

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

FORM 10-Q

(Mark One)

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

For the quarterly period ended June 30, 2020

OR

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

For the transition period from _____ to _____
Commission File Number: 001-38221

PQ Group Holdings Inc.

Delaware

(State or other jurisdiction of
incorporation or organization)

81-3406833

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

**300 Lindenwood Drive
Malvern, Pennsylvania**

(Address of principal executive offices)

19355

(Zip Code)

(610) 651-4400

(Registrant's telephone number, including area code)

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

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

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

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

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

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

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

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

The number of shares of common stock outstanding as of July 30, 2020 was 136,048,286.

PQ GROUP HOLDINGS INC.

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June 30, 2020

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PART I—FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS (UNAUDITED).

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF INCOME
(in thousands, except share and per share amounts)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Sales	\$ 359,525	\$ 431,675	\$ 721,123	\$ 790,896
Cost of goods sold	266,686	316,180	539,685	594,491
Gross profit	92,839	115,495	181,438	196,405
Selling, general and administrative expenses	38,926	43,375	82,224	84,083
Other operating expense, net	12,735	1,819	34,677	12,558
Operating income	41,178	70,301	64,537	99,764
Equity in net (income) from affiliated companies	(11,492)	(12,300)	(19,842)	(14,364)
Interest expense, net	22,275	28,540	46,730	57,158
Debt extinguishment costs	—	—	2,513	—
Other (income) expense, net	(2,114)	3,035	691	56
Income before income taxes and noncontrolling interest	32,509	51,026	34,445	56,914
Provision for income taxes	16,262	20,307	17,689	22,754
Net income	16,247	30,719	16,756	34,160
Less: Net income attributable to the noncontrolling interest	321	145	606	435
Net income attributable to PQ Group Holdings Inc.	\$ 15,926	\$ 30,574	\$ 16,150	\$ 33,725
Net income per share:				
Basic income per share	\$ 0.12	\$ 0.23	\$ 0.12	\$ 0.25
Diluted income per share	\$ 0.12	\$ 0.23	\$ 0.12	\$ 0.25
Weighted average shares outstanding:				
Basic	135,083,126	134,142,552	135,278,764	134,044,972
Diluted	135,671,830	135,323,024	136,079,540	135,107,007

See accompanying notes to condensed consolidated financial statements.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(in thousands)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Net income	\$ 16,247	\$ 30,719	\$ 16,756	\$ 34,160
Other comprehensive income (loss), net of tax:				
Pension and postretirement benefits	(13)	(31)	(28)	(61)
Net (loss) gain from hedging activities	495	(1,167)	(34)	(2,719)
Foreign currency translation	11,939	6,085	(34,416)	13,252
Total other comprehensive income (loss)	12,421	4,887	(34,478)	10,472
Comprehensive income (loss)	28,668	35,606	(17,722)	44,632
Less: Comprehensive income (loss) attributable to noncontrolling interests	697	285	(2,506)	890
Comprehensive income (loss) attributable to PQ Group Holdings Inc.	<u>\$ 27,971</u>	<u>\$ 35,321</u>	<u>\$ (15,216)</u>	<u>\$ 43,742</u>

See accompanying notes to condensed consolidated financial statements.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
CONDENSED CONSOLIDATED BALANCE SHEETS
(in thousands, except share and per share amounts)
(unaudited)

	June 30, 2020	December 31, 2019
ASSETS		
Cash and cash equivalents	\$ 88,640	\$ 72,284
Accounts receivable, net	197,777	179,632
Inventories, net	266,620	280,945
Prepaid and other current assets	34,667	35,730
Total current assets	587,704	568,591
Investments in affiliated companies	476,668	472,929
Property, plant and equipment, net	1,132,665	1,186,770
Goodwill	1,254,998	1,259,805
Other intangible assets, net	643,226	676,385
Right-of-use lease assets	50,293	57,295
Other long-term assets	101,656	99,070
Total assets	<u>\$ 4,247,210</u>	<u>\$ 4,320,845</u>
LIABILITIES		
Notes payable and current maturities of long-term debt	\$ 8,602	\$ 7,766
Accounts payable	109,231	144,365
Operating lease liabilities—current	14,392	15,183
Accrued liabilities	88,893	102,154
Total current liabilities	221,118	269,468
Long-term debt, excluding current portion	1,898,943	1,899,196
Deferred income taxes	222,180	218,037
Operating lease liabilities—noncurrent	34,799	40,156
Other long-term liabilities	93,996	108,670
Total liabilities	2,471,036	2,535,527
Commitments and contingencies (Note 17)		
EQUITY		
Common stock (\$0.01 par); authorized shares 450,000,000; issued shares 136,763,507 and 136,861,382 on June 30, 2020 and December 31, 2019, respectively; outstanding shares 136,045,822 and 136,464,961 on June 30, 2020 and December 31, 2019, respectively	1,368	1,369
Preferred stock (\$0.01 par); authorized shares 50,000,000; no shares issued or outstanding on June 30, 2020 and December 31, 2019	—	—
Additional paid-in capital	1,709,367	1,696,899
Retained earnings	119,163	103,013
Treasury stock, at cost; shares 717,685 and 396,421 on June 30, 2020 and December 31, 2019, respectively	(10,372)	(6,483)
Accumulated other comprehensive loss	(46,714)	(15,348)
Total PQ Group Holdings Inc. equity	1,772,812	1,779,450
Noncontrolling interest	3,362	5,868
Total equity	1,776,174	1,785,318
Total liabilities and equity	<u>\$ 4,247,210</u>	<u>\$ 4,320,845</u>

See accompanying notes to condensed consolidated financial statements.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)
(unaudited)

