

PART I

Items 1 and 2. *Business and Properties*

General

Plains GP Holdings, L.P. (“PAGP”) is a Delaware limited partnership formed in July 2013 that has elected to be taxed as a corporation for United States federal income tax purposes. PAGP does not directly own any operating assets; as of December 31, 2018, its principal sources of cash flow are derived from an indirect investment in Plains All American Pipeline, L.P. (“PAA”), a publicly traded Delaware limited partnership. As used in this Form 10-K and unless the context indicates otherwise (taking into account the fact that PAGP has no operating activities apart from those conducted by PAA and its subsidiaries), the terms “Partnership,” “we,” “us,” “our,” “ours” and similar terms refer to PAGP and its subsidiaries.

Organizational History

We completed our initial public offering (“IPO”) in October 2013, and our Class A shares are publicly traded on the New York Stock Exchange under the ticker symbol “PAGP”. Immediately prior to completion of our IPO, certain owners of Plains AAP, L.P. (“AAP”) transferred a portion of their interests in AAP to us, resulting in our ownership of a limited partnership interest in AAP. As of December 31, 2018, we owned (i) a 100% managing member interest in Plains All American GP LLC (“GP LLC”), which has also elected to be taxed as a corporation for United States federal income tax purposes, and (ii) an approximate 57% limited partner interest in AAP through our direct ownership of approximately 158.5 million Class A units of AAP (“AAP units”) and indirect ownership of approximately 1.0 million AAP units through GP LLC. As of such date, the remaining limited partner interests in AAP were held by a group of owners that included many of the owners of AAP immediately prior to our IPO and various current and former members of management (collectively, the “Legacy Owners”).

GP LLC is a Delaware limited liability company that also holds the non-economic general partner interest in AAP. AAP is a Delaware limited partnership that, as of December 31, 2018, directly owned a limited partner interest in PAA through its ownership of approximately 280.5 million PAA common units (approximately 35% of PAA’s total outstanding common units and Series A preferred units combined (together, “PAA Common Unit Equivalents”). AAP is the sole member of PAA GP LLC (“PAA GP”), a Delaware limited liability company that directly holds the non-economic general partner interest in PAA. Our non-economic general partner interest is held by PAA GP Holdings LLC (“PAGP GP”), a Delaware limited liability company.

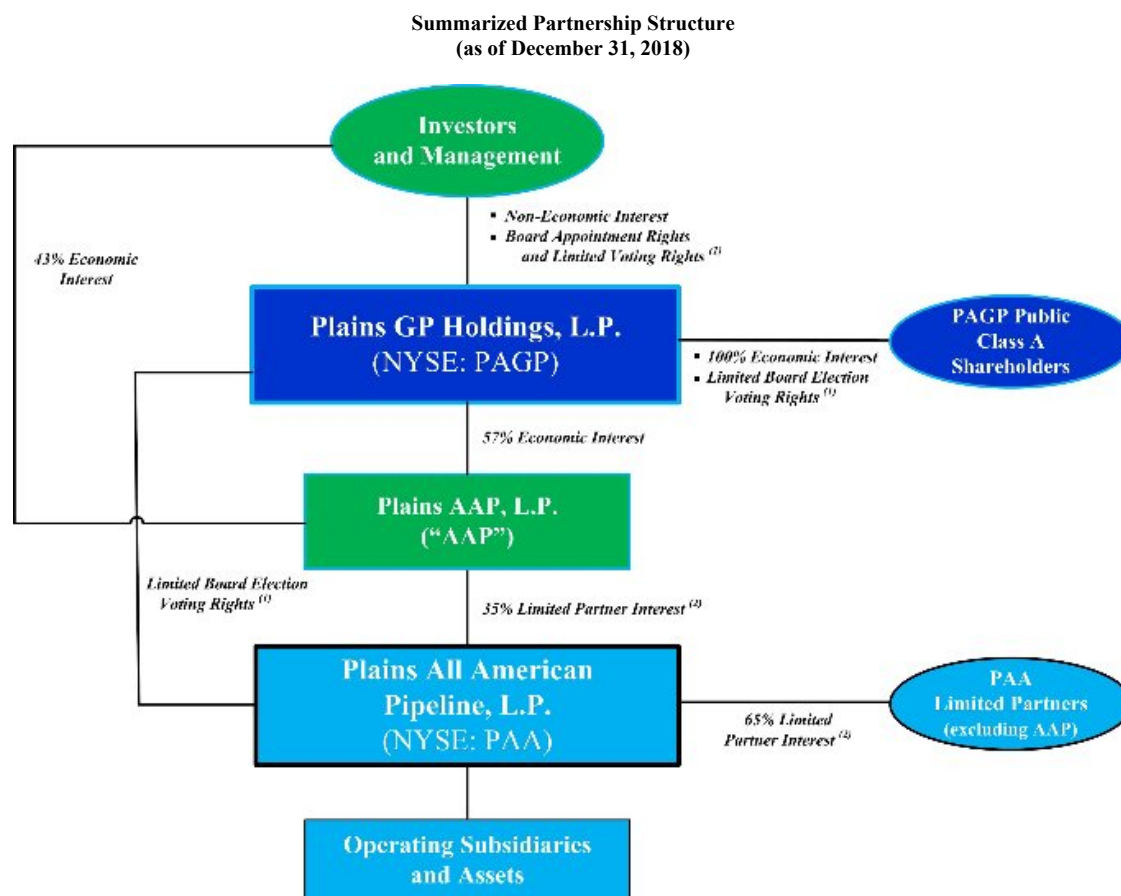
PAA is a publicly traded master limited partnership that owns and operates midstream energy infrastructure and provides logistics services primarily for crude oil, natural gas liquids (“NGL”) and natural gas. PAA owns an extensive network of pipeline transportation, terminalling, storage and gathering assets in key crude oil and NGL producing basins and transportation corridors and at major market hubs in the United States and Canada.

References to the “PAGP Entities” include PAGP GP, PAGP, GP LLC, AAP and PAA GP. References to the “Plains Entities” include the PAGP Entities and PAA and its subsidiaries.

Partnership Structure and Management

Our general partner manages our operations and activities and is responsible for exercising on our behalf any rights we have as the sole and managing member of GP LLC. The board of directors of our general partner (the “Board”) has ultimate responsibility for managing the business and affairs of AAP, PAA and us. GP LLC employs all domestic officers and personnel involved in the operation and management of PAA. PAA’s Canadian officers and personnel are employed by Plains Midstream Canada ULC (“PMC”). Our general partner does not receive a management fee or other compensation in connection with its management of our business.

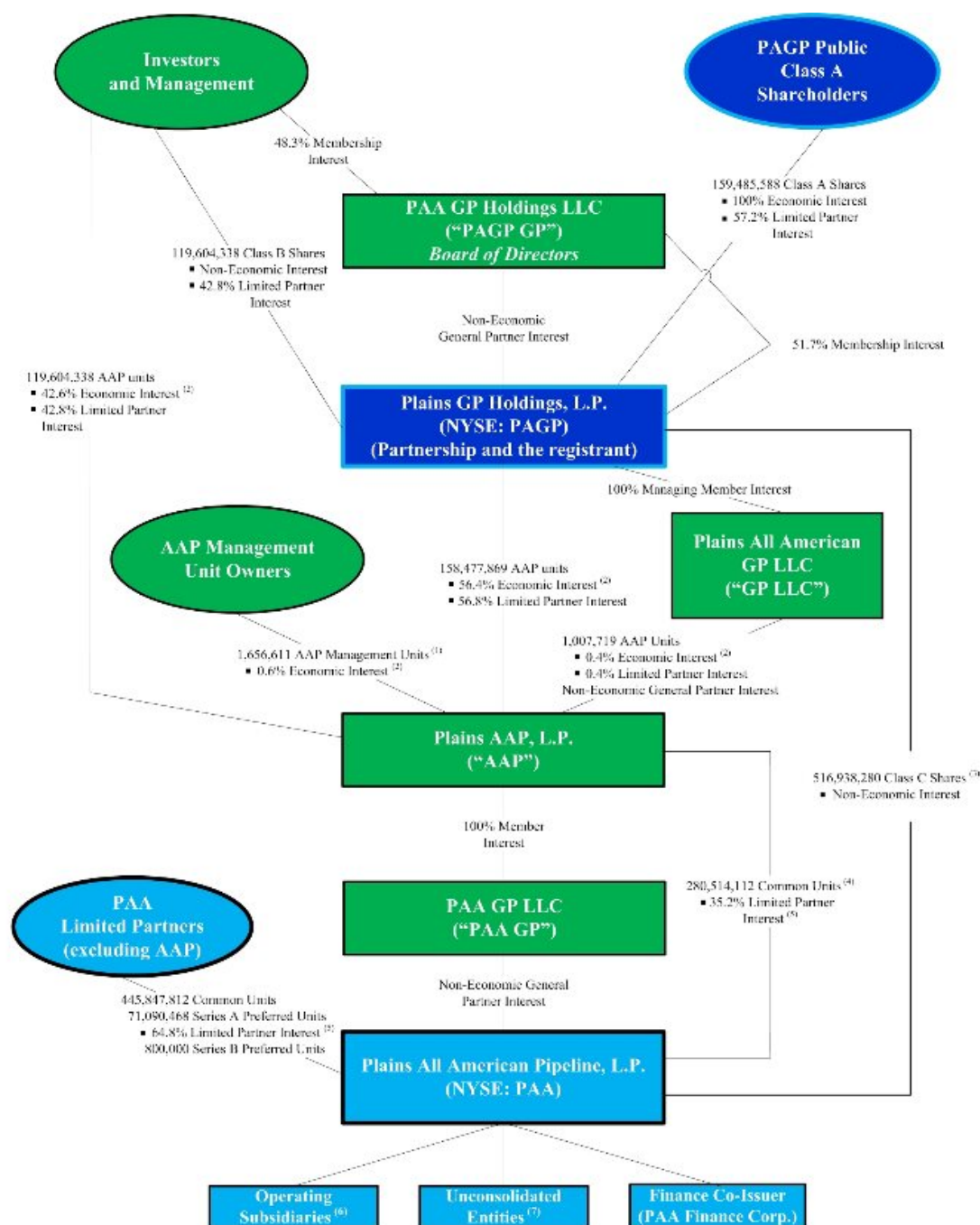
The two diagrams below show our organizational structure and ownership as of December 31, 2018 in both a summarized and more detailed format. The first diagram depicts our legal structure in summary format, while the second diagram depicts a more comprehensive view of such structure, including ownership and economic interests and shares and units outstanding:



(1) Through a “pass-through” voting right as a result of PAA’s ownership of our Class C shares, PAA’s common unitholders have the effective right to vote, pro rata with the holders of our Class A and Class B shares, for the election of eligible directors.

(2) Represents percentage ownership of PAA Common Unit Equivalents.

**Detailed Partnership Structure
(as of December 31, 2018)**



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- (1) Represents the number of AAP units for which the outstanding Class B units of AAP (referred to herein as the “AAP Management Units”) will be exchangeable, assuming the conversion of all such units at a rate of approximately 0.941 AAP units for each AAP Management Unit.
 - (2) Assumes conversion of all outstanding AAP Management Units into AAP units.
 - (3) Each Class C share represents a non-economic limited partner interest in us. Through a “pass-through” voting right as a result of PAA’s ownership of our Class C shares, PAA’s common unitholders have the effective right to vote, pro rata with the holders of our Class A and Class B shares, for the election of eligible directors.
 - (4) Amount does not include (i) 48,606 PAA common units that will become issuable to AAP that relate to AAP Management Units that were outstanding but not earned as of December 31, 2018 and (ii) 183,819 PAA common units that were issued to AAP in January 2019 in respect of AAP Management units that became earned effective December 31, 2018.
 - (5) Represents percentage ownership of PAA Common Unit Equivalents. PAA’s Series B preferred units are not convertible into common units and are not included in PAA Common Unit Equivalents.
 - (6) PAA holds direct and indirect ownership interests in consolidated operating subsidiaries including, but not limited to, Plains Marketing, L.P., Plains Pipeline, L.P. and PMC.
 - (7) PAA holds indirect equity interests in unconsolidated entities including Advantage Pipeline, L.L.C. (“Advantage”), BridgeTex Pipeline Company, LLC (“BridgeTex”), Cactus II Pipeline LLC (“Cactus II”), Caddo Pipeline LLC (“Caddo”), Cheyenne Pipeline LLC (“Cheyenne”), Diamond Pipeline LLC (“Diamond”), Eagle Ford Pipeline LLC (“Eagle Ford Pipeline”), Eagle Ford Terminals Corpus Christi LLC (“Eagle Ford Terminals”), Midway Pipeline LLC (“Midway Pipeline”), Saddlehorn Pipeline Company, LLC (“Saddlehorn”), Settoon Towing, LLC (“Settoon Towing”), STACK Pipeline LLC (“STACK”) and White Cliffs Pipeline, L.L.C. (“White Cliffs”).

Our Business

As of December 31, 2018, our only cash-generating assets consisted of approximately 159.5 million AAP units, which represented an approximate 57% limited partner and economic interest in AAP. Of these AAP units, we directly own approximately 158.5 million, and we indirectly own the remaining 1.0 million AAP units through our 100% ownership in GP LLC. Unless we directly acquire and hold assets or businesses in the future, our cash flows will be generated solely from the cash distributions we receive on the AAP units. AAP currently receives all of its cash flows from distributions on common units it owns in PAA. As of December 31, 2018, AAP owned approximately 280.5 million common units in PAA.

Accordingly, our primary business objective is to increase our cash available for distribution to our Class A shareholders through the execution by PAA of its business strategy. In addition, we may facilitate PAA’s growth activities through various means, including, but not limited to, making loans, purchasing equity interests or providing other forms of financial support to PAA.

We have and will maintain a one-to-one relationship between our Class A shares and the underlying PAA common units in which we have an indirect economic interest through our ownership interests in AAP and GP LLC (referred to as “Economic Parity”), such that the number of our outstanding Class A shares equals the number of AAP units we directly and indirectly own, which in turn equals the number of PAA common units held by AAP attributable to our direct and indirect ownership interest in AAP.

PAA’s Business Strategy

PAA’s principal business strategy is to provide competitive and efficient midstream transportation, terminalling, storage, processing, fractionation and supply and logistics services to producers, refiners and other customers. Toward this end, PAA endeavors to address regional supply and demand imbalances for crude oil and NGL in the United States and Canada by combining the strategic location and capabilities of its transportation, terminalling, storage, processing and fractionation assets with its supply, logistics and distribution expertise. We believe PAA’s successful execution of this strategy will enable it to generate sustainable earnings and cash flow. PAA intends to manage and grow its business by:

- running a safe, reliable, environmentally and socially responsible operation, which includes driving operational excellence, cost savings, asset optimization and improved efficiencies throughout the organization;

- developing and implementing growth projects that (i) address evolving crude oil and NGL needs in the midstream transportation and infrastructure sector and (ii) are well positioned to benefit from long-term industry trends and opportunities;
- using its transportation, terminalling, storage, processing and fractionation assets in conjunction with its supply and logistics activities to provide flexibility for customers, capture market opportunities, address physical market imbalances, mitigate inherent risks and increase margin; and
- selectively pursuing strategic and accretive acquisitions that complement its existing asset base and distribution capabilities.

PAA's Competitive Strengths

We believe that the following competitive strengths position PAA to successfully execute its principal business strategy:

- *Many of PAA's assets are strategically located and operationally flexible.* The majority of PAA's primary Transportation segment assets are in crude oil service, are located in well-established crude oil producing regions (with PAA's largest asset presence in the Permian Basin) and other transportation corridors and are connected, directly or indirectly, with PAA's Facilities segment assets. The majority of PAA's Facilities segment assets are located at major trading locations and premium markets that serve as gateways to major North American refinery and distribution markets where PAA has strong business relationships. In addition, PAA's assets include pipeline, rail, barge, truck and storage assets, which provide PAA's customers and PAA with significant flexibility and optionality to satisfy demand and balance markets, particularly during a dynamic period of changing product flows and recent developments with respect to rising crude oil exports.
- *PAA possesses specialized crude oil and NGL market knowledge.* We believe PAA's business relationships with participants in various phases of the crude oil and NGL distribution chain, from producers to refiners, as well as PAA's own industry expertise (including PAA's knowledge of North American crude oil and NGL flows), provide PAA with an extensive understanding of the North American physical crude oil and NGL markets.
- *PAA's supply and logistics activities typically generate a positive margin with the opportunity to realize incremental margins.* We believe the variety of activities executed within PAA's Supply and Logistics segment in combination with PAA's risk management strategies provides PAA with a low-risk opportunity to generate incremental margin, the amount of which may vary depending on market conditions (such as differentials and certain competitive factors).
- *PAA has the strategic and technical skills and the financial flexibility to continue to pursue acquisition and expansion opportunities, whether on its own or through joint ventures.* Since 1998, PAA has completed and integrated over 90 acquisitions with an aggregate purchase price of approximately \$13.2 billion . Since 1998, PAA has also implemented expansion capital projects totaling over \$14.4 billion . In addition, considering PAA's investment grade credit ratings at two of three agencies, liquidity and capital structure, PAA believes it has the financial resources and strength necessary to finance future strategic expansion, joint venture and acquisition opportunities. As of December 31, 2018 , PAA had approximately \$2.9 billion of liquidity available, including cash and cash equivalents and availability under its committed credit facilities, subject to continued covenant compliance.
- *PAA has an experienced management team whose interests are aligned with those of its unitholders.* PAA's executive management team has an average of 30 + years of industry experience, and an average of 16 years with PAA or its predecessors and affiliates. In addition, through their ownership of PAA common units and grants of phantom units and interests in us, PAA's management team has a vested interest in PAA's continued success.

Our Financial Strategy

Our financial strategy is designed to be complementary to PAA's financial and business strategies. Our only cash-generating assets consist of our direct and indirect limited partner interests in AAP, which currently receives all of its cash flows from distributions on the PAA common units it owns.

We have entered into an Omnibus Agreement with the Plains Entities which provides for (i) our ability to issue additional Class A shares and use the net proceeds therefrom to purchase a like number of AAP units from AAP, and the corresponding ability of AAP to use the net proceeds therefrom to purchase a like number of PAA common units from PAA and (ii) our ability to lend proceeds of any future indebtedness we incur to AAP, and AAP's corresponding ability to lend such proceeds to PAA, in each case on substantially the same terms as we incur.

Accordingly, we may access the equity capital markets from time to time to enhance the financial position of PAA and its ability to compete for incremental capital opportunities (including organic investments and third-party acquisitions) to drive future growth. We currently do not intend to incur any indebtedness in the near term. We would expect to fund direct acquisitions made by us, if any, with a combination of debt and equity.

PAA's Financial Strategy

Targeted Credit Profile

We believe that a major factor in PAA's continued success is its ability to maintain significant financial flexibility, a competitive cost of capital and access to the capital markets. In that regard, PAA intends to maintain a credit profile that it believes is consistent with investment grade credit ratings. PAA targets a credit profile with the following attributes:

- an average long-term debt-to-total capitalization ratio of approximately 50% or less;
- a long-term debt-to-Adjusted EBITDA multiple averaging between 3.5x and 4.0x, which has been the historical target range and is currently under internal review ("Adjusted EBITDA" is earnings before interest, taxes, depreciation and amortization (including our proportionate share of depreciation and amortization and gains and losses on significant asset sales by unconsolidated entities), gains and losses on asset sales and asset impairments, and gains on sales of investments in unconsolidated entities, adjusted for selected items that impact comparability. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations — Results of Operations — Non-GAAP Financial Measures" for a discussion of our selected items that impact comparability and our non-GAAP measures.);
- an average total debt-to-total capitalization ratio of approximately 60% or less; and
- an average Adjusted EBITDA-to-interest coverage multiple of approximately 3.3x or better.

The first two of these four metrics include long-term debt as a critical measure, but do not include certain components of PAA's capital structure such as short-term debt, preferred units and operating leases that may be considered by rating agencies in assigning their ratings. At December 31, 2018, PAA's publicly-traded senior notes comprised approximately 98% of its reported long-term debt. Additionally, PAA also routinely incurs short-term debt primarily in connection with its supply and logistics activities that involve the simultaneous purchase and forward sale of crude oil and NGL. The crude oil and NGL purchased in these transactions are hedged. These borrowings are self-liquidating as they are repaid with sales proceeds. PAA also incurs short-term debt to fund New York Mercantile Exchange ("NYMEX") and Intercontinental Exchange ("ICE") margin requirements. In certain market conditions, these routine short-term debt levels may increase above certain baseline levels. Similar to PAA's working capital borrowings, these borrowings are self-liquidating. PAA does not consider the working capital borrowings or margin requirements associated with these activities to be part of its long-term capital structure.

For PAA to maintain its targeted credit profile and achieve growth through acquisitions and expansion capital, PAA has historically targeted to fund approximately 55 % of the capital requirements associated with these activities with equity, cash flow in excess of distributions or proceeds from asset sales. However, in connection with PAA's leverage reduction plan, as discussed below, and in recognition of challenging financial markets, PAA has retained a larger amount of cash flow in excess of distributions, sold a meaningful amount of assets and refrained from accessing the equity capital markets. Additionally, from time to time, PAA may be outside the parameters of its targeted credit profile as, in certain cases, capital expenditures and acquisitions may be financed initially using debt or there may be delays in realizing anticipated synergies from acquisitions or contributions from expansion capital projects to Adjusted EBITDA.

PAA Leverage Reduction Plan

In August 2017, PAA announced that it was implementing an action plan to strengthen its balance sheet, reduce leverage, enhance its distribution coverage, minimize new issuances of common equity and position PAA for future distribution growth. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations —Executive Summary" for a summary of this action plan and the status of PAA's efforts to implement such plan.

PAA's Acquisitions

The acquisition of midstream assets and businesses that are strategic and complementary to PAA's existing operations constitutes an important component of its business strategy and growth objectives. Such assets and businesses include crude oil and NGL logistics assets as well as other energy assets that have characteristics and provide opportunities similar to its existing business lines and enable PAA to leverage its assets, knowledge and skill sets.

The following table summarizes acquisitions greater than \$200 million that PAA has completed over the past five years.

Acquisition	Date	Description	Approximate Purchase Price ⁽¹⁾ (in millions)
Alpha Crude Connector Gathering System	Feb-2017	Recently constructed gathering system located in the Northern Delaware Basin	\$ 1,215
Spectra Energy Partners Western Canada NGL Assets	Aug-2016	Integrated system of NGL assets located in Western Canada	\$ 204 ⁽²⁾
50% Interest in BridgeTex Pipeline Company, LLC ("BridgeTex")	Nov-2014	BridgeTex owns a crude oil pipeline that extends from Colorado City, Texas to East Houston	\$ 1,088 ⁽³⁾

(1) As applicable, the approximate purchase price includes total cash paid and debt assumed, including amounts for working capital and inventory.

(2) Approximate purchase price of \$180 million, net of cash, inventory and other working capital acquired.

(3) Approximate purchase price of \$1.075 billion, net of working capital acquired. In 2018, PAA sold a 30% interest in BridgeTex. See Note 9 to our Consolidated Financial Statements for more information. PAA accounts for its 20% interest in BridgeTex under the equity method of accounting.

PAA's Divestitures

In 2016, PAA initiated a program to evaluate potential sales of non-core assets and/or sales of partial interests in assets to strategic joint venture partners to optimize its asset portfolio and strengthen its balance sheet and leverage metrics. Through December 31, 2018, PAA has completed asset sales totaling approximately \$3.0 billion, of which approximately \$0.6 billion closed in 2016 (net of amounts paid for the remaining interest in a pipeline that was subsequently sold), approximately \$1.1 billion closed in 2017 and approximately \$1.3 billion closed in 2018. See Note 7 to our Consolidated Financial Statements for additional discussion of dispositions and divestitures.

Ongoing Acquisition, Divestiture and Investment Activities

Consistent with its business strategy, PAA is continuously engaged in the evaluation of potential acquisitions, joint ventures and capital projects. As a part of these efforts, PAA often engages in discussions with potential sellers or other parties regarding the possible purchase of or investment in assets and operations that are strategic and complementary to PAA's existing operations. In response to changing U.S. production profiles and increased competition for new build assets, over the last several years, PAA has increased its joint venture related activities in an effort to fully meet the current and future needs of its customers while also rationalizing assets and enhancing its investment returns. The vast majority of our joint ventures are accounted for as investments in unconsolidated subsidiaries. In addition, PAA has in the past evaluated and pursued, and intends in the future to evaluate and pursue, the acquisition of or investment in other energy-related assets that have characteristics and opportunities similar to PAA's existing business lines and enable PAA to leverage its assets, knowledge and skill sets. Such efforts may involve participation by PAA in processes that have been made public and involve a number of potential buyers or investors, commonly referred to as "auction" processes, as well as situations in which PAA believes it is the only party or one of a limited number of parties who are in negotiations with the potential seller or other party. These acquisition and investment efforts often involve assets which, if acquired or constructed, could have a material effect on PAA's financial condition and results of operations.

From time to time, PAA may also (i) sell assets that it regards as non-core or that it believes might be a better fit with the business or assets of a third-party buyer or (ii) sell partial interests in assets to strategic joint venture partners, in each case to optimize PAA's asset portfolio and strengthen its balance sheet and leverage metrics. With respect to a potential divestiture, PAA may also conduct an auction process or may negotiate a transaction with one or a limited number of potential buyers.

PAA typically does not announce a transaction until after it has executed a definitive agreement. However, in certain cases in order to protect its business interests or for other reasons, PAA may defer public announcement of a transaction until closing or a later date. Past experience has demonstrated that discussions and negotiations regarding a potential transaction can advance or terminate in a short period of time. Moreover, the closing of any transaction for which PAA has entered into a definitive agreement may be subject to customary and other closing conditions, which may not ultimately be satisfied or waived. Accordingly, PAA can give no assurance that its current or future acquisition or investment efforts will be successful, or that its strategic asset divestitures will be completed. Although PAA expects the acquisitions and investments it makes to be accretive in the long term, PAA can provide no assurance that its expectations will ultimately be realized. See Item 1A. “Risk Factors—Risks Related to PAA’s Business— If PAA makes acquisitions that fail to perform as anticipated, its future growth may be limited ” and “— Acquisitions and joint ventures involve risks that may adversely affect PAA’s business .”

PAA’s Expansion Capital Projects

PAA’s extensive asset base and its relationships with customers provide it with opportunities for organic growth through the construction of additional assets that are complementary to, and expand or extend, its existing asset base. The following expansion capital projects are included in PAA’s 2019 capital plan as of February 2019 :

Project	Description	Projected In-Service Date	2019 Plan Amount ⁽¹⁾ (\$ in millions)
Permian Basin Takeaway Pipeline Projects	Primarily includes contributions for our (i) 65% interest in the Cactus II joint venture pipeline and (ii) 20% interest in the Wink to Webster joint venture pipeline	2H 2019 - 2021	\$ 630
Complementary Permian Basin Projects	Multiple projects to support the Permian Basin takeaway pipeline projects, and to expand/extend our gathering and intra-basin pipelines as well as terminalling and storage facilities at market hub locations	1H 2019 - 2020+	285
Other Projects		1H 2019 - 2020+	185
Total Projected Expansion Capital Expenditures			\$ 1,100

- ⁽¹⁾ Represents the portion of the total project cost expected to be incurred during the year. Potential variation to current capital costs estimates may result from (i) changes to project design, (ii) final cost of materials and labor and (iii) timing of incurrence of costs due to uncontrollable factors such as receipt of permits or regulatory approvals and weather. Amounts reflect our expectation that certain projects will be owned in a joint venture structure with a proportionate share of the project cost dispersed among the partners.

Global Petroleum Market Overview

The health of the global petroleum market is dependent on the relative supply and demand of hydrocarbons, including crude oil and NGLs. These supply and demand economics are greatly influenced by the broader global economic climate, exposing the petroleum market to the challenges and volatility associated with global economic development. The table below depicts historical global liquids production and consumption and is derived from the U.S. Energy Information Administration (“EIA”) Short-Term Energy Outlook, February 2019 (see EIA website at www.eia.doe.gov):

							Δ from 2013 - 2014	Δ from 2014 - 2015	Δ from 2015 - 2016	Δ from 2016 - 2017	Δ from 2017 - 2018
	2013	2014	2015	2016	2017	2018					
million barrels per day ⁽²⁾											
Production (Supply)											
U.S.	12.4	14.1	15.1	14.8	15.7	17.9	1.8	1.0	(0.3)	0.8	2.2
OPEC	35.1	35.1	36.4	37.4	37.3	37.3	—	1.2	1.0	(0.1)	—
Other World	44.1	44.9	45.5	45.1	45.1	45.3	0.8	0.6	(0.3)	(0.1)	0.3
Total	91.6	94.2	97.0	97.4	98.0	100.5	2.5	2.8	0.4	0.6	2.5
Total Consumption (Demand)	92.3	93.9	95.9	96.9	98.6	100.0	1.6	2.0	1.0	1.7	1.5
Global Supply / Demand Balance	(0.6)	0.3	1.1	0.5	(0.5)	0.5	0.9	0.8	(0.6)	(1.1)	1.0

(1) Data reflects actuals through October 2018 .

(2) Amounts may not recalculate due to rounding.

In 2018, OPEC continued to manage crude oil production levels. Joined by certain non-OPEC countries such as Russia, OPEC and non-OPEC producers agreed to cut production by 1.2 million barrels per day from October 2018 levels, beginning January 2019. In addition, in December of 2018, the province of Alberta mandated crude oil production cuts by imposing production limits designed to remove approximately 325,000 barrels per day from the market; such production limits were relaxed in February 2019 to allow an additional 75,000 barrels per day of production.

Crude Oil Market Overview

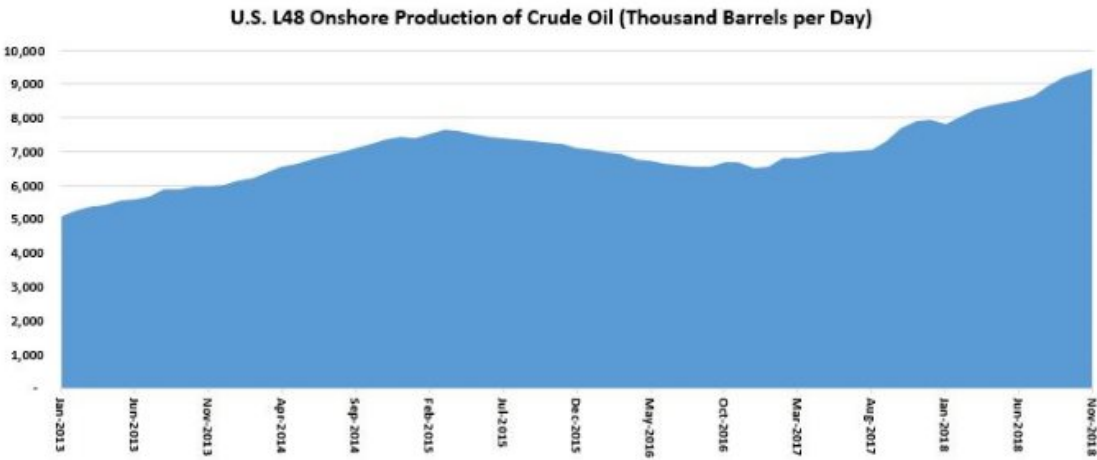
The definition of a commodity is a “mass-produced unspecialized product” and implies the attribute of fungibility. Crude oil is typically referred to as a commodity; however, it is neither unspecialized nor fungible. The crude slate available to U.S. and world-wide refineries consists of a substantial number of different grades and varieties of crude oil. Each crude oil grade has distinguishing physical properties. For example, specific gravity (generally referred to as light or heavy), sulfur content (generally referred to as sweet or sour) and metals content, along with other characteristics, collectively result in varying economic attributes. In many cases, these factors result in the need for such grades to be batched or segregated in the transportation and storage processes, blended to precise specifications or adjusted in value.

