shall not affect the Company’s obligation to make any payments that have accrued prior to the date of such notice pursuant to this Section 1(c) or otherwise, and (ii) if a registration statement covering the resale of the Warrant Shares that are subject to an Exercise Notice is not available for the resale of such Exercise Notice Warrant Shares and the Holder has submitted an Exercise Notice prior to receiving notice of the non-availability of such registration statement and the Company has not already delivered the Warrant Shares underlying such Exercise Notice electronically without any restrictive legend by crediting such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder’s or its designee’s balance account with DTC through its Deposit / Withdrawal At Custodian system, the Holder shall have the option, by delivery of notice to the Company, to (x) rescind such Exercise Notice in whole or in part and retain or have returned, as the case may be, any portion of this Warrant that has not been exercised pursuant to such Exercise Notice; provided that the rescission of an Exercise Notice shall not affect the Company’s obligation to make any payments that have accrued prior to the date of such notice pursuant to this Section 1(c) or otherwise, and/or (y) switch some or all of such Exercise Notice from a cash exercise to a Cashless Exercise.

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(d) Cashless Exercise. Notwithstanding anything contained herein to the contrary (other than Section 1(f) below), if at the time of exercise hereof a registration statement covering the resale of the Warrant Shares is not effective (or the prospectus contained therein is not available for use) for the issuance of all of the Warrant Shares, then the Holder may, in its sole discretion, exercise this Warrant in whole or in part and, in lieu of making the cash payment otherwise contemplated to be made to the Company upon such exercise in payment of the Aggregate Exercise Price, elect instead to receive upon such exercise the “Net Number” of Warrant Shares determined according to the following formula (a “**Cashless Exercise**”):

$$\text{Net Number} = \frac{(A \times B) - (A \times C)}{D}$$

For purposes of the foregoing formula:

A = the total number of shares with respect to which this Warrant is then being exercised.

B = the quotient of (x) the sum of the VWAP of the Common Stock of each of the ten (10) Trading Days ending at the close of business on the Principal Market immediately prior to the time of exercise as set forth in the applicable Exercise Notice, divided by (y) ten (10).

C = the Exercise Price then in effect for the applicable Warrant Shares at the time of such exercise.

D = as applicable: (i) the Closing Sale Price of the Common Stock on the Trading Day immediately preceding the date of the applicable Exercise Notice if such Exercise Notice is (1) both executed and delivered pursuant to Section 1(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 1(a) hereof on a Trading Day prior to the opening of “regular trading hours” (as defined in Rule 600(b)(64) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) the Bid Price of the Common Stock as of the time of the Holder’s execution of the applicable Exercise Notice if such Exercise Notice is executed during “regular trading hours” on a Trading Day and is delivered within two (2) hours thereafter pursuant to Section 1(a) hereof, or (iii) the Closing Sale Price of the Common Stock on the date of the applicable Exercise Notice if the date of such Exercise Notice is a Trading Day and such Exercise Notice is both executed and delivered pursuant to Section 1(a) hereof after the close of “regular trading hours” on such Trading Day.

If the Warrant Shares are issued in a Cashless Exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the 1933 Act, the Warrant Shares take on the registered characteristics of the Warrants being exercised. For purposes of Rule 144(d) promulgated under the 1933 Act, as in effect on the Subscription Date, it is intended that the Warrant Shares issued in a Cashless Exercise shall be deemed to have been acquired by the Holder, and the holding period for the Warrant Shares shall be deemed to have commenced, on the date this Warrant was originally issued pursuant to the Securities Purchase Agreement.

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(e) Disputes. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the number of Warrant Shares to be issued pursuant to

the terms hereof, the Company shall promptly issue to the Holder the number of Warrant Shares that are not disputed and resolve such dispute in accordance with Section 15.

(f) Limitations on Exercises. The Company shall not effect the exercise of any portion of this Warrant, and the Holder shall not have the right to exercise any portion of this Warrant, pursuant to the terms and conditions of this Warrant and any such exercise shall be null and void and treated as if never made, to the extent that after giving effect to such exercise, the Holder together with the other Attribution Parties collectively would beneficially own in excess of 4.99% (the “**Maximum Percentage**”) of the shares of Common Stock outstanding immediately after giving effect to such exercise. For purposes of the foregoing sentence, the aggregate number of shares of Common Stock beneficially owned by the Holder and the other Attribution Parties shall include the number of shares of Common Stock held by the Holder and all other Attribution Parties plus the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which the determination of such sentence is being made, but shall exclude shares of Common Stock which would be issuable upon (A) exercise of the remaining, unexercised portion of this Warrant beneficially owned by the Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any convertible notes or convertible preferred stock or warrants, including other SPA Warrants) beneficially owned by the Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 1(f)(i). For purposes of this Section 1(f)(i), beneficial ownership shall be calculated in accordance with Section 13(d) of the 1934 Act. For purposes of determining the number of outstanding shares of Common Stock the Holder may acquire upon the exercise of this Warrant without exceeding the Maximum Percentage, the Holder may rely on the number of outstanding shares of Common Stock as reflected in (x) the Company’s most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other public filing with the SEC, as the case may be, (y) a more recent public announcement by the Company or (z) any other written notice by the Company or the Transfer Agent, if any, setting forth the number of shares of Common Stock outstanding (the “**Reported Outstanding Share Number**”). If the Company receives an Exercise Notice from the Holder at a time when the actual number of outstanding shares of Common Stock is less than the Reported Outstanding Share Number, the Company shall (i) notify the Holder in writing of the number of shares of Common Stock then outstanding and, to the extent that such Exercise Notice would otherwise cause the Holder’s beneficial ownership, as determined pursuant to this Section 1(f)(i), to exceed the Maximum Percentage, the Holder must notify the Company of a reduced number of Warrant Shares to be acquired pursuant to such Exercise Notice (the number of shares by which such purchase is reduced, the “**Reduction Shares**”) and (ii) as soon as reasonably practicable, the Company shall return to the Holder any exercise price paid by the Holder for the Reduction Shares. For any reason at any time, upon the written or oral request of the Holder, the Company shall within one (1) Business Day confirm orally and in writing or by electronic mail to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of shares of Common Stock to the Holder upon exercise of this Warrant results in the Holder and the other Attribution Parties being deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding shares of Common Stock (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which the Holder’s and the other Attribution Parties’ aggregate beneficial ownership exceeds the Maximum Percentage (the “**Excess Shares**”) shall be deemed null and void and shall be cancelled ab initio, and the Holder shall not have the power to vote or to transfer the Excess Shares. As soon as reasonably practicable after the issuance of the Excess Shares has been deemed null and void, the Company shall return to the Holder the exercise price paid by the Holder for the Excess Shares. Upon delivery of a written notice to the Company, the Holder may from time to time increase (with such increase not effective until the sixty-first (61st) day after delivery of such notice) or decrease the Maximum Percentage to any other percentage not in excess of 9.99% as specified in such notice; provided that (i) any such increase in the Maximum Percentage will not be effective until the sixty-first (61st) day after such notice is delivered to the Company and (ii) any such increase or decrease will apply only to the Holder and the other Attribution Parties and not to any other holder of SPA Warrants that is not an Attribution Party of the Holder. For purposes of clarity, the shares of Common Stock issuable pursuant to the terms of this Warrant in excess of the Maximum Percentage shall not be deemed to be beneficially owned by the Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. No prior inability to exercise this Warrant pursuant to this paragraph shall have any effect on the applicability of the provisions of this paragraph with respect to any subsequent determination of exercisability. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 1(f)(i) to the extent necessary to correct this paragraph or any portion of this paragraph which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 1(f)(i) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of this Warrant.

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(g) Reservation of Shares.

(i) Required Reserve Amount. So long as this Warrant remains outstanding, the Company shall at all times keep reserved for issuance under this Warrant a number of shares of Common Stock at least equal to 100% of the maximum number of shares of Common Stock as shall be necessary to satisfy the Company’s obligation to issue shares of Common Stock under the SPA Warrants then outstanding (without regard to any limitations on exercise) (the “**Required Reserve Amount**”); provided that at no time shall the number of shares of Common Stock reserved pursuant to this Section 1(g)(i) be reduced other than proportionally in connection with any exercise or redemption of SPA Warrants or such other event covered by Section 2(a) below. The Required Reserve Amount (including, without limitation, each increase in the number of shares so reserved) shall be allocated pro rata among the holders of the SPA Warrants based on number of shares of Common Stock issuable upon exercise of SPA Warrants held by each holder on the Closing Date (without regard to any limitations on exercise) or increase in the number of reserved shares, as the case may be (the “**Authorized Share Allocation**”). In the event that a holder shall sell or otherwise transfer any of such holder’s SPA Warrants, each transferee shall be allocated a pro rata portion of such holder’s Authorized Share Allocation. Any shares of Common Stock reserved and allocated to any Person which ceases to hold any SPA Warrants shall be allocated to the remaining holders of SPA Warrants, pro rata based on the number of shares of Common Stock issuable upon exercise of the SPA Warrants then held by such holders (without regard to any limitations on exercise).

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(ii) Insufficient Authorized Shares. If, notwithstanding Section 1(g)(i) above, and not in limitation thereof, at any time while any of the SPA Warrants remain outstanding, the Company does not have a sufficient number of authorized and unreserved shares of Common Stock to satisfy its obligation to reserve the Required Reserve Amount (an “**Authorized Share Failure**”), then the Company shall immediately take all action necessary to increase the Company’s authorized shares of Common Stock to an amount sufficient to allow the Company to reserve the Required Reserve Amount for all the SPA Warrants then outstanding. Without limiting the generality of the foregoing sentence, as soon as practicable after the date of the occurrence of an Authorized Share Failure, but in no event later than sixty (60) days after the occurrence of such Authorized Share Failure, the Company shall hold a meeting of its stockholders for the approval of an increase in the number of authorized shares of Common Stock. In connection with such meeting, the Company shall provide each stockholder with a proxy statement and shall use its best efforts to solicit its stockholders’ approval of such increase in authorized shares of Common Stock and to cause its board of directors to recommend to the stockholders that they approve such proposal. In the event that the Company is prohibited from issuing shares of Common Stock upon an exercise of this Warrant due to the failure by the Company to have sufficient shares of Common Stock available out of the authorized but unissued shares of Common Stock (such unavailable number of shares of Common Stock, the “**Authorization Failure Shares**”), in lieu of delivering such Authorization Failure Shares to the Holder, the Company shall pay cash in exchange for the cancellation of such portion of this Warrant exercisable into such Authorization Failure Shares at a price equal to the sum of (i) the product of (x) such number of Authorization Failure Shares and (y) the greatest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date the Holder delivers the applicable Exercise Notice with respect to such Authorization Failure Shares to the Company and ending on the date of such issuance and payment under this Section 1(f); and (ii) to the extent the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of Authorization Failure Shares, any Buy-In Payment Amount, brokerage commissions and other out-of-pocket expenses, if any, of the Holder incurred in connection therewith.

2. ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF WARRANT SHARES. The Exercise Price and number of Warrant Shares issuable upon exercise of this Warrant are subject to adjustment from time to time as set forth in this Section 2.

(a) Stock Dividends and Splits. Without limiting any provision of Section 2(b) or Section 4, if the Company, at any time on or after the Subscription Date, (i) pays a stock dividend on one or more classes of its then outstanding shares of Common Stock or otherwise makes a distribution on any class of capital stock that is payable in shares of Common Stock, (ii) subdivides (by any stock split, stock dividend, recapitalization or otherwise) one or more classes of its then outstanding shares of Common Stock into a larger number of shares or (iii) combines (by combination, reverse stock split or otherwise) one or more classes of its then outstanding shares of Common Stock into a smaller number of shares, then in each such case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to clause (i) of this paragraph shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution, and any adjustment pursuant to clause (ii) or (iii) of this paragraph shall become effective immediately after the effective date of such subdivision or combination. If any event requiring an adjustment under this paragraph occurs during the period that an Exercise Price is calculated hereunder, then the calculation of such Exercise Price shall be adjusted appropriately to reflect such event.

(b) [Intentionally Omitted]

(c) [Intentionally Omitted]

(d) Number of Warrant Shares. Simultaneously with any adjustment to the Exercise Price pursuant to this Section 2(a), the number of Warrant Shares that may be purchased upon exercise of this Warrant shall be increased or decreased proportionately, so that after such adjustment the aggregate Exercise Price payable hereunder for the adjusted number of Warrant Shares shall be the same as the aggregate Exercise Price in effect immediately prior to such adjustment (without regard to any limitations on exercise contained herein).

(e) Other Events. In the event that the Company (or any Subsidiary (as defined in the Securities Purchase Agreement)) shall take any action to which the provisions hereof are not strictly applicable, or, if applicable, would not operate to protect the Holder from dilution or if any event occurs of the type contemplated by the provisions of this Section 2 but not expressly provided for by such provisions (including, without limitation, the granting of stock appreciation rights, phantom stock rights or other rights with equity features), then the Company's board of directors shall in good faith determine and implement an appropriate adjustment in the Exercise Price and the number of Warrant Shares (if applicable) so as to protect the rights of the Holder, provided that no such adjustment pursuant to this Section 2(d) will increase the Exercise Price or decrease the number of Warrant Shares as otherwise determined pursuant to this Section 2, provided further that if the Holder does not accept such adjustments as appropriately protecting its interests hereunder against such dilution, then the Company's board of directors and the Holder shall agree, in good faith, upon an independent investment bank of nationally recognized standing to make such appropriate adjustments, whose determination shall be final and binding absent manifest error and whose fees and expenses shall be borne by the Company.