	Common stock	Additional paid-in capital	Retained earnings	Treasury stock, at cost	Accumulated other comprehensive income (loss)	Non- controlling interest	Total
Balance, December 31, 2019	\$ 1,369	\$ 1,696,899	\$ 103,013	\$ (6,483)	\$ (15,348)	\$ 5,868	\$ 1,785,318
Net income	—	—	224	—	—	285	509
Other comprehensive income	—	—	—	—	(43,411)	(3,488)	(46,899)
Repurchases of common shares	—	—	—	(3,889)	—	—	(3,889)
Stock compensation expense	—	5,920	—	—	—	—	5,920
Shares issued under equity incentive plan, net of forfeitures	4	177	—	—	—	—	181
Balance, March 31, 2020	\$ 1,373	\$ 1,702,996	\$ 103,237	\$ (10,372)	\$ (58,759)	\$ 2,665	\$ 1,741,140
Net income	—	—	15,926	—	—	321	16,247
Other comprehensive income	—	—	—	—	12,045	376	12,421
Stock compensation expense	—	6,366	—	—	—	—	6,366
Shares issued under equity incentive plan, net of forfeitures	(5)	5	—	—	—	—	—
Balance, June 30, 2020	\$ 1,368	\$ 1,709,367	\$ 119,163	\$ (10,372)	\$ (46,714)	\$ 3,362	\$ 1,776,174
	Common stock	Additional paid-in capital	Retained earnings	Treasury stock, at cost	Accumulated other comprehensive income (loss)	Non- controlling interest	Total
Balance, December 31, 2018, as previously reported	\$ 1,358	\$ 1,674,703	\$ 25,523	\$ (2,920)	\$ (39,104)	\$ 4,585	\$ 1,664,145
Cumulative effect adjustment from adoption of new accounting standards	—	—	(2,049)	—	1,874	—	(175)
December 31, 2018, as adjusted	1,358	1,674,703	23,474	(2,920)	(37,230)	4,585	1,663,970
Net income	—	—	3,151	—	—	290	3,441
Other comprehensive income	—	—	—	—	5,270	315	5,585
Repurchases of common shares	—	—	—	(1,339)	—	—	(1,339)
Stock compensation expense	—	3,400	—	—	—	—	3,400
Shares issued under equity incentive plan, net of forfeitures	2	213	—	—	—	—	215
Balance, March 31, 2019	\$ 1,360	\$ 1,678,316	\$ 26,625	\$ (4,259)	\$ (31,960)	\$ 5,190	\$ 1,675,272
Net income	—	—	30,574	—	—	145	30,719
Other comprehensive income	—	—	—	—	4,747	140	4,887
Distributions to noncontrolling interests	—	—	—	—	—	(156)	(156)
Stock compensation expense	—	5,370	—	—	—	—	5,370
Shares issued under equity incentive plan, net of forfeitures	4	3,256	—	—	—	—	3,260
Balance, June 30, 2019	\$ 1,364	\$ 1,686,942	\$ 57,199	\$ (4,259)	\$ (27,213)	\$ 5,319	\$ 1,719,352

See accompanying notes to condensed consolidated financial statements.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)
(unaudited)

	Six months ended June 30,	
	2020	2019
Cash flows from operating activities:		
Net income	\$ 16,756	\$ 34,160
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation	66,744	65,535
Amortization	23,749	25,449
Amortization of deferred financing costs and original issue discount	2,427	2,872
Foreign currency exchange loss	2,483	923
Pension and postretirement healthcare benefit expense	(3)	2,185
Pension and postretirement healthcare benefit funding	(4,153)	(3,632)
Deferred income tax provision	5,990	10,844
Net (gain) loss on asset disposals	8,401	(8,839)
Stock compensation	12,286	8,770
Equity in net income from affiliated companies	(19,842)	(14,364)
Dividends received from affiliated companies	15,098	5,072
Net interest income on swaps designated as net investment hedges	(2,197)	(4,478)
Other, net	(1,225)	(4,356)
Working capital changes that provided (used) cash, excluding the effect of acquisitions and dispositions:		
Receivables	(24,601)	(46,261)
Inventories	(9,276)	(12,191)
Prepays and other current assets	42	2,183
Accounts payable	(15,322)	(189)
Accrued liabilities	(15,248)	(3,691)
Net cash provided by operating activities	<u>62,109</u>	<u>59,992</u>
Cash flows from investing activities:		
Purchases of property, plant and equipment	(50,510)	(65,475)
Proceeds from sale of product line	—	26,665
Proceeds from sale of assets	10,330	—
Proceeds from sale of investment	1,761	—
Net interest proceeds on swaps designated as net investment hedges	2,197	4,478
Other, net	—	475
Net cash used in investing activities	<u>(36,222)</u>	<u>(33,857)</u>
Cash flows from financing activities:		
Draw down of revolving credit facilities	164,704	74,863
Repayments of revolving credit facilities	(163,928)	(72,247)
Debt issuance costs	(3,023)	—
Repayments of long-term debt	—	(5,000)
Stock repurchases	(3,889)	(1,339)
Proceeds from stock options exercised	181	3,475
Other, net	—	(153)
Net cash used in financing activities	<u>(5,955)</u>	<u>(401)</u>
Effect of exchange rate changes on cash, cash equivalents and restricted cash	<u>(3,261)</u>	<u>(1,501)</u>
Net change in cash, cash equivalents and restricted cash	16,671	24,233
Cash, cash equivalents and restricted cash at beginning of period	73,917	59,726
Cash, cash equivalents and restricted cash at end of period	<u>\$ 90,588</u>	<u>\$ 83,959</u>

For supplemental cash flow disclosures, see Note 21.
See accompanying notes to condensed consolidated financial statements.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

1. Background and Basis of Presentation:

Description of Business

PQ Group Holdings Inc. and subsidiaries (the “Company” or “PQ Group Holdings”) is a leading integrated and innovative global provider of specialty catalysts, materials, chemicals and services. The Company supports customers globally through its strategically located network of manufacturing facilities. The Company believes that its products, which are predominantly inorganic, and services contribute to improving the sustainability of the environment.

The Company has four uniquely positioned specialty businesses: Refining Services provides sulfuric acid recycling to the North American refining industry; Catalysts serves the packaging and engineered plastics industry and, through its Zeolyst joint venture, the global refining, petrochemical and emissions control industries; Performance Materials produces transportation reflective safety markings for roads and airports; and Performance Chemicals supplies diverse product end uses, including personal and industrial cleaning products, fuel-efficient tires, surface coatings, and food and beverage products.

Seasonal changes and weather conditions typically affect the Company’s Performance Materials and Refining Services segments. In particular, the Company’s Performance Materials segment generally experiences lower sales and profit in the first and fourth quarters of the year because highway striping projects typically occur during warmer weather months. The Company’s Refining Services segment typically experiences similar seasonal fluctuations as a result of higher demand for gasoline products in the summer months. As a result, working capital requirements tend to be higher in the first and second quarters of the year, which can adversely affect the Company’s liquidity and cash flows. Because of this seasonality associated with certain of the Company’s segments, results for any one quarter are not necessarily indicative of the results that may be achieved for any other quarter or for the full year.