The lack of fungibility of the various grades of crude oil creates logistical transportation, terminalling and storage challenges and inefficiencies associated with regional volumetric supply and demand imbalances. These logistical inefficiencies are created as certain qualities of crude oil are indigenous to particular regions or countries. Also, each refinery has a distinct configuration of process units designed to handle particular grades of crude oil. The relative yields and the cost to obtain, transport and process the crude oil drive the refinery’s choice of feedstock. In addition, from time to time, natural disasters and geopolitical factors such as hurricanes, earthquakes, tsunamis, inclement weather, labor strikes, refinery disruptions, embargoes and armed conflicts may impact supply, demand, transportation and storage logistics.

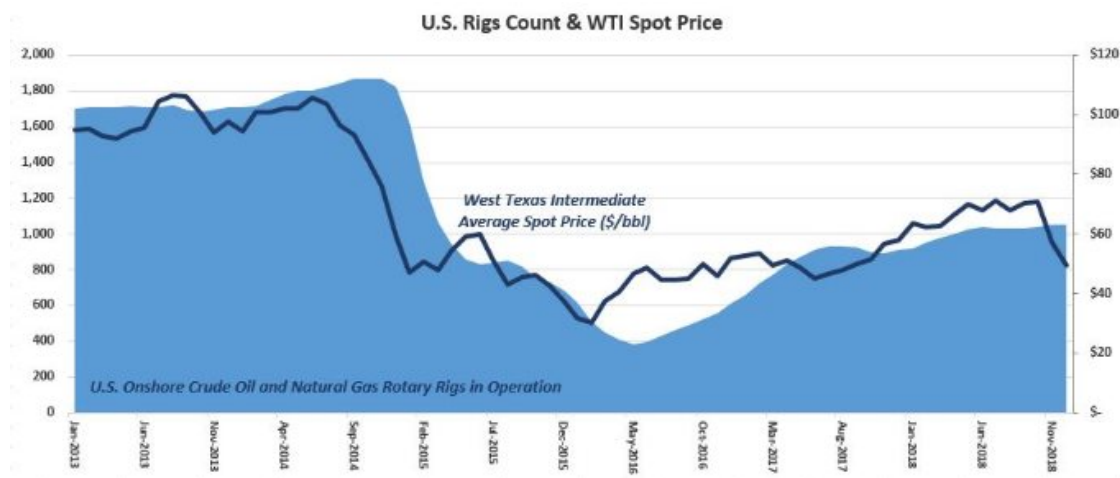
Our assets and our business strategy are designed to serve our producer and refiner customers by addressing regional crude oil supply and demand imbalances that exist in the United States and Canada. The nature and extent of these imbalances change from time to time as a result of a variety of factors, including regional production declines and/or increases; refinery expansions, modifications and shut-downs; available transportation and storage capacity; and government mandates and related regulatory factors.

From 2011 through 2015, the combination of (i) a significant increase in North American production volumes, (ii) a change in crude oil qualities and related differentials and (iii) high utilization of existing pipeline and terminal infrastructure stimulated multiple industry initiatives to build new pipeline and terminal infrastructure, convert certain pipeline assets to alternative service or reverse flows and expand the use of trucks, rail and barges for the movement of crude oil and condensate. Increased production from U.S. oil-producing areas such as the Rockies, the Permian Basin in West Texas, the Mid-Continent region, the Eagle Ford Shale in South Texas, and the Williston Basin in North Dakota caused U.S. lower 48 onshore crude oil production to increase by 3.7 million barrels per day, or 99%, between 2011 and 2015. In 2015, U.S. Lower 48 onshore crude oil production peaked at 7.6 million barrels per day in March. By that point crude oil prices had begun to decline, causing many North American operators to significantly scale back their capital programs, resulting in production declines. By February 2016 West Texas Intermediate crude averaged \$30.32 per barrel, down from averaging over \$100 per barrel in July 2014.

By mid-2016 crude oil prices began to rise and, subsequently, U.S. onshore rig count increased, reaching 1,054 by December 2018, and U.S. lower 48 onshore production reached a high of 9.5 million barrels per day in November 2018. As the rate of production grew throughout 2018, utilization on existing infrastructure began to increase in areas like the Permian Basin in West Texas, causing differentials between crude oil in West Texas and Cushing, Oklahoma (the U.S. pricing benchmark) to widen to nearly \$18 per barrel in August 2018.



Source: EIA



Source: EIA

U.S. Crude Oil Exports

The number of countries receiving exported U.S. crude oil has continued to rise since the removal of restrictions on exporting U.S. crude oil in December 2015. U.S. crude oil exports averaged 1.93 million barrels per day in the first eleven months of 2018, 0.77 (67%) million barrels per day more than the full-year 2017 and 1.34 (227%) million barrels per day more than full year 2016. During the week of November 30, 2018, the U.S. was a net exporter of crude oil and petroleum products for the first time in weekly data going back to 1991. Continued increases in U.S. crude oil exports will likely depend on increases in U.S. crude oil production and wider price differences between domestic and international crude oil. The table below depicts historical U.S. crude oil exports as reported by the EIA (see EIA website at www.eia.doe.gov):

	Annual U.S. Exports of Crude Oil				Δ from	Δ from	Δ from
	2015	2016	2017	2018 ⁽¹⁾	2015-2016	2016-2017	2017-2018 ⁽¹⁾
(in millions of barrels per day) ⁽²⁾							
PADD 1	0.07	0.17	0.01	0.03	0.10	(0.16)	0.02
PADD 2	0.08	0.11	0.21	0.13	0.02	0.11	(0.08)
PADD 3	0.29	0.29	0.92	1.76	—	0.63	0.84
PADD 4	0.01	0.01	—	—	—	(0.01)	—
PADD 5	0.01	0.01	0.01	0.01	—	—	—
Total U.S. Crude Oil Exports	0.47	0.59	1.16	1.93	0.13	0.57	0.77

(1) Data reflects actuals through November 2018.

(2) Amounts may not recalculate due to rounding.

NGL Market Overview

NGL primarily includes ethane, propane, normal butane, iso-butane and natural gasoline, and is derived from natural gas production and processing activities, as well as crude oil refining processes. Liquefied petroleum gas ("LPG") primarily includes propane and butane, which liquefy at moderate pressures thus making it easier to transport and store such products as compared to ethane. NGL refers to all NGL products including LPG when used in this Form 10-K.

NGL Demand. Individual NGL products have varying uses. Described below are the five basic NGL components and their typical uses:

- *Ethane (C2).* Ethane accounts for the largest portion of the NGL barrel and substantially all of the extracted ethane is used as feedstock in the production of ethylene, one of the basic building blocks for a wide range of plastics and other chemical products. When ethane recovery from a wet natural gas stream is uneconomic, ethane is left in the natural gas stream, subject to pipeline specifications.
- *Propane (C3).* Propane is used as heating fuel, engine fuel and industrial fuel, for agricultural burning and drying and also as petrochemical feedstock for the production of ethylene and propylene.
- *Normal butane (C4).* Normal butane is principally used for motor gasoline blending and as fuel gas, either alone or in a mixture with propane, and feedstock for the manufacture of ethylene and butadiene, a key ingredient of synthetic rubber. Normal butane is also used as a feedstock for iso-butane production and as a diluent in the transportation of heavy crude oil and bitumen, particularly in Canada.
- *Iso-butane.* Iso-butane is principally used by refiners to produce alkylates to enhance the octane content of motor gasoline.
- *Natural Gasoline.* Natural gasoline is principally used as a motor gasoline blend stock, a petrochemical feedstock, or as diluent in the transportation of heavy crude oil and bitumen, particularly in Canada.

NGL Supply. The bulk of NGL supply (approximately 90% in the United States and 73% in Canada) comes from gas processing plants, which separate a mixture of NGL from the dry gas (primarily methane). This NGL mix (also referred to as “Y Grade”) is then either fractionated at the processing site into the five individual NGL components (known as purity products), which may be transported, stored and sold to end use markets, or transported to a regional fractionation facility.

The majority of gas processing plants in the United States are located along the Gulf Coast, in the West Texas/Oklahoma area, the Marcellus and Utica region and in the Rockies region. In Canada, the vast majority of the processing capacity is located in Alberta, with a much smaller (but increasing) amount in British Columbia and Saskatchewan.

NGL products from refineries represent approximately 8% of the United States supply and 4% of Canadian supply and are by-products of the refinery conversion process. Consequently, they have generally already been separated into individual components and do not require further fractionation. NGL products from refineries are principally propane, with lesser amounts of butane, refinery naphthas (products similar to natural gasoline) and ethane. Due to refinery maintenance schedules and seasonal demand considerations, refinery production of propane and butane varies on a seasonal basis.

NGL (primarily propane and butane) is also imported into certain regions of the United States from Canada and other parts of the world (approximately 3% of total supply). Propane and butane is also exported from certain regions of the United States.

NGL Transportation and Trading Hubs. NGL, whether as a mixture or as purity products, is transported by pipelines, barges, railcars and tank trucks. The method of transportation used depends on, among other things, the resources of the transporter, the locations of production points and delivery points, cost-efficiency and the quantity of product being transported. Pipelines are generally the most cost-efficient mode of transportation when large, consistent volumes of product are to be delivered.

The major NGL infrastructure and trading hubs in North America are located at Mont Belvieu, Texas; Conway, Kansas; Edmonton, Alberta; and Sarnia, Ontario. Each of these hubs contains a critical mass of infrastructure, including fractionators, storage, pipelines and access to end markets, particularly Mont Belvieu.

NGL Storage. NGL must be stored under pressure to maintain a liquid state. The lighter the product (e.g., ethane), the greater the pressure that must be maintained. Large volumes of NGL are stored in underground caverns constructed in salt or granite; however, product is also stored in above ground tanks. Natural gasoline can be stored at relatively low pressures in tankage similar to that used to store motor gasoline. Propane and butane are stored at much higher pressures in steel spheres, cylinders, bullets, salt caverns or other configurations. Ethane is stored at very high pressures, typically in salt caverns. Storage is especially important for NGL as supply and demand can vary materially on a seasonal basis.

NGL Market Outlook. The growth of shale-based production in both traditional and new producing areas has resulted in a significant increase in NGL supplies from gas processing plants over the past several years. This has driven extensive expansion and new development of midstream infrastructure in Canada, the Bakken, Marcellus/Utica, and throughout Texas.

The growth of production in non-traditional producing regions and the increase in export capacity has shifted regional basis relationships and created new logistics and infrastructure opportunities. Growth of 13% in 2018 for North American NGL production has meant expansion into new markets, through exports or increased petrochemical demand. The continuation of a relatively low ratio of North American gas and NGL prices to world-wide crude oil prices will mean North American NGL can continue to be competitive on a world scale, either as feedstock for North American based manufacturing or export to overseas markets. In addition to substantially increased exports, a portion of the increased supply of NGL will be absorbed by the domestic petrochemical sector as low-cost feed stocks, as the North American petrochemical industry has enjoyed a supply cost advantage on a world scale.

We believe the fundamentals of an accessible resource base and improved midstream infrastructure should mean producers can continue to develop the most economic new supply. The NGL market is, among other things, expected to be driven by:

- the absolute prices of NGL products and their prices relative to natural gas and crude oil;
- drilling activity and wet natural gas production in developing liquids-rich production areas;
- available processing, fractionation, storage and transportation capacity;
- petro-chemical demand driven by the build-out or new builds of Ethylene Cracker capacity (ethane demand) and Propane Dehydrogenation facilities (propane demand);
- increased export capacity for both ethane and propane;
- diluent requirements for heavy Canadian oil;
- regulatory changes in gasoline specifications affecting demand for butane;
- seasonal demand from refiners;
- seasonal weather-related demand; and
- inefficiencies caused by regional supply and demand imbalances.

As a result of these and other factors, the NGL market is complex and volatile, which, along with expected market growth, creates opportunities to solve the logistical inefficiencies inherent in the business.

Natural Gas Storage Market Overview

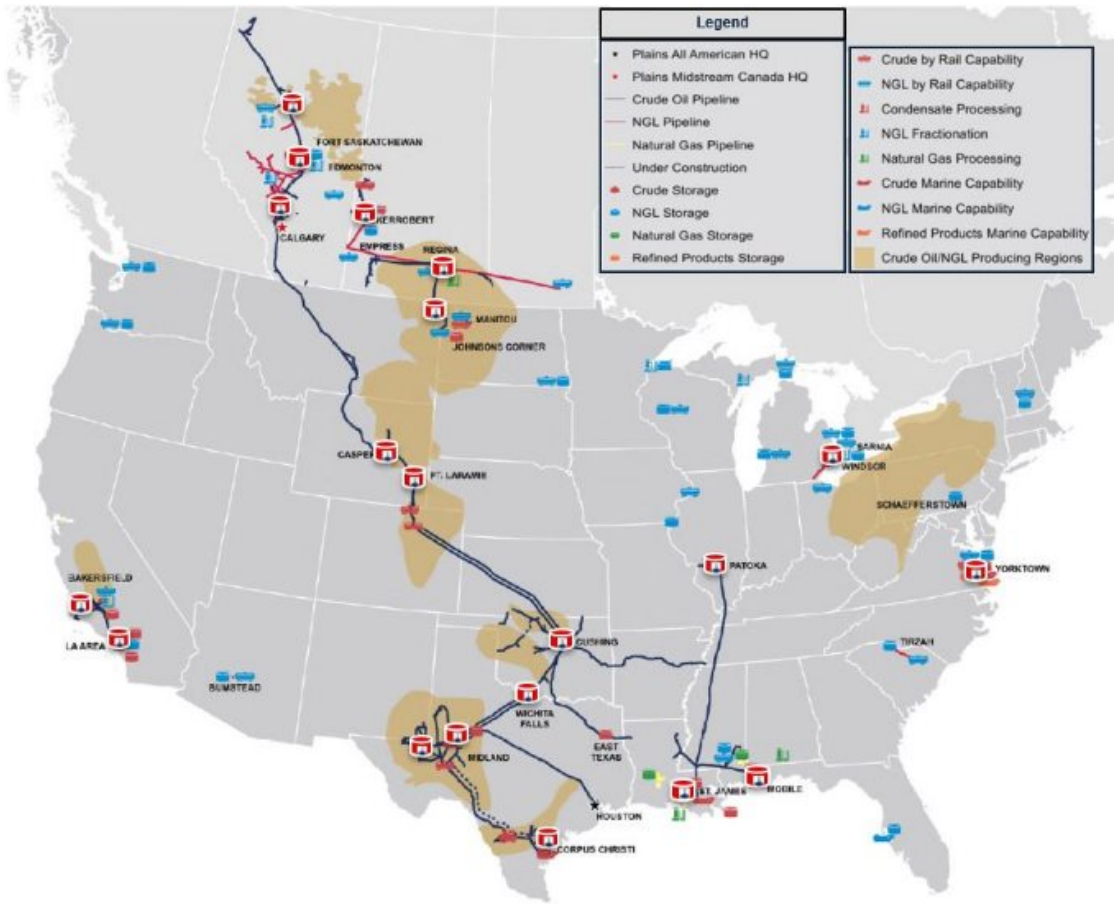
North American natural gas storage facilities provide a staging and warehousing function for seasonal swings in demand relative to supply, as well as an essential reliability cushion against disruptions in natural gas supply, demand and transportation by allowing natural gas to be injected into, withdrawn from or warehoused in such storage facilities as dictated by market conditions. Natural gas storage serves as the “shock absorber” that balances the market, serving as a source of supply to meet the consumption demands in excess of daily production capacity during high-demand periods and a warehouse for gas production in excess of daily demand during low-demand periods.

Overall market conditions for natural gas storage have been challenging during the last several years, driven by a variety of factors, including (i) increased natural gas supplies due to production from shale resources, (ii) a shift from Gulf of Mexico production to Northeast production causing less concern over supply disruptions from tropical weather and (iii) lower basis differentials in certain regions due to expansion and improved connectivity of natural gas transportation infrastructure.

Longer term, we believe several factors will contribute to meaningful growth in North American natural gas demand that will bolster the market need for and the commercial value of natural gas storage. These fundamental factors include (i) exports of North American volumes of LNG, (ii) increased exports of natural gas to Mexico, (iii) construction of new gas-fired power plants, (iv) sustained fuel switching from coal to natural gas among existing power plants and (v) growth in base-level industrial demand.

Description of Segments and Associated Assets

Under GAAP, we consolidate GP LLC, AAP and PAA and its subsidiaries. We currently have no separate operating activities apart from those conducted by PAA. As such, our segment analysis, presentation and discussion is the same as that of PAA, which conducts its operations through three segments—Transportation, Facilities and Supply and Logistics. Accordingly, any references to “we,” “us,” “our,” and similar terms describing assets, business characteristics or other related matters are references to assets, business characteristics or other matters involving PAA’s assets and operations. We have an extensive network of pipeline transportation, terminalling, storage and gathering assets in key crude oil and NGL producing basins and transportation corridors and at major market hubs in the United States and Canada. The map and descriptions below highlight our more significant assets (including certain assets under construction or development) as of December 31, 2018 . Unless the context requires otherwise, references herein to our “facilities” includes all of the pipelines, terminals, storage and other assets owned by us.



Following is a description of the activities and assets for each of our three business segments.

Transportation Segment

Our Transportation segment operations generally consist of fee-based activities associated with transporting crude oil and NGL on pipelines, gathering systems, trucks and barges. We generate revenue through a combination of tariffs, pipeline capacity agreements and other transportation fees. Our Transportation segment also includes equity earnings from our investments (ranging from 20% to 65%) in entities that own transportation assets. We account for these investments under the equity method of accounting. See Note 9 to our Consolidated Financial Statements for additional information regarding these investments.

As of December 31, 2018, we employed a variety of owned or, to a much lesser extent, leased long-term physical assets throughout the United States and Canada in this segment, including approximately:

- 17,965 miles of active crude oil and NGL pipelines and gathering systems;
- 31 million barrels of active, above-ground tank capacity used primarily to facilitate pipeline throughput and help maintain product quality segregation;
- 830 trailers (primarily in Canada); and
- 50 transport and storage barges and 20 transport tugs through our interest in Settoon Towing.

The following is a tabular presentation of our active crude oil and NGL pipeline assets in the United States and Canada as of December 31, 2018, grouped by geographic location:

Region	Ownership Percentage	Approximate System Miles ⁽¹⁾	2018 Average Net Barrels per Day ⁽²⁾ (in thousands)
Crude Oil Pipelines:			
Permian Basin:			
Gathering pipelines	100%	2,970	1,063
Intra-basin pipelines ⁽³⁾	50% - 100%	755	1,650
Long-haul pipelines ⁽³⁾	20% - 100%	1,310	1,019
		5,035	3,732
South Texas/Eagle Ford	50% - 100%	660	442
Central	50% - 100%	2,695	473
Gulf Coast ⁽³⁾	54% - 100%	1,170	178
Rocky Mountain ⁽³⁾	21% - 100%	3,395	284
Western	100%	555	183
Canada	100%	2,790	316
Crude Oil Pipelines Total		16,300	5,608
Canadian NGL Pipelines	21% - 100%	1,665	183
Crude Oil and NGL Pipelines Total		17,965	5,791

⁽¹⁾ Includes total mileage from pipelines owned by unconsolidated entities.

- (2) Represents average daily volumes for the entire year attributable to our interest. Average daily volumes are calculated as the total volumes (attributable to our interest) for the year divided by the number of days in the year. Volumes reflect tariff movements and thus may be included multiple times as volumes move through our integrated system.
- (3) Includes pipelines operated by a third party.

A significant portion of our pipeline assets are interconnected and are operated as a contiguous system. The following descriptions are organized by geographic location and represent a selection of our most significant assets. Pipeline capacities throughout these descriptions are based on our reasonable estimate of volumes that can be delivered from origin to final destination on our pipeline systems. We report pipeline volumes based on the tariffs charged for individual movements, some of which may only utilize a certain segment of a pipeline system (i.e. two short-haul movements on a pipeline from point A to point B and another point B to point C would double the pipeline tariff volumes on a particular system versus a point A to point C movement). As a result, at times, our reported tariff barrel movements may exceed our total capacity.

Crude Oil Pipelines

Permian Basin

We are among the largest providers of crude oil midstream infrastructure and services in the Permian Basin located in west Texas and southeastern New Mexico. Our Permian Basin asset base represents an interconnected system that aggregates receipts from wellhead gathering lines and bulk truck injection locations into intra-basin trunk lines for transportation and delivery to a combination of owned and third-party mainline takeaway pipelines. Accordingly, our Permian Basin crude oil pipelines fall into one of three categories: Gathering, Intra-basin or Long-haul.

Gathering Pipelines

We own and operate approximately 2,970 miles of gathering pipelines in the Permian Basin. Our gathering systems are in both the Midland Basin and the Delaware Basin and in aggregate represent approximately 2 million barrels per day of pipeline capacity. This gathering capacity includes pipeline capacity that delivers volumes to regional hubs and includes certain large diameter pipeline segments/systems. Approximately 75% of the capacity of our gathering systems is in the Delaware Basin. We currently expect to add approximately 600,000 barrels per day of capacity in 2019.

Intra-basin Pipelines

We operate an intra-basin Permian Basin pipeline system with a capacity of over 2 million barrels per day that connects gathering and truck injection volumes to our owned and operated as well as third-party mainline pipelines that transport crude oil to major market hubs. This interconnected pipeline system is designed to provide shippers flow assurance, flexibility and access to multiple markets. We added approximately 500,000 barrels per day of incremental capacity in 2018 through the completion of various expansion projects, and we currently expect to add approximately 400,000 barrels per day of capacity in 2019.

Two of our largest intra-basin pipelines are the Mesa and Sunrise Pipelines. The Mesa and Sunrise Pipelines extend from our Midland, Texas terminal to our Colorado City, Texas terminal where they have access to all of the Permian Basin takeaway pipelines that originate at Colorado City.

- *Mesa Pipeline.* We own a 63% undivided interest in and are the operator of Mesa Pipeline, which transports crude oil from Midland, Texas to a refinery at Big Spring, Texas, and to connecting carriers at Colorado City, Texas, with capacity of up to 400,000 barrels per day (approximately 252,000 barrels per day attributable to our interest).
- *Sunrise Pipeline.* Our Sunrise Pipeline, which transports crude oil from Midland, Texas to connecting carriers at Colorado City, Texas, has a capacity of approximately 350,000 barrels per day.

Long-haul Pipelines

We own interests in multiple long-haul Permian Basin pipeline systems that, on a combined basis, represent approximately 1 million barrels per day of currently operational takeaway capacity (net to our ownership interests) out of the Permian Basin.

- *Basin Pipeline (Permian to Cushing).* We own an 87% undivided joint interest in and are the operator of Basin Pipeline. Basin Pipeline has three primary origination locations: Jal, New Mexico; Wink, Texas; and Midland, Texas and, in addition to making intra-basin movements, serves as the primary route for transporting crude oil from the Permian Basin to Cushing, Oklahoma. Basin Pipeline also receives crude oil from a facility in southern Oklahoma which aggregates South Central Oklahoma Oil Province (SCOOP) production.
- *BridgeTex Pipeline (Permian to Houston).* After the sale of a portion of our interest in the third quarter of 2018, we now own a 20% interest in BridgeTex Pipeline Company, LLC, a joint venture with a subsidiary of Magellan Midstream Partners, L.P. (“Magellan”) and an affiliate of OMERS Infrastructure Management Inc. Such joint venture owns a crude oil pipeline (the “BridgeTex Pipeline”) with a capacity of 440,000 barrels per day that originates at Colorado City, Texas, receiving volumes from our Basin and Sunrise Pipelines, and extends to Houston, Texas. The BridgeTex Pipeline is operated by Magellan. See Note 9 to our Consolidated Financial Statements for additional information regarding the sale of a portion of our interest in BridgeTex Pipeline Company, LLC.
- *Sunrise II Pipeline.* In 2018, as part of our Sunrise expansion project, we added 500,000 barrels per day of capacity by looping the line from Midland, Texas to Colorado City, Texas and extended the line from Colorado City, Texas to Wichita Falls, Texas. We sold 100,000 barrels per day of the new capacity from Midland, Texas to Wichita Falls, Texas to a third party. We operate the Sunrise II Pipeline and own 400,000 barrels of the capacity. The Sunrise expansion is underpinned by long-term shipper commitments and was placed into service in November 2018. Our Sunrise II Pipeline transports crude oil from Midland, Texas and Colorado City, Texas to connecting carriers at Wichita Falls, Texas.
- *Cactus Pipeline (Permian to Corpus Christi).* We own and operate the Cactus Pipeline, which has a capacity of 390,000 barrels per day, originates at McCamey, Texas and extends to Gardendale, Texas. Cactus Pipeline volumes are interconnected to the Corpus Christi, Texas market through a connection at Gardendale, Texas to our Eagle Ford joint venture pipeline system.
- *Cactus II Pipeline (Permian to Corpus Christi).* Cactus II Pipeline is a joint-venture pipeline, of which we own 65%, that is currently under construction. Cactus II Pipeline will be a new Permian mainline system extending directly to the Corpus Christi, Texas market. In February 2018, we announced that Cactus II Pipeline was fully committed with long-term third-party contracts following the conclusion of a second binding open season. Cactus II Pipeline will have a capacity of 670,000 barrels per day and is expected to be placed into partial service in the second half of 2019.
- *Wink to Webster Pipeline.* In January 2019, we announced the formation of Wink to Webster Pipeline LLC (“W2W Pipeline”), a joint venture with subsidiaries of ExxonMobil and Lotus Midstream, LLC. We own a 20% interest in W2W Pipeline, which is currently developing a new pipeline system that will originate in the Permian Basin in West Texas and transport crude oil to the Texas Gulf Coast. The pipeline system will provide more than 1 million barrels per day of crude oil and condensate capacity, and the project is targeted to commence operations in the first half of 2021.

South Texas/Eagle Ford Area

We own a 100% interest in and are the operator of gathering systems that feed into our Gardendale Station. Additionally, we own a 50% interest in Eagle Ford Pipeline LLC, a joint venture with a subsidiary of Enterprise Products Partners, L.P. (“Enterprise”). This joint venture owns a pipeline system, of which we serve as the operator, that has a total capacity of approximately 660,000 barrels per day and connects Permian and Eagle Ford area production to Corpus Christi, Texas refiners and terminals. Additionally, the joint venture system has connectivity to Houston, Texas via a connection with Enterprise’s pipeline at Lyssy, Texas.

Central

We own and operate gathering and mainline pipelines that source crude oil from Western and Central Oklahoma and Southwest Kansas for transportation and delivery into our terminal facilities at Cushing, Oklahoma. In addition, we own and operate various pipeline systems that extend from our Cushing facility, or from other pipelines connected to our Cushing facility, to various demand locations. Below is a description of some of our most significant pipeline systems in the Central Region:

Diamond Pipeline (Cushing to Memphis). We own a 50% interest in Diamond Pipeline LLC, a joint venture with Valero Energy Corporation (“Valero”). This joint venture owns, and we operate, the Diamond Pipeline, which extends from our Cushing Terminal to Valero’s refinery in Memphis, Tennessee. The Diamond Pipeline is underpinned by a long-term minimum volume commitment and currently has a total capacity of 200,000 barrels per day, which is expandable by an additional 200,000 barrels per day as conditions warrant. Pending a successful open season on the Capline Pipeline system (“Capline”), the joint venture partners are contemplating an expansion and modest extension of the Diamond Pipeline that would connect to Capline and facilitate the movement of volumes from Cushing, Oklahoma to St. James, Louisiana (see discussion below).

Red River Pipeline (Cushing to Longview). The Red River Pipeline is an approximately 150,000 barrel per day capacity pipeline that extends from our Cushing Terminal to Longview, Texas, where it connects with various pipelines, including the Caddo Pipeline. We have an undivided 60% interest in the segment of the pipeline extending from Cushing, Oklahoma to Hewitt, Oklahoma near Valero’s refinery in Ardmore, Oklahoma. We have a 100% interest in the remaining portion of the pipeline that extends from Hewitt, Oklahoma to Longview, Texas. The Red River Pipeline is supported by long-term shipper commitments and we serve as operator.

Caddo Pipeline. We own a 50% interest in Caddo Pipeline LLC, a joint venture with Delek Logistics Partners, LP (“Delek”). The joint venture owns, and we operate, the Caddo Pipeline, which is an approximately 80,000 barrel per day capacity pipeline that originates in Longview, Texas at the terminus of the Red River Pipeline and serves refineries in Shreveport, Louisiana and El Dorado, Arkansas. The Caddo Pipeline is underpinned by shipper commitments.

STACK Pipeline. We own a 50% interest in STACK Pipeline LLC, a joint venture with Phillips 66 Partners, L.P. This joint venture owns the STACK Pipeline, which serves producers in the STACK (Sooner Trend Anadarko Basin Canadian and Kingfisher Counties) resource play and delivers to Cushing, Oklahoma. We serve as operator of this joint-venture system that has a total capacity of 250,000 barrels per day and is supported by producer commitments.

Gulf Coast

We own and/or operate pipelines in the Gulf Coast area with transportation and delivery into connecting carriers, terminal facilities and refineries. This includes a 54% interest in Capline. In January 2019, the owners of Capline converted their undivided joint interests into a limited liability company and launched a binding open season to solicit shipper interest for a reversal of Capline and the initiation of southbound service on Capline from Patoka, Illinois to St. James, Louisiana and potentially on our Diamond Pipeline and Capline from Cushing, Oklahoma to St. James, Louisiana.

Rocky Mountain

We own and operate pipelines that provide gathering services in the Bakken and the Powder River Basin. We own a pipeline system that can move Bakken crude oil to the Enbridge mainline system at Regina, Saskatchewan. In 2019, the pipeline will be modified to accommodate bidirectional flow, either from the Bakken into the Enbridge mainline system or from the Enbridge mainline system to our terminal in Trenton, North Dakota. We own an undivided joint interest in a pipeline system that extends from the Canadian border to our terminal in Guernsey, Wyoming. This pipeline system receives crude oil from our Rangeland and Milk River Pipelines in Canada. In addition to these assets, our largest Rocky Mountain area systems include the following joint venture pipelines, both of which connect to our terminal in Cushing:

Saddlehorn Pipeline. We own a 40% interest in Saddlehorn Pipeline LLC (“SP LLC”), which owns 190,000 barrels per day of capacity in the Saddlehorn Pipeline that extends from the Niobrara and DJ Basin to Cushing. Magellan serves as operator of the Saddlehorn Pipeline. The Saddlehorn Pipeline is supported by minimum volume commitments.