(f) Calculations. All calculations under this Section 2 shall be made by rounding to the nearest cent or the nearest 1/100th of a share, as applicable. The number of shares of Common Stock outstanding at any given time shall not include shares owned or held by or for the account of the Company, and the disposition of any such shares shall be considered an issuance or sale of Common Stock.

(g) Voluntary Adjustment By Company. Subject to the rules and regulations of the Principal Market, the Company may at any time during the term of this Warrant, with the prior written consent of the holders of a majority of the SPA Warrants then outstanding, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the board of directors of the Company.

3. RIGHTS UPON DISTRIBUTION OF ASSETS. In addition to any adjustments pursuant to Section 2 above, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property, options, evidence of indebtedness or any other assets by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "**Distribution**"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Distribution to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to the extent of any such excess) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such Distribution (and any Distributions declared or made on such initial Distribution or on any subsequent Distribution held similarly in abeyance) to the same extent as if there had been no such limitation).

4. PURCHASE RIGHTS: FUNDAMENTAL TRANSACTIONS.

(a) Purchase Rights. In addition to any adjustments pursuant to Section 2 above, if at any time the Company grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of Common Stock (the "**Purchase Rights**"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issuance or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Purchase Right to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Purchase Right (and beneficial ownership) to the extent of any such excess) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right held similarly in abeyance) to the same extent as if there had been no such limitation).

(b) Fundamental Transactions. The Company shall not enter into or be party to a Fundamental Transaction unless (i) the Successor Entity assumes in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 4(b) pursuant to written agreements in form and substance satisfactory to the Holder and approved by the Holder prior to such Fundamental Transaction, including agreements to deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant, including, without limitation, which is exercisable for a corresponding number of shares of capital stock equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such adjustments to the number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction) and (ii) the Successor Entity (including its Parent Entity) is a publicly traded corporation whose common stock is quoted on or listed for trading on an Eligible Market. Upon the consummation of each Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of the applicable Fundamental Transaction, the provisions of this Warrant referring to the "Company" shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein. Upon consummation of each Fundamental Transaction, the Successor Entity shall deliver to the Holder confirmation that there shall be issued upon exercise of this Warrant at any time after the consummation of the applicable Fundamental Transaction, in lieu of the shares of Common Stock (or other securities, cash, assets or other property (except such items still issuable under Sections 3 and 4(a) above, which shall continue to be receivable thereafter)) issuable upon the exercise of this Warrant prior to the applicable Fundamental Transaction, such shares of publicly traded common stock (or its equivalent) of the Successor Entity (including its Parent Entity) which the Holder would have been entitled to receive upon the happening of the applicable Fundamental Transaction had this Warrant been exercised immediately prior to the applicable Fundamental Transaction (without regard to any limitations on the exercise of this Warrant), as adjusted in accordance with the provisions of this Warrant. Notwithstanding the foregoing, and without limiting Section 1(f) hereof, the Holder may elect, at its sole option, by delivery of written notice to the Company to waive this Section 4(b) to permit the Fundamental Transaction without the assumption of this Warrant. In addition to and not in substitution for any other rights hereunder, prior to the consummation of each Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities or other assets with respect to or in exchange for shares of Common Stock (a "Corporate Event"), the Company shall make appropriate provision to insure that the Holder will thereafter have the right to receive upon an exercise of this Warrant at any time after the consummation of the applicable Fundamental Transaction but prior to the Expiration Date, in lieu of the shares of the Common Stock (or other securities, cash, assets or other property (except such items still issuable under Sections 3 and 4(a) above, which shall continue to be receivable thereafter)) issuable upon the exercise of the Warrant prior to such Fundamental Transaction, such shares of stock, securities, cash, assets or any other property whatsoever (including warrants or other purchase or subscription rights) which the Holder would have been entitled to receive upon the happening of the applicable Fundamental Transaction had this Warrant been exercised immediately prior to the applicable Fundamental Transaction (without regard to any limitations on the exercise of this Warrant). Provision made pursuant to the preceding sentence shall be in a form and substance reasonably satisfactory to the Holder.

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(c) Black Scholes Value. Notwithstanding the foregoing and the provisions of Section 4(b) above, at the request of the Holder delivered at any time commencing on the earliest to occur of (x) the public disclosure of any Fundamental Transaction, (y) the consummation of any Fundamental Transaction and (z) the Holder first becoming aware of any Fundamental Transaction through the date that is ninety (90) days after the public disclosure of the consummation of such Fundamental Transaction by the Company pursuant to a Current Report on Form 8-K filed with the SEC, the Company or the Successor Entity (as the case may be) shall purchase this Warrant from the Holder on the date of such request by paying to the Holder cash in an amount equal to the Black Scholes Value. Payment of such amounts shall be made by the Company (or at the Company's direction) to the Holder on or prior to the later of (x) the second (2nd) Trading Day after the date of such request and (y) the date of consummation of such Fundamental Transaction.

(d) Application. The provisions of this Section 4 shall apply similarly and equally to successive Fundamental Transactions and Corporate Events and shall be applied as if this Warrant (and any such subsequent warrants) were fully exercisable and without regard to any limitations on the exercise of this Warrant (provided that the Holder shall continue to be entitled to the benefit of the Maximum Percentage, applied however with respect to shares of capital stock registered under the 1934 Act and thereafter receivable upon exercise of this Warrant (or any such other warrant)).

5. NONCIRCUMVENTION. The Company hereby covenants and agrees that the Company will not, by amendment of its certificate of incorporation, bylaws or other organizational documents or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issuance or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, and will at all times in good faith carry out all the provisions of this Warrant and take all action as may be required to protect the rights of the Holder. Without limiting the generality of the foregoing, the Company (a) shall not increase the par value of any shares of Common Stock receivable upon the exercise of this Warrant above the Exercise Price then in effect, and (b) shall take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and non-assessable shares of Common Stock upon the exercise of this Warrant. Notwithstanding anything herein to the contrary, if after the one hundred eighty (180) calendar day anniversary of the Issuance Date, the Holder is not permitted to exercise this Warrant in full for any reason (other than pursuant to restrictions set forth in Section 1(f) hereof), the Company shall use its best efforts to promptly remedy such failure, including, without limitation, obtaining such consents or approvals as necessary to permit such exercise into shares of Common Stock.

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6. WARRANT HOLDER NOT DEEMED A STOCKHOLDER. Except as otherwise specifically provided herein, the Holder, solely in its capacity as a holder of this Warrant, shall not be entitled to vote or receive dividends or be deemed the holder of share capital of the Company for any purpose, nor shall anything contained in this Warrant be construed to confer upon the Holder, solely in its capacity as the Holder of this Warrant, any of the rights of a stockholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which it is then entitled to receive upon the due exercise of this Warrant. In addition, nothing contained in this Warrant shall be construed as imposing any liabilities on the Holder to purchase any securities (upon exercise of this Warrant or otherwise) or as a stockholder of the Company, whether such liabilities are asserted by the Company or by creditors of the Company. Notwithstanding this Section 6, the Company shall provide the Holder with copies of the same notices and other information given to the stockholders of the Company generally, contemporaneously with the giving thereof to the stockholders.

7. REISSUANCE OF WARRANTS.

(a) Transfer of Warrant. If this Warrant is to be transferred pursuant to the terms of the Securities Purchase Agreement, the Holder shall surrender this Warrant to the Company, whereupon the Company will forthwith issue and deliver upon the order of the Holder a new Warrant (in accordance with Section 7(d)), registered as the Holder may request, representing the right to purchase the number of Warrant Shares being transferred by the Holder and, if less than the total number of Warrant Shares then underlying this Warrant is being transferred, a new Warrant (in accordance with Section 7(d)) to the Holder representing the right to purchase the number of Warrant Shares not being transferred.

(b) Lost, Stolen or Mutilated Warrant. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant (as to which a written certification and the indemnification contemplated below shall suffice as such evidence), and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant (in accordance with Section 7(d)) representing the right to purchase the Warrant Shares then underlying this Warrant.

(c) Exchangeable for Multiple Warrants. This Warrant is exchangeable, upon the surrender hereof by the Holder at the principal office of the Company, for a new Warrant or Warrants (in accordance with Section 7(d)) representing in the aggregate the right to purchase the number of Warrant Shares then underlying this Warrant, and each such new Warrant will represent the right to purchase such portion of such Warrant Shares as is designated by the Holder at the time of such surrender; provided, however, no warrants for fractional shares of Common Stock shall be given.

(d) Issuance of New Warrants. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Warrant Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 7(a) or Section 7(c), the Warrant Shares designated by the Holder which, when added to the number of shares of Common Stock underlying the other new Warrants issued in connection with such issuance, does not exceed the number of Warrant Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of such new Warrant which is the same as the Issuance Date, and (iv) shall have the same rights and conditions as this Warrant.

8. NOTICES. (a) General. Whenever notice is required to be given under this Warrant, unless otherwise provided herein, such notice shall be given in writing, (i) if delivered (a) from within the domestic United States, by first-class registered or certified airmail, or nationally recognized overnight express courier, postage prepaid, electronic mail or by facsimile or (b) from outside the United States, by International Federal Express, electronic mail or facsimile, and (ii) will be deemed given (A) if delivered by first-class registered or certified mail domestic, three (3) Business Days after so mailed, (B) if delivered by nationally recognized overnight carrier, one (1) Business Day after so mailed, (C) if delivered by International Federal Express, two (2) Business Days after so mailed and (D) if delivered by electronic mail, when sent (provided that such sent email is kept on file (whether electronically or otherwise) by the sending party and the sending party does not receive an automatically generated message from the recipient's email server that such e-mail could not be delivered to such recipient) and (E) if delivered by facsimile, upon electronic confirmation of receipt of such facsimile, and will be delivered and addressed as follows:

(i) if to the Company, to:

Pacific Ethanol, Inc.
400 Capitol Mall, Suite 2060
Sacramento, CA 95814
Attention: General Counsel
Fax: (916) 446-3937
E-Mail: cwright@pacificethanol.com

(ii) if to the Holder, at such address or other contact information delivered by the Holder to Company or as is on the books and records of the Company.

(b) Required Notices. The Company shall provide the Holder with prompt written notice of all actions taken pursuant to this Warrant (other than the issuance of shares of Common Stock upon exercise in accordance with the terms hereof), including in reasonable detail a description of such action and the reason therefor. Without limiting the generality of the foregoing, the Company will give written notice to the Holder (i) immediately upon each adjustment of the Exercise Price and the number of Warrant Shares, setting forth in reasonable detail, and certifying, the calculation of such adjustment(s), (ii) at least ten Trading Days prior to the date on which the Company closes its books or takes a record (A) with respect to any dividend or distribution upon the shares of Common Stock, (B) with respect to any grants, issuances or sales of any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property to holders of shares of Common Stock or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to the Holder, and (iii) at least ten (10) Trading Days prior to the consummation of any Fundamental Transaction. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any of its Subsidiaries, the Company shall simultaneously file such notice with the SEC pursuant to a Current Report on Form 8-K. It is expressly understood and agreed that the time of execution specified by the Holder in each Exercise Notice shall be definitive and may not be disputed or challenged by the Company.

9. DISCLOSURE. Upon delivery by the Company to the Holder (or receipt by the Company from the Holder) of any notice in accordance with the terms of this Warrant, unless the Company has in good faith determined that the matters relating to such notice do not constitute material, non-public information relating to the Company or any of its Subsidiaries, the Company shall on or prior to 9:00 am, New York city time on the Business Day immediately following such notice delivery date, publicly disclose such material, non-public information on a Current Report on Form 8-K or otherwise. In the event that the Company believes that a notice contains material, non-public information relating to the Company or any of its Subsidiaries, the Company so shall indicate to the Holder explicitly in writing in such notice (or immediately upon receipt of notice from the Holder, as applicable), and in the absence of any such written indication in such notice (or notification from the Company immediately upon receipt of notice from the Holder), the Holder shall be entitled to presume that information contained in the notice does not constitute material, non-public information relating to the Company or any of its Subsidiaries.

10. ABSENCE OF TRADING AND DISCLOSURE RESTRICTIONS. The Company acknowledges and agrees that the Holder is not a fiduciary or agent of the Company and that the Holder shall have no obligation to (a) maintain the confidentiality of any information provided by the Company or (b) refrain from trading any securities while in possession of such information in the absence of a written non-disclosure agreement signed by an officer of the Holder that explicitly provides for such confidentiality and trading restrictions. In the absence of such an executed, written non-disclosure agreement, the Company acknowledges that the Holder may freely trade in any securities issued by the Company, may possess and use any information provided by the Company in connection with such trading activity, and may disclose any such information to any third party.

11. AMENDMENT AND WAIVER. Except as otherwise provided herein, the provisions of this Warrant (other than Section 1(f)) may be amended and the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, only if the Company has obtained the written consent of the Holder. No waiver

shall be effective unless it is in writing and signed by an authorized representative of the waiving party.

12. **SEVERABILITY.** If any provision of this Warrant is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Warrant so long as this Warrant as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

13. **GOVERNING LAW.** This Warrant shall be governed by and construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Warrant shall be governed by, the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to the Company at its principal executive office and agrees that such service shall constitute good and sufficient service of process and notice thereof. The Company hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Company in any other jurisdiction to collect on the Company's obligations to the Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of the Holder. **THE COMPANY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS WARRANT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

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14. **CONSTRUCTION: HEADINGS.** This Warrant shall be deemed to be jointly drafted by the Company and the Holder and shall not be construed against any Person as the drafter hereof. The headings of this Warrant are for convenience of reference and shall not form part of, or affect the interpretation of, this Warrant.

15. **DISPUTE RESOLUTION.**

(a) Submission to Dispute Resolution.