Basis of Presentation

The condensed consolidated financial statements included herein are unaudited. Certain information and footnote disclosures normally included in annual financial statements prepared in accordance with accounting principles generally accepted in the United States (“GAAP”) have been condensed or omitted pursuant to such rules and regulations for interim reporting. In the opinion of management, all adjustments of a normal and recurring nature necessary to state fairly the financial position and results of operations have been included. The results of operations are not necessarily indicative of the results to be expected for the full year. The accompanying unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and related notes included in the Company’s Annual Report on Form 10-K for the year ended December 31, 2019.

COVID-19

In March 2020, the outbreak of a novel coronavirus (“COVID-19”) was declared a national emergency in the United States. COVID-19 continues to spread in the United States and other parts of the world and has adversely impacted economic activity and contributed to volatility in financial markets. In response to the COVID-19 pandemic, the federal government and various state, local and foreign governments have issued decrees and orders that have disrupted many businesses and implemented social distancing, travel and other restrictions. In response to these restrictions, the Company has taken a variety of actions, including an international travel ban, distribution of personal protective equipment to employees and work-at-home requirements for many of the Company’s employees who are not an integral part of its manufacturing operations. The Company has also implemented and refined its existing business continuity plans in an effort to minimize operational disruptions. The Company’s manufacturing operations, as well as the operations of its key vendors and the majority of its key customers, have continued to operate with limited interruptions. The extent and impact of the COVID-19 pandemic on the Company’s business is highly uncertain and difficult to predict due to the rapidly evolving environment and continued uncertainties created by the COVID-19 pandemic. The Company is not aware of any specific event or circumstance that would require an update to our estimates or judgments or a revision of the carrying value of its assets or liabilities as of the date of the issuance of the condensed consolidated financial statements. These estimates may change, as the pandemic continues to evolve and the duration remains uncertain, and may adversely impact the Company’s results of operations, financial condition or cash flow.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

2. New Accounting Standards:

Recently Adopted Accounting Standards

In June 2016, the Financial Accounting Standards Board (“FASB”) issued guidance that affects loans, trade receivables and any other financial assets that have the contractual right to receive cash. Under the new guidance, an entity is required to recognize expected credit losses rather than incurred losses for financial assets. The new guidance is effective for fiscal years beginning after December 15, 2019 and interim periods within those fiscal years. The Company adopted the new guidance effective January 1, 2020, with no material impact to the Company’s consolidated financial position, results of operations or cash flows.

In August 2018, the FASB issued guidance which modifies certain disclosure requirements over fair value measurements. The guidance is effective for fiscal years beginning after December 15, 2019, including all interim periods within that fiscal year. The Company adopted the new guidance effective January 1, 2020. The Company does not classify any of its derivative contracts as Level 3 assets or liabilities, nor did the Company have any transfers amongst fair value levels during the six months ended June 30, 2020. As such, the guidance did not have an impact on the fair value measurement disclosures included in the Company’s consolidated financial statements.

In January 2017, the FASB issued guidance which eliminates the second step from the traditional two-step goodwill impairment test. Under current guidance, an entity performed the first step of the goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount; if an impairment loss was indicated, the entity computed the implied fair value of goodwill to determine whether an impairment loss existed, and if so, the amount to recognize. Under the new guidance, an impairment loss is recognized for the amount by which the carrying amount exceeds the reporting unit’s fair value (the Step 1 test), with no further testing required. Any impairment loss recognized is limited to the amount of goodwill allocated to the reporting unit. The new guidance is effective for public companies that are Securities and Exchange Commission (“SEC”) registrants for fiscal years beginning after December 15, 2019, with early adoption permitted for goodwill impairment tests performed on testing dates after January 1, 2017. The Company adopted the new guidance on January 1, 2020, and will apply the guidance prospectively to its goodwill impairment tests.

Accounting Standards Not Yet Adopted

In December 2019, the FASB issued new guidance to simplify the accounting for income taxes by removing certain exceptions to the general principles and also simplification of areas such as franchise taxes, step-up in tax basis goodwill, separate entity financial statements and interim recognition of enactment of tax laws or rate changes. The new guidance is effective for fiscal years beginning after December 15, 2020 and interim periods within those fiscal years, with early adoption permitted. The Company is currently evaluating the impact of this new guidance on its consolidated financial statements.

In March 2020, the FASB issued guidance to address certain accounting consequences from the anticipated transition from the use of the London Interbank Offered Rate (“LIBOR”) and other interbank offered rates to alternative reference rates. The new guidance contains practical expedients for reference rate reform related activities that impact debt, leases, derivatives and other contracts. The guidance is optional and may be elected over time as reference rate reform activities occur. During the three months ended June 30, 2020, the Company elected to apply the hedge accounting expedients related to probability and the assessments of effectiveness for future LIBOR-indexed cash flows to assume that the index upon which future hedged transactions will be based on matches the index of the corresponding derivatives. Application of these expedients preserves the presentation of derivatives consistent with past presentation. The Company continues to evaluate the impact of the guidance and may apply other elections as applicable as additional changes in the market occur.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

3. Revenue from Contracts with Customers:

Disaggregated Revenue

The Company's primary means of disaggregating revenues is by reportable segments, which can be found in Note 18 to these condensed consolidated financial statements.

The Company's portfolio of products are integrated into a variety of end uses, which are described in the table below.

Key End Uses	Key Products
Industrial & process chemicals	<ul style="list-style-type: none"> • Silicate precursors for the tire industry • Glass beads, or microspheres, for metal finishing end uses
Fuels & emission control	<ul style="list-style-type: none"> • Refinery catalysts • Emission control catalysts • Catalyst recycling services • Silicate for catalyst manufacturing
Packaging & engineered plastics	<ul style="list-style-type: none"> • Catalysts for high-density polyethylene and chemicals syntheses • Antiblocks for film packaging • Solid and hollow microspheres for composite plastics • Sulfur derivatives for nylon production
Highway safety & construction	<ul style="list-style-type: none"> • Reflective markings for roadways and airports • Silica gels for surface coatings
Consumer products	<ul style="list-style-type: none"> • Silica gels for edible oil and beer clarification • Precipitated silicas, silicates and zeolites for the dentifrice and dishwasher and laundry detergent applications
Natural resources	<ul style="list-style-type: none"> • Silicates for drilling muds • Hollow glass beads, or microspheres, for oil well cements • Silicates and alum for water treatment mining • Bleaching aids for paper

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

The following tables disaggregate the Company's sales, by segment and end use, for the three and six months ended June 30, 2020 and 2019:

Three months ended June 30, 2020					
	Refining Services	Catalysts	Performance Materials	Performance Chemicals	Total
Industrial & process chemicals	\$ 16,713	\$ 2	\$ 9,314	\$ 43,747	\$ 69,776
Fuels & emission control ⁽¹⁾	50,681	—	42	—	50,723
Packaging & engineered plastics	7,473	25,206	13,645	9,552	55,876
Highway safety & construction ⁽¹⁾	—	—	78,340	18,312	96,652
Consumer products	—	—	—	59,907	59,907
Natural resources	15,565	—	2,862	11,123	29,550
Total segment sales	90,432	25,208	104,203	142,641	362,484
Eliminations	(780)	(2)	(54)	(2,123)	(2,959)
Total	\$ 89,652	\$ 25,206	\$ 104,149	\$ 140,518	\$ 359,525

Three months ended June 30, 2019					
	Refining Services	Catalysts	Performance Materials	Performance Chemicals	Total
Industrial & process chemicals	\$ 21,903	\$ —	\$ 12,783	\$ 60,662	\$ 95,348
Fuels & emission control ⁽¹⁾	63,505	—	—	—	63,505
Packaging & engineered plastics	14,067	20,857	17,595	14,344	66,863
Highway safety & construction ⁽¹⁾	—	—	85,257	22,297	107,554
Consumer products	—	—	—	65,440	65,440
Natural resources	17,815	—	3,237	15,085	36,137
Total segment sales	117,290	20,857	118,872	177,828	434,847
Eliminations	(895)	214	(104)	(2,387)	(3,172)
Total	\$ 116,395	\$ 21,071	\$ 118,768	\$ 175,441	\$ 431,675

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

	Six months ended June 30, 2020				
	Refining Services	Catalysts	Performance Materials	Performance Chemicals	Total
Industrial & process chemicals	\$ 36,071	\$ 49	\$ 21,438	\$ 103,581	\$ 161,139
Fuels & emission control ⁽¹⁾	106,393	—	81	—	106,474
Packaging & engineered plastics	18,207	50,023	31,115	23,827	123,172
Highway safety & construction ⁽¹⁾	—	—	110,983	38,501	149,484
Consumer products	—	—	—	123,933	123,933
Natural resources	30,452	—	6,155	27,078	63,685
Total segment sales	191,123	50,072	169,772	316,920	727,887
Eliminations	(1,705)	(49)	(109)	(4,901)	(6,764)
Total	<u>\$ 189,418</u>	<u>\$ 50,023</u>	<u>\$ 169,663</u>	<u>\$ 312,019</u>	<u>\$ 721,123</u>

	Six months ended June 30, 2019				
	Refining Services	Catalysts	Performance Materials	Performance Chemicals	Total
Industrial & process chemicals	\$ 40,305	\$ 62	\$ 25,812	\$ 120,313	\$ 186,492
Fuels & emission control ⁽¹⁾	121,195	—	—	—	121,195
Packaging & engineered plastics	26,756	36,661	34,977	29,073	127,467
Highway safety & construction ⁽¹⁾	—	—	112,617	44,236	156,853
Consumer products	—	—	—	133,949	133,949
Natural resources	34,878	—	6,555	30,719	72,152
Total segment sales	223,134	36,723	179,961	358,290	798,108
Eliminations	(1,782)	(62)	(152)	(5,216)	(7,212)
Total	<u>\$ 221,352</u>	<u>\$ 36,661</u>	<u>\$ 179,809</u>	<u>\$ 353,074</u>	<u>\$ 790,896</u>

⁽¹⁾ As described in Note 1, the Company experiences seasonal sales fluctuations to customers in the fuels & emission control and highway safety & construction end uses.

Contract Assets and Liabilities

A contract asset is a right to consideration in exchange for goods that the Company has transferred to a customer when that right is conditional on something other than the passage of time. A contract liability exists when the Company receives consideration in advance of performance obligations. The Company has no contract assets on its condensed consolidated balance sheets as of June 30, 2020 and December 31, 2019.

The Company recognized a \$9,000 contract liability associated with the sale of a portion of its sulfate salts product line in June 2019, of which \$1,140 and \$6,450 of deferred revenue remained as of June 30, 2020 and December 31, 2019, respectively. The Company recognized revenue of \$1,035 and \$2,304 related to this contract liability during the three and six months ended June 30, 2020. The Company did not recognize revenue related to this contract liability during the three and six months ended June 30, 2019. Refer to Note 7 of these condensed consolidated financial statements for additional information related to the sale of the product line.

4. Fair Value Measurements:

Fair values are based on quoted market prices when available. When market prices are not available, fair values are generally estimated using discounted cash flow analyses, incorporating current market inputs for similar financial instruments with comparable terms and credit quality. In instances where there is little or no market activity for the same or similar instruments, the Company estimates fair values using methods, models and assumptions that management believes a hypothetical market participant would use to determine a current transaction price. These valuation techniques involve some level of management estimation and judgment that becomes significant with increasingly complex instruments or pricing models. Where appropriate, adjustments are included to reflect the risk inherent in a particular methodology, model or input used.

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The Company's financial assets and liabilities carried at fair value have been classified based upon a fair value hierarchy. The hierarchy gives the highest ranking to fair values determined using unadjusted quoted prices in active markets for identical assets and liabilities (Level 1) and the lowest ranking to fair values determined using methodologies and models with unobservable inputs (Level 3). The classification of an asset or a liability is based on the lowest level input that is significant to its measurement. For example, a Level 3 fair value measurement may include inputs that are both observable (Levels 1 and 2) and unobservable (Level 3). The levels of the fair value hierarchy are as follows:

- Level 1—Values are unadjusted quoted prices for identical assets and liabilities in active markets accessible at the measurement date. Active markets provide pricing data for trades occurring at least weekly and include exchanges and dealer markets.
- Level 2—Inputs include quoted prices for similar assets or liabilities in active markets, quoted prices from those willing to trade in markets that are not active, or other inputs that are observable or can be corroborated by market data for the term of the instrument. Such inputs include market interest rates and volatilities, spreads and yield curves.
- Level 3—Certain inputs are unobservable (supported by little or no market activity) and significant to the fair value measurement. Unobservable inputs reflect the Company's best estimate of what hypothetical market participants would use to determine a transaction price for the asset or liability at the reporting date.

The following table presents information about the Company's assets and liabilities that were measured at fair value on a recurring basis as of June 30, 2020 and December 31, 2019, and indicates the fair value hierarchy of the valuation techniques the Company utilized to determine such fair value.