White Cliffs Pipeline. We own an approximate 36% interest in White Cliffs Pipeline LLC, which currently consists of two crude oil pipelines with approximately 215,000 barrels per day of capacity that extend from the DJ Basin to Cushing, Oklahoma. Rose Rock Midstream, L.P. (“Rose Rock”) serves as the operator of the pipelines. In the second quarter of 2019, the total capacity will be reduced to 110,000 barrels per day as one of the crude oil pipelines will be converted to a NGL pipeline with an initial capacity of 90,000 barrels per day. The NGL pipeline is expected to return to service in late 2019 and will extend from the DJ Basin to a tie-in location with the Southern Hills Pipeline in Oklahoma. The conversion to the NGL pipeline is supported by long-term capacity lease and long-term throughput agreements. Rose Rock will also operate the NGL pipeline.

Western

We own and operate pipeline systems in our Western region including the following:

Gathering. We own and operate gathering pipelines with aggregate capacity of over 150,000 barrels per day that source crude oil from the San Joaquin Valley in California and connect to our Line 63 and Line 2000 pipelines, as well as other third-party pipelines and terminals.

Line 63 and Line 2000. We own and operate the Line 63 and Line 2000 pipelines, which have approximately 60,000 barrels per day and 110,000 barrels per day of pipeline capacity, respectively, and transport crude oil from the San Joaquin Valley to refineries and terminal facilities in the Los Angeles Basin and in Bakersfield, California. Additionally, we have a distribution pipeline system in the Los Angeles Basin that connects our storage assets with all major refineries and third-party pipelines and marine terminals in the Los Angeles Basin.

All American Pipeline. We own the All American Pipeline, which historically received crude oil from offshore oil producers at Las Flores, California and at Gaviota, California. The pipeline terminates at our Emidio Station. Between Gaviota and our Emidio Station, the All American Pipeline interconnects with our San Joaquin Valley Gathering System, Line 2000 and Line 63, as well as other third-party intrastate pipelines.

In May 2015, we experienced a crude oil release on the segment of the All American Pipeline known as Line 901 that runs from Las Flores to Gaviota in Santa Barbara County, California. The segment of the pipeline upstream of our Pentland station has been shut down since this incident. We are currently evaluating a replacement of the pipeline, subject to receipt of shipper commitments and regulatory approvals. See Note 18 to our Consolidated Financial Statements for additional information regarding the Line 901 incident.

Canada

Rainbow Pipeline. We own and operate the Rainbow Pipeline, which is an approximately 185,000 barrel per day capacity pipeline that extends from Zama, Alberta to Edmonton, Alberta. The pipeline transports both blended heavy and light crude oil and includes gathering and diluent pipelines. Rainbow Pipeline offers delivery optionality at Edmonton, Alberta, where it can connect to Enbridge, Trans Mountain and Pembina pipelines as well as IOL Refinery.

Rangeland Pipeline. We own and operate the Rangeland Pipeline system, which has the capacity to transport approximately 85,000 barrels per day of diluent, light sweet crude oil and light sour crude oil either north to Edmonton, Alberta or south to the U.S./Canadian border near Cutbank, Montana. The Rangeland Pipeline system consists of three main segments. The North Gathering system begins at Medicine River and Rimbey truck terminal, and ships to Sundre truck terminal. The South Sour mainline delivers sour from the Sundre truck terminal to Glacier Pipeline, and MAPL delivers sweet from Sundre to Edmonton. The Pipeline also offers delivery optionality at Edmonton, Alberta, where it can connect to Enbridge pipelines and the IOL Refinery.

South Saskatchewan Pipeline. We own and operate the South Saskatchewan system, which has approximately 70,000 barrels per day of capacity to transport heavy crude oil from the Cantuar, Dollard, Rapdan and Gull Lake gathering areas in southern Saskatchewan to the Enbridge mainline system at the Regina terminal.

Manito Pipeline. We own and operate the Manito Pipeline, which delivers heavy crude oil produced from the Lloydminster producing area of Alberta to our Kerrobert Terminal and our Kerrobert Rail Terminal. The Kerrobert Terminal is connected to both the Enbridge mainline system and our Kerrobert Rail Terminal. The Manito system includes blended crude oil lines with capacity of approximately 70,000 barrels per day and parallel diluent lines.

Milk River Pipeline. We own and operate Milk River Pipeline system, which has approximately 100,000 barrels per day of capacity to transport heavy crude oil from Milk River, Alberta to the U.S./Canadian border west of Coutts, Alberta and connects with the Cenex Santa Rita Pipeline System in the U.S.

Wascana Pipeline. We own and operate the Wascana Pipeline, which has approximately 40,000 barrels per day of capacity to move sweet crude from the Bakken North pipeline system to Enbridge's mainline system at Regina, Saskatchewan. The Wascana Pipeline is currently undergoing modifications to add bi-directional capability.

Canadian NGL Pipelines

Co-Ed NGL Pipeline. We own and operate the Co-Ed NGL pipeline, which has approximately 70,000 barrels per day of capacity to transport NGL that it gathers from approximately 27 field gas processing plants located in Alberta, including all of the NGL produced at the Cochrane Straddle Plant for delivery to NGL facilities at Fort Saskatchewan. Co-Ed's main volume capture regions are Southwest and Central Alberta, Cardium, Deep Basin, and Alberta Montney.

PPTC Pipeline. We own and operate the Plains Petroleum Transmission Company Pipeline (the "PPTC Pipeline"), which has approximately 15,000 barrels per day of capacity to transport NGL from Empress, Alberta to the Fort Whyte Terminal in Winnipeg, Manitoba. The PPTC Pipeline also provides access to several truck terminals and rail loading facilities.

Eastern Delivery System. We own and operate the Eastern Delivery System, which has various segments that transport propane and butane between Sarnia, Ontario and Windsor, Ontario and from Sarnia, Ontario to St. Clair, Michigan; refinery grade butane between Windsor, Ontario and Woodhaven, Michigan; and syncrude from Sarnia, Ontario to local refineries. The Eastern Delivery System also receives ethane from Kinder Morgan Utopia Pipeline at Windsor, Ontario for delivery to petrochemical facilities in the Sarnia, Ontario area, as well as our facility in Sarnia, Ontario. These pipelines have a combined capacity of approximately 150,000 barrels per day.

Facilities Segment

Our Facilities segment operations generally consist of fee-based activities associated with providing storage, terminalling and throughput services primarily for crude oil, NGL and natural gas, as well as NGL fractionation and isomerization services and natural gas and condensate processing services. We generate revenue through a combination of month-to-month and multi-year agreements and processing arrangements.

Revenues generated in this segment include (i) storage and throughput fees at our crude and NGL storage terminals and natural gas storage facilities, (ii) fees from natural gas and condensate processing services and from NGL fractionation and isomerization services and (iii) loading and unloading fees at our rail terminals.

As of December 31, 2018, we owned, operated or employed a variety of long-term physical assets throughout the United States and Canada in this segment, including:

- approximately 77 million barrels of crude oil storage capacity primarily at our terminalling and storage locations;
- approximately 32 million barrels of NGL storage capacity;
- approximately 63 billion cubic feet ("Bcf") of natural gas storage working gas capacity;
- approximately 25 Bcf of owned base gas;
- seven natural gas processing plants located throughout Canada and the Gulf Coast area of the United States;
- a condensate processing facility located in the Eagle Ford area of South Texas with an aggregate processing capacity of approximately 120,000 barrels per day;
- eight fractionation plants located throughout Canada and the United States with an aggregate net processing capacity of approximately 211,000 barrels per day, and an isomerization and fractionation facility in California with an aggregate processing capacity of approximately 15,000 barrels per day;
- 33 crude oil and NGL rail terminals located throughout the United States and Canada. See "Rail Facilities" below for an overview of various terminals and "Supply and Logistics" regarding our use of railcars;
- five marine facilities in the United States; and
- approximately 425 miles of active pipelines that support our facilities assets.

The following is a tabular presentation of our active Facilities segment storage and service assets in the United States and Canada as of December 31, 2018, grouped by product and service type, with capacity and volume as indicated:

Crude Oil Storage Facilities			Total Capacity (MMBbls)	
Cushing			25	
St. James			13	
LA Basin			8	
Patoka			7	
Mobile and Ten Mile			4	
Other ⁽¹⁾			20	
			77	
NGL Storage Facilities			Total Capacity (MMBbls)	
Fort Saskatchewan			10	
Sarnia Area			9	
Empress Area			4	
Bumstead			3	
Other			6	
			32	
Natural Gas Storage Facilities			Total Capacity (Bcf)	
Salt Caverns			63	
Natural Gas Processing Facilities ⁽²⁾		Ownership Interest	Total Gas Spec Product ⁽³⁾ (Bcf/d)	Gas Processing Capacity (Bcf/d)
United States Gulf Coast Area		100%	0.2	0.3
Canada		50-88%	2.5	7.1
			2.7	7.4
Condensate Stabilization Facility			Total Capacity (Bbls/d)	
Gardendale			120,000	
NGL Fractionation and Isomerization Facilities		Ownership Interest	Total Spec Product ⁽³⁾ (Bbls/d)	Net Capacity (Bbls/d)
Empress		100%	17,100	28,300
Fort Saskatchewan		21-100%	41,000	67,800
Sarnia		62-84%	53,900	90,000
Shafter		100%	9,500	15,000
Other		82-100%	9,800	25,000
			131,300	226,100

Rail Facilities	Ownership Interest	Loading Capacity (Bbls/d)	Unloading Capacity (Bbls/d)
Crude Oil Rail Facilities	100%	314,000	350,000
	Ownership Interest	Number of Rack Spots	Number of Storage Spots
NGL Rail Facilities ⁽⁴⁾	50-100%	335	1,635

(1) Amount includes approximately 2 million barrels of storage capacity associated with our crude oil rail terminal operations.

(2) While natural gas processing volumes and capacity amounts are presented, they currently are not a significant driver of our segment results.

(3) Represents average volumes net to our share for the entire year.

(4) Our NGL rail terminals are predominately utilized for internal purposes specifically for our supply and logistics activities. See our “Supply and Logistics Segment” discussion following this section for further discussion regarding the use of our rail terminals.

The following discussion contains a detailed description of our more significant Facilities segment assets.

Crude Oil Facilities

Cushing Terminal. We are the largest provider of crude oil terminalling services in Cushing, Oklahoma, which is one of the largest physical trading hubs in the United States and is the delivery point for crude oil futures contracts traded on the NYMEX. Our Cushing Terminal has been designated by the NYMEX as an approved delivery location for crude oil delivered under the NYMEX light sweet crude oil futures contract. As the NYMEX delivery point and a cash market hub, the Cushing Interchange serves as a source of refinery feedstock for Midwest and certain Gulf Coast refiners.

Our Cushing Terminal is designed to serve the operational needs of refiners, with an emphasis on ensuring operational reliability and flexibility. Accordingly, we have access to all major inbound and outbound pipelines in Cushing (23 direct pipeline connections) and our facility is designed to handle multiple grades of crude oil while minimizing the interface and enabling deliveries to connecting carriers at their maximum rate. Since 1999, we have completed multiple expansions that have increased the capacity of our Cushing Terminal.

St. James Terminal. The crude oil interchange at St. James, Louisiana is one of the three most liquid crude oil interchanges in the United States. Our facility is connected to major pipelines and other terminals and includes a manifold and header system that allows for receipts and deliveries with connecting pipelines at their maximum operating capacity. In addition, this facility includes a marine dock that is able to receive from, and deliver to, tankers and barges and is also connected to our rail unloading facility. See “Rail Facilities” below for further discussion.

L.A. Basin. We own four crude oil and black oil storage facilities in the Los Angeles area with storage capacity in commercial service and a distribution pipeline system of approximately 50 miles of pipeline in the Los Angeles Basin. We use the Los Angeles area storage and distribution system to service the storage and distribution needs of refining, pipeline and marine terminal facilities in the Los Angeles Basin. Our Los Angeles area system’s pipeline distribution assets connect our storage assets with major refineries and third-party pipelines and marine terminals in the Los Angeles Basin.

Patoka Terminal. Our Patoka Terminal includes crude oil storage and an associated manifold and header system at the Patoka Interchange located in Southern Illinois. Our terminal has access to all major pipelines and terminals at the Patoka Interchange, a growing regional hub serving both northbound and southbound movements.

Mobile and Ten Mile Terminal. We have a marine terminal in Mobile, Alabama (the “Mobile Terminal”) and a terminal at our nearby Ten Mile Facility. The facilities are pipeline connected. The Mobile Terminal is equipped with a ship/tanker dock, barge dock, truck unloading facilities and various third-party connections for crude oil movements to area refiners and our Ten Mile Facility is connected to our Pascagoula Pipeline.

Corpus Christi (Eagle Ford) Terminal. We own a 50% interest in Eagle Ford Terminals Corpus Christi LLC, a joint venture with a subsidiary of Enterprise. Eagle Ford Terminals is currently developing a terminal in Corpus Christi, Texas that, when completed, will be capable of loading ocean going vessels with either crude oil or condensate. Initial storage capacity of the terminal will be approximately 1 million barrels. The facility will have access to production from both the Eagle Ford and the Permian Basin through the Eagle Ford joint venture pipeline and is expected to be placed into service in the second quarter of 2019 .

NGL Storage Facilities

Fort Saskatchewan. The Fort Saskatchewan facility is located near Edmonton, Alberta in one of the key North American NGL hubs. The facility is a receipt, storage, fractionation and delivery facility for NGL and is connected to other major NGL plants and pipeline systems in the area. The facility's primary assets include 27 storage caverns. The facility includes assets operated by us and assets operated by a third party. Our ownership in the various facility assets ranges from approximately 21% to 100% . See the section entitled “—NGL Fractionation and Isomerization Facilities” below for additional discussion of this facility.

Sarnia Area. Our Sarnia Area facilities in Southwestern Ontario consist of (i) our Sarnia facility, (ii) our Windsor storage terminal and (iii) our St. Clair terminal. The Sarnia facility is a large NGL fractionation and storage facility located in the Sarnia Chemical Valley that contains multiple rail and truck loading spots. The Sarnia Area facilities are served by a network of 15 pipelines connected to various refineries, chemical plants and other pipeline systems in the area. This pipeline network also delivers product between our Sarnia facility and our Windsor storage terminal in addition to the delivery capability from our Sarnia facility to our St. Clair terminal.

Empress Area. We own a network of seven NGL terminals (Fort Whyte, Moose Jaw, Rapid City, Stewart Valley, Dewdney, Empress and Richardson). The facilities are complemented by various other NGL fractionation and extraction assets as described further below.

Bumstead. Our Bumstead facility is located at a major rail transit point near Phoenix, Arizona. The facility's primary assets include salt-dome storage caverns, a rail track and truck racks.

Natural Gas Storage Facilities

We own two U.S. Federal Energy Regulatory Commission (“FERC”) regulated natural gas storage facilities located on the Gulf Coast that are certificated for 112 Bcf of working gas capacity, and as of December 31, 2018 , we had an aggregate commercial working gas capacity of approximately 63 Bcf in service. Our facilities have aggregate certificated peak daily injection and withdrawal rates of 3.6 Bcf and 5.6 Bcf, respectively.

Our two natural gas storage facilities are strategically located within the Gulf Coast market and have a diverse group of customers, including liquefied natural gas (“LNG”) exporters, utilities, pipelines, producers, power generators and marketers whose storage needs vary from traditional seasonal storage services to hourly balancing. We are located near several major market hubs and our facilities have 14 physical interconnects with third-party interstate pipelines, intrastate pipelines and direct connect customers, serving markets in the Gulf Coast, Mid-Atlantic, Northeast, and Southeast regions of the United States.

Natural Gas Processing Facilities

We own and/or operate four straddle plants located in Western Canada. In addition to the processing capacity at our straddle plants, we have a long-term liquids supply contract relating to a third-party owned straddle plant with gross processing capacity of approximately 2.5 Bcf per day. We also own and operate three natural gas processing plants located in Louisiana and Alabama.

NGL Fractionation and Isomerization Facilities

Empress. We own the Empress fractionation facility, which is connected to and receives liquids from our Empress straddle plant. The facility is capable of producing spec NGL products and connects to our PPTC Pipeline network.

Fort Saskatchewan. Our recently expanded Fort Saskatchewan fractionation facility has a design capacity of 85,000 barrels per day and produces spec propane, butane, condensate and a propane and butane mix, which is sent to our Sarnia facility for further fractionation. Through our 21% ownership in the Keyera Fort Saskatchewan fractionation plant, we have additional fractionation capacity, net to our share, of approximately 17,000 barrels per day.

Sarnia. The Sarnia Fractionator is the largest fractionation plant in Eastern Canada and receives NGL feedstock from the Enbridge Pipeline and from refineries, gas plants and chemical plants in the area. The fractionation unit produces specification propane, isobutane, normal butane and natural gasoline. Our ownership in the various processing units at the Sarnia Fractionator ranges from 62% to 84% .

Shafter. Our Shafter facility located near Bakersfield, California provides isomerization and fractionation services to producers and customers. The primary assets consist of approximately 200,000 barrels of NGL storage and a processing facility with butane isomerization capacity of approximately 15,000 barrels per day including NGL fractionation capacity of approximately 12,000 barrels per day.

Condensate Processing Facility

Our Gardendale condensate processing facility located in La Salle County, Texas is designed to extract natural gas liquids from condensate. The facility is adjacent to our Gardendale terminal and rail facility and is connected to a third-party pipeline that delivers NGL to Mont Belvieu, Texas. The facility has a total processing capacity of 120,000 barrels per day and usable storage capacity of 160,000 barrels. Throughput at the Gardendale processing facility is supplied by long-term commitments from producers.

Rail Facilities

Crude Oil Rail Loading Facilities

We own crude oil and condensate rail loading facilities located at or near Carr, Colorado; Tampa, Colorado; Gardendale, Texas; McCamey, Texas; Manitou, North Dakota; and Kerrobert, Saskatchewan.

Crude Oil Rail Unloading Facilities

We own three crude oil rail unloading facilities. Our St. James, Louisiana facility receives unit trains and has a capacity of 140,000 barrels per day. Our Yorktown, Virginia rail facility can receive unit trains and has an unload capacity of approximately 140,000 barrels per day. Our Bakersfield, California rail facility receives unit trains and has permitted capacity to unload 70,000 barrels per day.

NGL Rail Facilities

We own 26 operational NGL rail facilities (including our Fort Saskatchewan rail facility, as well as facilities that can provide both crude oil and NGL service) strategically located near NGL storage, pipelines, gas production or propane distribution centers throughout the United States and Canada. We have the ability to switch our own railcars at eight of our facilities. We are currently in the process of commissioning rail offload capability at Tampa, Florida, which will add 14 unloading spots and room to store 14 cars, with total capacity of 28 cars on site at a time.

Supply and Logistics Segment

Our Supply and Logistics segment operations generally consist of the following merchant-related activities:

- the purchase of U.S. and Canadian crude oil at the wellhead, and the bulk purchase of crude oil at pipeline, terminal and rail facilities;
- the storage of inventory during contango market conditions and the seasonal storage of NGL and natural gas;
- the purchase of NGL from producers, refiners, processors and other marketers;
- the extraction of NGL from gas processed at our facilities;
- the resale or exchange of crude oil and NGL at various points along the distribution chain to refiners, operators of petrochemical facilities, exporters or other resellers; and
- the transportation of crude oil and NGL on trucks, barges, railcars, pipelines and vessels from various delivery points, market hub locations or directly to end users such as refineries, processors and fractionation facilities.

Our purchase and resale of crude oil and NGL results in us generating a margin, which is reduced by the transportation, facilities and other logistical costs associated with delivering the crude oil or NGL to market as well as related operating and general and administrative expenses. A portion of our results is impacted by overall market structure and the degree of market volatility, as well as variable operating expenses. Our activities are designed to limit downside exposure, while generating upside potential associated with opportunities inherent in volatile market conditions (including opportunities to benefit from fluctuating differentials and market structure). Opportunities to realize upside potential through our Supply and Logistics operations occur from time to time and are typically for short periods of time when there are local or regional infrastructure constraints. See “— Impact of Commodity Price Volatility and Dynamic Market Conditions on Our Business Model” below for further discussion.

In addition to hedged working inventories associated with its merchant activities, as of December 31, 2018, our Supply and Logistics segment owned significant volumes of crude oil and NGL classified as long-term assets and linefill or minimum inventory requirements and employed a variety of owned or leased physical assets throughout the United States and Canada, including approximately:

- 15 million barrels of crude oil and NGL linefill in pipelines owned by us;
- 4 million barrels of crude oil and NGL utilized as linefill in pipelines owned by third parties or otherwise required as long-term inventory;
- 750 trucks and 900 trailers; and
- 9,100 crude oil and NGL railcars.

In connection with its operations, our Supply and Logistics segment secures transportation and facilities services from our other two segments as well as third-party service providers under month-to-month and multi-year arrangements. Intersegment fees are based on posted tariff rates, rates similar to those charged to third parties or rates that we believe approximate market rates.

The following table shows the average daily volume of our supply and logistics activities for the year ended December 31, 2018 :

	Volumes (MBbls/d)
Crude oil lease gathering purchases	1,054
NGL sales	255
Supply and Logistics segment total volumes	1,309

Crude Oil and NGL Purchases. We purchase crude oil and NGL from multiple producers under contracts and believe we have established long-term, broad-based relationships with the crude oil and NGL producers in our areas of operations.

Our crude oil contracts generally range in term from thirty-day evergreen to five years, with the majority ranging from thirty days to one year and a limited number of contracts with remaining terms extending up to ten years. We utilize our truck fleet, railcars and pipelines as well as leased railcars, third-party pipelines, trucks and barges to transport crude oil to market. From time to time, we enter into various types of purchase and exchange transactions including fixed-price purchase contracts, collars, financial swaps and crude oil and NGL-related futures contracts as hedging devices.

We purchase NGL from producers, refiners and other NGL marketing companies under contracts that typically have ranged from immediate delivery to one year in term. In the last few years, we have implemented an increasing number of contracts with longer terms to ensure capacity utilization and base-load expansion projects. We also acquire NGL from gas shippers by paying an extraction right to remove the liquids from the gas flowing through our straddle plants at Empress, Alberta. We utilize our trucking fleet and pipeline network, as well as leased railcars, third-party tank trucks and third-party pipelines to transport NGL.

In addition to purchasing crude oil from producers, we purchase both domestic and foreign crude oil in bulk at major hub locations, rail and dock facilities. We also purchase NGL in bulk at major pipeline terminal points and storage facilities from major integrated oil companies, large independent producers or other NGL marketing companies or processors. Crude oil and NGL are purchased in bulk when we believe additional opportunities exist to realize margins further downstream in the

crude oil or NGL distribution chain. The opportunities to earn additional margins vary over time with changing market conditions. Accordingly, the margins associated with our bulk purchases will fluctuate from period to period.

Crude Oil and NGL Sales. The activities involved in the supply, logistics and distribution of crude oil and NGL are complex and require current detailed knowledge of crude oil and NGL sources and end markets, as well as a familiarity with a number of factors including individual refinery demand for specific grades of crude oil, area market price structures, location of customers, various modes and availability of transportation facilities to deliver crude oil and NGL to our customers.

We sell our crude oil to major integrated oil companies, independent refiners, exporters and other resellers in various types of sale and exchange transactions. Our crude oil sales contracts generally range in term from thirty-day evergreen to five years, with the majority ranging from thirty days to one year. We sell NGL primarily to propane and refined product retailers, petrochemical companies and refiners, and limited volumes to other marketers. The majority of our NGL contracts generally span a term of one year. For contracts greater than one year, pricing mechanisms are typically put in place to ensure any significant cost escalations are accounted for, which may include provisions for annual price negotiations designed to ensure both the buyer and seller remain at market-based pricing. We establish a margin for the crude oil and NGL we purchase by entering into physical sales contracts with third parties, or by entering into a future delivery obligation with respect to futures contracts on the NYMEX, ICE or over-the-counter exchanges. Through these transactions, we seek to maintain a position that is substantially balanced between purchases and sales and future delivery obligations. From time to time, we enter into various types of sale and exchange transactions, including fixed-price delivery contracts, collars, financial swaps and crude oil and NGL-related futures contracts as hedging devices.

Crude Oil and NGL Exchanges. We pursue exchange opportunities to enhance margins throughout the gathering and marketing process. When opportunities arise to increase our margin or to acquire a grade, type or volume of crude oil or NGL that more closely matches our physical delivery requirement, location or the preferences of our customers, we exchange physical crude oil or NGL, as appropriate, with third parties. These exchanges are effected through contracts called exchange or buy/sell agreements. Through an exchange agreement, we agree to buy crude oil or NGL that differs in terms of geographic location, grade of crude oil or type of NGL, or physical delivery schedule from crude oil or NGL we have available for sale. Generally, we enter into exchanges to acquire crude oil or NGL at locations that are closer to our end markets, thereby reducing transportation costs and increasing our margin. We also exchange our crude oil to be physically delivered at a later date, if the exchange is expected to result in a higher margin net of storage costs, and we enter into exchanges based on the grade of crude oil, which includes such factors as sulfur content and specific gravity, in order to meet the quality specifications of our physical delivery contracts. See Note 2 to our Consolidated Financial Statements for further discussion of our accounting for exchange and buy/sell agreements.

Credit. Our merchant activities involve the purchase of crude oil and NGL for resale and require significant extensions of credit by our suppliers. In order to assure our ability to perform our obligations under the purchase agreements, various credit arrangements are negotiated with our suppliers. These arrangements include open lines of credit and, to a lesser extent, standby letters of credit issued under our hedged inventory facility or our senior unsecured revolving credit facility.

When we sell crude oil and NGL, we must determine the amount, if any, of credit to be extended to any given customer. We manage our exposure to credit risk through credit analysis, credit approvals, credit limits, prepayment, letters of credit and monitoring procedures. Additionally, in an effort to mitigate credit risk, a significant portion of our transactions with counterparties are settled on a net-cash basis. Furthermore, we also enter into netting agreements (contractual agreements that allow us to offset receivables and payables with those counterparties against each other on our balance sheet) for the majority of our net-cash arrangements.

Because our typical sales transactions can involve large volumes of crude oil, the risk of nonpayment and nonperformance by customers is a major consideration in our business. We believe our sales are made to creditworthy entities or entities with adequate credit support. Generally, sales of crude oil are settled within 30 days of the month of delivery, and pipeline, transportation and terminalling services settle within 30 days from the date we issue an invoice for the provision of services.

We also have credit risk exposure related to our sales of NGL (principally propane); however, because our sales are typically in relatively small amounts to individual customers, we do not believe that these transactions pose a material concentration of credit risk. Typically, we enter into annual contracts to sell NGL on a forward basis, as well as to sell NGL on a current basis to local distributors and retailers. In certain cases our NGL customers prepay for their purchases, in amounts ranging up to 100 % of their contracted amounts.

Certain activities in our Supply and Logistics segment are affected by seasonal aspects, primarily with respect to NGL supply and logistics activities, which are sensitive to weather-related demand, particularly during the approximate five-month peak heating season of November through March.

Impact of Commodity Price Volatility and Dynamic Market Conditions on Our Business Model

Through our three business segments, we are engaged in the transportation, storage, terminalling and marketing of crude oil, NGL and natural gas. The majority of our activities are focused on crude oil, which is the principal feedstock used by refineries in the production of transportation fuels.

Crude oil, NGL and natural gas commodity prices have historically been very volatile. For example, since the mid-1980s, NYMEX West Texas Intermediate ("WTI") crude oil benchmark prices have ranged from a low of approximately \$10 per barrel during 1986 to a high of over \$147 per barrel during 2008. During 2018, WTI crude oil prices traded within a range of approximately \$43 to \$76 per barrel. There has also been volatility within the propane and butane markets as seen through the North American benchmark price located at Mont Belvieu, Texas. Specifically, over the last ten years, propane prices have ranged from a low of approximately 30% of the WTI benchmark price for crude oil in 2015 to a high of approximately 75% of the WTI benchmark price for crude oil in 2017. During 2018, propane averaged 57% of WTI and on a daily basis traded within a range of 49% to 68% of WTI. During the same ten-year period, butane has seen a price range from a low of approximately 35% of the WTI benchmark price for crude oil in 2015 to a high of approximately 108% of the WTI benchmark price for crude oil in 2017. During 2018, butane averaged 66% of WTI and on a daily basis traded within a range of 55% to 77% of WTI.

Absent extended periods of lower crude oil or NGL prices that are below production replacement costs or higher crude oil or NGL prices that have a significant adverse impact on consumption, demand for the services we provide in our fee-based Transportation and Facilities segments and our financial results from these activities have little correlation to absolute commodity prices. Relative contribution levels will vary from quarter-to-quarter due to seasonal and other similar factors, but we project that (absent material outperformance in our Supply and Logistics business) our fee-based Transportation and Facilities segments should comprise approximately 90% or greater of our aggregate segment results.

Results from our supply and logistics activities depend on our ability to sell crude oil and NGL at prices in excess of our aggregate cost. Although segment results may be adversely affected during certain transitional periods as discussed further below, our crude oil and NGL supply, logistics and distribution operations are not directly affected by the absolute level of prices, but are affected by overall levels of supply and demand for crude oil and NGL and relative fluctuations in market-related indices.

In developing our business model and allocating our resources among our three segments, we attempt to anticipate the impacts of shifts between supply-driven markets and demand-driven markets, seasonality, cyclicalities, regional surpluses and shortages, economic conditions and a number of other influences that can cause volatility and change market dynamics on a short, intermediate and long-term basis. Our objective is to position the Partnership such that our overall annual cash flow is not materially adversely affected by the absolute level of energy prices, shifts between demand-driven markets and supply-driven markets or other similar dynamics. Beginning in the second half of 2014 through early 2018, however, the market experienced impacts from aggressive competition and overbuilt infrastructure in certain regions, which caused supply and demand imbalances and price volatility. In some of the areas where we operate, there has been significantly increased competition for marginal or incremental volumes from shippers on third-party pipelines who have committed to ship more production than they have and are purchasing barrels in the market for shipment on the applicable third-party pipeline to satisfy their transportation commitments, often doing so at a loss because the loss on sale of the purchased crude oil will be less than the amount of the take-or-pay obligation on the pipeline. This type of activity has put downward pressure on margins across our three business segments. During such transitional markets, our Supply and Logistics segment may not be able to fully recover its costs on certain transactions.