(i) In the case of a dispute relating to the Exercise Price, the Closing Sale Price, the Bid Price, Black Scholes Consideration Value, Black Scholes Value or fair market value or the arithmetic calculation of the number of Warrant Shares (as the case may be) (including, without limitation, a dispute relating to the determination of any of the foregoing), the Company or the Holder (as the case may be) shall submit the dispute to the other party via facsimile or electronic mail (A) if by the Company, within two (2) Business Days after the occurrence of the circumstances giving rise to such dispute or (B) if by the Holder, at any time after the Holder learned of the circumstances giving rise to such dispute. If the Holder and the Company are unable to promptly resolve such dispute relating to such Exercise Price, such Closing Sale Price, such Bid Price, such Black Scholes Consideration Value Black Scholes Value or such fair market value or such arithmetic calculation of the number of Warrant Shares (as the case may be), at any time after the second (2nd) Business Day following such initial notice by the Company or the Holder (as the case may be) of such dispute to the Company or the Holder (as the case may be), then the Holder may, at its sole option, select an independent, reputable investment bank to resolve such dispute.

(ii) The Holder and the Company shall each deliver to such investment bank (A) a copy of the initial dispute submission so delivered in accordance with the first sentence of this Section 15 and (B) written documentation supporting its position with respect to such dispute, in each case, no later than 5:00 p.m. (New York time) by the fifth (5th) Business Day immediately following the date on which the Holder selected such investment bank (the "**Dispute Submission Deadline**") (the documents referred to in the immediately preceding clauses (A) and (B) are collectively referred to herein as the "**Required Dispute Documentation**") (it being understood and agreed that if either the Holder or the Company fails to so deliver all of the Required Dispute Documentation by the Dispute Submission Deadline, then the party who fails to so submit all of the Required Dispute Documentation shall no longer be entitled to (and hereby waives its right to) deliver or submit any written documentation or other support to such investment bank with respect to such dispute and such investment bank shall resolve such dispute based solely on the Required Dispute Documentation that was delivered to such investment bank prior to the Dispute Submission Deadline). Unless otherwise agreed to in writing by both the Company and the Holder or otherwise requested by such investment bank, neither the Company nor the Holder shall be entitled to deliver or submit any written documentation or other support to such investment bank in connection with such dispute (other than the Required Dispute Documentation).

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(iii) The Company and the Holder shall cause such investment bank to determine the resolution of such dispute and notify the Company and the Holder of such resolution no later than ten (10) Business Days immediately following the Dispute Submission Deadline. The fees and expenses of such investment bank shall be borne solely by the Company, and such investment bank's resolution of such dispute shall be final and binding upon all parties absent manifest error.

(b) Miscellaneous. The Company expressly acknowledges and agrees that (i) this Section 15 constitutes an agreement to arbitrate between the Company and the Holder (and constitutes an arbitration agreement) under the rules then in effect under § 7501, et seq. of the New York Civil Practice Law and Rules ("**CPLR**") and that the Holder is authorized to apply for an order to compel arbitration pursuant to CPLR § 7503(a) in order to compel compliance with this Section 15, (ii) the terms of this Warrant shall serve as the basis for the selected investment bank's resolution of the applicable dispute, such investment bank shall be entitled (and is hereby expressly authorized) to make all findings, determinations and the like that such investment bank determines are required to be made by such investment bank in connection with its resolution of such dispute.

16. **REMEDIES, CHARACTERIZATION, OTHER OBLIGATIONS, BREACHES AND INJUNCTIVE RELIEF.** The remedies provided in this Warrant shall be cumulative and in addition to all other remedies available under this Warrant, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit the right of the Holder to pursue actual and consequential damages for any failure by the Company to comply with the terms of this Warrant. The Company covenants to the Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. Amounts set forth or provided for herein with respect to payments, exercises and the like (and the computation thereof) shall be the amounts to be received by the Holder and shall not, except as expressly provided herein, be subject to any other obligation of the Company (or the performance thereof). The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the holder of this Warrant shall be entitled, in addition to all other available remedies, to specific performance and/or temporary, preliminary and permanent injunctive or other equitable relief from any court of competent jurisdiction in any such case without the necessity of proving actual damages and without posting a bond or other security. The Company shall provide all information and documentation to the Holder that is requested by the Holder to enable the Holder to confirm the Company's compliance with the

terms and conditions of this Warrant (including, without limitation, compliance with Section 2 hereof). The issuance of shares and certificates for shares as contemplated hereby upon the exercise of this Warrant shall be made without charge to the Holder or such shares for any issuance tax or other costs in respect thereof, provided that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than the Holder or its agent on its behalf.

17. **PAYMENT OF COLLECTION, ENFORCEMENT AND OTHER COSTS.** If (a) this Warrant is placed in the hands of an attorney for collection or enforcement or is collected or enforced through any legal proceeding or the holder otherwise takes action to collect amounts due under this Warrant or to enforce the provisions of this Warrant or (b) there occurs any bankruptcy, reorganization, receivership of the company or other proceedings affecting company creditors' rights and involving a claim under this Warrant, then the Company shall pay the costs incurred by the Holder for such collection, enforcement or action or in connection with such bankruptcy, reorganization, receivership or other proceeding, including, without limitation, attorneys' fees and disbursements.

18. **TRANSFER.** This Warrant may be offered for sale, sold, transferred or assigned without the consent of the Company.

19. **CERTAIN DEFINITIONS.** For purposes of this Warrant, the following terms shall have the following meanings:

(a) "**1933 Act**" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

(b) "**1934 Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

(c) [Intentionally Omitted]

(d) "**Affiliate**" means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that "control" of a Person means the power directly or indirectly either to vote 10% or more of the shares having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(e) [Intentionally Omitted]

(f) "**Attribution Parties**" means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Issuance Date, directly or indirectly managed or advised by the Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of the Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with the Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Company's Common Stock would or could be aggregated with the Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively the Holder and all other Attribution Parties to the Maximum Percentage.

(g) "**Bid Price**" means, for any security as of the particular time of determination, the bid price for such security on the Principal Market as reported by Bloomberg as of such time of determination, or, if the Principal Market is not the principal securities exchange or trading market for such security, the bid price of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg as of such time of determination, or if the foregoing does not apply, the bid price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg as of such time of determination, or, if no bid price is reported for such security by Bloomberg as of such time of determination, the average of the bid prices of any market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC) as of such time of determination. If the Bid Price cannot be calculated for a security as of the particular time of determination on any of the foregoing bases, the Bid Price of such security as of such time of determination shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 15. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination or other similar transaction during such period.

(h) "**Black Scholes Consideration Value**" means the value of the applicable Option, Convertible Security or Adjustment Right (as the case may be) as of the date of issuance thereof calculated using the Black Scholes Option Pricing Model obtained from the "OV" function on Bloomberg utilizing (i) an underlying price per share equal to the Closing Sale Price of the Common Stock on the Trading Day immediately preceding the public announcement of the execution of definitive documents with respect to the issuance of such Option or Convertible Security (as the case may be), (ii) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the remaining term of such Option, Convertible Security or Adjustment Right (as the case may be) as of the date of issuance of such Option, Convertible Security or Adjustment Right (as the case may be), (iii) a zero cost of borrow and (iv) an expected volatility equal to the greater of 100% and the 30 day volatility obtained from the "HVT" function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the date of issuance of such Option, Convertible Security or Adjustment Right (as the case may be).

(i) "**Black Scholes Value**" means the value of the unexercised portion of this Warrant remaining on the date of the Holder's request pursuant to Section 4(c), which value is calculated using the Black Scholes Option Pricing Model obtained from the "OV" function on Bloomberg utilizing (i) an underlying price per share equal to the greater of (1) the highest Closing Sale Price of the Common Stock during the period beginning on the Trading Day immediately preceding the announcement of the applicable Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder's request pursuant to Section 4(c) and (2) the sum of the price per share being offered in cash in the applicable Fundamental Transaction (if any) plus the value of the non-cash consideration being offered in the applicable Fundamental Transaction (if any), (ii) a strike price equal to the Exercise Price in effect on the date of the Holder's request pursuant to Section 4(c), (iii) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the greater of (1) the remaining term of this Warrant as of the date of the Holder's request pursuant to Section 4(c) and (2) the remaining term of this Warrant as of the date of consummation of the applicable Fundamental Transaction or as of the date of the Holder's request pursuant to Section 4(c) if such request is prior to the date of the consummation of the applicable Fundamental Transaction, (iv) a zero cost of borrow and (v) an expected volatility equal to the greater of 100% and the 30 day volatility obtained from the "HVT" function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the earliest to occur of (A) the public disclosure of the applicable Fundamental Transaction, (B) the consummation of the applicable Fundamental Transaction and (C) the date on which the Holder first became aware of the applicable Fundamental Transaction.

(j) “**Bloomberg**” means Bloomberg, L.P.

(k) “**Business Day**” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(l) “**Closing Sale Price**” means, for any security as of any date, the last closing trade price for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing trade price, then the last trade price of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last trade price of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing does not apply, the last trade price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no last trade price is reported for such security by Bloomberg, the average of the ask prices of any market makers for such security as reported in the “pink sheets” by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Sale Price of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 15. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination or other similar transaction during such period.

(m) “**Common Stock**” means (i) the Company’s shares of common stock, \$0.001 par value per share, and (ii) any capital stock into which such common stock shall have been changed or any share capital resulting from a reclassification of such common stock.

(n) [Intentionally Omitted]

(o) “**Eligible Market**” means The New York Stock Exchange, the NYSE American, the Nasdaq Global Select Market, the Nasdaq Global Market, the Nasdaq Capital Market, or the Principal Market.

(p) “**Expiration Date**” means the date that is the eighteen (18) month anniversary of the Issuance Date or, if such date falls on a day other than a Business Day or on which trading does not take place on the Principal Market (a “**Holiday**”), the next date that is not a Holiday.

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(q) “**Fundamental Transaction**” means (A) that the Company shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, (i) consolidate or merge with or into (whether or not the Company is the surviving corporation) another Subject Entity, or (ii) sell, assign, transfer, convey or otherwise dispose of all or substantially all of the properties or assets of the Company or any of its “significant subsidiaries” (as defined in Rule 1-02 of Regulation S-X) to one or more Subject Entities, or (iii) make, or allow one or more Subject Entities to make, or allow the Company to be subject to or have its Common Stock be subject to or party to one or more Subject Entities making, a purchase, tender or exchange offer that is accepted by the holders of at least either (x) 50% of the outstanding shares of Common Stock, (y) 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all Subject Entities making or party to, or Affiliated with any Subject Entities making or party to, such purchase, tender or exchange offer were not outstanding; or (z) such number of shares of Common Stock such that all Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such purchase, tender or exchange offer, become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (iv) consummate a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with one or more Subject Entities whereby all such Subject Entities, individually or in the aggregate, acquire, either (x) at least 50% of the outstanding shares of Common Stock, (y) at least 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all the Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such stock purchase agreement or other business combination were not outstanding; or (z) such number of shares of Common Stock such that the Subject Entities become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (v) reorganize, recapitalize or reclassify its Common Stock, (B) that the Company shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, allow any Subject Entity individually or the Subject Entities in the aggregate to be or become the “beneficial owner” (as defined in Rule 13d-3 under the 1934 Act), directly or indirectly, whether through acquisition, purchase, assignment, conveyance, tender, tender offer, exchange, reduction in outstanding shares of Common Stock, merger, consolidation, business combination, reorganization, recapitalization, spin-off, scheme of arrangement, reorganization, recapitalization or reclassification or otherwise in any manner whatsoever, of either (x) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock, (y) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock not held by all such Subject Entities as of the date of this Warrant calculated as if any shares of Common Stock held by all such Subject Entities were not outstanding, or (z) a percentage of the aggregate ordinary voting power represented by issued and outstanding shares of Common Stock or other equity securities of the Company sufficient to allow such Subject Entities to effect a statutory short form merger or other transaction requiring other shareholders of the Company to surrender their shares of Common Stock without approval of the shareholders of the Company or (C) directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, the issuance of or the entering into any other instrument or transaction structured in a manner to circumvent, or that circumvents, the intent of this definition in which case this definition shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this definition to the extent necessary to correct this definition or any portion of this definition which may be defective or inconsistent with the intended treatment of such instrument or transaction.

(r) “**Group**” means a “group” as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

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(s) “**Options**” means any rights, warrants or options to subscribe for or purchase Ordinary Shares or Convertible Securities.

(t) “**Parent Entity**” of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(u) “**Person**” means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(v) “**Principal Market**” means The Nasdaq Capital Market.

(w) “**SEC**” means the United States Securities and Exchange Commission or the successor thereto.

(x) “**Subject Entity**” means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(y) “**Successor Entity**” means the Person (or, if so elected by the Holder, the Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or

the Person (or, if so elected by the Holder, the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(z) "Trading Day" means, as applicable, (x) with respect to all price or trading volume determinations relating to the Common Stock, any day on which the Common Stock is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Stock, then on the principal securities exchange or securities market on which the Common Stock is then traded, provided that "Trading Day" shall not include any day on which the Common Stock is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Stock is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time) unless such day is otherwise designated as a Trading Day in writing by the Holder or (y) with respect to all determinations other than price determinations relating to the Common Stock, any day on which The New York Stock Exchange (or any successor thereto) is open for trading of securities.