	June 30, 2020	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Derivative contracts (Note 14)	\$ 5,397	\$ —	\$ 5,397	\$ —
Restoration plan assets	3,710	3,710	—	—
Total	\$ 9,107	\$ 3,710	\$ 5,397	\$ —
Liabilities:				
Derivative contracts (Note 14)	\$ 4,850	\$ —	\$ 4,850	\$ —

	December 31, 2019	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Derivative contracts (Note 14)	\$ 3,928	\$ —	\$ 3,928	\$ —
Restoration plan assets	4,199	4,199	—	—
Total	\$ 8,127	\$ 4,199	\$ 3,928	\$ —
Liabilities:				
Derivative contracts (Note 14)	\$ 12,415	\$ —	\$ 12,415	\$ —

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Restoration plan assets

The fair values of the Company's restoration plan assets are determined through quoted prices in active markets. Restoration plan assets are assets held in a Rabbi trust to fund the obligations of the Company's defined benefit supplementary retirement plans and include various stock and fixed income mutual funds. See Note 16 to these condensed consolidated financial statements regarding defined supplementary retirement plans. The Company's restoration plan assets are included in other long-term assets on its condensed consolidated balance sheets. Gains and losses related to these investments are included in other expense, net in the Company's condensed consolidated statements of income. Unrealized gains and losses associated with the underlying stock and fixed income mutual funds were immaterial as of June 30, 2020 and December 31, 2019, respectively.

Derivative contracts

Derivative assets and liabilities can be exchange-traded or traded over-the-counter ("OTC"). The Company generally values exchange-traded derivatives using models that calibrate to market transactions and eliminate timing differences between the closing price of the exchange-traded derivatives and their underlying instruments. OTC derivatives are valued using market transactions and other market evidence whenever possible, including market-based inputs to models, model calibration to market transactions, broker or dealer quotations or alternative pricing sources with reasonable levels of price transparency. When models are used, the selection of a particular model to value an OTC derivative depends on the contractual terms of, and specific risks inherent in, the instrument as well as the availability of pricing information in the market. The Company generally uses similar models to value similar instruments. Valuation models require a variety of inputs, including contractual terms, market prices and rates, forward curves, measures of volatility, and correlations of such inputs. For OTC derivatives that trade in liquid markets, such as forward contracts, swaps and options, model inputs can generally be corroborated by observable market data by correlation or other means, and model selection does not involve significant management judgment.

The Company has interest rate caps, natural gas swaps and cross-currency swaps that are fair valued using Level 2 inputs. In addition, the Company applies a credit valuation adjustment to reflect credit risk which is calculated based on credit default swaps. To the extent that the Company's net exposure under a specific master agreement is an asset, the Company utilizes the counterparty's default swap rate. If the net exposure under a specific master agreement is a liability, the Company utilizes a default swap rate comparable to PQ Group Holdings. The credit valuation adjustment is added to the discounted fair value to reflect the exit price that a market participant would be willing to receive to assume the Company's liabilities or that a market participant would be willing to pay for the Company's assets.

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5. Stockholders' Equity:

Accumulated Other Comprehensive Income

The following tables present the tax effects of each component of other comprehensive income for the three and six months ended June 30, 2020 and 2019:

	Three months ended June 30,					
	2020			2019		
	Pre-tax amount	Tax benefit/ (expense)	After-tax amount	Pre-tax amount	Tax benefit/ (expense)	After-tax amount
Defined benefit and other postretirement plans:						
Amortization of net gains and (losses)	\$ 21	\$ (8)	\$ 13	\$ (8)	\$ 2	\$ (6)
Amortization of prior service cost	(40)	14	(26)	(33)	8	(25)
Benefit plans, net	(19)	6	(13)	(41)	10	(31)
Net (loss) gain from hedging activities	660	(165)	495	(1,556)	389	(1,167)
Foreign currency translation ⁽¹⁾	13,153	(1,214)	11,939	5,469	616	6,085
Other comprehensive income (loss)	<u>\$ 13,794</u>	<u>\$ (1,373)</u>	<u>\$ 12,421</u>	<u>\$ 3,872</u>	<u>\$ 1,015</u>	<u>\$ 4,887</u>

	Six months ended June 30,					
	2020			2019		
	Pre-tax amount	Tax benefit/ (expense)	After-tax amount	Pre-tax amount	Tax benefit/ (expense)	After-tax amount
Defined benefit and other postretirement plans:						
Amortization of net gains and (losses)	\$ 65	\$ (16)	\$ 49	\$ (16)	\$ 4	\$ (12)
Amortization of prior service cost	(104)	27	(77)	(65)	16	(49)
Benefit plans, net	(39)	11	(28)	(81)	20	(61)
Net (loss) gain from hedging activities	(45)	11	(34)	(3,625)	906	(2,719)
Foreign currency translation ⁽¹⁾	(36,904)	2,488	(34,416)	14,751	(1,499)	13,252
Other comprehensive income (loss)	<u>\$ (36,988)</u>	<u>\$ 2,510</u>	<u>\$ (34,478)</u>	<u>\$ 11,045</u>	<u>\$ (573)</u>	<u>\$ 10,472</u>

⁽¹⁾ The income tax benefit or expense included in other comprehensive income is attributed to the portion of foreign currency translation associated with the Company's cross-currency interest rate swaps, for which the tax effect is based on the applicable U.S. deferred income tax rate. See Note 14 to these condensed consolidated financial statements for information regarding the Company's cross-currency interest rate swaps.

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The following table presents the changes in accumulated other comprehensive income (loss), net of tax, by component for the six months ended June 30, 2020 and 2019:

	Defined benefit and other postretirement plans	Net gain (loss) from hedging activities	Foreign currency translation	Total
December 31, 2019	\$ 3,568	\$ (1,838)	\$ (17,078)	\$ (15,348)
Other comprehensive loss before reclassifications	(1)	(1,091)	(31,304)	(32,396)
Amounts reclassified from accumulated other comprehensive income ⁽¹⁾	(27)	1,057	—	1,030
June 30, 2020	<u>\$ 3,540</u>	<u>\$ (1,872)</u>	<u>\$ (48,382)</u>	<u>\$ (46,714)</u>
December 31, 2018	\$ (546)	\$ 637	\$ (39,195)	\$ (39,104)
Other comprehensive income (loss) before reclassifications	2	(2,861)	12,797	9,938
Amounts reclassified from accumulated other comprehensive income ⁽¹⁾	(63)	142	—	79
Net current period other comprehensive income (loss)	(61)	(2,719)	12,797	10,017
Tax Cuts and Jobs Act, reclassification from AOCI to retained earnings	1,684	190	—	1,874
June 30, 2019	<u>\$ 1,077</u>	<u>\$ (1,892)</u>	<u>\$ (26,398)</u>	<u>\$ (27,213)</u>

⁽¹⁾ See the following table for details about these reclassifications. Amounts in parentheses indicate debits.