In challenging market conditions, such as those experienced over the last several years, we believe the complementary, integrated nature of our business activities and diversification of our asset base among varying regions and demand-driven and supply-driven markets provides flexibility for our customers and plays a valuable role in driving the growth of our fee-based Transportation and Facilities segments. Additionally, this approach is also intended to provide opportunities to realize incremental margin during volatile market conditions. For example, if crude oil prices are high relative to historical levels, we may hedge some of our expected pipeline loss allowance barrels, and if crude oil prices are low relative to historical prices, we may hedge a portion of our anticipated diesel purchases needed to operate our trucks and barges. Also, during periods when supply exceeds the demand for crude oil, NGL or natural gas in the near term, the market for such product is often in contango, meaning that the price for future deliveries is higher than current prices. In a contango market, entities that have access to

storage at major trading locations can purchase crude oil, NGL or natural gas at current prices for storage and simultaneously sell forward such products for future delivery at higher prices.

In executing our business model, we employ a variety of financial risk management tools and techniques, predominantly in our Supply and Logistics segment. These are discussed in greater detail below.

Risk Management

In order to hedge margins involving our physical assets and manage risks associated with our various commodity purchase and sale obligations and, in certain circumstances, to realize incremental margin during volatile market conditions, we use derivative instruments. We also use various derivative instruments to manage our exposure to interest rate risk and currency exchange rate risk. In analyzing our risk management activities, we draw a distinction between enterprise-level risks and trading-related risks. Enterprise-level risks are those that underlie our core businesses and may be managed based on management's assessment of the cost or benefit of doing so. Conversely, trading-related risks (the risks involved in trading in the hopes of generating an increased return) are not inherent in our core business; rather, those risks arise as a result of engaging in trading activities. Our policy is to manage the enterprise-level risks inherent in our core businesses, rather than trying to profit from trading activity. Our commodity risk management policies and procedures are designed to monitor NYMEX, ICE and over-the-counter positions, as well as physical volumes, grades, locations, delivery schedules and storage capacity, to help ensure that our hedging activities address our risks. Our interest rate and currency exchange rate risk management policies and procedures are designed to monitor our derivative positions and ensure that those positions are consistent with our objectives and approved strategies. We have a risk management function that has direct responsibility and authority for our risk policies, related controls around commercial activities and procedures and certain other aspects of corporate risk management. Our risk management function also approves all new risk management strategies through a formal process. Our approved strategies are intended to mitigate and manage enterprise-level risks that are inherent in our core businesses.

Our policy is generally to structure our purchase and sales contracts so that price fluctuations do not materially affect our operating income, and not to acquire and hold physical inventory or derivatives for the purpose of speculating on outright commodity price changes. Although we seek to maintain a position that is substantially balanced within our supply and logistics activities, we purchase crude oil, NGL and natural gas from thousands of locations and may experience net unbalanced positions for short periods of time as a result of production, transportation and delivery variances as well as logistical issues associated with inclement weather conditions and other uncontrollable events that may occur. When unscheduled physical inventory builds or draws do occur, they are monitored constantly and managed to a balanced position over a reasonable period of time. This activity is monitored independently by our risk management function and must take place within predefined limits and authorizations.

Customers

Marathon Petroleum Corporation and its subsidiaries accounted for 14%, 19% and 18% of our revenues for the years ended December 31, 2018, 2017 and 2016, respectively. ExxonMobil Corporation and its subsidiaries accounted for 14%, 11% and 14% of our revenues for the years ended December 31, 2018, 2017 and 2016, respectively. Phillips 66 Company and its subsidiaries accounted for 11% of our revenues in each of the years ended December 31, 2017 and 2016. No other customers accounted for 10% or more of our revenues during any of the three years ended December 31, 2018. The majority of revenues from these customers pertain to our supply and logistics operations. The sales to these customers occur at multiple locations and we believe that the loss of these customers would have only a short-term impact on our operating results. There is risk, however, that we would not be able to identify and access a replacement market at comparable margins. For a discussion of customers and industry concentration risk, see Note 15 to our Consolidated Financial Statements.

Competition

Competition among pipelines is based primarily on transportation charges, access to producing areas and supply regions and demand for crude oil and NGL by end users. Although new pipeline projects represent a source of competition for our business, there are also existing third-party owned pipelines with excess capacity in the vicinity of our operations that expose us to significant competition based on the relatively low operating cost associated with moving an incremental barrel of crude oil or NGL through such unutilized capacity. In the current environment, competition for marginal or incremental volumes has been exacerbated in some areas by shippers on third-party pipelines who have committed to ship more production than they own or have secured under contract and are purchasing barrels in the market and shipping them on the applicable third-party pipeline in satisfaction of their transportation commitment. This type of activity reduces the pool of incremental barrels that would otherwise be available for transport on our pipelines. In addition, in areas where additional infrastructure is necessary to accommodate new or increased production or changing product flows, we face competition in providing the required infrastructure solutions as well as the risk of building capacity in excess of sustainable demand levels. For example, over the last 18 months, several potential new pipeline projects have been announced or are currently under construction. In many cases the sponsors have represented that such projects are underpinned by substantial minimum volume commitments and/or acreage dedications. Combined with current pipeline takeaway capacity, these proposed or pending pipeline projects could result in significant excess capacity relative to projected crude oil production volumes, especially in the Permian Basin, where we have significant operations. In combination with incremental shipper commitments or dedications, the ratio of excess capacity to uncommitted barrels is expected to increase significantly, amplifying the competition for incremental barrels to fill available capacity on our assets and resulting in downward pressure on margins.

In addition, depending upon the specific movement, pipelines, which generally offer the lowest cost of transportation, may also face competition from other forms of transportation, such as truck, rail and barge. Although these alternative forms of transportation are typically higher cost, they can provide access to alternative markets at which a higher price may be realized for the commodity being transported, thereby overcoming the increased transportation cost.

We also face competition with respect to our supply and logistics and facilities services. Our competitors include other crude oil and NGL pipeline and terminalling companies, other NGL processing and fractionation companies, the major integrated oil companies and their marketing affiliates, independent gatherers, private equity backed entities, banks that have established a trading platform, brokers and marketers of widely varying sizes, financial resources and experience. Some of these competitors have capital resources greater than ours. The addition of new pipelines supported by minimum volume commitments and/or acreage dedications could also amplify the level of competition for purchasing wellhead barrels, especially in the Permian Basin and thus impact our margins.

With respect to our natural gas storage operations, the principal elements of competition are rates, terms of service, supply and market access and flexibility of service. An increase in competition in our markets could arise from new ventures or expanded operations from existing competitors. Our natural gas storage facilities compete with several other storage providers, including regional storage facilities and utilities. Certain pipeline companies have storage facilities connected to their systems that compete with some of our facilities.

Regulation

Our assets, operations and business activities are subject to extensive legal requirements and regulations under the jurisdiction of numerous federal, state, provincial and local agencies. Many of these agencies are authorized by statute to issue, and have issued, requirements binding on the pipeline industry, related businesses and individual participants. The failure to comply with such legal requirements and regulations can result in substantial fines and penalties, expose us to civil and criminal claims, and cause us to incur significant costs and expenses. See Item 1A. “Risk Factors — Risks Related to PAA’s Business — PAA’s operations are also subject to laws and regulations relating to protection of the environment and wildlife, operational safety, climate change and related matters that may expose it to significant costs and liabilities. The current laws and regulations affecting our business are subject to change and in the future PAA may be subject to additional laws and regulations, which could adversely impact PAA’s business.” At any given time there may be proposals, provisional rulings or proceedings in legislation or under governmental agency or court review that could affect our business. The regulatory burden on our assets, operations and activities increases our cost of doing business and, consequently, affects our profitability. We can provide no assurance that the increased costs associated with any new or proposed laws, rules or regulations will not be material. We may at any time also be required to apply significant resources in responding to governmental requests for information and/or enforcement actions.

The following is a summary of certain, but not all, of the laws and regulations affecting our operations.

Environmental, Health and Safety Regulation

General

Our operations involving the storage, treatment, processing and transportation of liquid hydrocarbons, including crude oil, are subject to stringent federal, state, provincial and local laws and regulations governing the discharge of materials into the environment or otherwise relating to protection of the environment. As with the industry generally, compliance with these laws and regulations increases our overall cost of doing business, including our capital costs to construct, maintain and upgrade equipment and facilities as regulations are updated or new regulations are invoked. Failure to comply with these laws and regulations could result in the assessment of administrative, civil and criminal penalties, the imposition of investigatory and remedial liabilities and the issuance of injunctions or other orders that may subject us to additional operational constraints. Failure to comply with these laws and regulations could also result in negative public perception of our operations or the industry in general, which may adversely impact our ability to conduct our business. Environmental and safety laws and regulations are subject to changes that may result in more stringent requirements, and we cannot provide any assurance that compliance with current and future laws and regulations will not have a material effect on our results of operations or earnings. A discharge of hazardous liquids into the environment could, to the extent such event is not insured, subject us to substantial expense, including both the cost to comply with applicable laws and regulations and any claims made by third parties. The following is a summary of some of the environmental, health and safety laws and regulations to which our operations are subject.

Pipeline Safety/Integrity Management

A substantial portion of our petroleum pipelines and our storage tank facilities in the United States are subject to regulation by the Department of Transportation's ("DOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA") pursuant to the Hazardous Liquids Pipeline Safety Act of 1979, as amended (the "HLPESA"). The HLPESA imposes safety requirements on the design, installation, testing, construction, operation, replacement and management of pipeline and tank facilities. Federal regulations implementing the HLPESA require pipeline operators to adopt measures designed to reduce the environmental impact of oil discharges from onshore oil pipelines, including the maintenance of comprehensive spill response plans and the performance of extensive spill response training for pipeline personnel. These regulations also require pipeline operators to develop and maintain a written qualification program for individuals performing covered tasks on pipeline facilities. Comparable regulation exists in some states in which we conduct intrastate common carrier or private pipeline operations. Regulation in Canada is under the National Energy Board ("NEB") and provincial agencies.

United States

The HLPESA was amended by the Pipeline Safety Improvement Act of 2002 and the Pipeline Inspection, Protection, Enforcement and Safety Act of 2006. These amendments have resulted in the adoption of rules by the DOT that require transportation pipeline operators to implement integrity management programs, including frequent inspections, correction of identified anomalies and other measures, to ensure pipeline safety in "high consequence areas" such as high population areas, areas unusually sensitive to environmental damage, and commercially navigable waterways. In the United States, our costs associated with the inspection, testing and correction of identified anomalies were approximately \$86 million in 2018, \$137 million in 2017 and \$89 million in 2016. Based on currently available information, our preliminary estimate for 2019 is that we will incur approximately \$69 million in capital expenditures and approximately \$28 million in operational expenditures associated with our required pipeline integrity management program. Significant additional expenses could be incurred if new or more stringently interpreted pipeline safety requirements are implemented. In addition to required activities, our integrity management program includes several voluntary, multi-year initiatives designed to prevent incidents. Costs incurred in connection with these voluntary initiatives were approximately \$38 million in 2018, \$39 million in 2017 and \$48 million in 2016, and our preliminary estimate for 2019 is that we will incur approximately \$52 million of such costs.

PHMSA was reauthorized and the HLPESA was amended in 2011 and 2016. The regulatory changes precipitated by these actions have increased our cost to operate. We anticipate that future rulemaking (including the 2019 reauthorization of PHMSA and the eventual adoption of the hazardous liquids rule) will have the potential to contribute to a higher cost to operate.

In October 2015, the Governor of California signed the Oil Spill Response: Environmentally and Ecologically Sensitive Areas Bill ("AB-864") which requires new and existing pipelines located near environmentally and ecologically sensitive areas connected to or located in the coastal zone to use best available technologies to reduce the amount of oil released in an oil spill to protect state waters and wildlife. Best available technology includes, but is not limited to, installation of leak detection technologies, automatic shutoff systems, or remote controlled sectionalized block valves, or any combination

of these technologies based on a risk analysis conducted by the operator. The California Office of the State Fire Marshal is in the process of developing the regulations required by AB 864 and issued updated draft regulations in January 2019. The updated draft regulations (while not yet adopted) require that the risk analysis, plans for installation of best available technology and any exemption requests be submitted in 2020 and installation of best available technology, if required, be completed by July 2022. These deadlines could change depending upon the date the final regulations are adopted. Compliance with these new regulations will impact our pipeline operations in California and add to the cost to operate the pipelines subject to these rules.

The DOT has issued guidelines with respect to securing regulated facilities against terrorist attack. We have instituted security measures and procedures in accordance with such guidelines to enhance the protection of certain of our facilities; however, we cannot provide any assurance that these security measures would fully protect our facilities from an attack.

The DOT has generally adopted American Petroleum Institute Standard 653 (“API 653”) as the standard for the inspection, repair, alteration and reconstruction of steel aboveground petroleum storage tanks subject to DOT jurisdiction. API 653 requires regularly scheduled inspection and repair of tanks remaining in service. In the United States, our costs associated with this program were approximately \$53 million, \$37 million and \$29 million in 2018, 2017 and 2016, respectively. For 2019, we have budgeted approximately \$51 million in connection with continued API 653 compliance activities and similar new EPA regulations for tanks not regulated by the DOT. Certain storage tanks may be taken out of service if we believe the cost of compliance will exceed the value of the storage tanks or replacement tankage may be constructed.

Canada

In Canada, the NEB and provincial agencies regulate the safety and integrity management of pipelines and storage tanks used for hydrocarbon transmission. We have incurred and will continue to incur costs related to such regulatory requirements.

We have implemented Pipeline, Facility and Cavern Integrity Management Programs to comply with applicable regulatory requirements and assist in our efforts to mitigate risk. Costs incurred for such integrity management activities were approximately \$71 million, \$60 million and \$59 million in 2018, 2017 and 2016, respectively, and our preliminary estimate for 2019 is that we will incur approximately \$76 million of such costs.

We cannot predict the potential costs associated with additional, future regulation. Significant additional expenses could be incurred, and additional operational requirements and constraints could be imposed, if new or more stringently interpreted pipeline safety requirements are implemented.

Occupational Safety and Health

United States

In the United States, we are subject to the requirements of the Occupational Safety and Health Act, as amended (“OSHA”) and comparable state statutes that regulate the protection of the health and safety of workers. In addition, the OSHA hazard communication standard requires that certain information be maintained about hazardous materials used or produced in operations and that this information be provided to employees, state and local government authorities and citizens. Certain of our facilities are subject to OSHA Process Safety Management (“PSM”) regulations, which are designed to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable or explosive chemicals. These regulations apply to any process which involves a chemical at or above specified thresholds or any process that involves 10,000 pounds or more of a flammable liquid or gas in one location.

Canada

Similar regulatory requirements exist in Canada under the federal and provincial Occupational Health and Safety Acts, Regulations and Codes. The agencies with jurisdiction under these regulations are empowered to enforce them through inspection, audit, incident investigation or investigation of a public or employee complaint. In some jurisdictions, the agencies have been empowered to administer penalties for contraventions without the company first being prosecuted. Additionally, under the Criminal Code of Canada, organizations, corporations and individuals may be prosecuted criminally for violating the duty to protect employee and public safety.

Solid Waste

We generate wastes, including hazardous wastes, which are subject to the requirements of the federal Resource Conservation and Recovery Act, as amended (“RCRA”), and analogous state and provincial laws. Many of the wastes that we generate are not subject to the most stringent requirements of RCRA because our operations generate primarily oil and gas wastes, which currently are excluded from consideration as RCRA hazardous wastes. It is possible, however, that in the future, oil and gas waste under RCRA may be revisited and our wastes subject to more rigorous and costly disposal requirements, resulting in additional capital expenditures or operating expenses. For example, pursuant to a settlement agreement with environmental organizations, the EPA must determine by 2019 whether currently exempt oil and gas wastes should be regulated under RCRA’s hazardous waste provisions.

Hazardous Substances

The federal Comprehensive Environmental Response, Compensation and Liability Act, as amended (“CERCLA”), also known as “Superfund,” and comparable state laws impose liability, without regard to fault or the legality of the original act, on certain classes of persons that contributed to the release of a “hazardous substance” into the environment. These persons include the owner or operator of the site or sites where the release occurred and companies that disposed of, or arranged for the disposal of, the hazardous substances found at the site. Such persons may be subject to strict, joint and several liability for the costs of cleaning up the hazardous substances that have been released into the environment, for damages to natural resources, and for the costs of certain health studies. It is not uncommon for neighboring landowners and other third parties to file claims for personal injury and property damage allegedly caused by hazardous substances or other pollutants released into the environment. In the course of our ordinary operations, we may generate waste that falls within CERCLA’s definition of a “hazardous substance.” Canadian federal and provincial laws also impose liabilities for releases of certain substances into the environment.

We are subject to the Environmental Protection Agency’s (“EPA”) Risk Management Plan regulations at certain facilities. These regulations are intended to work with OSHA’s PSM regulations to minimize the offsite consequences of catastrophic releases. The regulations require us to develop and implement a risk management program that includes a five-year accident history, an offsite consequence analysis process, a prevention program and an emergency response program. In January 2016, the EPA finalized revisions to the Risk Management Plan (“RMP”) rules, including requirements for the use of third-party compliance audits, root cause analyses for facilities that experience releases, process hazard analyses and enhanced information-sharing provisions, effective March 2017. However, the EPA has since published a rule delaying implementation of the RMP revisions until February 2019 while the agency considers whether to amend or repeal the rule. OSHA has announced that it is considering similar revisions to the PSM rule, but, to date, has not issued a Notice of Proposed Rulemaking. The potential for revisions to either the RMP or PSM rule is uncertain at this time.

Environmental Remediation

We currently own or lease, and in the past have owned or leased, properties where potentially hazardous liquids, including hydrocarbons, are or have been handled. These properties may be subject to CERCLA, RCRA and state and Canadian federal and provincial laws and regulations. Under such laws and regulations, we could be required to remove or remediate potentially hazardous liquids or associated wastes (including wastes disposed of or released by prior owners or operators) and to clean up contaminated property (including contaminated groundwater).

We maintain insurance of various types with varying levels of coverage that we consider adequate under the circumstances to cover our operations and properties. The insurance policies are subject to deductibles and retention levels that we consider reasonable and not excessive. Consistent with insurance coverage generally available in the industry, in certain circumstances our insurance policies provide limited coverage for losses or liabilities relating to gradual pollution, with broader coverage for sudden and accidental occurrences.

Assets we have acquired or will acquire in the future may have environmental remediation liabilities for which we are not indemnified. We have in the past experienced and in the future may experience releases of hydrocarbon products into the environment from our pipeline, rail, storage and other facility operations. We may also discover environmental impacts from past releases that were previously unidentified. The costs and liabilities associated with any such releases or environmental impacts could be significant and may not be covered by insurance; accordingly, such costs and liabilities could have a material adverse impact on our results of operations and/or financial position.

Air Emissions

Our United States operations are subject to the United States Clean Air Act (“Clean Air Act”), comparable state laws and associated state and federal regulations. Our Canadian operations are also subject to federal and provincial air emission regulations, which are discussed in subsequent sections.

As a result of the changing air emission requirements in both Canada and the United States, we may be required to incur certain capital and operating expenditures in the next several years to install air pollution control equipment and otherwise comply with more stringent federal, state, provincial and regional air emissions control requirements when we attempt to obtain or maintain permits and approvals for sources of air emissions. We can provide no assurance that future air compliance obligations will not have a material adverse effect on our financial condition or results of operations.

Climate Change Initiatives

United States

The EPA has adopted rules for the reporting the emission of carbon dioxide, methane and other greenhouse gases (“GHG”) from certain sources. Fewer than ten of our facilities are presently subject to the federal GHG reporting requirements. These include facilities with combustion GHG emissions and potential fugitive emissions above the reporting thresholds. We import sufficient quantities of finished fuel products into the United States to be required to report that activity as well.

In June 2016, the EPA finalized regulations affecting new, modified and reconstructed sources of air emissions in the oil and natural gas sector that require significant reductions in fugitive methane emissions from certain upstream and midstream oil and gas facilities. These new rules also require operators to implement fugitive emission leak detection and repair requirements for compressor stations. However, the EPA has taken several steps to delay implementation of its methane rules, and the agency proposed a rulemaking in June 2017 to stay the requirements for a period of two years and revisit implementation of the methane rules in their entirety. The EPA has not yet published a final rule but, as a result of these developments, future implementation of the 2016 rules is uncertain at this time. However, several states have either proposed or finalized similar regulations related to the reduction of methane emissions from the oil and natural gas sector.

California has implemented a GHG cap-and-trade program, authorized under Assembly Bill 32 (“AB32”). Since its start in 2014, California’s cap-and-trade program has only applied to large industrial facilities with carbon dioxide equivalent emissions over 25,000 metric tons. The California Air Resources Board has published a list of facilities that are subject to this program. At this time, the list only includes one of our facilities, the Lone Star Gas Liquids facility in Shafter, California because it is a significant combustion and propane fractionation source. As a result, compliance instruments for GHG emissions have been purchased since 2013.

Effective January 1, 2015, the AB32 regulations also covered finished fuel providers and importers. California finished fuels providers (refiners and importers) are required to purchase GHG emission credits for finished fuel sold in or imported into California. Plains Marketing was included in this portion of the regulation due to propane imports and completed its first year of compliance in 2016. The compliance requirements of the GHG cap-and-trade program through 2020 are currently being phased in. Effective January 1, 2018, importers of finished fuels responsible for compliance costs associated with GHG has changed from the consignee to the importer on title of the product. Plains Midstream Canada is now included in this change to the rule due to its imports of propane into California and will submit its first compliance report in 2019.

Executive Order B-30-15 was signed by California’s Governor in mid-2015. This Executive Order requires a 40% reduction in GHG emissions from the 1990 baseline level by 2030. The current 2020 goals for GHG emissions reductions are at 15% below the 1990 baseline level. Compliance with this reduction requirement may necessitate the lowering of the threshold for industrial facilities required to participate in the GHG cap and trade program.

While it is not possible at this time to predict how federal or state governments may choose to regulate GHG emissions, any new regulatory restrictions on GHG emissions could result in material increased compliance costs, additional operating restrictions and an increase in the cost of feedstock and products produced by our refinery customers.

In December 2015, the Paris Agreement was signed at the 21st annual Conference of Parties to the United Nations Framework Convention on Climate Change (“UNFCCC”). The Paris Agreement, which came into effect in November 2016, requires signatory parties to develop and implement carbon emission reduction policies with a goal of limiting the rise in average global temperatures to 2°C or less. The United States and Canada are currently signatories to the Agreement; however,

in June 2017, President Trump stated that the United States would withdraw from the Paris Agreement, but may enter into a future international agreement related to GHGs. In August 2017, the U.S. State Department officially informed the United Nations of the intent of the United States to withdraw from the Paris Agreement. The United States' adherence to the exit process is uncertain and/or the terms on which the United States may reenter the Paris Agreement or a separately negotiated agreement are unclear at this time. The Paris Agreement is likely to become a significant driver for future potential GHG reduction programs in participating countries. Notwithstanding potential risks related to climate change, the International Energy Agency estimates that global energy demand will continue to rise and will not peak until after 2040 and that oil and gas will continue to represent a substantial percentage of global energy use over that time. Finally, to the extent increasing concentrations of GHGs in the Earth's atmosphere may produce climate changes that have significant physical effects, such as increased frequency and severity of storms, droughts, floods and other climatic events, such events could have a material adverse effect on our assets, particularly those located in coastal or flood prone areas.

Although it is not possible at this time to predict how legislation or new regulations that may be adopted to address GHG emissions would impact our business, any such future laws and regulations could result in increased compliance costs or additional operating restrictions, and could have a material adverse effect on our business, demand for our services, financial condition, results of operations and cash flows.

Canada

Federal Regulations. Along with 197 other countries, Canada is a signatory to the UNFCCC "Durban Platform" committing it to develop a legally binding agreement to reduce GHG emissions by 2020. Further, on December 12, 2015, the UNFCCC ratified the Paris Agreement to accelerate climate change initiatives and to intensify the actions of member nations in the reduction of GHG emissions. This ratification also included requirements that all Parties report on their emissions status and agreement for a review every five years to assess success among member nations in attaining objectives and targets under this agreement.

Large emitters of GHG have been required to report their emissions under the Canadian Greenhouse Gas Emissions Reporting Program since 2004. Effective January 1, 2018, the Federal Department of Environment and Climate Change lowered the reporting threshold for all facilities from 50 thousand tonnes per year ("kt/y") to 10 kt/y GHG emissions. This has resulted in one additional PMC facility (for a total of four locations) being currently required to prepare annual reports of their emissions. The associated costs with this new reporting requirement is not considered to be material.

In October 2016, the Government of Canada implemented a pan-Canadian approach to pricing carbon pollution requiring all Canadian provinces and territories to have carbon pricing in place by 2018, which is now in effect. The provinces and territories were granted flexibility in deciding how they implement carbon pricing either by placing a direct price on carbon pollution or adopting a cap and trade system. The Provincial programs that fail to meet the Federal government's requirements for their programs are required to adopt the Federal program. The Federal program includes two components: a direct price on carbon pollution (the Federal price on carbon pollution will start at \$20/tonne in 2019 and rise by \$10 a year to reach \$50/tonne in 2022) and an output based pricing system ("OBPS") designed to address competitiveness risk for large emitters.

In April 2018, the Federal Department of Environment and Climate Change introduced regulations designed to reduce methane emissions by up to 45% by 2025 (from 2012 levels) from oil and natural gas facilities. The scope and requirements of the proposed rule are similar to the EPA methane rules described above. Effective June 2017, the Federal Department of Environment and Climate Change has introduced the Multi Sector Air Pollutants Regulations which set air pollution emission standards across Canada for several industrial sectors that utilize applicable equipment regulated under this program. The regulations establish specific limits to the amount of nitrogen oxides emitted from gas fueled boilers, heaters and stationary spark-ignition engines above a specified power rating. Based on these regulations, reporting obligations exist that are associated with seven facilities with equipment that meets specifications of the program. The implications of these regulations coming into effect are not believed to be material.

Provincial Regulations

Ontario. In February 2015, the Ontario Ministry of Environment and Climate Change issued a discussion paper that identified carbon pricing as a critical action necessary to reduce emissions of greenhouse gases. In April 2015, the Ontario government announced it would be implementing a GHG cap and trade program, which would be implemented through the Western Climate Initiative ("WCI"), which includes Quebec and California. Mandatory participants for the program were responsible for their emissions starting on January 1, 2017. PMC's facility at Sarnia was considered to be a mandatory participant in the program. In June 2018, the newly formed Ontario Provincial government repealed the provincial cap and trade program with the passing of the Cap and Trade Cancellation Act which now subjects the province to the Federal carbon

pricing program. At this time, we do not believe that the cancellation of Ontario's cap and trade program, or replacement with the Federal program, will have a material adverse effect on our operations.

The Ontario government has introduced an updated Sulphur Dioxide ("SO₂") standard which requires the reduction of SO₂ from the current one hour average emission rate of 690 micrograms per cubic meter of air ("ug/m³") to the new one hour standard of 100 ug/m³ by 2023 at industrial facilities. The introduction of this reduction measure will require further evaluation of current emissions and further measures to be implemented based on initial emission testing. The impact of this requirement is not known at this time.

Alberta. The Alberta Climate Change and Emissions Management Act provides a framework for managing GHG emissions by reducing specified gas emissions to 50% of 1990 levels by December 31, 2020. The Specified Gas Emitters Regulation ("SGER") was the initial program introduced which imposed GHG emissions limits on large emitters and required reductions in GHG emissions intensity. PMC has two facilities (Fort Saskatchewan Storage and Fractionation Facility and Empress VI) which do not meet the reduction obligations. As such, PMC has been required to submit compliance payments to the Climate Change Emissions Management Fund. In January 2018, the SGER was replaced with the Carbon Competitive Incentive Regulation ("CCIR") for compliance years 2018 onwards. Although various elements of the SGER are carried through into the CCIR, the CCIR has fundamental differences, both in the way a facility's regulated emissions are calculated as well as how the emission intensity reduction is measured, which aligns with the program developed by the Federal government and their OBPS requirements. Compliance options under the CCIR are similar to those under the previous SGER such that a GHG fund credit purchase is required if reduction targets identified under the program are not attained, which has historically resulted in payments being made to the province for the two facilities under this program.

In association with the Federal methane reduction targets, the Alberta government has introduced the Alberta Methane reduction program, which requires a 45% reduction of methane from oil and gas operations by 2025. The primary focus will be on the improvement of measurement and reporting, and leak detection programs which will be formalized internally within existing operational budgets.

Other Canadian Jurisdictions. Nova Scotia and Quebec Cap and Trade programs cover propane supplied by PMC into the Nova Scotia and Quebec markets. PMC is required to purchase GHG emission credits and submit annual compliance reports under each province's respective Cap and Trade program. Effective April 1, 2019, the Federal carbon pricing program comes into effect for provinces that do not have a carbon pricing program in place. This includes Saskatchewan, Manitoba, Ontario and New Brunswick.

Water

The U.S. Federal Water Pollution Control Act, as amended, also known as the Clean Water Act ("CWA"), and analogous state and Canadian federal and provincial laws impose restrictions and strict controls regarding the discharge of pollutants into navigable waters of the United States and Canada, as well as state and provincial waters. Federal, state and provincial regulatory agencies can impose administrative, civil and/or criminal penalties for non-compliance with discharge permits or other requirements of the CWA, and can also pursue injunctive relief to enforce compliance with the CWA and analogous laws.

The U.S. Oil Pollution Act of 1990 ("OPA") amended certain provisions of the CWA, as they relate to the release of petroleum products into navigable waters. OPA subjects owners of facilities to strict, joint and potentially unlimited liability for containment and removal costs, natural resource damages and certain other consequences of an oil spill. State and Canadian federal and provincial laws also impose requirements relating to the prevention of oil releases and the remediation of areas.

In addition, for over 35 years, the Army Corps of Engineers (the "Corps") has authorized construction, maintenance and repair of pipelines under a streamlined nationwide permit program under the CWA known as Nationwide Permit 12 ("NWP"). The NWP program is supported by strong statutory and regulatory history and was originally approved by Congress in 1977. From time to time, environmental groups have challenged the NWP program; however, to date, federal courts have upheld the validity of NWP program under the CWA. We cannot predict whether future lawsuits will be filed to contest the validity of NWP; however, in the event that a court wholly or partially strikes down the NWP program, which we believe to be unlikely, we could face significant delays and financial costs when seeking project approvals from the Corps.