(aa) "VWAP" means, for any security as of any date, the dollar volume-weighted average price for such security on the Principal Market (or, if the Principal Market is not the principal trading market for such security, then on the principal securities exchange or securities market on which such security is then traded), during the period beginning at 9:30 a.m., New York time, and ending at 4:00 p.m., New York time, as reported by Bloomberg through its "VAP" function (set to 09:30 start time and 16:00 end time) or, if the foregoing does not apply, the dollar volume-weighted average price of such security in the over-the-counter market on the electronic bulletin board for such security during the period beginning at 9:30 a.m., New York time, and ending at 4:00 p.m., New York time, as reported by Bloomberg, or, if no dollar volume-weighted average price is reported for such security by Bloomberg for such hours, the average of the highest closing bid price and the lowest closing ask price of any of the market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the VWAP cannot be calculated for such security on such date on any of the foregoing bases, the VWAP of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 15. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination, recapitalization or other similar transaction during such period.

[signature page follows]

IN WITNESS WHEREOF, the Company has caused this Warrant to Purchase Common Stock to be duly executed as of the Issuance Date set out above.

PACIFIC ETHANOL, INC.

By: /s/ Michael D. Kandris
Name: Michael D. Kandris
Title: President and CEO

EXHIBIT A

EXERCISE NOTICE

TO BE EXECUTED BY THE REGISTERED HOLDER TO EXERCISE THIS
WARRANT TO PURCHASE COMMON STOCK

PACIFIC ETHANOL, INC.

The undersigned holder hereby exercises the right to purchase _____ of the shares of Common Stock ("Warrant Shares") of Pacific Ethanol, Inc., a Delaware corporation (the "Company"), evidenced by Warrant to Purchase Common Stock No. A-1 (the "Warrant"). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

1. Form of Exercise Price. The Holder intends that payment of the Aggregate Exercise Price shall be made as:

- _____ a "Cash Exercise" with respect to _____ Warrant Shares; and/or
- _____ a "Cashless Exercise" with respect to _____ Warrant Shares.

In the event that the Holder has elected a Cashless Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder hereby represents and warrants that (i) this Exercise Notice was executed by the Holder at _____ [a.m.][p.m.] on the date set forth below and (ii) if applicable, the Bid Price as of such time of execution of this Exercise Notice was \$_____.

If this Exercise Notice is being delivered after the Alternate Exercise Eligibility Date, check here if Holder is electing to use the following Alternate Exercise Price in this exercise:_____.

2. Payment of Exercise Price. In the event that the Holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder shall pay the Aggregate Exercise Price in the sum of \$_____ to the Company in accordance with the terms of the Warrant.

3. Delivery of Warrant Shares. The Company shall deliver to Holder, or its designee or agent as specified below, _____ Warrant Shares in accordance with the terms of the Warrant. Delivery shall be made to Holder, or for its benefit, as follows:

Check here if requesting delivery as a certificate to the following name and to the following address:

Issue to: _____

Check here if requesting delivery by Deposit/Withdrawal at Custodian as follows:

DTC Participant: _____
DTC Number: _____
Account Number: _____

Date: _____,

Name of Registered Holder

By: _____

Name:
Title:

Tax ID: _____
Facsimile: _____
E-mail Address: _____

EXHIBIT B

ACKNOWLEDGMENT

The Company hereby acknowledges this Exercise Notice and hereby directs _____ to issue the above indicated number of shares of Common Stock in accordance with the Transfer Agent Instructions dated _____, 201_, from the Company and acknowledged and agreed to by _____.

PACIFIC ETHANOL, INC.

By: _____
Name: Michael D. Kandris
Title: President and CEO

REGISTRATION RIGHTS AGREEMENT

This **REGISTRATION RIGHTS AGREEMENT** (this “**Agreement**”), dated as of October 28, 2020, is by and among Pacific Ethanol, Inc., a Delaware corporation, with offices located at 400 Capitol Mall, Suite 2060, Sacramento, California (the “**Company**”), and the undersigned buyers (each, a “**Buyer**,” and collectively, the “**Buyers**”).

RECITALS

A. In connection with the Securities Purchase Agreement by and among the parties hereto, dated as of the date hereof (the “**Securities Purchase Agreement**”), the Company has agreed, upon the terms and subject to the conditions of the Securities Purchase Agreement, to issue and sell to each Buyer the Warrants (as defined in the Securities Purchase Agreement) which will be exercisable into Warrant Shares (as defined in the Securities Purchase Agreement) in accordance with the terms of the Warrants.

B. To induce the Buyers to consummate the transactions contemplated by the Securities Purchase Agreement, the Company has agreed to provide certain registration rights under the Securities Act of 1933, as amended, and the rules and regulations thereunder, or any similar successor statute (collectively, the “**1933 Act**”), and applicable state securities laws.

AGREEMENT

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and each of the Buyers hereby agree as follows:

1. Definitions.

Capitalized terms used herein and not otherwise defined herein shall have the respective meanings set forth in the Securities Purchase Agreement. As used in this Agreement, the following terms shall have the following meanings:

(a) “**Business Day**” means any day other than Saturday, Sunday or any other day on which commercial banks in New York, New York are authorized or required by law to remain closed.

(b) “**Closing Date**” shall have the meaning set forth in the Securities Purchase Agreement.

(c) “**Effective Date**” means the date that the applicable Registration Statement has been declared effective by the SEC.

(d) “**Effectiveness Deadline**” means (i) with respect to the initial Registration Statement required to be filed pursuant to Section 2(a), the earlier of the (A) 60th calendar day after the Closing Date (or the 90th calendar day after the Closing Date if such Registration Statement is subject to a full review by the SEC) and (B) 2nd Business Day after the date the Company is notified (orally or in writing, whichever is earlier) by the SEC that such Registration Statement will not be reviewed or will not be subject to further review, and effectiveness may be immediately accelerated and (ii) with respect to any additional Registration Statements that may be required to be filed by the Company pursuant to this Agreement, the earlier of the (A) 60th calendar day following the date on which the Company was required to file such additional Registration Statement (or the 90th calendar day following the date on which the Company was required to file such additional Registration Statement if such additional Registration Statement is subject to a full review by the SEC) and (B) 2nd Business Day after the date the Company is notified (orally or in writing, whichever is earlier) by the SEC that such Registration Statement will not be reviewed or will not be subject to further review, and effectiveness may be immediately accelerated.

(e) “**Filing Deadline**” means (i) with respect to the initial Registration Statement required to be filed pursuant to Section 2(a), the 30th calendar day after the Closing Date and (ii) with respect to any additional Registration Statements that may be required to be filed by the Company pursuant to this Agreement, the date on which the Company was required to file such additional Registration Statement pursuant to the terms of this Agreement.

(f) “**Investor**” means a Buyer or any transferee or assignee of any Registrable Securities or Warrants, as applicable, to whom a Buyer assigns its rights under this Agreement and who agrees to become bound by the provisions of this Agreement in accordance with Section 9 and any transferee or assignee thereof to whom a transferee or assignee of any Registrable Securities or Warrants, as applicable, assigns its rights under this Agreement and who agrees to become bound by the provisions of this Agreement in accordance with Section 9.

(g) “**Person**” means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization or a government or any department or agency thereof.

(h) “**register**,” “**registered**,” and “**registration**” refer to a registration effected by preparing and filing one or more Registration Statements in compliance with the 1933 Act and pursuant to Rule 415 and the declaration of effectiveness of such Registration Statement(s) by the SEC.

(i) “**Registrable Securities**” means (i) the Warrant Shares, and (ii) any capital stock of the Company issued or issuable with respect to the Warrant Shares or the Warrants, including, without limitation, (1) as a result of any stock split, stock dividend, recapitalization, exchange or similar event or otherwise and (2) shares of capital stock of the Company into which the shares of Common Stock (as defined in the Warrants) are converted or exchanged and shares of capital stock of a Successor Entity (as defined in the Warrants) into which the shares of Common Stock are converted or exchanged, in each case, without regard to any limitations on exercise of the Warrants.

(j) “**Registration Statement**” means a registration statement or registration statements of the Company filed under the 1933 Act covering Registrable Securities.

(k) “**Required Holders**” means, as of any given time, the holders of a majority of the Registrable Securities as of such time (excluding any Registrable Securities held by the Company or any of its Subsidiaries as of such time).

(l) “**Required Registration Amount**” means 100% of the maximum number of Warrant Shares issuable upon exercise of the Warrants.

(m) “**Rule 144**” means Rule 144 promulgated by the SEC under the 1933 Act, as such rule may be amended from time to time, or any other similar or successor rule or regulation of the SEC that may at any time permit the Investors to sell securities of the Company to the public without registration.

(n) “**Rule 415**” means Rule 415 promulgated by the SEC under the 1933 Act, as such rule may be amended from time to time, or any other similar or successor rule or regulation of the SEC providing for offering securities on a continuous or delayed basis.

(o) "SEC" means the United States Securities and Exchange Commission or any successor thereto.

2. Registration.

(a) Mandatory Registration. The Company shall prepare and, as soon as practicable, but in no event later than the Filing Deadline, file with the SEC an initial Registration Statement on Form S-3 covering the resale of all of the Registrable Securities, provided that such initial Registration Statement shall register for resale at least the number of shares of Common Stock equal to the Required Registration Amount as of the date such Registration Statement is initially filed with the SEC; provided further that if Form S-3 is unavailable for such a registration, the Company shall use such other form as is required by Section 2(c). Such initial Registration Statement, and each other Registration Statement required to be filed pursuant to the terms of this Agreement, shall contain (except if otherwise directed by the Required Holders or as required by applicable law, rule or regulation) the "Selling Stockholders" and "Plan of Distribution" sections in substantially the forms attached hereto as **Exhibit A**. The Company shall use its best efforts to have such initial Registration Statement, and each other Registration Statement required to be filed pursuant to the terms of this Agreement, declared effective by the SEC as soon as practicable, but in no event later than the applicable Effectiveness Deadline for such Registration Statement.

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(b) Ineligibility to Use Form S-3. In the event that Form S-3 is not available for the registration of the resale of Registrable Securities hereunder, the Company shall (i) register the resale of the Registrable Securities on Form S-1 or another appropriate form reasonably acceptable to the Required Holders and (ii) undertake to register the resale of the Registrable Securities on Form S-3 as soon as such form is available, provided that the Company shall maintain the effectiveness of all Registration Statements then in effect until such time as a Registration Statement on Form S-3 covering the resale of all the Registrable Securities has been declared effective by the SEC and the prospectus contained therein is available for use.

(c) Sufficient Number of Shares Registered. In the event the number of shares available under any Registration Statement is insufficient to cover all of the Registrable Securities required to be covered by such Registration Statement or an Investor's allocated portion of the Registrable Securities pursuant to Section 2(h), the Company shall amend such Registration Statement (if permissible), or file with the SEC a new Registration Statement (on the short form available therefor, if applicable), or both, so as to cover at least the Required Registration Amount as of the Trading Day immediately preceding the date of the filing of such amendment or new Registration Statement, in each case, as soon as practicable, but in any event not later than thirty (30) days after the necessity therefor arises (but taking account of any Staff position with respect to the date on which the Staff will permit such amendment to the Registration Statement and/or such new Registration Statement (as the case may be) to be filed with the SEC). The Company shall use its best efforts to cause such amendment to such Registration Statement and/or such new Registration Statement (as the case may be) to become effective as soon as practicable following the filing thereof with the SEC, but in no event later than the applicable Effectiveness Deadline for such Registration Statement.

(d) Effect of Failure to Maintain Effectiveness of any Registration Statement. If the Company shall fail to satisfy any condition set forth in Rule 144(i)(2) (a "Current Public Information Failure") as a result of which any of the Investors are unable to sell Registrable Securities without restriction under Rule 144 (including, without limitation, volume restrictions), then, as partial relief for the damages to any holder by reason of any such delay in, or reduction of, its ability to sell the underlying shares of Common Stock (which remedy shall not be exclusive of any other remedies available at law or in equity, including, without limitation, specific performance), the Company shall pay to each holder of Registrable Securities relating to such Registration Statement an amount in cash equal to two percent (2%) of the amount, if any, by which the closing price of the Common Stock of the Company on the Principal Market or any successor market exceeds such Investor's exercise price under such Investor's Warrant, multiplied by the Warrant Shares then underlying such Investor's Warrant (1) on the date of such Current Public Information Failure, as applicable, and (2) on every thirty (30) day anniversary of a Current Public Information Failure until the earlier of (i) the date such Current Public Information Failure is cured and (ii) such time that such public information is no longer required pursuant to Rule 144 (in each case, pro rated for periods totaling less than thirty (30) days). The payments to which a holder of Registrable Securities shall be entitled pursuant to this Section 2(e) are referred to herein as "**Registration Delay Payments.**" Following the initial Registration Delay Payment for any particular event or failure (which shall be paid on the date of such event or failure, as set forth above), without limiting the foregoing, if an event or failure giving rise to the Registration Delay Payments is cured prior to any thirty (30) day anniversary of such event or failure, then such Registration Delay Payment shall be made on the third (3rd) Business Day after such cure. In the event the Company fails to make Registration Delay Payments in a timely manner in accordance with the foregoing, such Registration Delay Payments shall bear interest at the rate of one percent (1%) per month (prorated for partial months) until paid in full. Notwithstanding the foregoing, no Registration Delay Payments shall be owed to an Investor (with respect to any period during which all of such Investor's Registrable Securities may be sold by such Investor without restriction under Rule 144 (including, without limitation, volume restrictions) and without the need for current public information required by Rule 144(c)(1) (or Rule 144(i)(2), if applicable). Notwithstanding anything herein to the contrary, no Investor shall receive both a Registration Delay Payment and payment under Section 7(e) of the Securities Purchase Agreement as to any Notice Failure or Delivery Failure (as such terms are defined in the Securities Purchase Agreement) or in respect of the circumstances thereof.