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The following table presents the reclassifications out of accumulated other comprehensive income for the three and six months ended June 30, 2020 and 2019:

Details about Accumulated Other Comprehensive Income Components	Amounts Reclassified from Accumulated Other Comprehensive Income ⁽¹⁾				Affected Line Item where Income is Presented
	Three months ended June 30,		Six months ended June 30,		
	2020	2019	2020	2019	
Amortization of defined benefit and other postretirement items:					
Prior service credit (cost)	\$ 58	\$ 33	\$ 104	\$ 65	Other income (expense) ⁽²⁾
Actuarial gains (losses)	(34)	9	(68)	18	Other income (expense) ⁽²⁾
	24	42	36	83	Total before tax
	(4)	(10)	(9)	(20)	Tax expense
	<u>\$ 20</u>	<u>\$ 32</u>	<u>\$ 27</u>	<u>\$ 63</u>	Net of tax
Gains and losses on cash flow hedges:					
Interest rate caps	\$ (398)	\$ (169)	\$ (629)	\$ (292)	Interest expense
Natural gas swaps	(402)	(87)	(775)	104	Cost of goods sold
	(800)	(256)	(1,404)	(188)	Total before tax
	198	63	347	46	Tax benefit
	<u>\$ (602)</u>	<u>\$ (193)</u>	<u>\$ (1,057)</u>	<u>\$ (142)</u>	Net of tax
Total reclassifications for the period	<u>\$ (582)</u>	<u>\$ (161)</u>	<u>\$ (1,030)</u>	<u>\$ (79)</u>	Net of tax

(1) Amounts in parentheses indicate debits to profit/loss.

(2) These accumulated other comprehensive income (loss) components are components of net periodic pension and other postretirement cost (see Note 16 to these condensed consolidated financial statements for additional details).

Stock Repurchase Program

The Company records repurchases of its common stock for treasury at cost. Upon the reissuance of the Company's common stock from treasury, differences between the proceeds from reissuance and the average cost of the treasury stock are credited or charged to capital in excess of par value to the extent of prior credits related to the reissuance of treasury stock. If no such credits exist, the differences are charged to retained earnings.

On March 12, 2020, the Company announced plans to purchase up to \$50,000 of PQ Group Holdings Inc. common stock under a stock repurchase program approved by the Company's Board of Directors. The Company may repurchase shares from time to time for cash in open market transactions or in privately negotiated transactions in accordance with applicable federal securities laws. The Company will determine the timing and the amount of any repurchases based on its evaluation of market conditions, share price and other factors. The stock repurchase program is valid until March 2022.

From the announcement date of the program through June 30, 2020, the Company repurchased 211,700 shares on the open market at an average price of \$9.73 for a total of \$2,059, none of which repurchases were made during the three months ended June 30, 2020. As of June 30, 2020, \$7,941 was available for additional share repurchases under the program.

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6. Asset Swap Transaction:

On February 19, 2020, the Company entered into a long-term agreement with a leading global thermoplastic producer to supply glass beads, and to meet that supply, exchanged inventory and production equipment related to the Company's ThermoDrop® product line for inventory, production equipment and two glass bead manufacturing facilities (the "beads business") of the thermoplastic producer (the "asset swap") in a non-cash transaction. The acquisition of the beads business qualified for recognition as a business combination, which has been recorded using the acquisition method of accounting. Under the acquisition method, the purchase price is allocated to the identifiable net assets acquired based on the fair value as of the acquisition date. The excess of the purchase price over the fair value of the identifiable net assets acquired is recorded to goodwill.

The fair value of the assets exchanged related to the Company's ThermoDrop® product line represents the purchase price consideration for the beads business. Based on the fair value of the assets disposed, the Company recognized a pre-tax loss on disposal of \$6,475 during the six months ended June 30, 2020, which is included in other operating expense, net in the Company's condensed consolidated statement of income.

The following table sets forth the calculation and allocation of the consideration given and the identifiable net assets acquired with respect to the asset swap, which was complete as of June 30, 2020.

	Provisional Purchase Price Allocation	Adjustments	Purchase Price Allocation
Total consideration	\$ 25,166	\$ 3,432	\$ 28,598
Recognized amounts of identifiable assets acquired and liabilities assumed:			
Inventories	\$ 9,912	\$ 127	\$ 10,039
Property, plant and equipment	9,490	1,339	10,829
Right-of-use lease assets	378	—	378
Fair value of assets acquired	19,780	1,466	21,246
Operating lease liabilities, current	(203)	—	(203)
Operating lease liabilities, non-current	(175)	—	(175)
	(378)	—	(378)
Fair value of net assets acquired	19,402	1,466	20,868
Goodwill	5,764	1,966	7,730
	\$ 25,166	\$ 3,432	\$ 28,598

The Company believes that the asset swap will expand its geographic footprint, enabling it to better serve its current and future customers. Combined with anticipated synergies within its existing business, this contributed to a total purchase price that resulted in the recognition of goodwill. All of the goodwill was assigned to the Company's Performance Materials segment. The goodwill associated with the asset swap is still under evaluation for tax purposes.

Results of the beads business since the date of the asset swap are included in the Company's condensed consolidated statements of income and were not material for disclosure. Amounts that would have been recognized in the Company's condensed consolidated statements of income during the three months ended March 31, 2020 had the adjustments to the provisional amounts been recognized as of the date of the asset swap were not material. Transaction costs associated with the asset swap were not material for the three and six months ended June 30, 2020.

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7. Sale of Product Line:

On June 28, 2019, the Company completed the sale of a portion of its sulfate salts product line within its Performance Chemicals segment for \$28,000, subject to a working capital adjustment, and recorded a pre-tax gain on sale of \$11,362. The transaction was recorded as an asset sale, with the gain on disposition included in the other operating expense, net line item in the Company's condensed consolidated statement of income for the three and six months ended June 30, 2019 (see Note 9 to these condensed consolidated financial statements for additional details). At the time of disposition, the carrying value of the Company's net working capital related to this non-core product line was \$4,215. In addition to the net working capital sold as part of the transaction, the Company also derecognized \$3,423 of property, plant and equipment related to the product line and allocated \$9,000 of the consideration received to a liability for deferred revenue.