In May 2015, the EPA published a final rule that attempted to clarify federal jurisdiction under the CWA over waters of the United States. This clarification greatly expanded the definition of "waters of the United States" thus increasing the jurisdiction of the Corps. A number of legal challenges to this rule are pending. Additionally, following the issuance of a presidential executive order to review the rule, the EPA and the Corps proposed a rulemaking in June 2017 to repeal the May

2015 rule. The EPA and Corps also announced their intent to issue a new rule defining the CWA’s jurisdiction and recently finalized a stay delaying implementation of the rule for two years. Several states and environmental organizations have already announced their intent to challenge the stay and any attempt by the EPA and the Corps to rescind or revise the rule. On December 11, 2018, the EPA and the Corps released the pre-publication version of the Proposed 2018 Rule concerning the redefinition of “waters of the United States.” The proposal narrows the definition of the federal waters covered under the CWA’s key permitting programs such as Section 404 dredge and fill permits, Section 402 discharge permits, and Section 311 oil spill prevention plans. The Proposed Rule works towards the administration’s larger goal of re-balancing the relationship between the federal government, tribal governments, and states by drawing boundaries between those waters subject to federal CWA requirements and those waters that states and tribal governments have flexibility to manage under their respective authorities. As written in the Proposed Rule, fewer waters would be federally regulated relative to the May 2015 rule, which would lessen CWA permitting burdens for oil and gas operations as well as reduce mitigation requirements.

Endangered Species

New projects may require approvals and environmental analysis under federal, state and provincial laws, including the National Environmental Policy Act and the Endangered Species Act in the United States and the Species at Risk Act in Canada. The resulting costs and liabilities associated with lengthy regulatory review and approval requirements could materially and negatively affect the viability of such projects.

Other Regulations

Transportation Regulation

Our transportation activities are subject to regulation by multiple governmental agencies. Our historical operating costs reflect the recurring costs resulting from compliance with these regulations. The following is a summary of the types of transportation regulation that may impact our operations.

General Interstate Regulation in the United States. Our interstate common carrier liquids pipeline operations are subject to rate regulation by the FERC under the Interstate Commerce Act (“ICA”). The ICA requires that tariff rates for liquids pipelines, which include both crude oil pipelines and refined products pipelines, be just and reasonable and non-discriminatory.

State Regulation in the United States. Our intrastate liquids pipeline transportation activities are subject to various state laws and regulations, as well as orders of state regulatory bodies, including the Railroad Commission of Texas (“TRRC”) and the California Public Utility Commission (“CPUC”). The CPUC prohibits certain of our subsidiaries from acting as guarantors of our senior notes and credit facilities.

U.S. Energy Policy Act of 1992 and Subsequent Developments. In October 1992, Congress passed the Energy Policy Act of 1992 (“EPAct”), which, among other things, required the FERC to issue rules to establish a simplified and generally applicable ratemaking methodology for petroleum pipelines and to streamline procedures in petroleum pipeline proceedings. The FERC responded to this mandate by establishing a formulaic methodology for petroleum pipelines to change their rates within prescribed ceiling levels that are tied to an inflation index. The FERC reviews the formula every five years. Effective July 1, 2016, the annual index adjustment for the five year period ending June 30, 2021 will equal the producer price index for finished goods for the applicable year plus an adjustment factor of 1.23%. Pipelines may raise their rates to the rate ceiling level generated by application of the annual index adjustment factor each year; however, a shipper may challenge such increase if the increase in the pipeline’s rates is substantially in excess of the actual cost increases incurred by the pipeline during the relevant year. If the FERC’s annual index adjustment reduces the ceiling level such that it is lower than a pipeline’s filed rate, the pipeline must reduce its rate to conform with the lower ceiling. Indexing is the default methodology to change rates. The FERC, however, retained cost-of-service ratemaking, market-based rates and settlement rates as alternatives to the indexing approach that may be used in certain specified circumstances. Because the indexing methodology for the next five-year period is tied in part to an inflation index and is not based on our specific costs, the indexing methodology could hamper our ability to recover cost increases.

Under the EPAct, petroleum pipeline rates in effect for the 365-day period ending on the date of enactment of EPAct are deemed to be just and reasonable under the ICA if such rates had not been subject to complaint, protest or investigation during such 365-day period. Generally, complaints against such “grandfathered” rates may only be pursued if the complainant can show that a substantial change has occurred since the enactment of EPAct in either the economic circumstances of the oil pipeline or in the nature of the services provided that were a basis for the rate. EPAct places no such limit on challenges to a provision of an oil pipeline tariff rate or rules as unduly discriminatory or preferential.

Pipeline Rate Regulation in the United States. The FERC historically has not investigated rates of liquids pipelines on its own initiative when those rates have not been the subject of a protest or complaint by a shipper. The majority of our Transportation segment profit in the United States is produced by rates that are either grandfathered or set by agreement with one or more shippers. FERC issued an Advance Notice of Proposed Rulemaking on October 20, 2016 that addressed issues related to FERC's indexing methodology and liquids pipeline reporting practices. If implemented, the proposals in this rulemaking could affect the profitability of certain liquids pipelines. On December 15, 2016, FERC issued a Notice of Inquiry regarding certain matters related to FERC's income tax allowance policy. In 2018, FERC issued a revised policy statement (subsequently modified in a final rule issued in July 2018) in which it held that it will no longer permit an income tax allowance to be included in cost-of-service rates for interstate pipelines structured as master limited partnerships. The FERC also indicated that it will incorporate the effects of the revised policy statement in its next review of the oil pipeline index level, which will take effect in July 2021. See Item 1A. "Risk Factors—Risks Related to PAA's Business — PAA's assets are subject to federal, state and provincial regulation. Rate regulation or a successful challenge to the rates PAA charges on its U.S. and Canadian pipeline systems may reduce the amount of cash it generates." for additional discussion on how our rates could be impacted by this policy change.

Canadian Regulation. Our Canadian pipeline assets are subject to regulation by the NEB and by provincial authorities. With respect to a pipeline over which it has jurisdiction, the relevant regulatory authority has the power, upon application by a third party, to determine the rates we are allowed to charge for transportation on, and set other terms of access to, such pipeline. In such circumstances, if the relevant regulatory authority determines that the applicable terms and conditions of service are not just and reasonable, the regulatory authority can impose conditions it considers appropriate.

Trucking Regulation

United States

We operate a fleet of trucks to transport crude oil and oilfield materials as a private, contract and common carrier. We are licensed to perform both intrastate and interstate motor carrier services. As a motor carrier, we are subject to certain safety regulations issued by the DOT. The trucking regulations cover, among other things: (i) driver operations, (ii) log book maintenance, (iii) truck manifest preparations, (iv) safety placard placement on the trucks and trailer vehicles, (v) drug and alcohol testing and (vi) operation and equipment safety. We are also subject to OSHA with respect to our U.S. trucking operations.

Canada

Our trucking assets in Canada are subject to regulation by both federal and provincial transportation agencies in the provinces in which they are operated. These regulatory agencies do not set freight rates, but do establish and administer rules and regulations relating to other matters including equipment, facility inspection, reporting and safety. We are licensed to operate both intra- and inter-provincially under the direction of the National Safety Code ("NSC") that is administered by Transport Canada. Our for-hire service is primarily the transportation of crude oil, condensates and NGL. We are required under the NSC to, among other things, monitor: (i) driver operations, (ii) log book maintenance, (iii) truck manifest preparations, (iv) safety placard placement on the trucks and trailers, (v) operation and equipment safety and (vi) many other aspects of trucking operations. We are also subject to Occupational Health and Safety regulations with respect to our Canadian trucking operations.

Railcar Regulation

We own and operate a number of railcar loading and unloading facilities in the United States and Canada. In connection with these rail terminals, we own and lease a significant number of railcars. Our railcar operations are subject to the regulatory jurisdiction of the Federal Railroad Administration of the DOT, the OSHA, as well as other federal and state regulatory agencies and Canadian regulatory agencies for operations in Canada.

Railcar accidents involving trains carrying crude oil from North Dakota's Bakken shale formation have led to increased regulatory scrutiny. PHMSA issued a safety advisory warning that Bakken crude may be more flammable than other grades of crude oil and reinforcing the requirement to properly test, characterize, classify, and, where appropriate, sufficiently degasify hazardous materials prior to and during transportation. PHMSA also initiated "Operation Classification," a compliance initiative involving unannounced inspections and testing of crude oil samples to verify that offerors of the materials have properly classified, described and labeled the hazardous materials before transportation. In December 2015, Congress passed the Fixing America's Surface Transportation ("FAST") Act which was subsequently signed by the President. This legislation

clarified the parameters around the timeline and requirements for railcars hauling crude oil in the United States. We believe our railcar fleet is in compliance in all material respects with current standards for crude oil moved by rail.

In December 2014, the North Dakota Industrial Commission adopted new standards to improve the safety of Bakken crude oil for transport. The new standard, Commission Order 25417, was effective April 1, 2015, and requires operators/producers to condition Bakken crude oil to certain vapor pressure limits. Under the order, all Bakken crude oil produced in North Dakota will be conditioned with no exceptions. The order requires operators/producers to separate light hydrocarbons from all Bakken crude oil to be transported and prohibits the blending of light hydrocarbons back into oil supplies prior to shipment. We are not directly responsible for the conditioning or stabilization of Bakken crude oil; however, under the order, it is our responsibility to notify the State of North Dakota upon discovering that Bakken crude oil received at our rail facility exceeds the permitted vapor pressure limits.

Cross Border Regulation

As a result of our cross border activities, including transportation and importation of crude oil, NGL and natural gas between the United States and Canada, we are subject to a variety of legal requirements pertaining to such activities including presidential permit requirements, export/import license requirements, tariffs, Canadian and U.S. customs and taxes and requirements relating to toxic substances. U.S. legal requirements relating to these activities include regulations adopted pursuant to the Short Supply Controls of the Export Administration Act (“EAA”), the North American Free Trade Agreement (“NAFTA”) and the Toxic Substances Control Act (“TSCA”), as well as presidential permit requirements of the U.S. Department of State. In addition, the importation and exportation of natural gas from and to the United States and Canada is subject to regulation by U.S. Customs and Border Protection, U.S. Department of Energy and the NEB. Violations of these licensing, tariff and tax reporting requirements or failure to provide certifications relating to toxic substances could result in the imposition of significant administrative, civil and criminal penalties. Furthermore, the failure to comply with U.S. federal, state and local tax requirements, as well as Canadian federal and provincial tax requirements, could lead to the imposition of additional taxes, interest and penalties.

Market Anti-Manipulation Regulation

In November 2009, the Federal Trade Commission (“FTC”) issued regulations pursuant to the Energy Independence and Security Act of 2007, intended to prohibit market manipulation in the petroleum industry. Violators of the regulations face civil penalties of up to approximately \$1.2 million per violation per day (adjusted annually for inflation). In July 2010, Congress passed the Dodd-Frank Act, which incorporated an expansion of the authority of the Commodity Futures Trading Commission (“CFTC”) to prohibit market manipulation in the markets regulated by the CFTC. This authority, with respect to crude oil swaps and futures contracts, is similar to the anti-manipulation authority granted to the FTC with respect to crude oil purchases and sales. In July 2011, the CFTC issued final rules to implement their new anti-manipulation authority. The rules subject violators to a civil penalty of up to the greater of approximately \$1.1 million (adjusted annually for inflation) or triple the monetary gain to the person for each violation.

Natural Gas Storage Regulation

Our natural gas storage operations are subject to regulatory oversight by numerous federal, state and local regulatory agencies, many of which are authorized by statute to issue, and have issued, rules and regulations binding on the natural gas storage and pipeline industry, related businesses and market participants. The failure to comply with such laws and regulations can result in substantial penalties and fines.

The following is a summary of the kinds of regulation that may impact our natural gas storage operations. However, our unitholders should not rely on such discussion as an exhaustive review of all regulatory considerations affecting our natural gas storage operations.

Our natural gas storage facilities provide natural gas storage services in interstate commerce and are subject to comprehensive regulation by the FERC under the Natural Gas Act of 1938 (“NGA”). Pursuant to the NGA and FERC regulations, storage providers are prohibited from making or granting any undue preference or advantage to any person or subjecting any person to any undue prejudice or disadvantage or from maintaining any unreasonable difference in rates, charges, service, facilities, or in any other respect. The terms and conditions for services provided by our facilities are set forth in natural gas tariffs on file with the FERC. We have been granted market-based rate authorization for the services that our facilities provide. Market-based rate authority allows us to negotiate rates with individual customers based on market demand.

The FERC also has authority over the siting, construction, and operation of United States pipeline transportation and storage facilities and related facilities used in the transportation, storage and sale for resale of natural gas in interstate commerce, including the extension, enlargement or abandonment of such facilities. The FERC's authority extends to maintenance of accounts and records, terms and conditions of service, acquisition and disposition of facilities, initiation and discontinuation of services, imposition of creditworthiness and credit support requirements applicable to customers and relationships among pipelines and storage companies and certain affiliates. Our natural gas storage entities are required by the FERC to post certain information daily regarding customer activity, capacity and volumes on their respective websites. Additionally, the FERC has jurisdiction to impose rules and regulations applicable to all natural gas market participants to ensure market transparency. FERC regulations require that buyers and sellers of more than a de minimis volume of natural gas report annual numbers and volumes of relevant transactions to the FERC. Our natural gas storage facilities are subject to these annual reporting requirements.

Under the Energy Policy Act of 2005 ("EPAAct 2005") and related regulations, it is unlawful in connection with the purchase or sale of natural gas or transportation services subject to FERC jurisdiction to use or employ any device, scheme or artifice to defraud; to make any untrue statement of material fact or omit to make any such statement necessary to make the statements made not misleading; or to engage in any act or practice that operates as a fraud or deceit upon any person. EPAAct 2005 gives the FERC civil penalty authority to impose penalties for certain violations of up to approximately \$1.2 million per day for each violation (adjusted annually for inflation). FERC also has the authority to order disgorgement of profits from transactions deemed to violate the NGA and the EPAAct 2005.

In December 2016, PHMSA issued an interim final rule ("IFR") that establishes minimum federal standards for salt dome underground natural gas storage facilities. The IFR imposes new requirements on "downhole facilities," including wells, wellbore tubing and casings at underground natural gas storage facilities. The IFR addresses construction, maintenance, risk management and integrity management procedures for these facilities and includes registration and reporting obligations. The IFR adopts and incorporates by reference the requirements and recommendations contained in American Petroleum Institute ("API") Recommended Practice 1170. The IFR required that existing salt dome underground natural gas storage facilities meet the appropriate requirements and mandatory recommendations of API 1170 by January 18, 2018. However, PHMSA issued a partial stay of the IFR's requirements in June 2017. A final rule is expected in 2019. We do not anticipate that compliance with the final rule will have a significant adverse effect on our operations.

The natural gas industry historically has been heavily regulated. New rules, orders, regulations or laws may be passed or implemented that impose additional costs, burdens or restrictions on us. We cannot give any assurance regarding the likelihood of such future rules, orders, regulations or laws or the effect they could have on our business, financial condition, and results of operations or ability to make distributions to our unitholders.

Operational Hazards and Insurance

Pipelines, terminals, trucks or other facilities or equipment may experience damage as a result of an accident, natural disaster, terrorist attack, cyber event or other event. These hazards can cause personal injury and loss of life, severe damage to and destruction of property and equipment, pollution or environmental damage and suspension of operations. We maintain various types and varying levels of insurance coverage that we consider adequate under the circumstances to cover our operations and properties, and we self-insure certain risks, including gradual pollution and named windstorm. With respect to our insurance, our policies are subject to deductibles and retention levels that we consider reasonable and not excessive. However, such insurance does not cover every potential risk that might occur, associated with operating pipelines, terminals and other facilities and equipment, including the potential loss of significant revenues and cash flows.

Since the terrorist attacks of September 11, 2001, the United States Government has issued numerous warnings that energy assets, including our nation's pipeline infrastructure, may be future targets of terrorist organizations. These developments expose our operations and assets to increased risks. We have instituted security measures and procedures in conformity with DOT or the Transportation Safety Administration guidance. We will institute, as appropriate, additional security measures or procedures indicated by the DOT or the Transportation Safety Administration. However, there can be no assurance that these or any other security measures would protect our facilities from an attack. Any future terrorist attacks on our facilities, those of our customers and, in some cases, those of our competitors, could have a material adverse effect on our business, whether insured or not.

The occurrence of a significant event not fully insured, indemnified or reserved against, or the failure of a party to meet its indemnification obligations, could materially and adversely affect our operations and financial condition. We believe that we maintain adequate insurance coverage, although insurance will not cover many types of interruptions that might occur, will not cover amounts up to applicable deductibles and will not cover all risks associated with certain of our assets and

operations. Additionally we self-insure certain risks including, gradual pollution and named windstorm. With respect to our insurance coverage, no assurance can be given that we will be able to maintain adequate insurance in the future at rates we consider reasonable. As a result, we may elect to self-insure or utilize higher deductibles in certain other insurance programs. In addition, although we believe that we have established adequate reserves and liquidity to the extent such risks are not insured, costs incurred in excess of these reserves may be higher or we may not receive insurance proceeds in a timely manner, which may potentially have a material adverse effect on our financial conditions, results of operations or cash flows.

Title to Properties and Rights-of-Way

Our real property holdings generally consist of: (i) parcels of land that we own in fee, (ii) surface leases and underground storage leases and (iii) easements, rights-of-way, permits, crossing agreements or licenses from landowners or governmental authorities permitting the use of certain lands for our operations. In all material respects, we believe we have satisfactory title or the right to use the sites upon which our significant facilities are located, subject to customary liens, restrictions or encumbrances. Except for challenges that we do not regard as material relative to our overall operations, we believe that we have satisfactory rights pursuant to all of our material leases, easements, rights-of-way, permits and licenses. Some of our real property rights (mainly for pipelines) may be subject to termination under agreements that provide for one or more of: periodic payments, term periods, renewal rights, abandonment of use, revocation by the licensor or grantor and possible relocation obligations.

Employees and Labor Relations

To carry out our operations, through GP LLC or its affiliates, we employed approximately 4,900 employees at December 31, 2018. Of these employees, 149 are covered by four separate collective agreements, all of which are scheduled for renegotiation in 2019. We consider employee relations to be good.

Summary of Tax Considerations

The following is a summary of material U.S. federal income tax consequences and tax considerations related to the purchase, ownership and disposition of our Class A shares by a taxpayer that holds our Class A shares as a “capital asset” (generally property held for investment). This summary is based on the provisions of the Internal Revenue Code of 1986, as amended (“the Code”), U.S. Treasury regulations, administrative rulings and judicial decisions, all as in effect on the date hereof, and all of which are subject to change, possibly with retroactive effect. We have not sought any ruling from the Internal Revenue Service, or the IRS, with respect to the statements made and the conclusions reached in the following summary, and there can be no assurance that the IRS or a court will agree with such statements and conclusions.

This summary does not address all aspects of U.S. federal income taxation or the tax considerations arising under the laws of any non-U.S., state, or local jurisdiction, or under U.S. federal estate and gift tax laws. In addition, this summary does not address tax considerations applicable to investors that may be subject to special treatment under the U.S. federal income tax laws. The tax consequences of ownership of Class A shares depends in part on the owner’s individual tax circumstances. It is the responsibility of each shareholder, either individually or through a tax advisor, to investigate the legal and tax consequences, under the laws of pertinent U.S. federal, states and localities, as well as Canada and the Canadian provinces, of the shareholder’s investment in us. Further, it is the responsibility of each shareholder to file all U.S. federal, Canadian, state, provincial and local tax returns that may be required of the shareholder. Also see Item 1A. “Risk Factors — Tax Risks.”

Corporate Status

Although we are a Delaware limited partnership, we have elected to be treated as a corporation for U.S. federal income tax purposes. As a result, we are subject to tax as a corporation and distributions on our Class A shares will be treated as distributions on corporate stock for U.S. federal income tax purposes. No Schedule K-1 will be issued with respect to our Class A shares. Instead, holders of Class A shares will receive a Form 1099 from us with respect to distributions received on our Class A shares.

Consequences to U.S. Holders

The discussion in this section is addressed to holders of our Class A shares who are U.S. holders for U.S. federal income tax purposes. For purposes of this discussion, a “U.S. holder” is a beneficial owner of our Class A shares that, for U.S. federal income tax purposes, is:

- an individual who is a citizen or resident of the United States;

- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust (i) the administration of which is subjected to the primary supervision of a U.S. court and which has one or more United States persons who have the authority to control all substantial decisions of the trust or (ii) which has made a valid election under applicable U.S. Treasury regulations to be treated as a United States person.

Distributions

Distributions with respect to our Class A shares will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent that the amount of a distribution with respect to our Class A shares exceeds our current and accumulated earnings and profits, such distribution will be treated first as a tax-free return of capital to the extent of the U.S. holder's adjusted tax basis in such Class A shares, which reduces such basis dollar-for-dollar, and thereafter as capital gain from the sale or exchange of such Class A shares. See "— Gain on Disposition of Class A Shares" below. Non-corporate holders that receive distributions on our Class A shares that are treated as dividends for U.S. federal income tax purposes generally will be subject to U.S. federal income tax at a reduced rate (currently at a maximum tax rate of 20%) provided certain holding period requirements are met.

Both AAP and PAA have made elections permitted by Section 754 of the Code. As a result, our acquisition of AAP Class A units in connection with our IPO and in connection with exchanges since the IPO by the Legacy Owners and their permitted transferees of their AAP Class A units and Class B shares for Class A shares have resulted in basis adjustments with respect to our interest in the assets of AAP (and indirectly in PAA). Such adjustments have resulted in depreciation and amortization deductions that we anticipate will offset a substantial portion of our taxable income for an extended period of time. In addition, future exchanges of AAP Class A units and Class B shares for our Class A shares will result in additional basis adjustments with respect to our interest in the assets of AAP (and indirectly in PAA). We expect to benefit from additional tax deductions resulting from those adjustments, the amount of which will vary depending on the value of the Class A shares at the time of the exchange.

We do not expect to have any earnings and profits for an extended period of time, which we estimate will include, at a minimum, each of the periods ending December 31, 2019 through 2021, and we may not have sufficient earnings and profits during future tax years for any distributions on our Class A shares to qualify as dividends for U.S. federal income tax purposes. If a distribution on our Class A shares fails to qualify as a dividend for U.S. federal income tax purposes, U.S. corporate holders would be unable to utilize the corporate dividends-received deduction with respect to such distribution.

Investors in our Class A shares are encouraged to consult their tax advisors as to the tax consequences of receiving distributions on our Class A shares that do not qualify as dividends for U.S. federal income tax purposes, including, in the case of corporate investors, the inability to claim the corporate dividends received deduction with respect to such distributions.

Gain on Disposition of Class A Shares

A U.S. holder generally will recognize capital gain or loss on a sale, exchange, certain redemptions, or other taxable disposition of our Class A shares equal to the difference, if any, between the amount realized upon the disposition of such Class A shares and the U.S. holder's adjusted tax basis in those shares. A U.S. holder's tax basis in our shares generally will be equal to the amount paid for such shares reduced (but not below zero) by distributions received on such shares that are not treated as dividends for U.S. federal income tax purposes. Such capital gain or loss generally will be long-term capital gain or loss if the U.S. holder's holding period for the shares sold or disposed of is more than one year. Long-term capital gains of individuals generally are subject to U.S. federal income tax at a reduced rate (currently at a maximum rate of 20%). The deductibility of net capital losses is subject to limitations.

Backup Withholding and Information Reporting

Information returns generally will be filed with the IRS with respect to distributions on our Class A shares and the proceeds from a disposition of our Class A shares. U.S. holders may be subject to backup withholding on distributions with respect to our Class A shares and on the proceeds of a disposition of our Class A shares unless such U.S. holders furnish the applicable withholding agent with a taxpayer identification number, certified under penalties of perjury, and certain other

information, or otherwise establish, in the manner prescribed by law, an exemption from backup withholding. Penalties apply for failure to furnish correct information and for failure to include reportable payments in income.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules will be creditable against a U.S. holder's U.S. federal income tax liability, and the U.S. holder may be entitled to a refund, provided the U.S. holder timely furnishes the required information to the IRS. U.S. holders are urged to consult their own tax advisors regarding the application of the backup withholding rules to their particular circumstances and the availability of, and procedure for, obtaining an exemption from backup withholding.

Consequences to Non-U.S. Holders

The discussion in this section is addressed to holders of our Class A shares who are non-U.S. holders for U.S. federal income tax purposes. For purposes of this discussion, a "non-U.S. holder" is a beneficial owner of our Class A shares that is an individual, corporation, estate or trust that is not a U.S. holder as defined above.

Distributions

Distributions with respect to our Class A shares will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent those distributions exceed our current and accumulated earnings and profits, the distributions will be treated as a non-taxable return of capital to the extent of the non-U.S. holder's tax basis in our common stock and thereafter as capital gain from the sale or exchange of such common stock. See "—Gain on Disposition of Class A Shares." Subject to the withholding requirements under FATCA (as defined below) and with respect to effectively connected dividends, each of which is discussed below, any distribution paid to a non-U.S. holder on our Class A shares generally will be subject to U.S. withholding tax at a rate of 30% of the gross amount of the distribution or such lower rate as may be specified by an applicable income tax treaty. To receive the benefit of a reduced treaty rate on distributions, a non-U.S. holder must provide the applicable withholding agent with an IRS Form W-8BEN or IRS Form W-8BEN-E (or other applicable or successor form) certifying qualification for the reduced rate.

Non-U.S. holders are encouraged to consult their tax advisors regarding the withholding rules applicable to distributions on our Class A shares, the requirement for claiming treaty benefits, and any procedures required to obtain a refund of any overwithheld amounts.

Distributions treated as dividends that are paid to a non-U.S. holder and are effectively connected with a trade or business conducted by the non-U.S. holder in the United States (and, if required by an applicable income tax treaty, are treated as attributable to a permanent establishment maintained by the non-U.S. holder in the United States) generally will be taxed on a net income basis at the rates and in the manner generally applicable to United States persons (as defined under the Code). Such effectively connected dividends will not be subject to U.S. withholding tax if the non-U.S. holder satisfies certain certification requirements by providing the applicable withholding agent a properly executed IRS Form W-8ECI (or successor form) certifying eligibility for exemption. If a non-U.S. holder is a non-U.S. corporation, it may also be subject to a "branch profits tax" (at a 30% rate or such lower rate as may be specified by an applicable income tax treaty) on its effectively connected earnings and profits (as adjusted for certain items), which will include effectively connected dividends.

Gain on Disposition of Class A Shares

Subject to the discussion below under "— Additional Withholding Requirements under FATCA," a non-U.S. holder generally will not be subject to U.S. federal income tax on any gain realized upon the sale or other disposition of our Class A shares unless:

- the non-U.S. holder is an individual who is present in the United States for a period or periods aggregating 183 days or more during the calendar year in which the sale or disposition occurs and certain other conditions are met;
- the gain is effectively connected with a trade or business conducted by the non-U.S. holder in the United States (and, if required by an applicable income tax treaty, is attributable to a permanent establishment maintained by the non-U.S. holder in the United States); or

- our Class A shares constitute a United States real property interest by reason of our status as a United States real property holding corporation (“USRPHC”) for U.S. federal income tax purposes and as a result such gain is treated as effectively connected with a trade or business conducted by the non-U.S. holder in the United States.

A non-U.S. holder described in the first bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate as may be specified by an applicable income tax treaty) on the amount of such gain, which generally may be offset by U.S. source capital losses.

A non-U.S. holder whose gain is described in the second bullet point above or, subject to the exceptions described in the next paragraph, the third bullet point above, generally will be taxed on a net income basis at the rates and in the manner generally applicable to United States persons (as defined under the Code) unless an applicable income tax treaty provides otherwise. If the non-U.S. holder is a corporation for U.S. federal income tax purposes whose gain is described in the second bullet point above, then such gain would also be included in its effectively connected earnings and profits (as adjusted for certain items), which may be subject to a branch profits tax (at a 30% rate or such lower rate as may be specified by an applicable income tax treaty).

Generally, a corporation is a USRPHC if the fair market value of its United States real property interests equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests and its other assets used or held for use in a trade or business. We believe that we currently are, and expect to remain for the foreseeable future, a USRPHC for U.S. federal income tax purposes. However, as long as our Class A shares continue to be “regularly traded on an established securities market” (within the meaning of the U.S. Treasury Regulations), only a non-U.S. holder that actually or constructively owns, or owned at any time during the shorter of the five-year period ending on the date of the disposition or the non-U.S. holder’s holding period for the Class A shares, more than 5% of our Class A shares will be treated as disposing of a United States real property interest and will be taxable on gain realized on the disposition of our Class A shares as a result of our status as a USRPHC. If our Class A shares were not considered to be regularly traded on an established securities market, such non-U.S. holder (regardless of the percentage of our Class A shares owned) would be treated as disposing of a United States real property interest and would be subject to U.S. federal income tax on a taxable disposition of our Class A shares (as described in the preceding paragraph), and a withholding tax would apply to the gross proceeds from such disposition at the applicable withholding rate (currently at a rate of 15%).

Non-U.S. holders should consult their tax advisors with respect to the application of the foregoing rules to their ownership and disposition of our Class A shares.

Backup Withholding and Information Reporting

Generally, we must report annually to the IRS and to each non-U.S. holder the amount of dividends paid to such holder, the name and address of the recipient, and the amount, if any, of tax withheld with respect to those dividends. These information reporting requirements apply even if withholding was not required. Pursuant to tax treaties or other agreements, the IRS may make such reports available to tax authorities in the recipient’s country of residence. Payments of dividends to a non-U.S. holder generally will not be subject to backup withholding if the non-U.S. holder establishes an exemption by properly certifying its non-U.S. status on an IRS Form W-8BEN, IRS Form W-8BEN-E or other appropriate version of IRS Form W-8, provided that the withholding agent does not have actual knowledge, or reason to know, that the beneficial owner is a United States person that is not an exempt recipient.

Payments of the proceeds from a sale or other disposition by a non-U.S. holder of our Class A shares effected by or through a U.S. office of a broker generally will be subject to information reporting and backup withholding (at the applicable rate) unless the non-U.S. holder establishes an exemption by properly certifying its non-U.S. status on an IRS Form W-8BEN, IRS Form W-8BEN-E or other appropriate version of IRS Form W-8 and certain other conditions are met. Information reporting and backup withholding generally will not apply to any payment of the proceeds from a sale or other disposition of our Class A shares effected outside the United States by a non-U.S. office of a broker. However, unless such broker has documentary evidence in its records that the non-U.S. holder is not a United States person and certain other conditions are met, or the non-U.S. holder otherwise establishes an exemption, information reporting will apply to a payment of the proceeds of the disposition of our Class A shares effected outside the United States by such a broker if it has certain relationships within the United States.

Backup withholding is not an additional tax. Rather, the U.S. federal income tax liability (if any) of persons subject to backup withholding will be reduced by the amount of tax withheld. If backup withholding results in an overpayment of taxes, a refund may be obtained, provided that the required information is timely furnished to the IRS.