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(e) Offering. Notwithstanding anything to the contrary contained in this Agreement, but subject to the payment of the Registration Delay Payments pursuant to Section 2(d), in the event the staff of the SEC (the "Staff") or the SEC seeks to characterize any offering pursuant to a Registration Statement filed pursuant to this Agreement as constituting an offering of securities by, or on behalf of, the Company, or in any other manner, such that the Staff or the SEC do not permit such Registration Statement to become effective and used for resales in a manner that does not constitute such an offering and that permits the continuous resale at the market by the Investors participating therein (or as otherwise may be acceptable to each Investor) without being named therein as an "underwriter," then the Company shall reduce the number of shares to be included in such Registration Statement by all Investors until such time as the Staff and the SEC shall so permit such Registration Statement to become effective as aforesaid. In making such reduction, the Company shall reduce the number of shares to be included by all Investors on a pro rata basis (based upon the number of Registrable Securities otherwise required to be included for each Investor) unless the inclusion of shares by a particular Investor or a particular set of Investors are resulting in the Staff or the SEC's "by or on behalf of the Company" offering position, in which event the shares held by such Investor or set of Investors shall be the only shares subject to reduction (and if by a set of Investors on a pro rata basis by such Investors or on such other basis as would result in the exclusion of the least number of shares by all such Investors); provided, that, with respect to such pro rata portion allocated to any Investor, such Investor may elect the allocation of such pro rata portion among the Registrable Securities of such Investor. In addition, in the event that the Staff or the SEC requires any Investor seeking to sell securities under a Registration Statement filed pursuant to this Agreement to be specifically identified as an "underwriter" in order to permit such Registration Statement to become effective, and such Investor does not consent to being so named as an underwriter in such Registration Statement, then, in each such case, the Company shall reduce the total number of Registrable Securities to be registered on behalf of such Investor, until such time as the Staff or the SEC does not require such identification or until such Investor accepts such identification and the manner thereof. Any reduction pursuant to this paragraph will first reduce all Registrable Securities other than those issued pursuant to the Securities Purchase Agreement. In the event of any reduction in Registrable Securities pursuant to this paragraph, an affected Investor shall have the right to require, upon delivery of a written request to the Company signed by such Investor, the Company to file a registration statement within thirty (30) days of such request (subject to any restrictions imposed by Rule 415 or required by the Staff or the SEC) for resale by such Investor in a manner acceptable to such Investor, and the Company shall following such request cause to be and keep effective such registration statement in the same manner as otherwise contemplated in this Agreement for registration statements hereunder, in each case until such time as: (i) all Registrable Securities held by such Investor have been registered and sold pursuant to an effective Registration Statement in a manner acceptable to such Investor or (ii) all Registrable Securities may be resold by such Investor without restriction (including, without limitation, volume limitations) pursuant to Rule 144 (taking account of any Staff position with respect to "affiliate" status) and without the need for current public information required by Rule 144(c)(1) (or Rule 144(i)(2), if applicable) or (iii) such Investor agrees to be named as an underwriter in any such Registration Statement in a manner acceptable to such Investor as to all Registrable Securities held by such Investor and that have not theretofore been included in a Registration Statement under this Agreement (it being understood that the special demand right under this sentence may be exercised by an Investor multiple times and with respect to limited amounts of Registrable Securities in order to permit the resale thereof by such Investor as contemplated above).

(f) Piggyback Registrations. Without limiting any obligation of the Company hereunder or under the Securities Purchase Agreement, if there is not an effective Registration Statement covering all of the Registrable Securities or the prospectus contained therein is not available for use and the Company shall determine to prepare and file with the SEC a registration statement or offering statement relating to an offering for its own account or the account of others under the 1933 Act of any of its equity securities (other than on Form S-4 or Form S-8 (each as promulgated under the 1933 Act) or their then equivalents relating to equity securities to be issued solely in connection with any acquisition of any entity or business or equity securities issuable in connection with the Company's stock option or other employee benefit plans), then the Company shall deliver to each Investor a written notice of such determination and, if within five (5) days after the date of the delivery of such notice, any such Investor shall so request in writing, the Company shall include in such registration statement or offering statement all or any part of such Registrable Securities such Investor requests to be registered; provided, however, the Company shall not be required to register any Registrable Securities pursuant to this Section 2(g) that are eligible for resale pursuant to Rule 144 without restriction (including, without limitation, volume restrictions) and without the need for current public information required by Rule 144(c)(1) (or Rule 144(i)(2), if applicable) or that are the subject of a then-effective Registration Statement.

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(g) Allocation of Registrable Securities. The initial number of Registrable Securities included in any Registration Statement and any increase in the number of Registrable Securities included therein shall be allocated pro rata among the Investors based on the number of Registrable Securities held by each Investor at the time such Registration Statement covering such initial number of Registrable Securities or increase thereof is declared effective by the SEC. In the event that an Investor sells or otherwise transfers any of such Investor's Registrable Securities, each transferee or assignee (as the case may be) that becomes an Investor shall be allocated a pro rata portion of the then-remaining number of Registrable Securities included in such Registration Statement for such transferor or assignee (as the case may be). Any shares of Common Stock included in a Registration Statement and which remain allocated to any Person which ceases to hold any Registrable Securities covered by such Registration Statement shall be allocated to the remaining Investors, pro rata based on the number of Registrable Securities then held by such Investors which are covered by such Registration Statement.

(h) No Inclusion of Other Securities. The Company shall in no event include any securities other than Registrable Securities on any Registration Statement filed in accordance herewith (except as contemplated in Section 2(f)) without the prior written consent of the Required Holders. Until the Applicable Date (as defined in the Securities Purchase Agreement), the Company shall not file any Registration Statement except with respect to the Registrable Securities, and except as otherwise permitted under the Securities Purchase Agreement.

3. Related Obligations.

The Company shall use its best efforts to effect the registration of the Registrable Securities in accordance with the intended method of disposition thereof, and, pursuant thereto, the Company shall have the following obligations:

(a) The Company shall promptly prepare and file with the SEC a Registration Statement with respect to all the Registrable Securities (but in no event later than the applicable Filing Deadline) and use its best efforts to cause such Registration Statement to become effective as soon as practicable after such filing (but in no event later than the Effectiveness Deadline). Subject to Allowable Grace Periods, the Company shall keep each Registration Statement effective (and the prospectus contained therein available for use) pursuant to Rule 415 for resales by the Investors on a delayed or continuous basis at then-prevailing market prices (and not fixed prices) at all times until the earlier of (i) the date as of which all of the Investors may sell all of the Registrable Securities required to be covered by such Registration Statement (disregarding any reduction pursuant to Section 2(f)) without restriction pursuant to Rule 144 (including, without limitation, volume restrictions) and without the need for current public information required by Rule 144(c)(1) (or Rule 144(i)(2), if applicable) or (ii) the date on which the Investors shall have sold all of the Registrable Securities covered by such Registration Statement (the "**Registration Period**"). Notwithstanding anything to the contrary contained in this Agreement, the Company shall ensure that, when filed and at all times while effective, each Registration Statement (including, without limitation, all amendments and supplements thereto) and the prospectus (including, without limitation, all amendments and supplements thereto) used in connection with such Registration Statement (1) shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein, or necessary to make the statements therein (in the case of prospectuses, in the light of the circumstances in which they were made) not misleading and (2) will disclose (whether directly or through incorporation by reference to other SEC filings to the extent permitted) all information required to be disclosed regarding the Company and its securities. The Company shall submit to the SEC, within one (1) Business Day after the later of the date that (i) the Company learns that no review of a particular Registration Statement will be made by the Staff or that the Staff has no further comments on a particular Registration Statement (as the case may be) and (ii) the consent of Legal Counsel is obtained pursuant to Section 3(c) (which consent shall be immediately sought), a request for acceleration of effectiveness of such Registration Statement to a time and date not later than twenty-four (24) hours after the submission of such request. The Company shall respond in writing to comments made by the SEC in respect of a Registration Statement as soon as practicable, but in no event later than fifteen (15) Business Days after the receipt of comments by or notice from the SEC that an amendment is required in order for a Registration Statement to be declared effective.

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(b) Subject to Section 3(r) of this Agreement, the Company shall prepare and file with the SEC such amendments (including, without limitation, post-effective amendments) and supplements to each Registration Statement and the prospectus used in connection with each such Registration Statement, which prospectus is to be filed pursuant to Rule 424 promulgated under the 1933 Act, as may be necessary to keep each such Registration Statement effective at all times during the Registration Period for such Registration Statement, and, during such period, comply with the provisions of the 1933 Act with respect to the disposition of all Registrable Securities of the Company required to be covered by such Registration Statement until such time as all of such Registrable Securities shall have been disposed of in accordance with the intended methods of disposition by the seller or sellers thereof as set forth in such Registration Statement; provided, however, by 8:30 a.m. (New York time) on the Business Day immediately following each Effective Date, the Company shall file with the SEC in accordance with Rule 424(b) under the 1933 Act the final prospectus to be used in connection with sales pursuant to the applicable Registration Statement (whether or not such a prospectus is technically required by such rule). In the case of amendments and supplements to any Registration Statement which are required to be filed pursuant to this Agreement (including, without limitation, pursuant to this Section 3(b)) by reason of the Company filing a report on Form 8-K, Form 10-Q or Form 10-K or any analogous report under the Securities Exchange Act of 1934, as amended (the "**1934 Act**"), the Company shall, if permitted under the applicable rules and regulations of the SEC, have incorporated such report by reference into such Registration Statement, if applicable, or shall file such amendments or supplements with the SEC on the same day on which the 1934 Act report is filed which created the requirement for the Company to amend or supplement such Registration Statement.

(c) The Company shall (A) permit Legal Counsel and legal counsel for each other Investor to review and comment upon (i) each Registration Statement at least five (5) Business Days prior to its filing with the SEC and (ii) all amendments and supplements to each Registration Statement (including, without limitation, the prospectus contained therein) (except for Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any similar or successor reports) within a reasonable number of days prior to their filing with the SEC, and (B) not file any Registration Statement or amendment or supplement thereto in a form to which Legal Counsel or any legal counsel for any other Investor reasonably objects. The Company shall not submit a request for acceleration of the effectiveness of a Registration Statement or any amendment or supplement thereto or to any prospectus contained therein without the prior consent of Legal Counsel, which consent shall not be unreasonably withheld. The Company shall promptly furnish to Legal Counsel and legal counsel for each other Investor, without charge, (i) copies of any correspondence from the SEC or the Staff to the Company or its representatives relating to each Registration Statement, provided that such correspondence shall not contain any material, non-public information regarding the Company or any of its Subsidiaries (as defined in the Securities Purchase Agreement), (ii) after the same is prepared and filed with the SEC, one (1) copy of each Registration Statement and any amendment(s) and supplement(s) thereto, including, without limitation, financial statements and schedules, all documents incorporated therein by reference,

if requested by an Investor, and all exhibits and (iii) upon the effectiveness of each Registration Statement, one (1) copy of the prospectus included in such Registration Statement and all amendments and supplements thereto. The Company shall reasonably cooperate with legal counsel for the Investor in performing the Company's obligations pursuant to this Section 3.

(d) The Company shall promptly furnish to each Investor whose Registrable Securities are included in any Registration Statement, without charge and promptly at the Investor's request, (i) after the same is prepared and filed with the SEC, at least one (1) copy of each Registration Statement and any amendment(s) and supplement(s) thereto, including, without limitation, financial statements and schedules, all documents incorporated therein by reference, if requested by an Investor, all exhibits and each preliminary prospectus, (ii) upon the effectiveness of each Registration Statement, ten (10) copies of the prospectus included in such Registration Statement and all amendments and supplements thereto (or such other number of copies as such Investor may reasonably request from time to time) and (iii) such other documents, including, without limitation, copies of any preliminary or final prospectus, as such Investor may reasonably request from time to time in order to facilitate the disposition of the Registrable Securities owned by such Investor.

(e) The Company shall use its best efforts to (i) register and qualify, unless an exemption from registration and qualification applies, the resale by Investors of the Registrable Securities covered by a Registration Statement under such other securities or "blue sky" laws of all applicable jurisdictions in the United States, (ii) prepare and file in those jurisdictions, such amendments (including, without limitation, post-effective amendments) and supplements to such registrations and qualifications as may be necessary to maintain the effectiveness thereof during the Registration Period, (iii) take such other actions as may be necessary to maintain such registrations and qualifications in effect at all times during the Registration Period, and (iv) take all other actions reasonably necessary or advisable to qualify the Registrable Securities for sale in such jurisdictions; provided, however, the Company shall not be required in connection therewith or as a condition thereto to (x) qualify to do business in any jurisdiction where it would not otherwise be required to qualify but for this Section 3(e), (y) subject itself to general taxation in any such jurisdiction, or (z) file a general consent to service of process in any such jurisdiction. The Company shall promptly notify Legal Counsel, legal counsel for each other Investor and each Investor who holds Registrable Securities of the receipt by the Company of any notification with respect to the suspension of the registration or qualification of any of the Registrable Securities for sale under the securities or "blue sky" laws of any jurisdiction in the United States or its receipt of actual notice of the initiation or threatening of any proceeding for such purpose.