Concurrent with the product line sale, the Company entered into a tolling arrangement with the buyer in which the Company agreed to use its existing sulfate salt manufacturing facilities to manufacture the product for the buyer, the majority of which runs until June 2021. The Company deferred \$9,000 of the \$28,000 consideration received as a liability, to be recognized as the Company executes its performance obligations over the term of the contractual agreement with the buyer. Additionally, the Company concluded that an embedded lease arrangement exists as a result of the combination of the sale and tolling agreements. Given the ability of the buyer to control substantially all of the output of the facilities and the existence of bargain purchase options on the manufacturing assets, the Company determined that the buyer is effectively leasing the assets from the Company and derecognized the associated property, plant and equipment under a sales-type leasing arrangement. The gain on the sale of fixed assets is included as part of the Company's overall gain on sale related to the transaction, with the Company's net investment in the leased assets having been settled as part of the consideration received in the transaction with no additional future cash flows to be recognized on the lease.

8. Goodwill:

The change in the carrying amount of goodwill for the six months ended June 30, 2020 is summarized as follows:

	<u>Refining Services</u>	<u>Catalysts</u>	<u>Performance Materials</u>	<u>Performance Chemicals</u>	<u>Total</u>
Balance as of December 31, 2019	\$ 311,892	\$ 78,611	\$ 275,919	\$ 593,383	\$ 1,259,805
Goodwill recognized	—	—	7,730	—	7,730
Foreign exchange impact	—	(1,677)	(922)	(9,938)	(12,537)
Balance as of June 30, 2020	<u>\$ 311,892</u>	<u>\$ 76,934</u>	<u>\$ 282,727</u>	<u>\$ 583,445</u>	<u>\$ 1,254,998</u>

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9. Other Operating Expense, Net:

A summary of other operating expense, net is as follows:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Amortization expense	\$ 8,550	\$ 8,636	\$ 17,187	\$ 17,300
Transaction and other related costs	775	943	2,644	1,008
Restructuring and other related costs	3,051	80	5,040	111
Net (gain) loss on asset disposals ⁽¹⁾	(1,020)	(9,659)	8,401	(8,839)
Environmental related costs	537	848	546	1,327
Other, net	842	971	859	1,651
	<u>\$ 12,735</u>	<u>\$ 1,819</u>	<u>\$ 34,677</u>	<u>\$ 12,558</u>

⁽¹⁾ During the six months ended June 30, 2020, the Company completed the purchase price allocation related to the asset swap. In doing so, the Company reduced its provisional loss on disposal of \$9,907 (which was recorded during the three month period ended March 31, 2020) to a loss of \$,475, which is reflected in net (gain) loss on asset disposals during the six months ended June 30, 2020. The \$3,432 reduction to the loss on the asset swap is reflected in net (gain) loss on asset disposals during the three months ended June 30, 2020. Refer to Note 6 to these condensed consolidated financial statements for details on the asset swap.

During the three and six months ended June 30, 2019, the Company recognized a gain of \$1,362 related to the sale of a product line. Refer to Note 7 of these condensed consolidated financial statements for additional details.

10. Inventories, Net:

Inventories, net, are classified and valued as follows:

	June 30, 2020	December 31, 2019
Finished products and work in process	\$ 219,731	\$ 222,940
Raw materials	46,889	58,005
	<u>\$ 266,620</u>	<u>\$ 280,945</u>
Valued at lower of cost or market:		
LIFO basis	\$ 154,571	\$ 168,935
Valued at lower of cost and net realizable value:		
FIFO or average cost basis	112,049	112,010
	<u>\$ 266,620</u>	<u>\$ 280,945</u>

11. Investments in Affiliated Companies:

The Company accounts for investments in affiliated companies under the equity method. Affiliated companies accounted for on the equity basis as of June 30, 2020 are as follows:

Company	Country	Percent Ownership
PQ Silicates Ltd.	Taiwan	50%
Zeolyst International	USA	50%
Zeolyst C.V.	Netherlands	50%
Asociacion para el Estudio de las Tecnologias de Equipamiento de Carreteras, S.A. ("Aetec")	Spain	20%

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Following is summarized information of the combined investments⁽¹⁾:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Sales	\$ 88,161	\$ 89,938	\$ 159,368	\$ 158,032
Gross profit	34,470	35,137	65,609	54,551
Operating income	24,688	27,052	45,697	36,259
Net income	26,333	27,910	46,368	37,150

(1) Summarized information of the combined investments is presented at 100%; the Company's share of the net assets and net income of affiliates is calculated based on the percent ownership specified in the table above.

In March 2020, the Company sold its 49% interest in the Quaker Holdings joint venture to a third party. Prior to the Company's disposition of its shares in the joint venture, the Company received a liquidating dividend of \$729 as well as \$1,032 for the sale of the joint venture shares, which was included in the proceeds from sale of investment within the investing activities section of the Company's consolidated statement of cash flows.

The Company's investments in affiliated companies balance as of June 30, 2020 and December 31, 2019 includes net purchase accounting fair value adjustments of \$247,215 and \$250,532, respectively, related to the series of transactions consummated on May 4, 2016 to reorganize and combine the businesses of PQ Holdings Inc. and Eco Services Operations LLC, consisting primarily of goodwill and intangible assets such as customer relationships, technical know-how and trade names. Consolidated equity in net income from affiliates is net of \$1,659 and \$3,317 of amortization expense related to purchase accounting fair value adjustments for the three and six months ended June 30, 2020, respectively. Consolidated equity in net income from affiliates is net of \$1,659 and \$4,217 of amortization expense related to purchase accounting fair value adjustments for the three and six months ended June 30, 2019, respectively.

12. Property, Plant and Equipment:

A summary of property, plant and equipment, at cost, and related accumulated depreciation is as follows:

	June 30, 2020	December 31, 2019
Land	\$ 175,532	\$ 183,117
Buildings	223,416	221,449
Machinery and equipment	1,241,387	1,236,531
Construction in progress	81,749	82,687
	<u>1,722,084</u>	<u>1,723,784</u>
Less: accumulated depreciation	(589,419)	(537,014)
	<u>\$ 1,132,665</u>	<u>\$ 1,186,770</u>

Depreciation expense was \$33,243 and \$32,381 for the three months ended June 30, 2020 and 2019, respectively. Depreciation expense was \$66,744 and \$65,535 for the six months ended June 30, 2020 and 2019, respectively.