Additional Withholding Requirements under FATCA

Sections 1471 through 1474 of the Code, and the Treasury regulations and administrative guidance issued thereunder (“FATCA”), impose a 30% withholding tax on any dividends paid on our Class A shares if paid to a “foreign financial institution” or a “non-financial foreign entity” (each as defined in the Code) (including, in some cases, when such foreign financial institution or non-financial foreign entity is acting as an intermediary), unless (i) in the case of a foreign financial institution, such institution enters into an agreement with the U.S. government to withhold on certain payments, and to collect and provide to the U.S. tax authorities substantial information regarding U.S. account holders of such institution (which includes certain equity and debt holders of such institution, as well as certain account holders that are non-U.S. entities with U.S. owners), (ii) in the case of a non-financial foreign entity, such entity certifies that it does not have any “substantial United States owners” (as defined in the Code) or provides the applicable withholding agent with a certification identifying each direct and indirect substantial United States owner of the entity (in either case, generally on an IRS Form W-8BEN-E), or (iii) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules and provides appropriate documentation (such as an IRS Form W-8BEN-E). Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing these rules may be subject to different rules. Under certain circumstances, a holder might be eligible for refunds or credits of such taxes.

Available Information

We make available, free of charge on our Internet website at ir.pagp.com, our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable after we electronically file the material with, or furnish it to, the Securities and Exchange Commission (“SEC”). The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at <http://www.sec.gov>.

Item 1A. Risk Factors

Risks Inherent in an Investment in Us

Our cash flow will be entirely dependent upon the ability of PAA to make cash distributions to AAP, and the ability of AAP to make cash distributions to us.

The source of our earnings and cash flow currently consists exclusively of cash distributions from AAP, which currently consist exclusively of cash distributions from PAA. The amount of cash that PAA will be able to distribute to its partners, including AAP, each quarter principally depends upon the amount of cash it generates from its business. For a description of certain factors that can cause fluctuations in the amount of cash that PAA generates from its business, please read “—Risks Related to PAA’s Business” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” PAA may not have sufficient available cash each quarter to continue paying distributions at its current level or at all. If PAA reduces its per unit distribution, either because of reduced operating cash flow, higher expenses, capital requirements or otherwise, we will have less cash available for distribution and would likely be required to reduce our per share distribution. The amount of cash PAA has available for distribution depends primarily upon PAA’s cash flow, including cash flow from the release of financial reserves as well as borrowings, and is not solely a function of profitability, which will be affected by non-cash items. As a result, PAA may make cash distributions during periods when it records losses and may not make cash distributions during periods when it records profits.

Furthermore, AAP’s ability to distribute cash to us and our ability to distribute cash received from AAP to our Class A shareholders is limited by a number of factors, including:

- our payment of any income taxes;
- restrictions on distributions contained in PAA’s credit facilities and any future debt agreements entered into by AAP, PAA or us; and
- reserves our general partner establishes for the proper conduct of our business, to comply with applicable law or any agreement binding on us or our subsidiaries (exclusive of PAA and its subsidiaries), which reserves are not subject to a limit pursuant to our partnership agreement.

A material increase in amounts paid or reserved with respect to any of these factors could restrict our ability to pay quarterly distributions to our Class A shareholders.

The distributions AAP is entitled to receive may fluctuate, which may reduce cash distributions to our Class A shareholders.

At December 31, 2018, we directly and indirectly owned an approximate 57% limited partner interest in AAP, which owned 280,514,112 PAA common units. All of the cash flow we receive from AAP is derived from its ownership of these PAA common units. Because distributions on PAA common units are dependent on the amount of cash PAA generates, distributions may fluctuate based on PAA's performance. The actual amount of cash that is available to be distributed each quarter will depend on numerous factors, some of which are beyond our control and the control of PAA. Cash distributions are dependent primarily on cash flow, including cash flow from financial reserves and working capital borrowings, and not solely on profitability, which is affected by non-cash items. Therefore, PAA's cash distributions might be made during periods when PAA records losses and might not be made during periods when PAA record profits.

If distributions on our Class A shares are not paid with respect to any fiscal quarter, our Class A shareholders will not be entitled to receive that quarter's payments in the future.

Our distributions to our Class A shareholders are not cumulative. Consequently, if distributions on our Class A shares are not paid with respect to any fiscal quarter, our Class A shareholders will not be entitled to receive that quarter's payments in the future.

The amount of cash that we and PAA distribute each quarter may limit our ability to grow.

Because we distribute all of our available cash, our growth may not be as fast as the growth of businesses that reinvest their available cash to expand ongoing operations. In fact, because currently our cash flow is generated solely from distributions we receive from AAP, which are derived from AAP's partnership interests in PAA, our growth will initially be completely dependent upon PAA. The amount of distributions received by AAP is based on PAA's per unit distribution paid on each PAA common unit and the number of PAA common units that AAP owns. If we issue additional Class A shares or we were to incur debt or are required to pay taxes, the payment of distributions on those additional Class A shares, or interest on such debt or payment of such taxes could increase the risk that we will be unable to maintain or increase our cash distribution levels.

Restrictions in PAA's credit facilities could limit AAP's ability to make distributions to us, thereby limiting our ability to make distributions to our Class A shareholders.

PAA's credit facilities contain various operating and financial restrictions and covenants. PAA's ability to comply with these restrictions and covenants may be affected by events beyond its control, including prevailing economic, financial and industry conditions. If PAA is unable to comply with these restrictions and covenants, any indebtedness under these credit facilities may become immediately due and payable and PAA's lenders' commitment to make further loans under these credit facilities may terminate. PAA might not have, or be able to obtain, sufficient funds to make these accelerated payments.

For more information regarding PAA's credit facilities, please read "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources." For information regarding risks related to PAA's credit facilities, please see "—Risks Related to PAA's Business—The terms of PAA's indebtedness may limit its ability to borrow additional funds or capitalize on business opportunities. In addition, PAA's future debt level may limit its future financial and operating flexibility."

Our shareholders do not elect or have the power to remove our general partner. The Class B shareholders own a sufficient number of shares to allow them to prevent the removal of our general partner.

Our shareholders have only limited voting rights on matters affecting our business and, therefore, limited ability to influence management's decisions regarding our business. If our Class A shareholders are dissatisfied with the performance of our general partner, they have little ability to remove our general partner. Our general partner may only be removed by vote of the holders of at least 66 2/3 % of our outstanding shares (including both Class A and Class B shares). At December 31, 2018, the Legacy Owners owned approximately 43% of our outstanding Class A and Class B shares. This ownership level enables the Legacy Owners to prevent our general partner's removal.

As a result of these provisions, the price at which our shares trade may be lower because of the absence or reduction of a takeover premium in the trading price.

Our general partner may cause us to issue additional Class A shares or other equity securities, including equity securities that are senior to our Class A shares, or cause AAP to issue additional securities, in each case without shareholder approval, which may adversely affect our shareholders.

Our general partner may cause us to issue an unlimited number of additional Class A shares or other equity securities of equal rank with the Class A shares, or cause AAP to issue additional securities, in each case without shareholder approval. In addition, we may issue an unlimited number of shares that are senior to our Class A shares in right of distribution, liquidation and voting. Except for Class A shares issued in connection with the exercise of an Exchange Right, which will result in the cancellation of an equivalent number of Class B shares and therefore have no effect on the total number of outstanding shares, the issuance of additional Class A shares or our other equity securities of equal or senior rank, or the issuance by AAP of additional securities, will have the following effects:

- each shareholder's proportionate ownership interest in us may decrease;
- the amount of cash available for distribution on each Class A share may decrease;
- the relative voting strength of each previously outstanding Class A share may be diminished;
- the ratio of taxable income to distributions may increase; and
- the market price of the Class A shares may decline.

If PAA's unitholders remove PAA GP, AAP may be required to sell or exchange its indirect general partner interest and we would lose the ability to manage and control PAA.

We currently manage our investment in PAA through our membership interest in GP LLC, the general partner of AAP. PAA's partnership agreement, however, gives unitholders of PAA the right to remove PAA GP upon the affirmative vote of holders of $66 \frac{2}{3}\%$ of PAA's outstanding units. If PAA GP withdraws as general partner in compliance with PAA's partnership agreement or is removed as general partner of PAA where cause (as defined in PAA's partnership agreement) does not exist and a successor general partner is elected in accordance with PAA's partnership agreement, AAP will receive cash in exchange for its general partner interest. If PAA GP withdraws in circumstances other than those described in the preceding sentence and a successor general partner is elected in accordance with PAA's partnership agreement, the successor general partner will purchase the general partner interest for its fair market value. If PAA GP's interests are not purchased in accordance with the foregoing theory, they would be converted into common units based on an independent valuation. In each case, PAA GP would also lose its ability to manage PAA.

In addition, if PAA GP is removed as general partner of PAA, we would face an increased risk of being deemed an investment company. Please read "—If in the future we cease to manage and control PAA, we may be deemed to be an investment company under the Investment Company Act of 1940."

Shareholders may not have limited liability if a court finds that shareholder action constitutes control of our business.

Under Delaware law, our shareholders could be held liable for our obligations to the same extent as a general partner if a court determined that the right or the exercise of the right by our shareholders as a group to remove or replace our general partner, to approve some amendments to the partnership agreement or to take other action under our partnership agreement constituted participation in the "control" of our business. Additionally, the limitations on the liability of holders of limited partner interests for the liabilities of a limited partnership have not been clearly established in many jurisdictions.

Furthermore, Section 17-607 of the Delaware Revised Uniform Limited Partnership Act provides that, under some circumstances, a shareholder may be liable to us for the amount of a distribution for a period of three years from the date of the distribution.

If in the future we cease to manage and control PAA, we may be deemed to be an investment company under the Investment Company Act of 1940.

If we cease to indirectly manage and control PAA and are deemed to be an investment company under the Investment Company Act of 1940, we would either have to register as an investment company under the Investment Company Act of 1940, obtain exemptive relief from the SEC or modify our organizational structure or our contractual rights to fall outside the definition of an investment company. Registering as an investment company could, among other things, materially limit our ability to engage in transactions with affiliates, including the purchase and sale of certain securities or other property to or from our affiliates, restrict the ability of PAA and us to borrow funds or engage in other transactions involving leverage, require us to add additional directors who are independent of us and our affiliates, and adversely affect the price of our Class A shares.

Our partnership agreement restricts the rights of shareholders owning 20% or more of our shares.

Our shareholders' voting rights are restricted by the provision in our partnership agreement generally providing that any shares held by a person or group that owns 20% or more of any class of shares then outstanding, other than our general partner, the Legacy Owners (or certain transferees in private, non-exchange transactions), their respective affiliates and persons who acquired such shares with the prior approval of our general partner's board of directors, cannot be voted on any matter, except that such shares constituting up to 19.9% of the total shares outstanding may be voted in the election of directors. In addition, our partnership agreement contains provisions limiting the ability of our shareholders to call meetings or to acquire information about our operations, as well as other provisions limiting our shareholders' ability to influence the manner or direction of our management. As a result, the price at which our Class A shares will trade may be lower because of the absence or reduction of a takeover premium in the trading price.

If PAA's general partner, which is owned by AAP, is not fully reimbursed or indemnified for obligations and liabilities it incurs in managing the business and affairs of PAA, its value, and, therefore, the value of our Class A shares, could decline.

AAP, GP LLC and their affiliates may make expenditures on behalf of PAA for which PAA GP will seek reimbursement from PAA. Under Delaware partnership law, PAA GP has unlimited liability for the obligations of PAA, such as its debts and environmental liabilities, except for those contractual obligations of PAA that are expressly made without recourse to the general partner. To the extent PAA GP incurs obligations on behalf of PAA, it is entitled to be reimbursed or indemnified by PAA. If PAA is unable or unwilling to reimburse or indemnify PAA GP, PAA GP may be required to satisfy those liabilities or obligations, which would reduce AAP's cash flows to us.

The price of our Class A shares may be volatile, and holders of our Class A shares could lose a significant portion of their investments.

The market price of our Class A shares could be volatile, and our shareholders may not be able to resell their Class A shares at or above the price at which they purchased such Class A shares due to fluctuations in the market price of the Class A shares, including changes in price caused by factors unrelated to our operating performance or prospects or the operating performance or prospects of PAA. The following factors, among others, could affect our Class A share price:

- PAA's operating and financial performance and prospects and the trading price of its common units;
- the level of PAA's quarterly distributions and our quarterly distributions;
- quarterly variations in the rate of growth of our financial indicators, such as distributable cash flow per Class A share, net income and revenues;
- changes in revenue or earnings and distribution estimates or publication of research reports by analysts;
- speculation by the press or investment community;
- sales of our Class A shares by our shareholders;
- the exercise by the Legacy Owners of their exchange rights with respect to any retained AAP units;
- announcements by PAA or its competitors of significant contracts, acquisitions, strategic partnerships, joint ventures, securities offerings or capital commitments;
- general market conditions, including conditions in financial markets;
- changes in accounting standards, policies, guidance, interpretations or principles;
- adverse changes in tax laws or regulations;

- domestic and international economic, legal and regulatory factors related to PAA's performance; and
- other factors described in these "Risk Factors."

An increase in interest rates may cause the market price of our shares to decline.

Like all equity investments, an investment in our Class A shares is subject to certain risks. In exchange for accepting these risks, investors may expect to receive a higher rate of return than would otherwise be obtainable from lower-risk investments. Accordingly, as interest rates rise, the ability of investors to obtain higher risk-adjusted rates of return by purchasing government-backed debt securities may cause a corresponding decline in demand for riskier investments generally, including yield-based equity investments such as publicly traded limited partnership interests. Reduced demand for our Class A shares resulting from investors seeking other more favorable investment opportunities may cause the trading price of our Class A shares to decline.

Future sales of our Class A shares in the public market could reduce our Class A share price, and any additional capital raised by us through the sale of equity or convertible securities may have a dilutive effect on our shareholders.

Subject to certain limitations and exceptions, holders of AAP units may exchange their AAP units (together with a corresponding number of Class B shares) for Class A shares (on a one-for-one basis, subject to customary conversion rate adjustments for equity splits and reclassification and other similar transactions) and then sell those Class A shares. We may also issue additional Class A shares or convertible securities in subsequent public or private offerings.

We cannot predict the size of future issuances of our Class A shares or securities convertible into Class A shares or the effect, if any, that future issuances and sales of our Class A shares will have on the market price of our Class A shares. Sales of substantial amounts of our Class A shares (including shares issued in connection with an acquisition), or the perception that such sales could occur, may adversely affect prevailing market prices of our Class A shares.

The Legacy Owners hold a significant portion of the combined voting power of our Class A and Class B shares.

At December 31, 2018, through their ownership of Class B shares, the Legacy Owners held approximately 43% of the combined voting power of our Class A and Class B shares. The Legacy Owners are entitled to act separately in their own respective interests with respect to their partnership interests in us, and collectively they currently have the ability to influence (i) the outcome of all matters requiring shareholder approval, including certain mergers and other material transactions and (ii) a change in the composition of our board of directors or a change in control of our company that could deprive our shareholders of an opportunity to receive a premium for their Class A shares as part of a sale of our company. So long as the Legacy Owners continue to own a significant amount of our outstanding shares, even if such amount is less than 50%, they will continue to be able to strongly influence all matters requiring shareholder approval, regardless of whether or not other shareholders believe that such matters are in their own best interests.

A valuation allowance on our deferred tax asset could reduce our earnings.

As of December 31, 2018, we have a gross deferred tax asset of approximately \$1.3 billion. GAAP requires that a valuation allowance must be established for deferred tax assets when it is more likely than not that they will not be realized. We believe that the deferred tax asset we recorded through 2018 will be realized and that a valuation allowance is not required. However, if we were to determine that a valuation allowance was appropriate for our deferred tax asset, we would be required to take an immediate charge to earnings with a corresponding reduction of partners' capital and increase in balance sheet leverage as measured by debt-to-total capitalization. In light of the Tax Cuts and Jobs Act of 2017, a valuation allowance will not be required for any U.S. federal deferred tax asset created after 2017.

The New York Stock Exchange ("NYSE") does not require a limited partnership like us to comply with certain of its corporate governance requirements.

Because we are a limited partnership, the NYSE does not require our general partner to have a majority of independent directors on its board of directors or to establish a compensation committee or a nominating and corporate governance committee. Accordingly, our shareholders do not have the same protections afforded to certain corporations that are subject to all of the NYSE corporate governance requirements. In addition, as a limited partnership we are not required to seek shareholder approval for issuances of Class A shares, including issuances in excess of 20% of our outstanding equity securities, or for issuances of equity to certain affiliates.

We may incur liability as a result of our ownership of our and PAA's general partner.

Under Delaware law, a general partner of a limited partnership is generally liable for the debts and liabilities of the partnership for which it serves as general partner, subject to the terms of any indemnification agreements contained in the partnership agreement and except to the extent the partnership's contracts are non-recourse to the general partner. As a result of our structure, we indirectly own and control the general partner of PAA and own a portion of our general partner's membership interests. Our percentage ownership of our general partner is expected to increase over time as the Legacy Owners exercise their exchange rights. To the extent the indemnification provisions in the applicable partnership agreement or non-recourse provisions in our contracts are not sufficient to protect us from such liability, we may in the future incur liabilities as a result of our ownership of these general partner entities.

Risks Related to Conflicts of Interest

Our existing organizational structure and the relationships among us, PAA, our respective general partners, the Legacy Owners and affiliated entities present the potential for conflicts of interest. Moreover, additional conflicts of interest may arise in the future among us and the entities affiliated with any general partner or similar interests we acquire or among PAA and such entities.

Conflicts of interest may arise as a result of our organizational structure and the relationships among us, PAA, our respective general partners, the Legacy Owners and affiliated entities.

Our partnership agreement defines the duties of our general partner (and, by extension, its officers and directors). Our general partner's board of directors or its conflicts committee will have authority on our behalf to resolve any conflict involving us and they have broad latitude to consider the interests of all parties to the conflict.

Conflicts of interest may arise between us and our shareholders, on the one hand, and our general partner and its owners and affiliated entities, on the other hand, or between us and our shareholders, on the one hand, and PAA and its unitholders, on the other hand. The resolution of these conflicts may not always be in our best interest or that of our shareholders.

Our partnership agreement defines our general partner's duties to us and contains provisions that reduce the remedies available to our shareholders for actions that might otherwise be challenged as breaches of fiduciary or other duties under state law.

Our partnership agreement contains provisions that substantially reduce the standards to which our general partner would otherwise be held by state fiduciary duty law. For example, our partnership agreement:

- permits our general partner to make a number of decisions in its individual capacity, as opposed to in its capacity as our general partner. This entitles our general partner to consider only the interests and factors that it desires, and it has no duty or obligation to give any consideration to any interest of, or factors affecting, us, the Legacy Owners, our affiliates or any limited partner. Examples include its right to vote membership interests in our general partner held by us, the exercise of its limited call right, its rights to transfer or vote any shares it may own, and its determination whether or not to consent to any merger or consolidation of our partnership or amendment to our partnership agreement;
- generally provides that our general partner will not have any liability to us or our shareholders for decisions made in its capacity as a general partner so long as it acted in good faith which, pursuant to our partnership agreement, requires a subjective belief that the determination, or other action or anticipated result thereof is in, or not opposed to, our best interests;
- generally provides that any resolution or course of action adopted by our general partner and its affiliates in respect of a conflict of interest will be permitted and deemed approved by all of our partners, and will not constitute a breach of our partnership agreement or any duty stated or implied by law or equity if the resolution or course of action in respect of such conflict of interest is:
 - approved by a majority of the members of our general partner's conflicts committee after due inquiry, based on a subjective belief that the course of action or determination that is the subject of such approval is fair and reasonable to us;

- approved by majority vote of our Class A shares and Class B shares (excluding Class C shares and excluding shares owned by our general partner and its affiliates, but including shares owned by the Legacy Owners) voting together as a single class;
 - determined by our general partner (after due inquiry) to be on terms no less favorable to us than those generally being provided to or available from unrelated third parties; or
 - determined by our general partner (after due inquiry) to be fair and reasonable to us, which determination may be made taking into account the circumstances and the relationships among the parties involved (including our short-term or long-term interests and other arrangements or relationships that could be considered favorable or advantageous to us).
- provides that, to the fullest extent permitted by law, in connection with any action or inaction of, or determination made by, our general partner or the conflicts committee of our general partner's board of directors with respect to any matter relating to us, it shall be presumed that our general partner or the conflicts committee of our general partner's board of directors acted in a manner that satisfied the contractual standards set forth in our partnership agreement, and in any proceeding brought by any limited partner or by or on behalf of such limited partner or any other limited partner or our partnership challenging any such action or inaction of, or determination made by, our general partner, the person bringing or prosecuting such proceeding shall have the burden of overcoming such presumption; and
 - provides that our general partner and its officers and directors will not be liable for monetary damages to us, our limited partners or assignees for any acts or omissions unless there has been a final and non-appealable judgment entered by a court of competent jurisdiction determining that our general partner or those other persons acted in bad faith or engaged in fraud or willful misconduct or, in the case of a criminal matter, acted with knowledge that such person's conduct was criminal.

The Legacy Owners may have interests that conflict with holders of our Class A shares.

At December 31, 2018, the Legacy Owners owned approximately 43% of our outstanding Class A and Class B shares and approximately 43% of the AAP units. As a result, the Legacy Owners may have conflicting interests with holders of Class A shares. For example, the Legacy Owners may have different tax positions from us which could influence their decisions regarding whether and when to cause us to dispose of assets.

Furthermore, conflicts of interest could arise in the future between us, on the one hand, and the Legacy Owners, on the other hand, concerning among other things, potential competitive business activities or business opportunities. These conflicts of interest may not be resolved in our favor.

If we are presented with business opportunities, PAA has the first right to pursue such opportunities.

Pursuant to the administrative agreement, we have agreed to certain business opportunity arrangements to address potential conflicts with respect to business opportunities that may arise among us, our general partner, PAA, PAA GP, AAP and GP LLC. If a business opportunity is presented to us, our general partner, PAA, PAA GP, AAP or GP LLC, then PAA will have the first right to pursue such business opportunity. We have the right to pursue and/or participate in such business opportunity if invited to do so by PAA, or if PAA abandons the business opportunity and GP LLC so notifies our general partner. Accordingly, the terms of the administrative agreement limit our ability to pursue business opportunities.

Our general partner's affiliates and the Legacy Owners may compete with us.

Our partnership agreement provides that our general partner will be restricted from engaging in any business activities other than acting as our general partner and those activities incidental to its ownership of interests in us. The restrictions contained in our general partner's limited liability company agreement are subject to a number of exceptions. Affiliates of our general partner and the Legacy Owners will not be prohibited from engaging in other businesses or activities that might be in direct competition with us except to the extent they compete using our confidential information.

Our general partner has a call right that may require our shareholders to sell their Class A shares at an undesirable time or price.

If at any time more than 80% of our outstanding Class A shares and Class B shares on a combined basis (including Class A shares issuable upon the exchange of Class B shares) are owned by our general partner, the Legacy Owners (or certain transferees in private, non-exchange transactions) or their respective affiliates, our general partner will have the right (which it may assign to any of its affiliates, the Legacy Owners or us), but not the obligation, to acquire all, but not less than all, of the remaining Class A shares held by public shareholders at a price equal to the greater of (x) the current market price of such shares as of the date three days before notice of exercise of the call right is first mailed and (y) the highest price paid by our general partner, the Legacy Owners (or certain transferees in private, non-exchange transactions) or their respective affiliates for such shares during the 90 day period preceding the date such notice is first mailed. As a result, holders of our Class A shares may be required to sell such Class A shares at an undesirable time or price and may not receive any return of or on their investment. Class A shareholders may also incur a tax liability upon a sale of their Class A shares. At December 31, 2018, the Legacy Owners owned approximately 43% of the Class A shares and Class B shares on a combined basis.

Risks Related to PAA's Business

PAA's profitability depends on the volume of crude oil, natural gas and NGL shipped, processed, purchased, stored, fractionated and/or gathered at or through the use of its facilities, which can be negatively impacted by a variety of factors outside of its control.

PAA's profitability could be materially impacted by a decline in the volume of crude oil, natural gas and NGL transported, gathered, stored or processed at or through its facilities. A material decrease in crude oil or natural gas production or crude oil refining, as a result of depressed commodity prices, natural decline rates attributable to crude oil and natural gas reservoirs, a decrease in exploration and development activities, supply disruptions, economic conditions or otherwise, could result in a decline in the volume of crude oil, natural gas or NGL handled by PAA's facilities.

During the latter half of 2014 and continuing into 2016, benchmark crude oil prices declined significantly; as a result, many of the companies that produce oil and gas significantly reduced capital expenditures. Such reduced expenditure levels, coupled with high decline rates for many horizontal wells in the shale resource plays, led to production declines in many areas in the Lower 48 United States (excluding Gulf of Mexico production). After recovering in late 2017 through mid-2018, benchmark crude oil prices experienced volatility in the second half of 2018. If producers again reduce drilling activity in response to future declines in benchmark crude oil prices, it could adversely impact production. Other factors that could adversely impact production include reduced capital market access, increased capital raising costs for producers or adverse governmental or regulatory action. In turn, such developments could lead to reduced throughput on PAA's pipelines and at PAA's other facilities, which, depending on the level of production declines, could have a material adverse effect on PAA's business.

Also, except with respect to some of our recently constructed pipeline assets, third-party shippers generally do not have long-term contractual commitments to ship crude oil on PAA's pipelines. A decision by a shipper to substantially reduce or cease to ship volumes of crude oil on PAA's pipelines could cause a significant decline in its revenues.

To maintain the volumes of crude oil PAA purchases in connection with its operations, PAA must continue to contract for new supplies of crude oil to offset volumes lost because of reduced drilling activity by producers, natural declines in crude oil production from depleting wells or volumes lost to competitors. If production declines, competitors with under-utilized assets could impair PAA's ability to secure additional supplies of crude oil.

PAA's profitability can be negatively affected by a variety of factors stemming from competition in its industry, including risks associated with the general capacity overbuild of midstream energy infrastructure in some of the areas where it operates.

PAA faces competition in all aspects of its business and can give no assurances that it will be able to compete effectively against its competitors. In general, competition comes from a wide variety of participants in a wide variety of contexts, including new entrants and existing participants and in connection with day-to-day business, expansion capital projects, acquisitions and joint venture activities. Some of PAA's competitors have capital resources many times greater than PAA's and control greater supplies of crude oil, natural gas or NGL.

A significant driver of competition in some of the markets where PAA operates (including, for example, the Eagle Ford, Permian Basin, and Rockies/Bakken areas) stems from the rapid development of new midstream energy infrastructure capacity that was driven by the combination of (i) significant increases in oil and gas production and development in the applicable production areas, both actual and anticipated, (ii) relatively low barriers to entry and (iii) generally widespread access to relatively low cost capital. While this environment presented opportunities for PAA, many of these areas have become, or in the future may become, overbuilt, resulting in an excess of midstream energy infrastructure capacity. For example, in the past eighteen months, several potential new pipeline projects have been announced or are currently under construction, and such projects may result in excess takeaway capacity in certain areas where PAA operates. In addition, as an established participant in some markets, PAA also faces competition from aggressive new entrants to the market who are willing to provide services at a lower rate of return in order to establish relationships and gain a foothold in the market. PAA also faces competition for incremental volumes from shippers on third-party pipelines who overcommitted relative to their actual production or committed supplies and are now purchasing barrels on the open market and shipping them on such third-party pipelines in order to satisfy their minimum commitment levels. In addition, PAA's Supply and Logistics segment is a customer of its Transportation and Facilities segments (See Note 20 to our Consolidated Financial Statements for a discussion of operating segments). Competition that impacts PAA's Supply and Logistics activities could result in a reduction in the use of its Transportation and Facilities assets by its Supply and Logistics segment. All of these competitive effects put downward pressure on PAA's throughput and margins and, together with other adverse competitive effects, could have a significant adverse impact on PAA's financial position, cash flows and ability to pay or increase distributions to its unitholders.

With respect to PAA's crude oil activities, its competitors include other crude oil pipelines, the major integrated oil companies, their marketing affiliates, refiners, private equity-backed entities, and independent gatherers, brokers and marketers of widely varying sizes, financial resources and experience. PAA competes against these companies on the basis of many factors, including geographic proximity to production areas, market access, rates, terms of service, connection costs and other factors.

With respect to PAA's natural gas storage operations, the principal elements of competition are rates, terms of service, supply and market access and flexibility of service. PAA's natural gas storage facilities compete with several other storage providers, including regional storage facilities and utilities. Certain pipeline companies have existing storage facilities connected to their systems that compete with some of PAA's facilities.

With regard to PAA's NGL operations, it competes with large oil, natural gas and natural gas liquids companies that may, relative to PAA, have greater financial resources and access to supplies of natural gas and NGL. The principal elements of competition are rates, processing fees, geographic proximity to the natural gas or NGL mix, available processing and fractionation capacity, transportation alternatives and their associated costs, and access to end-user markets.

Fluctuations in supply and demand, which can be caused by a variety of factors outside of PAA's control, can negatively affect its operating results.

Supply and demand for crude oil and other hydrocarbon products PAA handles is dependent upon a variety of factors, including price, the impact of future economic conditions, fuel conservation measures, alternative fuel adoption, governmental regulation, including climate change regulations, and technological advances in fuel economy and energy generation devices. For example, the adoption of legislation or regulatory programs to reduce emissions of greenhouse gases could increase the cost of consuming crude oil and other hydrocarbon products, thereby causing a reduction in the demand for such products. Demand also depends on the ability and willingness of shippers having access to PAA's transportation assets to satisfy their demand by deliveries through those assets. The supply of crude oil depends on a variety of global political and economic factors, including the reliance of foreign governments on petroleum revenues. Excess global supply of crude oil may negatively impact PAA's operating results by decreasing the price of crude oil and making production and transportation less profitable in areas PAA services.

Fluctuations in demand for crude oil, such as those caused by refinery downtime or shutdowns, can have a negative effect on PAA's operating results. Specifically, reduced demand in an area serviced by PAA's transportation systems will negatively affect the throughput on such systems. Although the negative impact may be mitigated or overcome by PAA's ability to capture differentials created by demand fluctuations, this ability is dependent on location and grade of crude oil, and thus is unpredictable.

Fluctuations in demand for NGL products, whether because of general or industry specific economic conditions, new government regulations, global competition, reduced demand by consumers for products made with NGL products, increased competition from petroleum-based feedstocks due to pricing differences, mild winter weather for some NGL products, particularly propane, or other reasons, could result in a decline in the volume of NGL products PAA handles or a reduction of

the fees it charges for its services. Also, increased supply of NGL products could reduce the value of NGL PAA handles and reduce the margins realized by it.

NGL and products produced from NGL also compete with products from global markets. Any reduced demand or increased supply for ethane, propane, normal butane, iso-butane or natural gasoline in the markets PAA accesses for any of the reasons stated above could adversely affect demand for the services PAA provides as well as NGL prices, which could negatively impact its operating results.

A natural disaster, catastrophe, terrorist attack (including eco-terrorist attacks), process safety failure or other event, including pipeline or facility accidents and attacks on PAA's electronic and computer systems, could interrupt its operations and/or result in severe personal injury, property damage and environmental damage, which could have a material adverse effect on its financial position, results of operations and cash flows.