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(f) The Company shall notify Legal Counsel, legal counsel for each other Investor and each Investor in writing of the happening of any event, as promptly as practicable after becoming aware of such event, as a result of which the prospectus included in a Registration Statement, as then in effect, may include an untrue statement of a material fact or omission to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading (provided that in no event shall such notice contain any material, non-public information regarding the Company or any of its Subsidiaries), and, subject to Section 3(r), promptly prepare a supplement or amendment to such Registration Statement and such prospectus contained therein to correct such untrue statement or omission and upon request deliver ten (10) copies of such supplement or amendment to Legal Counsel, legal counsel for each other Investor and each Investor (or such other number of copies as Legal Counsel, legal counsel for each other Investor or such Investor may reasonably request). The Company shall also promptly notify Legal Counsel, legal counsel for each other Investor and each Investor in writing (i) when a prospectus or any prospectus supplement or post-effective amendment has been filed, when a Registration Statement or any post-effective amendment has become effective (notification of such effectiveness shall be delivered to Legal Counsel, legal counsel for each other Investor and each Investor by facsimile or e-mail on the same day of such effectiveness and by overnight mail), and when the Company receives written notice from the SEC that a Registration Statement or any post-effective amendment will be reviewed by the SEC, (ii) of any request by the SEC for amendments or supplements to a Registration Statement or related prospectus or related information, (iii) of the Company's reasonable determination that a post-effective amendment to a Registration Statement would be appropriate; and (iv) of the receipt of any request by the SEC or any other federal or state governmental authority for any additional information relating to the Registration Statement or any amendment or supplement thereto or any related prospectus. The Company shall respond as promptly as practicable to any comments received from the SEC with respect to each Registration Statement or any amendment thereto (it being understood and agreed that the Company's response to any such comments shall be delivered to the SEC no later than fifteen (15) Business Days after the receipt thereof).

(g) The Company shall (i) use its best efforts to prevent the issuance of any stop order or other suspension of effectiveness of each Registration Statement or the use of any prospectus contained therein, or the suspension of the qualification, or the loss of an exemption from qualification, of any of the Registrable Securities for sale in any jurisdiction and, if such an order or suspension is issued, to obtain the withdrawal of such order or suspension at the earliest possible moment and (ii) notify Legal Counsel, legal counsel for each other Investor and each Investor who holds Registrable Securities of the issuance of such order and the resolution thereof or its receipt of actual notice of the initiation or threat of any proceeding for such purpose.

(h) If any Investor may be required under applicable securities law to be described in any Registration Statement as an underwriter and such Investor consents to so being named an underwriter, at the request of any Investor, the Company shall furnish to such Investor, on the date of the effectiveness of such Registration Statement and thereafter from time to time on such dates as an Investor may reasonably request (i) a letter, dated such date, from the Company's independent certified public accountants in form and substance as is customarily given by independent certified public accountants to underwriters in an underwritten public offering, addressed to the Investors, and (ii) an opinion, dated as of such date, of counsel representing the Company for purposes of such Registration Statement, in form, scope and substance as is customarily given in an underwritten public offering, addressed to the Investors.

(i) If any Investor may be required under applicable securities law to be described in any Registration Statement as an underwriter and such Investor consents to so being named an underwriter, upon the written request of such Investor, the Company shall make available for inspection by (i) such Investor, (ii) legal counsel for such Investor and (iii) one (1) firm of accountants or other agents retained by such Investor (collectively, the "Inspectors"), all pertinent financial and other records, and pertinent corporate documents and properties of the Company (collectively, the "Records"), as shall be reasonably deemed necessary by each Inspector, and cause the Company's officers, directors and employees to supply all information which any Inspector may reasonably request; provided, however, each Inspector shall agree in writing to hold in strict confidence and not to make any disclosure (except to such Investor) or use of any Record or other information which the Company's board of directors determines in good faith to be confidential, and of which determination the Inspectors are so notified, unless (1) the disclosure of such Records is necessary to avoid or correct a misstatement or omission in any Registration Statement or is otherwise required under the 1933 Act, (2) the release of such Records is ordered pursuant to a final, non-appealable subpoena or order from a court or government body of competent jurisdiction, or (3) the information in such Records has been made generally available to the public other than by disclosure in violation of this Agreement or any other Transaction Document (as defined in the Securities Purchase Agreement). Such Investor agrees that it shall, upon learning that disclosure of such Records is sought in or by a court or governmental body of competent jurisdiction or through other means, give prompt notice to the Company and allow the Company, at its expense, to undertake appropriate action to prevent disclosure of, or to obtain a protective order for, the Records deemed confidential. Nothing herein (or in any other confidentiality agreement between the Company and such Investor, if any) shall be deemed to limit any Investor's ability to sell Registrable Securities in a manner which is otherwise consistent with applicable laws and regulations.

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(j) The Company shall hold in confidence and not make any disclosure of information concerning an Investor provided to the Company unless (i) disclosure of such information is necessary to comply with federal or state securities laws, (ii) the disclosure of such information is necessary to avoid or correct a misstatement or omission in any Registration Statement or is otherwise required to be disclosed in such Registration Statement pursuant to the 1933 Act, (iii) the release of such information is ordered pursuant to a subpoena or other final, non-appealable order from a court or governmental body of competent jurisdiction, or (iv) such information has been made generally available to the public other than by disclosure in violation of this Agreement or any other Transaction Document. The Company agrees that it shall, upon learning that disclosure of such

information concerning an Investor is sought in or by a court or governmental body of competent jurisdiction or through other means, give prompt written notice to such Investor and allow such Investor, at such Investor's expense, to undertake appropriate action to prevent disclosure of, or to obtain a protective order for, such information.

(k) Without limiting any obligation of the Company under the Securities Purchase Agreement, the Company shall use its best efforts either to (i) cause all of the Registrable Securities covered by each Registration Statement to be listed on each securities exchange on which securities of the same class or series issued by the Company are then listed, if any, if the listing of such Registrable Securities is then permitted under the rules of such exchange, (ii) secure designation and quotation of all of the Registrable Securities covered by each Registration Statement on an Eligible Market (as defined in the Securities Purchase Agreement), or (iii) if, despite the Company's best efforts to satisfy the preceding clauses (i) or (ii) the Company is unsuccessful in satisfying the preceding clauses (i) or (ii), without limiting the generality of the foregoing, to use its best efforts to arrange for at least two market makers to register with the Financial Industry Regulatory Authority ("FINRA") as such with respect to such Registrable Securities. In addition, the Company shall cooperate with each Investor and any broker or dealer through which any such Investor proposes to sell its Registrable Securities in effecting a filing with FINRA pursuant to FINRA Rule 5110 as requested by such Investor. The Company shall pay all fees and expenses in connection with satisfying its obligations under this Section 3(k).

(l) The Company shall cooperate with the Investors who hold Registrable Securities being offered and, to the extent applicable, facilitate the timely preparation and delivery of certificates (not bearing any restrictive legend) representing the Registrable Securities to be offered pursuant to a Registration Statement and enable such certificates to be in such denominations or amounts (as the case may be) as the Investors may reasonably request from time to time and registered in such names as the Investors may request.

(m) If requested by an Investor, the Company shall as soon as practicable after receipt of notice from such Investor and subject to Section 3(r) hereof, (i) incorporate in a prospectus supplement or post-effective amendment such information as an Investor reasonably requests to be included therein relating to the sale and distribution of Registrable Securities, including, without limitation, information with respect to the number of Registrable Securities being offered or sold, the purchase price being paid therefor and any other terms of the offering of the Registrable Securities to be sold in such offering; (ii) make all required filings of such prospectus supplement or post-effective amendment after being notified of the matters to be incorporated in such prospectus supplement or post-effective amendment; and (iii) supplement or make amendments to any Registration Statement or prospectus contained therein if reasonably requested by an Investor holding any Registrable Securities.

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(n) The Company shall use its best efforts to cause the Registrable Securities covered by a Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to consummate the disposition of such Registrable Securities.

(o) The Company shall make generally available to its security holders as soon as practical, but not later than ninety (90) days after the close of the period covered thereby, an earnings statement (in form complying with, and in the manner provided by, the provisions of Rule 158 under the 1933 Act) covering a twelve-month period beginning not later than the first day of the Company's fiscal quarter next following the applicable Effective Date of each Registration Statement.

(p) The Company shall otherwise use its best efforts to comply with all applicable rules and regulations of the SEC in connection with any registration hereunder.

(q) Within one (1) Business Day after a Registration Statement which covers Registrable Securities is declared effective by the SEC, the Company shall deliver, and shall cause legal counsel for the Company to deliver, to the transfer agent for such Registrable Securities (with copies to the Investors whose Registrable Securities are included in such Registration Statement) confirmation that such Registration Statement has been declared effective by the SEC.

(r) Notwithstanding anything to the contrary herein (but subject to the last sentence of this Section 3(r)), at any time after the Effective Date of a particular Registration Statement, the Company may delay the disclosure of material, non-public information concerning the Company or any of its Subsidiaries the disclosure of which at the time is not, in the good faith opinion of the board of directors of the Company, in the best interest of the Company and, in the opinion of counsel to the Company, otherwise required (a "Grace Period"), provided that the Company shall promptly notify the Investors in writing of the (i) existence of material, non-public information giving rise to a Grace Period (provided that in each such notice the Company shall not disclose the content of such material, non-public information to any of the Investors) and the date on which such Grace Period will begin and (ii) date on which such Grace Period ends, provided further that (I) no Grace Period shall exceed ten (10) consecutive days and during any three hundred sixty five (365) day period all such Grace Periods shall not exceed an aggregate of thirty (30) days, (II) the first day of any Grace Period must be at least five (5) Trading Days after the last day of any prior Grace Period and (III) no Grace Period may exist during the sixty (60) Trading Day period immediately following the Effective Date of such Registration Statement (provided that such sixty (60) Trading Day period shall be extended by the number of Trading Days during such period and any extension thereof contemplated by this proviso during which such Registration Statement is not effective or the prospectus contained therein is not available for use) (each, an "Allowable Grace Period"). For purposes of determining the length of a Grace Period above, such Grace Period shall begin on and include the date the Investors receive the notice referred to in clause (i) above and shall end on and include the later of the date the Investors receive the notice referred to in clause (ii) above and the date referred to in such notice. The provisions of Section 3(g) hereof shall not be applicable during the period of any Allowable Grace Period. Upon expiration of each Grace Period, the Company shall again be bound by the first sentence of Section 3(f) with respect to the information giving rise thereto unless such material, non-public information is no longer applicable. Notwithstanding anything to the contrary contained in this Section 3(r), the Company shall cause its transfer agent to deliver unlegended shares of Common Stock to a transferee of an Investor in accordance with the terms of the Securities Purchase Agreement in connection with any sale of Registrable Securities with respect to which such Investor has entered into a contract for sale, and delivered a copy of the prospectus included as part of the particular Registration Statement to the extent applicable, prior to such Investor's receipt of the notice of a Grace Period and for which the Investor has not yet settled.

(s) The Company shall take all other reasonable actions necessary to expedite and facilitate disposition by each Investors of its Registrable Securities pursuant to each Registration Statement.

(t) Neither the Company nor any Subsidiary or affiliate thereof shall identify any Investor as an underwriter in any public disclosure or filing with the SEC, the Principal Market or any Eligible Market without the Investor's consent and any Investor being deemed an underwriter by the SEC shall not relieve the Company of any obligations it has under this Agreement or any other Transaction Document (as defined in the Securities Purchase Agreement), except to the extent the Investor fails to so consent; provided, however, that the foregoing shall not prohibit the Company from including the disclosure found in the "Plan of Distribution" section attached hereto as Exhibit B in the Registration Statement.

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(u) Neither the Company nor any of its Subsidiaries has entered, as of the date hereof, nor shall the Company or any of its Subsidiaries, on or after the date of this Agreement, enter into any agreement with respect to its securities, that would have the effect of impairing the rights granted to the Investors in this Agreement or otherwise conflicts with the provisions hereof.

4. Obligations of the Investors.

(a) At least five (5) Business Days prior to the first anticipated filing date of each Registration Statement, the Company shall notify each Investor in writing of the

information the Company requires from each such Investor with respect to such Registration Statement. It shall be a condition precedent to the obligations of the Company to timely complete the registration pursuant to this Agreement with respect to the Registrable Securities of a particular Investor that such Investor shall promptly furnish to the Company such information regarding itself, the Registrable Securities held by it and the intended method of disposition of the Registrable Securities held by it, as shall be reasonably required to effect and maintain the effectiveness of the registration of such Registrable Securities and shall promptly execute such documents in connection with such registration as the Company may reasonably request.

(b) Each Investor, by such Investor's acceptance of the Registrable Securities, agrees to cooperate with the Company as reasonably requested by the Company in connection with the preparation and filing of each Registration Statement hereunder, unless such Investor has notified the Company in writing of such Investor's election to exclude all of such Investor's Registrable Securities from such Registration Statement.

(c) Each Investor agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 3(g) or the first sentence of 3(f), such Investor will immediately discontinue disposition of Registrable Securities pursuant to any Registration Statement(s) covering such Registrable Securities until such Investor's receipt of the copies of the supplemented or amended prospectus contemplated by Section 3(g) or the first sentence of Section 3(f) or receipt of notice that no supplement or amendment is required. Notwithstanding anything to the contrary in this Section 4(c), the Company shall cause its transfer agent to deliver unlegended shares of Common Stock to a transferee of an Investor in accordance with the terms of the Securities Purchase Agreement in connection with any sale of Registrable Securities with respect to which such Investor has entered into a contract for sale prior to the Investor's receipt of a notice from the Company of the happening of any event of the kind described in Section 3(g) or the first sentence of Section 3(f) and for which such Investor has not yet settled.

5. Expenses of Registration.

All reasonable expenses, other than underwriting discounts and commissions, incurred in connection with registrations, filings or qualifications pursuant to Sections 2 and 3, including, without limitation, all registration, listing and qualifications fees, printers and accounting fees, FINRA filing fees (if any) and fees and disbursements of counsel for the Company shall be paid by the Company. The Company shall reimburse Legal Counsel for its reasonable fees and disbursements in connection with registration and filing or qualification pursuant to Sections 2 and 3 of this Agreement which amount shall be limited to \$10,000 for each such registration and filing or qualification.

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6. Indemnification.