Some of PAA's operations involve risks of personal injury, property damage and environmental damage that could curtail its operations and otherwise materially adversely affect its cash flow. Virtually all of PAA's operations are exposed to potential natural disasters or other natural events, including hurricanes, tornadoes, storms, floods, earthquakes, shifting soil and/or landslides. The location of some of PAA's assets and its customers' assets in the U.S. Gulf Coast region makes them particularly vulnerable to hurricane or tropical storm risk. PAA's facilities and operations are also vulnerable to accidents caused by process safety failures, equipment failures or human error. In addition, since the September 11, 2001 terrorist attacks, the U.S. government has issued warnings that energy assets, specifically the nation's pipeline infrastructure, may be future targets of terrorist organizations. Terrorists may target PAA's physical facilities and hackers may attack its electronic and computer systems.

If one or more of PAA's pipelines or other facilities, including electronic and computer systems, or any facilities or businesses that deliver products, supplies or services to PAA or that it relies on in order to operate its business, are damaged by severe weather or any other disaster, accident, catastrophe, terrorist attack or event, its operations could be significantly interrupted. These interruptions could involve significant damage or injury to people, property or the environment, and repairs could take from a week or less for minor incidents to six months or more for major interruptions. Any such event that interrupts the revenues generated by its operations, or which causes PAA to make significant expenditures not covered by insurance, could reduce its cash available for paying distributions to its partners and, accordingly, adversely affect its financial condition and the market price of its securities.

PAA may also suffer damage (including reputational damage) as a result of a disaster, accident, catastrophe, terrorist attack or other such event. The occurrence of such an event, or a series of such events, especially if one or more of them occurs in a highly populated or sensitive area, could negatively impact public perception of PAA's operations and/or make it more difficult for PAA to obtain the approvals, permits, licenses or real property interests PAA needs in order to operate its assets or complete planned growth projects.

Cybersecurity breaches and other disruptions could compromise PAA's information and operations, and expose it to liability, which would cause its business and reputation to suffer.

PAA is reliant on the continuous and uninterrupted operation of its information technology systems. User access of PAA's sites and information technology systems are critical elements to its operations, as is cloud security and protection against cyber security incidents. In the ordinary course of its business, PAA collects and stores sensitive data in its data centers and on its networks, including intellectual property, proprietary business information, information regarding its customers, suppliers, royalty owners and business partners, and personally identifiable information of its employees. The secure processing, maintenance and transmission of this information is critical to PAA's operations and business strategy. Despite PAA's security measures, its information technology and infrastructure may be vulnerable to attacks by hackers or breached due to employee error, malfeasance or other disruptions. Any such breach could compromise PAA's networks and the information stored there could be accessed, publicly disclosed, lost or stolen. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information, regulatory penalties for divulging shipper information, disruption of PAA's operations, damage to its reputation, and loss of confidence in its services, which could adversely affect its business.

PAA's information technology infrastructure is critical to the efficient operation of its business and essential to its ability to perform day-to-day operations. Potential risks to PAA's IT systems could include unauthorized attempts to extract business sensitive, confidential or personal information, denial of access extortion, corruption of information or disruption of business processes, or by inadvertent or intentional actions by PAA's employees or vendors. Breaches in PAA's information technology infrastructure or physical facilities, or other disruptions, could result in damage to its assets, safety incidents,

damage to the environment, remediation costs, potential liability, regulatory enforcement, violation of privacy or securities laws and regulations or the loss of contracts, any of which could have a material adverse effect on its operations, financial position and results of operations.

PAA may face opposition to the development or operation of its pipelines and facilities from various groups.

PAA may face opposition to the development or operation of its pipelines and facilities from environmental groups, landowners, tribal groups, local groups and other advocates. Such opposition could take many forms, including organized protests, attempts to block or sabotage PAA's operations, intervention in regulatory or administrative proceedings involving its assets, or lawsuits or other actions designed to prevent, disrupt or delay the development or operation of PAA's assets and business. For example, repairing PAA's pipelines often involves securing consent from individual landowners to access their property; one or more landowners may resist PAA's efforts to make needed repairs, which could lead to an interruption in the operation of the affected pipeline or other facility for a period of time that is significantly longer than would have otherwise been the case. In addition, acts of sabotage or eco-terrorism could cause significant damage or injury to people, property or the environment or lead to extended interruptions of PAA's operations. Any such event that interrupts the revenues generated by PAA's operations, or which causes PAA to make significant expenditures not covered by insurance, could reduce PAA's cash available for paying distributions to its partners and, accordingly, adversely affect PAA's financial condition and the market price of its securities.

Recently, activists concerned about the potential effects of climate change have directed their attention towards sources of funding for fossil-fuel energy companies, which has resulted in certain financial institutions, funds and other sources of capital restricting or eliminating their investment in energy-related activities. Ultimately, this could make it more difficult to secure funding for exploration and production activities or energy infrastructure related projects, and consequently could both indirectly affect demand for PAA's services and directly affect PAA's ability to fund construction or other capital projects.

The results of PAA's Supply and Logistics segment are influenced by the overall forward market for crude oil and NGL, and certain market structures, the absence of pricing volatility and other market factors may adversely impact its results.

Results from PAA's Supply and Logistics segment are dependent on a variety of factors affecting the markets for crude oil and NGL, including regional and international supply and demand imbalances, takeaway availability and constraints, transportation costs and the overall forward market for crude oil. Periods when differentials are wide or when there is volatility in the forward market structure are generally more favorable for PAA's Supply and Logistics segment. During periods where the infrastructure is over-built and/or there is a lack of volatility in the pricing structure PAA's results may be negatively impacted. Depending on the overall duration of these transition periods, how PAA has allocated its assets to particular strategies and the time length of its crude oil purchase and sale contracts and storage agreements, these periods may have either an adverse or beneficial effect on PAA's aggregate segment results. In the past, the results from PAA's Supply and Logistics segment have varied significantly based on market conditions and this segment may continue to experience highly variable results as a result of future changes to the markets for crude oil and NGL.

Loss of PAA's investment grade credit rating or the ability to receive open credit could negatively affect its borrowing costs, ability to purchase crude oil, NGL and natural gas supplies or to capitalize on market opportunities.

PAA believes that, because of its strategic asset base and complementary business model, PAA will continue to benefit from swings in market prices and shifts in market structure during periods of volatility in the crude oil, NGL and natural gas markets. The extent to which PAA is able to capture that benefit, however, is subject to numerous risks and uncertainties, including whether PAA will be able to maintain an attractive credit rating and continue to receive open credit from its suppliers and trade counterparties. PAA's senior unsecured debt is currently rated as "investment grade" by Standard & Poor's and Fitch Ratings Inc. In August 2017, Moody's Investors Service downgraded its rating of PAA's senior unsecured debt to a level below investment grade. A further downgrade by Standard & Poor's or Fitch Ratings, Inc. to a level below PAA's current ratings levels assigned by such rating agencies could increase its borrowing costs, reduce its borrowing capacity and cause its counterparties to reduce the amount of open credit we receive from them. This could negatively impact PAA's ability to capitalize on market opportunities. For example, PAA's ability to utilize its crude oil storage capacity for merchant activities to capture contango market opportunities is dependent upon having adequate credit facilities, both in terms of the total amount of credit facilities and the cost of such credit facilities, which enables PAA to finance the storage of the crude oil from the time it completes the purchase of the crude oil until the time it completes the sale of the crude oil. Loss of PAA's remaining investment grade credit ratings could also adversely impact its cash flows, its ability to make distributions at its current levels and the value of its outstanding equity and debt securities.

If PAA makes acquisitions that fail to perform as anticipated, its future growth may be limited .

In evaluating acquisitions, PAA generally prepares one or more financial cases based on a number of business, industry, economic, legal, regulatory, and other assumptions applicable to the proposed transaction. Although PAA expects a reasonable basis will exist for those assumptions, the assumptions will generally involve current estimates of future conditions. Realization of many of the assumptions will be beyond PAA's control. Moreover, the uncertainty and risk of inaccuracy associated with any financial projection will increase with the length of the forecasted period. Some acquisitions may not be accretive in the near term, and will be accretive in the long term only if PAA is able to timely and effectively integrate the underlying assets and such assets perform at or near the levels anticipated in its acquisition projections.

Acquisitions and joint ventures involve risks that may adversely affect PAA's business .

Any acquisition involves potential risks, including:

- performance from the acquired businesses or assets that is below the forecasts PAA used in evaluating the acquisition;
- a significant increase in PAA's indebtedness and working capital requirements;
- the inability to timely and effectively integrate the operations of recently acquired businesses or assets;
- the incurrence of substantial unforeseen environmental and other liabilities arising out of the acquired businesses or assets for which PAA is either not fully insured or indemnified, including liabilities arising from the operation of the acquired businesses or assets prior to PAA's acquisition;
- risks associated with operating in lines of business that are distinct and separate from PAA's historical operations;
- customer or key employee loss from the acquired businesses; and
- the diversion of management's attention from other business concerns.

Any of these factors could adversely affect PAA's ability to achieve anticipated levels of cash flows from its acquisitions, realize other anticipated benefits and its ability to pay distributions to its partners or meet its debt service requirements.

PAA is also involved in many strategic joint ventures. PAA may not always be in complete alignment with its joint venture counterparties - PAA may have differing strategic or commercial objectives or PAA may disagree on governance matters with respect to the joint venture entity. When PAA enters into joint ventures it may be subject to the risk that its counterparties do not fund their obligations. In some joint ventures PAA may not be responsible for construction or operation of such projects and will rely on its joint venture counterparties for such services. Joint ventures may also require PAA to expend additional internal resources that could otherwise be directed to other projects. If PAA is unable to successfully execute and manage its existing and proposed joint venture projects, it could adversely impact PAA's financial and operating results.

PAA may not be able to fully implement or capitalize upon planned growth projects.

PAA has a number of organic growth projects that involve the construction of new midstream energy infrastructure assets or the expansion or modification of existing assets. Many of these projects involve numerous regulatory, environmental, commercial, economic, weather-related, political and legal uncertainties that are beyond its control, including the following:

- As these projects are undertaken, required approvals, permits and licenses may not be obtained, may be delayed, may be obtained with conditions that materially alter the expected return associated with the underlying projects or may be granted and then subsequently withdrawn;
- PAA may face opposition to its planned growth projects from environmental groups, landowners, local groups and other advocates, including lawsuits or other actions designed to disrupt or delay PAA's planned projects;
- PAA may not be able to obtain, or PAA may be significantly delayed in obtaining, all of the rights of way or other real property interests it needs to complete such projects, or the costs PAA incurs in order to obtain such rights of way or other interests may be greater than PAA anticipated;
- Despite the fact that PAA will expend significant amounts of capital during the construction phase of these projects, revenues associated with these organic growth projects will not materialize until the projects have been completed and placed into commercial service, and the amount of revenue generated from these projects could be significantly lower than anticipated for a variety of reasons;

- PAA may construct pipelines, facilities or other assets in anticipation of market demand that dissipates or market growth that never materializes;
- Due to unavailability or costs of materials, supplies, power, labor or equipment, including increased costs associated with any import duties or requirements to source certain supplies or materials from U.S. suppliers or manufacturers, the cost of completing these projects could turn out to be significantly higher than PAA budgeted and the time it takes to complete construction of these projects and place them into commercial service could be significantly longer than planned; and
- The completion or success of PAA's projects may depend on the completion or success of third-party facilities over which PAA have no control.

As a result of these uncertainties, the anticipated benefits associated with PAA's capital projects may not be achieved or could be delayed. In turn, this could negatively impact PAA's cash flow and its ability to make or increase cash distributions to its partners.

PAA's growth strategy requires access to new capital. Tightened capital markets or other factors that increase its cost of capital could impair its ability to grow.

PAA continuously considers potential acquisitions and opportunities for expansion capital projects. Acquisition transactions can be effected quickly, may occur at any time and may be significant in size relative to its existing assets and operations. PAA's ability to fund its capital projects and make acquisitions depends on whether it can access the necessary financing to fund these activities. Any limitations on its access to capital or increase in the cost of that capital could significantly impair its growth strategy. PAA's ability to maintain its targeted credit profile, including maintaining its credit ratings, could affect PAA's cost of capital as well as its ability to execute its growth strategy. In addition, a variety of factors beyond its control could impact the availability or cost of capital, including domestic or international economic conditions, increases in key benchmark interest rates and/or credit spreads, the adoption of new or amended banking or capital market laws or regulations, the re-pricing of market risks and volatility in capital and financial markets.

Due to these factors, PAA cannot be certain that funding for its capital needs will be available from bank credit arrangements, capital markets or other sources on acceptable terms. If funding is not available when needed, or is available only on unfavorable terms, PAA may be unable to implement its development plans, enhance its existing business, complete acquisitions and construction projects, take advantage of business opportunities or respond to competitive pressures, any of which could have a material adverse effect on its revenues and results of operations.

PAA is exposed to the credit risk of its customers and other counterparties it transacts within the ordinary course of its business activities.

Risks of nonpayment and nonperformance by customers or other counterparties are a significant consideration in PAA's business. Although PAA has credit risk management policies and procedures that are designed to mitigate and limit its exposure in this area, there can be no assurance that PAA has adequately assessed and managed the creditworthiness of its existing or future counterparties or that there will not be an unanticipated deterioration in their creditworthiness or unexpected instances of nonpayment or nonperformance, all of which could have an adverse impact on PAA's cash flow and its ability to pay or increase its cash distributions to its partners.

PAA has a number of minimum volume commitment contracts that support pipelines in its Transportation segment. In addition, certain of the pipelines in which PAA owns a joint venture interest have minimum volume commitment contracts. Pursuant to such contracts, shippers are obligated to pay for a minimum volume of transportation service regardless of whether such volume is actually shipped (typically referred to as a deficiency payment), subject to the receipt of credits that typically expire if not used by a certain date. While such contracts provide greater revenue certainty, if the applicable shipper fails to transport the minimum required volume and is required to make a deficiency payment, under applicable accounting rules, the revenue associated with such deficiency payment may not be recognized until the applicable transportation credit has expired or has been used. Deferred revenue associated with non-performance by shippers under minimum volume contracts could be significant and could adversely affect PAA's profitability and earnings.

In addition, in those cases in which PAA provides division order services for crude oil purchased at the wellhead, it may be responsible for distribution of proceeds to all parties. In other cases, PAA pays all of or a portion of the production proceeds to an operator who distributes these proceeds to the various interest owners. These arrangements expose PAA to operator credit risk, and there can be no assurance that PAA will not experience losses in dealings with such operators and other parties.

Further, to the extent one or more of PAA's major customers experiences financial distress or commences bankruptcy proceedings, contracts with such customers (including contracts that are supported by acreage dedications) may be subject to renegotiation or rejection under applicable provisions of the United States Bankruptcy Code. Any such renegotiation or rejection could have an adverse effect on PAA's revenue and cash flows and its ability to make cash distributions to its unitholders.

PAA has also undertaken numerous projects that require cooperation with and performance by joint venture co-owners. In addition, in connection with various acquisition, divestiture, joint venture and other transactions, PAA often receives indemnifications from various parties for certain risks or liabilities. Nonperformance by any of these parties could result in increased costs or other adverse consequences that could decrease PAA's earnings and returns.

PAA also relies to a significant degree on the banks that lend to it under its revolving credit facility for financial liquidity, and any failure of those banks to perform on their obligations to PAA could significantly impair its liquidity. Furthermore, nonpayment by the counterparties to PAA's interest rate, commodity and/or foreign currency derivatives could expose it to additional interest rate, commodity price and/or foreign currency risk.

PAA's risk policies cannot eliminate all risks. In addition, any non-compliance with its risk policies could result in significant financial losses.

Generally, it is PAA's policy to establish a margin for crude oil or other products it purchases by selling such products for physical delivery to third-party users, or by entering into a future delivery obligation under derivative contracts. Through these transactions, PAA seeks to maintain a position that is substantially balanced between purchases on the one hand, and sales or future delivery obligations on the other hand. PAA's policy is not to acquire and hold physical inventory or derivative products for the purpose of speculating on commodity price changes. These policies and practices cannot, however, eliminate all risks. For example, any event that disrupts PAA's anticipated physical supply of crude oil or other products could expose it to risk of loss resulting from price changes. PAA is also exposed to basis risk when crude oil or other products are purchased against one pricing index and sold against a different index. Moreover, PAA is exposed to some risks that are not hedged, including risks on certain of its inventory, such as linefill, which must be maintained in order to transport crude oil on its pipelines. In an effort to maintain a balanced position, specifically authorized personnel can purchase or sell crude oil, refined products and NGL, up to predefined limits and authorizations. Although this activity is monitored independently by PAA's risk management function, it exposes PAA to commodity price risks within these limits.

In addition, PAA's operations involve the risk of non-compliance with its risk policies. PAA has taken steps within its organization to implement processes and procedures designed to detect unauthorized trading; however, PAA can provide no assurance that these steps will detect and prevent all violations of its risk policies and procedures, particularly if deception, collusion or other intentional misconduct is involved.

PAA's operations are also subject to laws and regulations relating to protection of the environment and wildlife, operational safety, climate change and related matters that may expose it to significant costs and liabilities. The current laws and regulations affecting our business are subject to change and in the future PAA may be subject to additional laws and regulations, which could adversely impact PAA's business .

PAA's operations involving the storage, treatment, processing, and transportation of liquid hydrocarbons, including crude oil, NGL and refined products, as well as PAA's operations involving the storage of natural gas, are subject to stringent federal, state, and local laws and regulations governing the discharge of materials into the environment. PAA's operations are also subject to laws and regulations relating to protection of the environment and wildlife, operational safety, climate change and related matters. Compliance with all of these laws and regulations increases its overall cost of doing business, including its capital costs to construct, maintain and upgrade equipment and facilities. For example, the adoption of legislation or regulatory programs to reduce emissions of greenhouse gases (such as carbon dioxide and methane), including cap and trade programs, could require PAA to incur increased operating costs, such as costs to purchase and operate emissions control systems, to acquire emissions allowances or comply with new regulatory or reporting requirements. In addition, with respect to our railcar operations, the adoption of new regulations designed to enhance the overall safety of crude oil and natural gas liquids transportation by rail could result in increased operating costs and potentially involve substantial capital expenditures. Also, new or additional regulations, new interpretations of existing requirements or changes in PAA's operations could trigger new permitting requirements applicable to its operations, which could result in increased costs or delays of, or denial of rights to conduct, PAA's development programs. The failure to comply with any such laws and regulations could result in the assessment of administrative, civil, and criminal penalties, the imposition of investigatory and remedial liabilities, the issuance of injunctions that may subject PAA to additional operational requirements and constraints, or claims of damages to property or persons resulting from its operations. In addition, criminal violations of certain environmental laws, or in some cases even the allegation of criminal violations, may result in the temporary suspension or outright debarment from participating in government contracts. The laws and regulations applicable to PAA's operations are subject to change and interpretation by the relevant governmental agency, including the possibility that exemptions it currently qualifies for may be modified or changed in ways that require PAA to incur significant additional compliance costs. PAA's business and operations may also become subject to additional laws or regulations. Any new laws or regulations, or changes to or interpretations of existing laws or regulations, adverse to PAA could have a material adverse effect on its operations, revenues, expenses and profitability.

PAA has a history of incremental additions to the miles of pipelines it owns, both through acquisitions and expansion capital projects. PAA has also increased its terminal and storage capacity and operate several facilities on or near navigable waters and domestic water supplies. Although PAA has implemented programs intended to maintain the integrity of its assets (discussed below), as it acquires additional assets it is at risk for an increase in the number of releases of liquid hydrocarbons into the environment. These releases expose PAA to potentially substantial expense, including clean-up and remediation costs, fines and penalties, and third party claims for personal injury or property damage related to past or future releases. Some of these expenses could increase by amounts disproportionately higher than the relative increase in pipeline mileage and the increase in revenues associated therewith. PAA's refined products terminal assets are also subject to significant compliance costs and liabilities. In addition, because of the increased volatility of refined products and their tendency to migrate farther and faster than crude oil when released, releases of refined products into the environment can have a more significant impact than crude oil and require significantly higher expenditures to respond and remediate. The incurrence of such expenses not covered by insurance, indemnity or reserves could materially adversely affect PAA's results of operations.

PAA currently devotes substantial resources to comply with DOT-mandated pipeline integrity rules. The DOT regulations include requirements for the establishment of pipeline integrity management programs and for protection of "high consequence areas" where a pipeline leak or rupture could produce significant adverse consequences. Pipeline safety regulations are revised frequently. For example, PHMSA is expected to publish finalized regulations in the first half of 2019 for hazardous liquid pipelines which will significantly extend and expand the reach of certain PHMSA integrity management requirements (i.e., periodic assessments, leak detection and repairs) regardless of proximity to a high consequence area. The final rule will also impose new reporting requirements for certain unregulated pipelines, including all hazardous liquid gathering lines. The adoption of new regulations requiring more comprehensive or stringent safety standards could require PAA to install new or modified safety controls, pursue new capital projects, or conduct maintenance programs on an accelerated basis, all of which could require PAA to incur increased operational costs that could be significant.

Although PAA continues to focus on pipeline and facility integrity management as a primary operational emphasis, doing so requires substantial time and resources and cannot eliminate all risk of releases. PAA has an internal review process pursuant to which it examines various aspects of its pipeline and gathering systems that are not currently subject to the DOT pipeline integrity management mandate. The purpose of this process is to review the surrounding environment, condition and operating history of these pipeline and gathering assets to determine if such assets warrant additional investment or replacement. Accordingly, in addition to potential cost increases related to unanticipated regulatory changes or injunctive remedies resulting from regulatory agency enforcement actions, PAA may elect (as a result of its own internal initiatives) to spend substantial sums to enhance the integrity of and upgrade its pipeline systems to maintain environmental compliance and, in some cases, PAA may take pipelines out of service if it believes the cost of upgrades will exceed the value of the pipelines. PAA cannot provide any assurance as to the ultimate amount or timing of future pipeline integrity expenditures but any such expenditures could be significant. See “Environmental — General” in Note 18 to our Consolidated Financial Statements. In addition, despite PAA’s pipeline and facility integrity management efforts, it can provide no assurance that its pipelines and facilities will not experience leaks or releases or that PAA will be able to fully comply with all of the federal, state and local laws and regulations applicable to the operation of PAA’s pipelines or facilities; any such leaks or releases could be material and could have a significant adverse impact on PAA’s reputation, financial position, cash flows and ability to pay or increase distributions to its unitholders.

PAA’s assets are subject to federal, state and provincial regulation. Rate regulation or a successful challenge to the rates PAA charges on its U.S. and Canadian pipeline systems may reduce the amount of cash it generates.

PAA’s U.S. interstate common carrier liquids pipelines are subject to regulation by the FERC under the ICA. The ICA requires that tariff rates and terms and conditions of service for liquids pipelines be just and reasonable and non-discriminatory. PAA is also subject to the Pipeline Safety Regulations of the DOT. PAA’s intrastate pipeline transportation activities are subject to various state laws and regulations as well as orders of regulatory bodies.

For PAA’s U.S. interstate common carrier liquids pipelines subject to FERC regulation under the ICA, shippers may protest its pipeline tariff filings or file complaints against its existing rates or complaints alleging that we are engaging in discriminating behavior. The FERC can also investigate on its own initiative. Under certain circumstances, the FERC could limit PAA’s ability to set rates based on its costs, or could order PAA to reduce its rates and could require the payment of reparations to complaining shippers for up to two years prior to the complaint. Natural gas storage facilities are subject to regulation by the FERC, the DOT, and certain state agencies.

In March 2018, FERC issued a revised policy statement (subsequently modified in a final rule issued in July 2018) in which it held that it will no longer permit an income tax allowance to be included in cost-of-service rates for interstate pipelines structured as master limited partnerships. The FERC also indicated that it will incorporate the effects of the revised policy statement in its next review of the oil pipeline index level, which will take effect in July 2021. PAA does not have cost-of-service rates that would be impacted by this policy change; PAA’s FERC regulated tariffs are either grandfathered or based on negotiated rates. However, depending on how the FERC incorporates its most recent tax policy statement into its next index review, the policy could potentially have a negative impact on the FERC adder to the PPI-FG Index, which in turn could have a negative effect on PAA’s ability to increase its index-based rates. The policy could impact future (i.e., July 2021 and later) tariff escalations on PAA’s FERC regulated pipelines, as well as some of PAA’s state-regulated pipelines that have negotiated rates with escalations tied to the FERC Index.

In addition, PAA routinely monitors the public filings and proceedings of other parties with the FERC and other regulatory agencies in an effort to identify issues that could potentially impact its business. Under certain circumstances PAA may choose to intervene in such third-party proceedings in order to express its support for, or its opposition to, various issues raised by the parties to such proceedings. For example, if PAA believes that a petition filed with, or order issued by, the FERC is improper, overbroad or otherwise flawed, PAA may attempt to intervene in such proceedings for the purpose of protesting such petition or order and requesting appropriate action such as a clarification, rehearing or other remedy. Despite such efforts, PAA can provide no assurance that the FERC and other agencies that regulate its business will not issue future orders or declarations that increase its costs or otherwise adversely affect its operations.

The FERC issued a Notice of Inquiry on April 19, 2018 (Certificate Policy Statement NOI), thereby initiating a review of its policies on certification of natural gas pipelines and storage facilities, including an examination of its long-standing Policy Statement on Certification of New Interstate Natural Gas Pipeline Facilities, issued in 1999, that is used to determine whether to grant certificates for new pipeline and storage projects and expansions. Comments on the Certificate Policy Statement NOI were due on July 25, 2018, and PAA is unable to predict what, if any, changes may be proposed as a result of the NOI that will affect PAA’s natural gas storage business or when such proposals, if any, might become effective.

PAA's Canadian pipelines are subject to regulation by the NEB and by provincial authorities. Under the National Energy Board Act, the NEB could investigate the tariff rates or the terms and conditions of service relating to a jurisdictional pipeline on its own initiative, upon the filing of a toll or tariff application, or upon the filing of a written complaint. If the NEB found the rates or terms of service relating to such pipeline to be unjust or unreasonable or unjustly discriminatory, the NEB could require PAA to change its rates, provide access to other shippers, or change its terms of service. A provincial authority could, on the application of a shipper or other interested party, investigate the tariff rates or PAA's terms and conditions of service relating to its provincially-regulated proprietary pipelines. If it found PAA's rates or terms of service to be contrary to statutory requirements, it could impose conditions it considers appropriate. A provincial authority could declare a pipeline to be a common carrier pipeline, and require PAA to change its rates, provide access to other shippers, or otherwise alter its terms of service. Any reduction in PAA's tariff rates would result in lower revenue and cash flows.

Some of PAA's operations cross the U.S./Canada border and are subject to cross-border regulation.

PAA's cross border activities subject it to regulatory matters, including import and export licenses, tariffs, Canadian and U.S. customs and tax issues and toxic substance certifications. Such regulations include the Short Supply Controls of the EAA, the NAFTA and the TSCA. Violations of these licensing, tariff and tax reporting requirements could result in the imposition of significant administrative, civil and criminal penalties.

PAA's purchases and sales of crude oil, natural gas and NGL, and hedging activities, expose it to potential regulatory risks.

The FTC, the FERC and the CFTC hold statutory authority to monitor certain segments of the physical and futures energy commodities markets. These agencies have imposed broad regulations prohibiting fraud and manipulation of such markets. With regard to PAA's physical purchases and sales of crude oil, natural gas or NGL and any related hedging activities that it undertakes, PAA is required to observe the market-related regulations enforced by these agencies, which hold substantial enforcement authority. PAA's purchases and sales may also be subject to certain reporting and other requirements. Additionally, to the extent that PAA enters into transportation contracts with common carrier pipelines that are subject to FERC regulation, it is subject to FERC requirements related to the use of such capacity. Any failure on PAA's part to comply with the regulations and policies of the FERC, the FTC or the CFTC could result in the imposition of civil and criminal penalties. Failure to comply with such regulations, as interpreted and enforced, could have a material adverse effect on PAA's business, results of operations, financial condition and its ability to make cash distributions to its unitholders.

The enactment and implementation of derivatives legislation could have an adverse impact on PAA's ability to use derivative instruments to reduce the effect of commodity price, interest rate and other risks associated with its business and increase the working capital requirement to conduct these hedging activities .

The Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), enacted on July 21, 2010, established federal oversight and regulation of derivative markets and entities, such as PAA, that participate in those markets. The Dodd-Frank Act requires the CFTC and the SEC to promulgate rules and regulations implementing the Dodd-Frank Act. Although the CFTC has finalized certain regulations, others remain to be finalized or implemented and it is not possible at this time to predict when this will be accomplished.

In October 2011, the CFTC issued regulations to set position limits for certain futures and option contracts in the major energy markets. The initial position limits rule was vacated by the United States District Court for the District of Columbia in September 2012. However, in November 2013, the CFTC proposed new rules that would place limits on positions in certain core futures and equivalent swaps contracts for, or linked to, certain physical commodities, subject to exceptions for certain bona fide hedging transactions. As these new position limit rules are not yet final, the impact of those provisions on PAA is uncertain at this time.

The CFTC has designated certain interest rate swaps and credit default swaps for mandatory clearing, and the associated rules require PAA, in connection with covered derivative activities, to comply with clearing and trade-execution requirements or take steps to qualify for an exemption from such requirements. PAA does not utilize credit default swaps and PAA qualifies for, and expects to continue to qualify for, the end-user exception from the mandatory clearing requirements for swaps entered into to hedge its interest rate risks. Should the CFTC designate commodity derivatives for mandatory clearing, PAA would expect to qualify for an end-user exception from the mandatory clearing requirements for swaps entered into to hedge its commodity price risk. However, the majority of PAA's financial derivative transactions used for hedging commodity price risks are currently executed and cleared over exchanges that require the posting of margin or letters of credit based on initial and variation margin requirements. Pursuant to the Dodd Frank Act, however, the CFTC or federal banking regulators may require the posting of collateral with respect to uncleared interest rate and commodity derivative transactions.

Certain banking regulators and the CFTC have adopted final rules establishing minimum margin requirements for uncleared swaps. Although PAA qualifies for the end-user exception from margin requirements for swaps entered into to hedge commercial risks, if any of PAA's swaps do not qualify for the commercial end-user exception, or if PAA is otherwise required to post additional cash margin or collateral it could reduce PAA's ability to execute hedges necessary to reduce commodity price exposures and protect cash flows. Posting of additional cash margin or collateral could affect PAA's liquidity (defined as unrestricted cash on hand plus available capacity under its credit facilities) and reduce PAA's ability to use cash for capital expenditures or other partnership purposes.

Even if PAA itself is not required to post additional cash margin or collateral for its derivative contracts, the banks and other derivatives dealers who are PAA's contractual counterparties will be required to comply with other new requirements under the Dodd-Frank Act and related rules. The costs of such compliance may be passed on to customers such as PAA, thus decreasing the benefits to PAA of hedging transactions or reducing its profitability. In addition, implementation of the Dodd-Frank Act and related rules and regulations could reduce the overall liquidity and depth of the markets for financial and other derivatives PAA utilizes in connection with its business, which could expose PAA to additional risks or limit the opportunities PAA is able to capture by limiting the extent to which PAA is able to execute its hedging strategies.