(a) To the fullest extent permitted by law, the Company will, and hereby does, indemnify, hold harmless and defend each Investor and each of its directors, officers, shareholders, members, partners, employees, agents, advisors, representatives (and any other Persons with a functionally equivalent role of a Person holding such titles notwithstanding the lack of such title or any other title) and each Person, if any, who controls such Investor within the meaning of the 1933 Act or the 1934 Act and each of the directors, officers, shareholders, members, partners, employees, agents, advisors, representatives (and any other Persons with a functionally equivalent role of a Person holding such titles notwithstanding the lack of such title or any other title) of such controlling Persons (each, an "**Indemnified Person**"), against any losses, obligations, claims, damages, liabilities, contingencies, judgments, fines, penalties, charges, costs (including, without limitation, court costs, reasonable attorneys' fees and costs of defense and investigation), amounts paid in settlement or expenses, joint or several, (collectively, "**Claims**") incurred in investigating, preparing or defending any action, claim, suit, inquiry, proceeding, investigation or appeal taken from the foregoing by or before any court or governmental, administrative or other regulatory agency, body or the SEC, whether pending or threatened, whether or not an Indemnified Person is or may be a party thereto ("**Indemnified Damages**"), to which any of them may become subject insofar as such Claims (or actions or proceedings, whether commenced or threatened, in respect thereof) arise out of or are based upon: (i) any untrue statement or alleged untrue statement of a material fact in a Registration Statement or any post-effective amendment thereto or in any filing made in connection with the qualification of the offering under the securities or other "blue sky" laws of any jurisdiction in which Registrable Securities are offered ("**Blue Sky Filing**"), or the omission or alleged omission to state a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) any untrue statement or alleged untrue statement of a material fact contained in any preliminary prospectus if used prior to the effective date of such Registration Statement and contained in the final prospectus (as amended or supplemented, if the Company files any amendment thereof or supplement thereto with the SEC) or the omission or alleged omission to state therein any material fact necessary to make the statements made therein, in light of the circumstances under which the statements therein were made, not misleading or (iii) any violation or alleged violation by the Company of the 1933 Act, the 1934 Act, any other law, including, without limitation, any state securities law, or any rule or regulation thereunder relating to the offer or sale of the Registrable Securities pursuant to a Registration Statement or (iv) any violation of this Agreement (the matters in the foregoing clauses (i) through (iv) being, collectively, "**Violations**"). Subject to Section 6(c), the Company shall reimburse the Indemnified Persons, promptly as such expenses are incurred and are due and payable, for any legal fees or other reasonable expenses incurred by them in connection with investigating or defending any such Claim. Notwithstanding anything to the contrary contained herein, the indemnification agreement contained in this Section 6(a): (i) shall not apply to a Claim by an Indemnified Person arising out of or based upon a Violation which occurs in reliance upon and in conformity with information furnished in writing to the Company by such Indemnified Person for such Indemnified Person expressly for use in connection with the preparation of such Registration Statement or any such amendment thereof or supplement thereto, if such prospectus was timely made available by the Company pursuant to Section 3(d); and (ii) shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of the Company, which consent shall not be unreasonably withheld or delayed. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of the Indemnified Person and shall survive the transfer of any of the Registrable Securities by any of the Investors pursuant to Section 9.

(b) In connection with any Registration Statement in which an Investor is participating, such Investor agrees to severally and not jointly indemnify, hold harmless and defend, to the same extent and in the same manner as is set forth in Section 6(a), the Company, each of its directors, each of its officers who signs the Registration Statement and each Person, if any, who controls the Company within the meaning of the 1933 Act or the 1934 Act (each, an "**Indemnified Party**"), against any Claim or Indemnified Damages to which any of them may become subject, under the 1933 Act, the 1934 Act or otherwise, insofar as such Claim or Indemnified Damages arise out of or are based upon any Violation, in each case, to the extent, and only to the extent, that such Violation occurs in reliance upon and in conformity with written information furnished to the Company by such Investor expressly for use in connection with such Registration Statement; and, subject to Section 6(c) and the below provisos in this Section 6(b), such Investor will reimburse an Indemnified Party any legal or other expenses reasonably incurred by such Indemnified Party in connection with investigating or defending any such Claim; provided, however, the indemnity agreement contained in this Section 6(b) and the agreement with respect to contribution contained in Section 7 shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of such Investor, which consent shall not be unreasonably withheld or delayed, provided further that such Investor shall be liable under this Section 6(b) for only that amount of a Claim or Indemnified Damages as does not exceed the net proceeds to such Investor as a result of the applicable sale of Registrable Securities pursuant to such Registration Statement. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Indemnified Party and shall survive the transfer of any of the Registrable Securities by any of the Investors pursuant to Section 9.

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(c) Promptly after receipt by an Indemnified Person or Indemnified Party (as the case may be) under this Section 6 of notice of the commencement of any action or proceeding (including, without limitation, any governmental action or proceeding) involving a Claim, such Indemnified Person or Indemnified Party (as the case may be) shall, if a Claim in respect thereof is to be made against any indemnifying party under this Section 6, deliver to the indemnifying party a written notice of the commencement thereof, and the indemnifying party shall have the right to participate in, and, to the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume control of the defense thereof with counsel mutually satisfactory to the indemnifying party and the Indemnified Person or the Indemnified Party (as the case may be);

provided, however, an Indemnified Person or Indemnified Party (as the case may be) shall have the right to retain its own counsel with the fees and expenses of such counsel to be paid by the indemnifying party if: (i) the indemnifying party has agreed in writing to pay such fees and expenses; (ii) the indemnifying party shall have failed promptly to assume the defense of such Claim and to employ counsel reasonably satisfactory to such Indemnified Person or Indemnified Party (as the case may be) in any such Claim; or (iii) the named parties to any such Claim (including, without limitation, any impleaded parties) include both such Indemnified Person or Indemnified Party (as the case may be) and the indemnifying party, and such Indemnified Person or such Indemnified Party (as the case may be) shall have been advised by counsel that a conflict of interest is likely to exist if the same counsel were to represent such Indemnified Person or such Indemnified Party and the indemnifying party (in which case, if such Indemnified Person or such Indemnified Party (as the case may be) notifies the indemnifying party in writing that it elects to employ separate counsel at the expense of the indemnifying party, then the indemnifying party shall not have the right to assume the defense thereof and such counsel shall be at the expense of the indemnifying party, provided further that in the case of clause (iii) above the indemnifying party shall not be responsible for the reasonable fees and expenses of more than one (1) separate legal counsel for such Indemnified Person or Indemnified Party (as the case may be). The Indemnified Party or Indemnified Person (as the case may be) shall reasonably cooperate with the indemnifying party in connection with any negotiation or defense of any such action or Claim by the indemnifying party and shall furnish to the indemnifying party all information reasonably available to the Indemnified Party or Indemnified Person (as the case may be) which relates to such action or Claim. The indemnifying party shall keep the Indemnified Party or Indemnified Person (as the case may be) reasonably apprised at all times as to the status of the defense or any settlement negotiations with respect thereto. No indemnifying party shall be liable for any settlement of any action, claim or proceeding effected without its prior written consent; provided, however, the indemnifying party shall not unreasonably withhold, delay or condition its consent. No indemnifying party shall, without the prior written consent of the Indemnified Party or Indemnified Person (as the case may be), consent to entry of any judgment or enter into any settlement or other compromise which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such Indemnified Party or Indemnified Person (as the case may be) of a release from all liability in respect to such Claim or litigation, and such settlement shall not include any admission as to fault on the part of the Indemnified Party. Following indemnification as provided for hereunder, the indemnifying party shall be subrogated to all rights of the Indemnified Party or Indemnified Person (as the case may be) with respect to all third parties, firms or corporations relating to the matter for which indemnification has been made. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action shall not relieve such indemnifying party of any liability to the Indemnified Person or Indemnified Party (as the case may be) under this Section 6, except to the extent that the indemnifying party is materially and adversely prejudiced in its ability to defend such action.

(d) The indemnification required by this Section 6 shall be made by periodic payments of the amount thereof during the course of the investigation or defense, as and when bills are received or Indemnified Damages are incurred.

(e) The indemnity and contribution agreements contained herein shall be in addition to (i) any cause of action or similar right of the Indemnified Party or Indemnified Person against the indemnifying party or others, and (ii) any liabilities the indemnifying party may be subject to pursuant to the law.

7. Contribution.

To the extent any indemnification by an indemnifying party is prohibited or limited by law, the indemnifying party agrees to make the maximum contribution with respect to any amounts for which it would otherwise be liable under Section 6 to the fullest extent permitted by law; provided, however: (i) no contribution shall be made under circumstances where the maker would not have been liable for indemnification under the fault standards set forth in Section 6 of this Agreement, (ii) no Person involved in the sale of Registrable Securities which Person is guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the 1933 Act) in connection with such sale shall be entitled to contribution from any Person involved in such sale of Registrable Securities who was not guilty of fraudulent misrepresentation; and (iii) contribution by any seller of Registrable Securities shall be limited in amount to the amount of net proceeds received by such seller from the applicable sale of such Registrable Securities pursuant to such Registration Statement. Notwithstanding the provisions of this Section 7, no Investor shall be required to contribute, in the aggregate, any amount in excess of the amount by which the net proceeds actually received by such Investor from the applicable sale of the Registrable Securities subject to the Claim exceeds the amount of any damages that such Investor has otherwise been required to pay, or would otherwise be required to pay under Section 6(b), by reason of such untrue or alleged untrue statement or omission or alleged omission.

8. Reports Under the 1934 Act

With a view to making available to the Investors the benefits of Rule 144, the Company agrees to:

(a) make and keep public information available, as those terms are understood and defined in Rule 144;

(b) file with the SEC in a timely manner all reports and other documents required of the Company under the 1933 Act and the 1934 Act so long as the Company remains subject to such requirements (it being understood and agreed that nothing herein shall limit any obligations of the Company under the Securities Purchase Agreement) and the filing of such reports and other documents is required for the applicable provisions of Rule 144; and

(c) furnish to each Investor so long as such Investor owns Registrable Securities, promptly upon request, (i) a written statement by the Company, if true, that it has complied with the reporting, submission and posting requirements of Rule 144, the 1933 Act and the 1934 Act, (ii) a copy of the most recent annual or quarterly report of the Company and such other reports and documents so filed by the Company with the SEC if such reports are not publicly available via EDGAR, and (iii) such other information as may be reasonably requested to permit the Investors to sell such securities pursuant to Rule 144 without registration.

9. Assignment of Registration Rights.

All or any portion of the rights under this Agreement shall be automatically assignable by each Investor to any transferee or assignee (as the case may be) of all or any portion of such Investor's Registrable Securities or Warrants if: (i) such Investor agrees in writing with such transferee or assignee (as the case may be) to assign all or any portion of such rights, and a copy of such agreement is furnished to the Company within a reasonable time after such transfer or assignment (as the case may be); (ii) the Company is, within a reasonable time after such transfer or assignment (as the case may be), furnished with written notice of (a) the name and address of such transferee or assignee (as the case may be), and (b) the securities with respect to which such registration rights are being transferred or assigned (as the case may be); (iii) immediately following such transfer or assignment (as the case may be) the further disposition of such securities by such transferee or assignee (as the case may be) is restricted under the 1933 Act or applicable state securities laws if so required; (iv) at or before the time the Company receives the written notice contemplated by clause (ii) of this sentence such transferee or assignee (as the case may be) agrees in writing with the Company to be bound by all of the provisions contained herein; (v) such transfer or assignment (as the case may be) shall have been made in accordance with the applicable requirements of the Securities Purchase Agreement and the Warrants (as the case may be); and (vi) such transfer or assignment (as the case may be) shall have been conducted in accordance with all applicable federal and state securities laws.

10. Amendment of Registration Rights.

Provisions of this Agreement may be amended and the observance thereof may be waived (either generally or in a particular instance and either retroactively or prospectively), only with the written consent of the Company and the Required Holders; provided that any such amendment or waiver that complies with the foregoing, but that disproportionately, materially and adversely affects the rights and obligations of any Investor relative to the comparable rights and obligations of the other Investors shall require the prior written consent of such adversely affected Investor. Any amendment or waiver effected in accordance with this Section 10 shall be binding upon each Investor and the Company, provided that no such amendment shall be effective to the extent that it (1) applies to less than all of the holders of Registrable Securities or (2) imposes any obligation or liability on any Investor without such Investor's prior written consent (which may be granted or withheld in such Investor's sole discretion). No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party. No consideration shall be offered or paid to any Person to amend or consent to a

11. Miscellaneous.

(a) Solely for purposes of this Agreement, a Person is deemed to be a holder of Registrable Securities whenever such Person owns, or is deemed to own, of record such Registrable Securities. If the Company receives conflicting instructions, notices or elections from two or more Persons with respect to the same Registrable Securities, the Company shall act upon the basis of instructions, notice or election received from such record owner of such Registrable Securities.

(b) Any notices, consents, waivers or other communications required or permitted to be given under the terms of this Agreement must be in writing and will be deemed to have been delivered: (i) upon receipt, when delivered personally; (ii) upon receipt, when sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party) or electronic mail (provided that such sent email is kept on file (whether electronically or otherwise) by the sending party and the sending party does not receive an automatically generated message from the recipient's email server that such e-mail could not be delivered to such recipient); or (iii) one (1) Business Day after deposit with a nationally recognized overnight delivery service with next day delivery specified, in each case, properly addressed to the party to receive the same. The addresses, facsimile numbers and email addresses for such communications shall be:

If to the Company:

Pacific Ethanol, Inc.
400 Capitol Mall, Suite 2060
Sacramento, California 95814
Telephone: (916) 403-2123

Attention: Chief Executive Officer With a copy (for informational purposes only) to:

Troutman Pepper Hamilton Sanders LLP
5 Park Plaza, Suite 1400
Irvine, California 92614
Telephone: (949) 622-2700
Attention: Larry A. Cerutti, Esq.
Email: Larry.Cerutti@Troutman.com

If to the Transfer Agent:

American Stock Transfer & Trust Company, LLC
6201 15th Avenue
Brooklyn, New York 11219
Telephone: (212) 936-5100
Facsimile: (718) 765-8719

Attention: Felix Orihuela and William Torre If to a Buyer, to its address, facsimile number and/or email address set forth on the Schedule of Buyers attached to the Securities Purchase Agreement, with copies to such Buyer's representatives as set forth on the Schedule of Buyers, or to such other address, facsimile number, and/or email address and/or to the attention of such other Person as the recipient party has specified by written notice given to each other party five (5) days prior to the effectiveness of such change

(c) Failure of any party to exercise any right or remedy under this Agreement or otherwise, or delay by a party in exercising such right or remedy, shall not operate as a waiver thereof. The Company and each Investor acknowledge and agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that each party hereto shall be entitled to an injunction or injunctions to prevent or cure breaches of the provisions of this Agreement by any other party hereto and to enforce specifically the terms and provisions hereof (without the necessity of showing economic loss and without any bond or other security being required), this being in addition to any other remedy to which any party may be entitled by law or equity.

(d) All questions concerning the construction, validity, enforcement and interpretation of this Agreement shall be governed by the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to such party at the address for such notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION HEREWITH OR ARISING OUT OF THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY.

(e) If any provision of this Agreement is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Agreement so long as this Agreement as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

(f) This Agreement, the other Transaction Documents, the schedules and exhibits attached hereto and thereto and the instruments referenced herein and therein constitute the entire agreement among the parties hereto and thereto solely with respect to the subject matter hereof and thereof. There are no restrictions, promises, warranties or undertakings, other than those set forth or referred to herein and therein. This Agreement, the other Transaction Documents, the schedules and exhibits attached hereto and thereto and the instruments referenced herein and therein supersede all prior agreements and understandings among the parties hereto solely with respect to the subject matter

hereof and thereof; provided, however, nothing contained in this Agreement or any other Transaction Document shall (or shall be deemed to) (i) have any effect on any agreements any Investor has entered into with the Company or any of its Subsidiaries prior to the date hereof with respect to any prior investment made by such Investor in the Company, (ii) waive, alter, modify or amend in any respect any obligations of the Company or any of its Subsidiaries or any rights of or benefits to any Investor or any other Person in any agreement entered into prior to the date hereof between or among the Company and/or any of its Subsidiaries and any Investor and all such agreements shall continue in full force and effect or (iii) limit any obligations of the Company under any of the other Transaction Documents.

(g) Subject to compliance with Section 9 (if applicable), this Agreement shall inure to the benefit of and be binding upon the permitted successors and assigns of each of the parties hereto. This Agreement is not for the benefit of, nor may any provision hereof be enforced by, any Person, other than the parties hereto, their respective permitted successors and assigns and the Persons referred to in Sections 6 and 7 hereof.

(h) The headings in this Agreement are for convenience of reference only and shall not limit or otherwise affect the meaning hereof. Unless the context clearly indicates otherwise, each pronoun herein shall be deemed to include the masculine, feminine, neuter, singular and plural forms thereof. The terms "including," "includes," "include" and words of like import shall be construed broadly as if followed by the words "without limitation." The terms "herein," "hereunder," "hereof" and words of like import refer to this entire Agreement instead of just the provision in which they are found.

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(i) This Agreement may be executed in two or more identical counterparts, each of which shall be deemed an original, but all of which shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party. In the event that any signature is delivered by facsimile transmission or by an email which contains a portable document format (.pdf) file of an executed signature page, such signature page shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such signature page were an original thereof.

(j) Each party shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents as any other party may reasonably request in order to carry out the intent and accomplish the purposes of this Agreement and the consummation of the transactions contemplated hereby.

(k) The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent and no rules of strict construction will be applied against any party. Notwithstanding anything to the contrary set forth in Section 10, terms used in this Agreement but defined in the other Transaction Documents shall have the meanings ascribed to such terms on the Closing Date in such other Transaction Documents unless otherwise consented to in writing by each Investor.

(l) All consents and other determinations required to be made by the Investors pursuant to this Agreement shall be made, unless otherwise specified in this Agreement, by the Required Holders, determined as if all of the outstanding Warrants then held by the Investors have been converted for Registrable Securities without regard to any limitations on redemption, amortization and/or Warrant of the Warrants then held by Investors.

(m) This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns, and is not for the benefit of, nor may any provision hereof be enforced by, any other Person.

(n) The obligations of each Investor under this Agreement and the other Transaction Documents are several and not joint with the obligations of any other Investor, and no Investor shall be responsible in any way for the performance of the obligations of any other Investor under this Agreement or any other Transaction Document. Nothing contained herein or in any other Transaction Document, and no action taken by any Investor pursuant hereto or thereto, shall be deemed to constitute the Investors as, and the Company acknowledges that the Investors do not so constitute, a partnership, an association, a joint venture or any other kind of group or entity, or create a presumption that the Investors are in any way acting in concert or as a group or entity with respect to such obligations or the transactions contemplated by the Transaction Documents or any matters, and the Company acknowledges that the Investors are not acting in concert or as a group, and the Company shall not assert any such claim, with respect to such obligations or the transactions contemplated by this Agreement or any of the other the Transaction Documents. Each Investor shall be entitled to independently protect and enforce its rights, including, without limitation, the rights arising out of this Agreement or out of any other Transaction Documents, and it shall not be necessary for any other Investor to be joined as an additional party in any proceeding for such purpose. The use of a single agreement with respect to the obligations of the Company contained herein was solely in the control of the Company, not the action or decision of any Investor, and was done solely for the convenience of the Company and not because it was required or requested to do so by any Investor. It is expressly understood and agreed that each provision contained in this Agreement and in each other Transaction Document is between the Company and an Investor, solely, and not between the Company and the Investors collectively and not between and among Investors.

[signature page follows]

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IN WITNESS WHEREOF, each Buyer and the Company have caused their respective signature page to this Registration Rights Agreement to be duly executed as of the date first written above.

COMPANY:

PACIFIC ETHANOL, INC.

By: /s/ Bryon T. McGregor
Name: Bryon T. McGregor
Title: CFO

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IN WITNESS WHEREOF, each Buyer and the Company have caused their respective signature page to this Registration Rights Agreement to be duly executed as of the date first written above.

BUYERS:

CVI INVESTMENTS, INC.

By: Heights Capital Management, Inc., its authorized agent

By: /s/ Martin Kobinger
Name: Martin Kobinger
Title: Investment Manager

EXHIBIT A

SELLING STOCKHOLDERS

The shares of common stock being offered by the selling stockholders are those issuable to the selling stockholders upon exercise of the Warrants. For additional information regarding the issuance of the Warrants, see "Private Placement of Warrants" above. We are registering the shares of common stock in order to permit the selling stockholders to offer the shares for resale from time to time. Except for the ownership of the Warrants issued pursuant to the Securities Purchase Agreement [and a related offering], the selling stockholders have not had any material relationship with us within the past three years.

The table below lists the selling stockholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder) of the shares of common stock held by each of the selling stockholders. The second column lists the number of shares of common stock beneficially owned by the selling stockholders, based on their respective ownership of shares of common stock, as of _____, 2020, assuming exercise of the Warrants held by each such selling stockholder on that date but taking account of any limitations on exercise set forth therein.

The third column lists the shares of common stock being offered by this prospectus by the selling stockholders and does not take in account any limitations on exercise of the Warrants set forth therein.

In accordance with the terms of a registration rights agreement with the holders of the Warrants, this prospectus generally covers the resale of 100% of the maximum number of shares of common stock issued or issuable pursuant to the Warrants, determined as if the outstanding Warrants were exercised in full (without regard to any limitations on exercise contained therein solely for the purpose of such calculation). The fourth column assumes the sale of all of the shares offered by the selling stockholders pursuant to this prospectus.

Under the terms of the Warrants, a selling stockholder may not convert the Warrants to the extent (but only to the extent) such selling stockholder or any of its affiliates would beneficially own a number of shares of our common stock which would exceed [4.99/9.99]% of the outstanding shares of the Company. The number of shares in the second column reflects these limitations. The selling stockholders may sell all, some or none of their shares in this offering. See "Plan of Distribution."

<u>Name of Selling Stockholder</u>	<u>Number of Shares of Common Stock Owned Prior to Offering</u>	<u>Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus</u>	<u>Number of Shares of Common Stock of Owned After Offering</u>
CVI Investments, Inc. (1)			
(1) []			

PLAN OF DISTRIBUTION

We are registering the shares of common stock issuable upon Warrant of the Warrants to permit the resale of these shares of common stock by the holders of the Warrants from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock. We will bear all fees and expenses incident to our obligation to register the shares of common stock.

The selling stockholders may sell all or a portion of the shares of common stock held by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of common stock are sold through underwriters or broker-dealers, the selling stockholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of common stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions, pursuant to one or more of the following methods:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales made after the date the Registration Statement is declared effective by the SEC;

- broker-dealers may agree with a selling security holder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell shares of common stock under Rule 144 promulgated under the Securities Act of 1933, as amended, if available, rather than under this prospectus. In addition, the selling stockholders may transfer the shares of common stock by other means not described in this prospectus. If the selling stockholders effect such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholders or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the shares of common stock or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of common stock in the course of hedging in positions they assume. The selling stockholders may also sell shares of common stock short and deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also loan or pledge shares of common stock to broker-dealers that in turn may sell such shares.

The selling stockholders may pledge or grant a security interest in some or all of the Warrants or shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending, if necessary, the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer and donate the shares of common stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

To the extent required by the Securities Act and the rules and regulations thereunder, the selling stockholders and any broker-dealer participating in the distribution of the shares of common stock may be deemed to be “underwriters” within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of common stock is made, a prospectus supplement, if required, will be distributed, which will set forth the aggregate amount of shares of common stock being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling stockholders and any discounts, commissions or concessions allowed or re-allowed or paid to broker-dealers.

Under the securities laws of some states, the shares of common stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of common stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the registration statement, of which this prospectus forms a part.

The selling stockholders and any other person participating in such distribution will be subject to applicable provisions of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of common stock by the selling stockholders and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

We will pay all expenses of the registration of the shares of common stock pursuant to the registration rights agreement, estimated to be \$[] in total, including, without limitation, Securities and Exchange Commission filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, a selling stockholder will pay all underwriting discounts and selling commissions, if any. We will indemnify the selling stockholders against liabilities, including some liabilities under the Securities Act in accordance with the registration rights agreements or the selling stockholders will be entitled to contribution. We may be indemnified by the selling stockholders against civil liabilities, including liabilities under the Securities Act that may arise from any written information furnished to us by the selling stockholder specifically for use in this prospectus, in accordance with the related registration rights agreements or we may be entitled to contribution.

Once sold under the registration statement, of which this prospectus forms a part, the shares of common stock will be freely tradable in the hands of persons other than our affiliates.

SUBSIDIARIES OF THE REGISTRANT

Subsidiary Name*State or Jurisdiction of
Incorporation or Organization

Kinergy Marketing LLC	Oregon
Alto Nutrients, LLC	California
Alto Specialty Products, LLC	Delaware
Alto Op Co.	Delaware
Alto West, LLC	Delaware
Alto Columbia, LLC	Delaware
Pacific Ethanol Madera LLC	Delaware
Alto Magic Valley, LLC	Delaware
Pacific Ethanol Stockton LLC	Delaware
Alto Central, LLC	Delaware
Alto Canton, LLC	Delaware
Alto Pekin, LLC	Delaware
Alto ICP, LLC	Delaware

* All subsidiaries are directly or indirectly wholly-owned by the Registrant unless otherwise specified by footnote.

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in Registration Statements (Nos. 333-169002, 333-176540, 333-185884, 333-189478, 333-196876, 333-212070, 333-225622, 333-234613 and 333-250180) on Form S-8 and (No. 333-238939 and 333-250821) on Form S-3 and (No. 333-201879) on Form S-4 and (No. 333-235990) on Form S-1 of Alto Ingredients, Inc. of our report dated March 26, 2021, relating to the consolidated financial statements of Alto Ingredients, Inc., appearing in this Annual Report on Form 10-K of Alto Ingredients, Inc. for the year ended December 31, 2020.

/s/ RSM US LLP

Rochester, Minnesota
March 26, 2021

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Michael D. Kandris, certify that:

1. I have reviewed this Annual Report on Form 10-K of Alto Ingredients, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Michael D. Kandris

Michael D. Kandris
President and Chief Executive Officer
(Principal Executive Officer)

Date: March 26, 2021

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Bryon T. McGregor, certify that:

1. I have reviewed this Annual Report on Form 10-K of Alto Ingredients, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Bryon T. McGregor
Bryon T. McGregor
Chief Financial Officer
(Principal Financial Officer)

Date: March 26, 2021

**CERTIFICATION OF
CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of Alto Ingredients, Inc. (the "Company") for the period ended December 31, 2020 (the "Report"), the undersigned hereby certify in their capacities as Chief Executive Officer and Chief Financial Officer of the Company, respectively, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 26, 2021

By: /s/ Michael D. Kandris
Michael D. Kandris
President and Chief Executive Officer
(Principal Executive Officer)

Dated: March 26, 2021

By: /s/ Bryon T. McGregor
Bryon T. McGregor
Chief Financial Officer
(Principal Financial Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signatures that appear in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.