Finally, the Dodd-Frank Act was intended, in part, to reduce the volatility of oil and gas prices, which some legislators attributed to speculative trading in derivatives and commodity instruments related to oil and gas. PAA's financial results could be adversely affected if a consequence of the Dodd-Frank Act and implementing regulations is lower commodity prices.

The full impact of the Dodd-Frank Act and related regulatory requirements upon PAA's business will not be known until the regulations are implemented and the market for derivatives contracts has adjusted. The Dodd-Frank Act and any new regulations could significantly increase the cost of derivative contracts, materially alter the terms of derivative contracts, reduce the availability of derivatives to protect against risks PAA encounters, reduce PAA's ability to monetize or restructure its existing derivative contracts. If PAA reduces its use of derivatives as a result of the Dodd-Frank Act and regulations implementing the Dodd-Frank Act, PAA's results of operations may become more volatile and its cash flows may be less predictable. Any of these consequences could have a material adverse effect on PAA, its financial condition and its results of operations.

Legislation and regulatory initiatives relating to hydraulic fracturing or other drilling activities could reduce domestic production of crude oil and natural gas.

Hydraulic fracturing is an important and common practice that is used to stimulate production of hydrocarbons from unconventional geological formations. Recent advances in hydraulic fracturing techniques have resulted in significant increases in crude oil and natural gas production in many basins in the United States and Canada. The process involves the injection of water, sand and chemicals under pressure into the formation to fracture the surrounding rock and stimulate production, and it is typically regulated by state and provincial oil and gas commissions. PAA does not perform hydraulic fracturing, but many of the producers using its pipelines do. Hydraulic fracturing has been subject to increased scrutiny due to public concerns that it could result in contamination of drinking water supplies, and there have been a variety of legislative and regulatory proposals to prohibit, restrict, or more closely regulate various forms of hydraulic fracturing. Any legislation or regulatory initiatives that curtail hydraulic fracturing or otherwise limit producers' ability to drill or complete wells could reduce the production of crude oil and natural gas in the United States or Canada, and could thereby reduce demand for PAA's transportation, terminalling and storage services as well as its supply and logistics services.

Climate change laws and regulations restricting emissions of greenhouse gases could result in increased operating costs and reduced demand for crude oil and natural gas, while potential physical effects of climate change could disrupt crude oil production and cause PAA to incur significant costs in preparing for or responding to those effects.

In response to findings that emissions of GHGs present an endangerment to public health and the environment, the EPA has adopted regulations under existing provisions of the federal Clean Air Act to reduce GHG emissions. For example, in June 2016, the EPA finalized new regulations, known as Subpart OOOOa, that set emissions standards for methane and volatile organic compounds from new and modified oil and natural gas production and natural gas processing and transmission facilities. However, there have been attempts to modify these regulations, and litigation concerning the regulations is ongoing.

While Congress has from time to time considered legislation to reduce emissions of GHGs, no significant legislation to reduce GHG emissions has been adopted at the federal level. In the absence of federal climate legislation, a number of state and regional GHG restrictions have emerged. Analogous regulations are or may be implemented in Canada. Any future laws and regulations that limit emissions of GHGs could adversely affect demand for oil and natural gas that operators, some of whom are PAA's customers, produce and could thereby reduce demand for PAA's midstream services.

Moreover, activists concerned about the potential effects of climate change have directed their attention at sources of funding for fossil-fuel energy companies, which has resulted in certain sources of capital restricting or eliminating their investment in oil and natural gas activities. Additionally, activist shareholders have introduced proposals that may seek to force companies to adopt aggressive emission reduction targets or restrict more carbon-intensive activities. While PAA cannot predict the outcomes of such proposals, they could make it more difficult for operators to engage in exploration and production activities, ultimately reducing demand for PAA's services. Finally, many scientists have concluded that increasing concentrations of GHGs in the Earth's atmosphere may produce significant physical effects, such as increased frequency and severity of storms, droughts, floods and other climatic events; if any such effects were to occur, they have the potential to cause physical damage to PAA's assets and thus could have an adverse effect on its financial condition and operations.

PAA may in the future encounter increased costs related to, and lack of availability of, insurance.

Over the last several years, as the scale and scope of PAA's business activities has expanded, the breadth and depth of available insurance markets has contracted. As a result of these factors and other market conditions, as well as the fact that PAA has experienced several incidents over the last 3 to 5 years, premiums and deductibles for certain insurance policies have increased substantially. Accordingly, PAA can give no assurance that it will be able to maintain adequate insurance in the future at rates or on other terms PAA considers commercially reasonable. In addition, although PAA believes that it currently maintains adequate insurance coverage, insurance will not cover many types of interruptions or events that might occur and will not cover all risks associated with its operations. In addition, the proceeds of any such insurance may not be paid in a timely manner and may be insufficient if such an event were to occur. The occurrence of a significant event, the consequences of which are either not covered by insurance or not fully insured, or a significant delay in the payment of a major insurance claim, could materially and adversely affect PAA's financial position, results of operations and cash flows.

The terms of PAA's indebtedness may limit its ability to borrow additional funds or capitalize on business opportunities. In addition, PAA's future debt level may limit its future financial and operating flexibility.

As of December 31, 2018, the face value of PAA's consolidated debt outstanding was approximately \$9.3 billion, consisting of approximately \$9.2 billion face value of long-term debt (including senior notes and long-term commercial paper and credit facility borrowings) and approximately \$0.1 billion of short-term borrowings. As of December 31, 2018, PAA had approximately \$2.9 billion of liquidity available, including cash and cash equivalents and available borrowing capacity under its senior unsecured revolving credit facility and its senior secured hedged inventory facility, subject to continued covenant compliance. Lower Adjusted EBITDA could increase PAA's leverage ratios and effectively reduce its ability to incur additional indebtedness.

The amount of PAA's current or future indebtedness could have significant effects on its operations, including, among other things:

- a significant portion of PAA's cash flow will be dedicated to the payment of principal and interest on its indebtedness and may not be available for other purposes, including the payment of distributions on its units and capital expenditures;
- credit rating agencies may view PAA's debt level negatively;
- covenants contained in PAA's existing debt arrangements will require it to continue to meet financial tests that may adversely affect its flexibility in planning for and reacting to changes in its business;
- PAA's ability to obtain additional financing for working capital, capital expenditures, acquisitions and general partnership purposes may be limited;
- PAA may be at a competitive disadvantage relative to similar companies that have less debt; and
- PAA may be more vulnerable to adverse economic and industry conditions as a result of its significant debt level.

PAA's credit agreements prohibit distributions on, or purchases or redemptions of, units if any default or event of default is continuing. In addition, the agreements contain various covenants limiting PAA's ability to, among other things, incur indebtedness if certain financial ratios are not maintained, grant liens, engage in transactions with affiliates, enter into sale-leaseback transactions, and sell substantially all of its assets or enter into a merger or consolidation. PAA's credit facilities treat a change of control as an event of default and also requires PAA to maintain a certain debt coverage ratio. PAA's senior notes do not restrict distributions to unitholders, but a default under its credit agreements will be treated as a default under the senior notes. Please read Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources—Credit Agreements, Commercial Paper Program and Indentures."

PAA's ability to access capital markets to raise capital on favorable terms will be affected by its debt level, its operating and financial performance, the amount of its current maturities and debt maturing in the next several years, and by prevailing market conditions. Moreover, if the rating agencies were to downgrade PAA's credit ratings, then it could experience an increase in its borrowing costs, face difficulty accessing capital markets or incurring additional indebtedness, be unable to receive open credit from its suppliers and trade counterparties, be unable to benefit from swings in market prices and shifts in market structure during periods of volatility in the crude oil market or suffer a reduction in the market price of its common units. If PAA is unable to access the capital markets on favorable terms at the time a debt obligation becomes due in the future, it might be forced to refinance some of its debt obligations through bank credit, as opposed to long-term public debt securities or equity securities, or sell assets. The price and terms upon which PAA might receive such extensions or additional bank credit, if at all, could be more onerous than those contained in existing debt agreements. Any such arrangements could, in turn, increase the risk that PAA's leverage may adversely affect its future financial and operating flexibility and thereby impact its ability to pay cash distributions at expected rates.

Increases in interest rates could adversely affect PAA's business and the trading price of its units.

As of December 31, 2018, the face value of PAA's consolidated debt was approximately \$9.3 billion, of which approximately \$9.1 billion was at fixed interest rates and approximately \$0.2 billion was at variable interest rates. PAA is exposed to market risk due to the short-term nature of its commercial paper borrowings and the floating interest rates on its credit facilities. PAA's results of operations, cash flows and financial position could be adversely affected by significant increases in interest rates above current levels. Additionally, increases in interest rates could adversely affect PAA's Supply and Logistics segment results by increasing interest costs associated with the storage of hedged crude oil and NGL inventory. Further, the trading price of PAA's common units may be sensitive to changes in interest rates and any rise in interest rates could adversely impact such trading price.

Changes in currency exchange rates could adversely affect PAA's operating results.

Because PAA is a U.S. dollar reporting company and also conducts operations in Canada, it is exposed to currency fluctuations and exchange rate risks that may adversely affect the U.S. dollar value of its earnings, cash flow and partners' capital under applicable accounting rules. For example, as the U.S. dollar appreciates against the Canadian dollar, the U.S. dollar value of PAA's Canadian dollar denominated earnings is reduced for U.S. reporting purposes.

PAA's business requires the retention and recruitment of a skilled workforce, and difficulties recruiting and retaining its workforce could result in a failure to implement PAA's business plans.

PAA's operations and management require the retention and recruitment of a skilled workforce, including engineers, technical personnel and other professionals. PAA and its affiliates compete with other companies in the energy industry for this skilled workforce. If PAA is unable to (i) retain current employees; and/or (ii) recruit new employees of comparable knowledge and experience, PAA's business could be negatively impacted. In addition, PAA could experience increased costs to retain and recruit these professionals.

An impairment of long-term assets could reduce PAA's earnings.

At December 31, 2018, PAA had approximately \$14.8 billion of net property and equipment, \$916 million of linefill and base gas, \$2.5 billion of goodwill, \$2.7 billion of investments accounted for under the equity method of accounting and \$772 million of net intangible assets capitalized on its balance sheet. GAAP requires an assessment for impairment on an annual basis or in certain circumstances, including when there is an indication that the carrying value of property and equipment may not be recoverable or a determination that it is more likely than not that a reporting unit's carrying value is in excess of the reporting unit's fair value. If PAA was to determine that any of its property and equipment, linefill and base gas, goodwill, intangibles or equity method investments was impaired, it could be required to take an immediate charge to earnings, which could adversely impact its operating results, with a corresponding reduction of partners' capital and increase in balance sheet leverage as measured by debt-to-total capitalization. See Note 6 to our Consolidated Financial Statements for additional information regarding impairments.

Rail and marine transportation of crude oil have inherent operating risks.

PAA's supply and logistics operations include purchasing crude oil that is carried on railcars, tankers or barges. Such cargos are at risk of being damaged or lost because of events such as derailment, marine disaster, inclement weather, mechanical failures, grounding or collision, fire, explosion, environmental accidents, piracy, terrorism and political instability. Such occurrences could result in death or injury to persons, loss of property or environmental damage, delays in the delivery of cargo, loss of revenues, termination of contracts, governmental fines, penalties or restrictions on conducting business, higher insurance rates and damage to PAA's reputation and customer relationships generally. Although certain of these risks may be covered under PAA's insurance program, any of these circumstances or events could increase its costs or lower its revenues.

PAA is dependent on the use or availability of third-party assets for certain of its operations.

Certain of PAA's business activities require the use or availability of third-party assets over which it may have little or no control. If at any time the availability of these assets is limited or denied, and if access to alternative assets cannot be arranged, it could have an adverse effect on PAA's business, results of operations and cash flow.

Non-utilization of certain assets could significantly reduce its profitability due to fixed costs incurred to obtain the right to use such assets.

From time to time in connection with its business, PAA may lease or otherwise secure the right to use certain assets (such as railcars, trucks, barges, ships, pipeline capacity, storage capacity and other similar assets) with the expectation that the revenues it generates through the use of such assets will be greater than the fixed costs it incurs pursuant to the applicable leases or other arrangements. However, when such assets are not utilized or are under-utilized, PAA's profitability could be negatively impacted because the revenues it earns are either non-existent or reduced, but it remains obligated to continue paying any applicable fixed charges, in addition to the potential of incurring other costs attributable to the non-utilization of such assets. Non-utilization of assets PAA leases or otherwise secures the right to use in connection with its business could have a significant negative impact on PAA's profitability and cash flows.

Many of PAA's assets have been in service for many years and require significant expenditures to maintain them. As a result, its maintenance or repair costs may increase in the future.

PAA's pipelines, terminals, storage and processing and fractionation assets are generally long-lived assets, and many of them have been in service for many years. The age and condition of its assets could result in increased maintenance or repair expenditures in the future. Any significant increase in these expenditures could adversely affect PAA's results of operations, financial position or cash flows, as well as its ability to make cash distributions to our unitholders.

PAA does not own all of the land on which its pipelines and facilities are located, which could result in disruptions to its operations.

PAA does not own all of the land on which its pipelines and facilities have been constructed, and therefore are potentially subject to more onerous terms and/or increased costs to retain necessary land use if PAA does not have valid rights-of-way or if such rights-of-way lapse or terminate. In some instances, PAA obtains the rights to construct and operate its pipelines on land owned by third parties and governmental agencies for a specific period of time. Following a decision issued in May 2017 by the Tenth Circuit Court of Appeals, tribal ownership of even a very small fractional interest in tribal land owned or at one time owned by an individual Indian landowner, bars condemnation of any interest in the allotment. Consequently, the inability to condemn such allotted lands under circumstances where existing pipeline rights-of-way may soon lapse or terminate serves as an additional potential impediment for pipeline operations. In September 2018, the Fourth Circuit Court of Appeals reversed a decision of the United States Forest Service ("USFS") issuing a permit for the construction of a pipeline and granting a right of way across the Appalachian Trail, ruling that the USFS lacked statutory authority. This decision may make it more difficult to obtain permits and rights of way on certain federal lands and may be used as precedent to challenge existing and future permits and rights of way. PAA cannot guarantee that it will always be able to renew existing rights-of-way or obtain new rights-of-way on favorable terms or without experiencing significant delays and costs. Any loss of rights with respect to real property, through PAA's inability to renew right-of-way contracts or otherwise, could have a material adverse effect on its business, results of operations, and financial position.

For various operating and commercial reasons, PAA may not be able to perform all of its obligations under its contracts, which could lead to increased costs and negatively impact its financial results.

Various operational and commercial factors could result in an inability on PAA's part to satisfy its contractual commitments and obligations. For example, in connection with the provision of firm storage services and hub services to its natural gas storage customers, PAA enters into contracts that obligate PAA to honor its customers' requests to inject gas into its storage facilities, withdraw gas from its facilities and wheel gas through its facilities, in each case subject to volume, timing and other limitations set forth in such contracts. The following factors could adversely impact PAA's ability to perform its obligations under these contracts:

- a failure on the part of PAA's storage facilities to perform as it expects them to, whether due to malfunction of equipment or facilities or realization of other operational risks;
- the operating pressure of PAA's storage facilities (affected in varying degree, depending on the type of storage cavern, by total volume of working and base gas, and temperature);
- a variety of commercial decisions PAA makes from time to time in connection with the management and operation of its storage facilities. Examples include, without limitation, decisions with respect to matters such as (i) the aggregate amount of commitments PAA is willing to make with respect to wheeling, injection, and withdrawal services, which could exceed PAA's capabilities at any given time for various reasons, (ii) the timing of scheduled and unplanned maintenance or repairs, which can impact equipment availability and capacity, (iii) the schedule for and rate at which PAA conducts opportunistic leaching activities at its facilities in connection with the expansion of existing salt caverns, which can impact the amount of storage capacity PAA has available to satisfy its customers' requests, (iv) the timing and aggregate volume of any base gas park and/or loan transactions PAA consummates, which can directly affect the operating pressure of PAA's storage facilities and (v) the amount of compression capacity and other gas handling equipment that PAA installs at its facilities to support gas wheeling, injection and withdrawal activities; and
- adverse operating conditions due to hurricanes, extreme weather events or conditions, and operational problems or issues with third-party pipelines, storage or production facilities.

Although PAA manages and monitors all of these various factors in connection with the ongoing operation of its natural gas storage facilities with the goal of performing all of its contractual commitments and obligations and optimizing its revenue, one or more of the above factors may adversely impact PAA's ability to satisfy its injection, withdrawal or wheeling obligations under its storage contracts. In such event, PAA may be liable to its customers for losses or damages they suffer and/or PAA may need to incur costs or expenses in order to permit it to satisfy its obligations.

If PAA fails to obtain materials in the quantity and the quality it needs, and at commercially acceptable prices, whether due to tariffs, quotas or other factors, PAA's results of operations, financial condition and cash flows could be materially and adversely affected.

PAA's business requires access to steel and other materials to construct and maintain new and existing pipelines and facilities. If PAA experiences a shortage in the supply of these materials or is unable to source sufficient quantities of high quality materials at acceptable prices and in a timely manner, it could materially and adversely affect PAA's ability to construct new infrastructure and maintain its existing assets.

In addition, some of the materials used in PAA's business are imported. Existing and future import duties and quotas could materially increase PAA's costs of procuring imported or domestic steel and/or create shortages or difficulties in procuring sufficient quantities of steel meeting PAA's required technical specifications. A material increase in PAA's costs of construction and maintenance or any significant delays in its ability to complete its infrastructure projects could have a material adverse effect on PAA's financial position, results of operations and cash flows.

Cost reimbursements due to PAA's general partner may be substantial and will reduce PAA's cash available for distribution to its unitholders.

Prior to making any distribution on its common units, PAA will reimburse its general partner and its affiliates, including officers and directors of its general partner, for all expenses incurred on PAA's behalf. In addition, PAA is required to pay all direct and indirect expenses of the Plains Entities, other than income taxes of any of the PAGP Entities. The reimbursement of expenses and the payment of fees and expenses could adversely affect PAA's ability to make distributions. PAA's general partner has sole discretion to determine the amount of these expenses. In addition, PAA's general partner and its affiliates may provide PAA with services for which PAA will be charged reasonable fees as determined by its general partner.

Cash distributions are not guaranteed and may fluctuate with PAA's performance and the establishment of financial reserves.

Because distributions on PAA's common units are dependent on the amount of cash it generates, distributions may fluctuate based on PAA's performance, which will result in fluctuations in the amount of distributions ultimately received by AAP. The actual amount of cash that is available to be distributed each quarter will depend on numerous factors, some of which are beyond PAA's control and the control of PAA's general partner. Cash distributions are dependent primarily on cash flow, levels of financial reserves and working capital borrowings, and not solely on profitability, which is affected by non-cash items. PAA's levels of financial reserves are established by its general partner and include reserves for the proper conduct of PAA's business (including future capital expenditures and anticipated credit needs), compliance with law or contractual obligations and funding of future distributions to its Series A and Series B preferred unitholders. Therefore, cash distributions might be made during periods when PAA records losses and might not be made during periods when it records profits.

PAA's preferred units have rights, preferences and privileges that are not held by, and are preferential to the rights of, holders of PAA's common units.

PAA's Series A preferred units and PAA's Series B preferred units (together, "PAA's preferred units"), rank senior to all of PAA's other classes or series of equity securities with respect to distribution rights and rights upon liquidation. These preferences could adversely affect the market price for PAA's common units, or could make it more difficult for PAA to sell its common units in the future.

In addition, distributions on PAA's preferred units accrue and are cumulative, at the rate of 8% per annum with respect to PAA's Series A preferred units and 6.125% with respect to PAA's Series B preferred units on the original issue price. PAA's Series A preferred units are convertible into PAA common units by the holders of such units or by PAA in certain circumstances. PAA's Series B preferred units are not convertible into PAA common units, but are redeemable by PAA in certain circumstances. PAA's obligation to pay distributions on PAA's preferred units, or on the PAA common units issued following the conversion of PAA's Series A preferred units, could impact its liquidity and reduce the amount of cash flow available for working capital, capital expenditures, growth opportunities, acquisitions, and other general partnership purposes. PAA's obligations to the holders of PAA's preferred units could also limit its ability to obtain additional financing or increase its borrowing costs, which could have an adverse effect on PAA's financial condition.

Tax Risks

As our only cash-generating assets consist of our partnership interest in AAP and its related direct and indirect interests in PAA, our tax risks are primarily derivative of the tax risks associated with an investment in PAA.

The tax treatment of PAA depends on its status as a partnership for U.S. federal income tax purposes, as well as it not being subject to a material amount of additional entity-level taxation by individual states. If the Internal Revenue Service ("IRS") were to treat PAA as a corporation for federal income tax purposes or if PAA becomes subject to additional amounts of entity-level taxation for state or foreign tax purposes, it would reduce the amount of cash available for distribution to us and increase the portion of our distributions treated as taxable dividends.

At December 31, 2018, we owned an approximate 57% limited partner interest in AAP, which directly owned a limited partner interest in PAA through its ownership of 280,514,112 PAA common units (approximately 35% of PAA's total Series A preferred units and common units). Accordingly, the value of our indirect investment in PAA, as well as the anticipated after-tax economic benefit of an investment in our Class A shares, depends largely on PAA being treated as a partnership for federal income tax purposes, which requires that 90% or more of PAA's gross income for every taxable year consist of qualifying income, as defined in Section 7704 of the Internal Revenue Code of 1986, as amended (the "Code"). Based on PAA's current operations, and current Treasury Regulations, PAA believes that it is treated as a partnership rather than a corporation for such purposes; however, a change in PAA's business could cause it to be treated as a corporation for federal income tax purposes.

Current law may change, causing PAA to be treated as a corporation for federal income tax purposes or otherwise subjecting PAA to additional entity-level taxation. In addition, several states are evaluating ways to subject partnerships to entity-level taxation through the imposition of state income, franchise and other forms of taxation. Imposition of any new or increased federal or state taxes on PAA may result in a decrease in the amount of distributions AAP receives from PAA and our resulting cash flows could be reduced substantially, which would adversely affect our ability to pay distributions to our shareholders.

If PAA were treated as a corporation for federal income tax purposes, it would pay federal income tax on its taxable income at the corporate tax rate and would likely pay state income taxes at varying rates. Distributions to PAA's partners, including AAP, would generally be taxed again as corporate distributions, and no income, gains, losses or deductions would flow through to PAA's partners. Because a tax would be imposed upon PAA as a corporation, its cash available for distribution would be substantially reduced. Therefore, treatment of PAA as a corporation would result in a material reduction in the anticipated cash flow and after-tax return to us, likely causing a substantial reduction in the value of our Class A shares.

Moreover, if PAA were treated as a corporation we would not be entitled to the deductions associated with our initial acquisition of interests in AAP or subsequent exchanges of retained AAP interests and Class B shares for our Class A shares. As a result, if PAA were treated as a corporation, (i) our liability for taxes would likely be higher, further reducing our cash available for distribution, and (ii) a greater portion of the cash we are able to distribute will be treated as a taxable dividend.

The tax treatment of publicly traded partnerships or an investment in PAA units could be subject to potential legislative, judicial or administrative changes or differing interpretations, possibly applied on a retroactive basis.

The present U.S. federal income tax treatment of publicly traded partnerships, including PAA, or an investment in PAA common units may be modified by administrative, legislative or judicial changes or differing interpretations at any time. From time to time, members of Congress have proposed and considered substantive changes to the existing U.S. federal income tax laws that would affect publicly traded partnerships, including a prior legislative proposal that would have eliminated the qualifying income exception to the treatment of all publicly-traded partnerships as corporations upon which PAA relies for its treatment as a partnership for U.S. federal income tax purposes. In addition, the Treasury Department has issued, and in the future may issue, regulations interpreting those laws that affect publicly traded partnerships. Although there are no current legislative or administrative proposals, there can be no assurance that there will not be further changes to U.S. federal income tax laws or the Treasury Department's interpretation of the qualifying income rules in a manner that could impact PAA's ability to qualify as a publicly traded partnership in the future.

Any modification to the U.S. federal income tax laws may be applied retroactively and could make it more difficult or impossible for PAA to meet the exception for certain publicly traded partnerships to be treated as partnerships for U.S. federal income tax purposes. We are unable to predict whether any of these changes or other proposals will ultimately be enacted. Any such changes could negatively impact the value of our indirect investment in PAA.

If the IRS makes audit adjustments to PAA's income tax returns for tax years beginning after December 31, 2017, it (and some states) may assess and collect any taxes (including any applicable penalties and interest) resulting from such audit adjustments directly from PAA, in which case PAA's cash distribution to AAP and our cash available for distribution to our shareholders might be substantially reduced.

Pursuant to the Bipartisan Budget Act of 2015, for tax years beginning after December 31, 2017, if the IRS makes audit adjustments to PAA's income tax returns, it (and some states) may assess and collect any taxes (including any applicable penalties and interest) resulting from such audit adjustments directly from PAA. To the extent possible under the new rules, PAA's general partner may elect to either pay the taxes (including any applicable penalties and interest) directly to the IRS or, if PAA is eligible, issue a revised information statement to each unitholder and former unitholder with respect to an audited and adjusted return. Although PAA's general partner may elect to have PAA's unitholders and former unitholders take such audit adjustment into account and pay any resulting taxes (including applicable penalties or interest) in accordance with their interests in PAA during the tax year under audit, there can be no assurance that such election will be practical, permissible or effective in all circumstances. As a result, PAA's current unitholders, including us through AAP, may bear some or all of the tax liability resulting from such audit adjustment, even if such unitholders did not own units in PAA during the tax year under audit. If, as a result of any such audit adjustment, PAA or AAP is required to make payments of taxes, penalties and interest, then the amount of distributions we receive from AAP could be substantially reduced, which would adversely affect our ability to pay distributions to our shareholders. These rules are not applicable for tax years beginning on or prior to December 31, 2017.

Taxable gain or loss on the sale of our Class A shares could be more or less than expected.

If a holder sells our Class A shares, the holder will recognize a gain or loss equal to the difference between the amount realized and the holder's tax basis in those Class A shares. To the extent that the amount of our distributions exceeds our current and accumulated earnings and profits, the distributions will be treated as a tax free return of capital and will reduce a holder's tax basis in the Class A shares. We did not have any earnings and profits in 2018 and we do not expect to have any earnings and profits for an extended period of time, which we estimate will include, at a minimum, each of the periods ending December 31,

2019 through 2021. Because our distributions in excess of our earnings and profits decrease a holder's tax basis in Class A shares, such excess distributions will result in a corresponding increase in the amount of gain, or a corresponding decrease in the amount of loss, recognized by the holder upon the sale of the Class A shares.

Our current tax treatment may change, which could affect the value of our Class A shares or reduce our cash available for distribution.

Our expectation that tax deductions associated with our initial and subsequent acquisitions of interests in AAP (as a result of the exercise by Legacy Owners of their exchange rights) will offset all of our current taxable income for an extended period of time, and thus result in our distributions not constituting taxable dividends for an extended period of time, is based on current law with respect to the amortization of basis adjustments associated with our acquisition of interests in AAP. Changes in federal income tax law relating to such tax treatment could result in (i) our being subject to additional taxation at the entity level with the result that we would have less cash available for distribution, and (ii) a greater portion of our distributions being treated as taxable dividends. Moreover, we are subject to tax in numerous jurisdictions. Changes in current law in these jurisdictions, particularly relating to the treatment of deductions attributable to acquisitions of interests in AAP, could result in our being subject to additional taxation at the entity level with the result that we would have less cash available for distribution.

Any decrease in our Class A share price could adversely affect our amount of cash available for distribution.

Changes in certain market conditions may cause our Class A share price to decrease. If our Legacy Owners exchange their retained interests in AAP and Class B shares in us for our Class A shares at a point in time when our Class A share price is below the price at which Class A shares were sold in our initial public offering or in any subsequent exchange, the ratio of our income tax deductions to gross income would decline. This decline could result in our being subject to tax sooner than expected, our tax liability being greater than expected, or a greater portion of our distributions being treated as taxable dividends.

The IRS Forms 1099-DIV that our shareholders receive from their brokers may over-report dividend income with respect to our shares for U.S. federal income tax purposes, which may result in a shareholder's overpayment of tax. In addition, failure to report dividend income in a manner consistent with the IRS Forms 1099-DIV may cause the IRS to assert audit adjustments to a shareholder's U.S. federal income tax return. For non-U.S. holders of our shares, brokers or other withholding agents may overwithhold taxes from dividends paid, in which case a shareholder generally would have to timely file a U.S. tax return or an appropriate claim for refund in order to claim a refund of the overwithheld taxes.

Distributions we pay with respect to our shares will constitute "dividends" for U.S. federal income tax purposes only to the extent of our current and accumulated earnings and profits. Distributions we pay in excess of our earnings and profits will not be treated as "dividends" for U.S. federal income tax purposes; instead, they will be treated first as a tax-free return of capital to the extent of a shareholder's tax basis in their shares and then as capital gain realized on the sale or exchange of such shares. We may be unable to timely determine the portion of our distributions that is a "dividend" for U.S. federal income tax purposes, which may result in a shareholder's overpayment of tax with respect to distribution amounts that should have been classified as a tax-free return of capital. In such a case, a shareholder generally would have to timely file an amended U.S. tax return or an appropriate claim for refund in order to obtain a refund of the overpaid tax.

For a U.S. holder of our shares, the IRS Forms 1099-DIV may not be consistent with our determination of the amount that constitutes a "dividend" for U.S. federal income tax purposes or a shareholder may receive a corrected IRS Form 1099-DIV (and may therefore need to file an amended federal, state or local income tax return). We will attempt to timely notify our shareholders of available information to assist with income tax reporting (such as posting the correct information on our website). However, the information that we provide to our shareholders may be inconsistent with the amounts reported by a broker on IRS Form 1099-DIV, and the IRS may disagree with any such information and may make audit adjustments to a shareholder's tax return.

For a non-U.S. holder of our shares, "dividends" for U.S. federal income tax purposes will be subject to withholding of U.S. federal income tax at a 30% rate (or such lower rate as may be specified by an applicable income tax treaty) unless the dividends are effectively connected with conduct of a U.S. trade or business. In the event that we are unable to timely determine the portion of our distributions that is a "dividend" for U.S. federal income tax purposes, or a shareholder's broker or withholding agent chooses to withhold taxes from distributions in a manner inconsistent with our determination of the amount that constitutes a "dividend" for such purposes, a shareholder's broker or other withholding agent may overwithhold taxes from distributions paid. In such a case, a shareholder generally would have to timely file a U.S. tax return or an appropriate claim for refund in order to obtain a refund of the overwithheld tax.

Item 1B. *Unresolved Staff Comments*

None.

Item 3. *Legal Proceedings*

The information required by this item is included in Note 18 to our Consolidated Financial Statements, and is incorporated herein by reference thereto.

Item 4. *Mine Safety Disclosures*

Not applicable.