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13. Long-term Debt:

The summary of long-term debt is as follows:

	June 30, 2020	December 31, 2019
Term Loan Facility	\$ 947,497	\$ 947,497
6.75% Senior Secured Notes due 2022	625,000	625,000
5.75% Senior Unsecured Notes due 2025	295,000	295,000
ABL Facility	—	—
Other	65,484	64,629
Total debt	1,932,981	1,932,126
Original issue discount	(14,448)	(13,434)
Deferred financing costs	(10,988)	(11,730)
Total debt, net of original issue discount and deferred financing costs	1,907,545	1,906,962
Less: current portion	(8,602)	(7,766)
Total long-term debt, excluding current portion	\$ 1,898,943	\$ 1,899,196

The fair value of a financial instrument is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants. As of June 30, 2020 and December 31, 2019, the fair value of the term loan facility and senior secured and unsecured notes was \$1,841,160 and \$1,905,822, respectively. The fair value is classified as Level 2 based upon the fair value hierarchy (see Note 4 to these condensed consolidated financial statements for further information on fair value measurements).

In July 2020, the Company entered into an agreement for a new senior secured term loan facility in an aggregate principal amount of \$50,000 with an original issue discount of 1.5% and interest at a floating rate of LIBOR (with a 1.0% minimum LIBOR floor) plus 3.0% per annum. The proceeds were used to redeem its existing \$625,000 of 6.75% Senior Secured Notes due 2022 and pay the associated early redemption premiums.

14. Financial Instruments:

The Company uses (1) interest rate related derivative instruments to manage its exposure to changes in interest rates on its variable-rate debt instruments, (2) commodity derivatives to manage its exposure to commodity price fluctuations, and (3) foreign currency related derivative instruments to manage its foreign currency exposure to its net investments in certain foreign operations. The Company does not speculate using derivative instruments.

By using derivative financial instruments to hedge exposures to changes in interest rates, commodity prices and foreign currency, the Company exposes itself to credit risk and market risk. Credit risk is the failure of the counterparty to perform under the terms of the derivative contract. When the fair value of a derivative contract is an asset, the counterparty owes the Company, which creates credit risk for the Company. When the fair value of a derivative contract is a liability, the Company owes the counterparty and therefore, the Company is not exposed to the counterparty's credit risk in those circumstances. The Company minimizes counterparty credit risk in derivative instruments by entering into transactions with high quality counterparties. The derivative instruments entered into by the Company do not contain credit-risk-related contingent features.

Market risk is the adverse effect on the value of a derivative instrument that results from a change in interest rates, currency exchange rates or commodity prices. The market risk associated with the Company's derivative instruments is managed by establishing and monitoring parameters that limit the types and degree of market risk that may be undertaken.

Use of Derivative Financial Instruments to Manage Commodity Price Risk. The Company is exposed to risks in energy costs due to fluctuations in energy prices, particularly natural gas. The Company has a hedging program in the United States which allows the Company to mitigate exposure to natural gas volatility with natural gas swap agreements. Fair value is determined based on estimated amounts that would be received or paid to terminate the contracts at the reporting date based on quoted market prices of comparable contracts. The respective current and non-current liabilities are recorded in accrued liabilities and other long-term liabilities and the respective current and non-current assets are recorded in prepaid and other current assets and other long-term assets, as applicable, in the Company's consolidated balance sheet. As the derivatives are designated and qualify as cash flow hedges, the gains or losses on the natural gas swaps are recorded in stockholders' equity as a component of other comprehensive income (loss) ("OCI"), net of tax.

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Reclassifications of the gains and losses on natural gas hedges into earnings are recorded in production costs and subsequently charged to cost of goods sold in the condensed consolidated statements of income in the period in which the associated inventory is sold. As of June 30, 2020, the Company's natural gas swaps had a remaining notional quantity of 2.5 million MMBTU to mitigate commodity price volatility through December 2021.

Use of Derivative Financial Instruments to Manage Interest Rate Risk. The Company is exposed to fluctuations in interest rates on its senior secured credit facilities. Changes in interest rates will not affect the market value of such debt but will affect the Company's interest payments over the term of the loans. Likewise, an increase in interest rates could have a material impact on the Company's cash flow. The Company hedges the interest rate fluctuations on debt obligations through interest rate cap agreements. The Company records these agreements at fair value as assets or liabilities in its consolidated balance sheet. As the derivatives are designated and qualify as cash flow hedges, the gains or losses on the interest rate cap agreements are recorded in stockholders' equity as a component of OCI, net of tax. Reclassifications of the gains and losses on the interest rate cap agreements into earnings are recorded as part of interest expense in the condensed consolidated statements of income as the Company makes its interest payments on the hedged portion of its senior secured credit facilities. Fair value is determined based on estimated amounts that would be received or paid to terminate the contracts at the reporting date based on quoted market prices.

In July 2016, the Company entered into interest rate cap agreements, paying a premium of \$1,551 to mitigate interest rate volatility from July 2016 through July 2020 by employing varying cap rates, ranging from 1.50% to 3.00%, on \$1,000,000 of notional variable-rate debt.

In November 2018, the Company entered into additional interest rate cap agreements to mitigate interest volatility from July 2020 through July 2022, with a cap rate of 3.50% on \$500,000 of notional variable-rate debt and a \$3,380 premium annuitized during the effective period. In February 2020, the Company restructured its \$500,000 of notional variable-rate debt interest rate cap agreements from July 2020 through July 2022, to lower the interest cap rate to 2.50% with an incremental \$130 premium annuitized during the effective period. In March 2020, the Company again amended such interest rate cap agreements to lower the cap rate to 0.84% from 2.50% on \$500,000 of notional variable-rate debt and paid an additional incremental \$900 premium annuitized during the effective period. The term remains unchanged from July 2020 through July 2022. The total cumulative annuitized premium on the \$500,000 of notional variable-rate debt is \$4,410. The cap rate in effect at June 30, 2020 is 3.00%.

In July 2020, the Company entered into additional interest rate cap agreements to mitigate interest rate volatility from August 2020 to August 2023, with a cap rate of 1.00% on \$400,000 of notional variable-rate debt.

Use of Derivative Financial Instruments to Manage Foreign Currency Risk. The Company is exposed to risks related to its net investments in foreign operations due to fluctuations in foreign currency exchange rates, particularly between the United States dollar and the Euro. In February 2018, the Company entered into multiple cross-currency interest rate swap arrangements with an aggregate notional amount of €280,000 (\$314,818 as of June 30, 2020) to hedge this exposure on the net investments of certain of its Euro-denominated subsidiaries. The Company records these swap agreements at fair value as assets or liabilities in its consolidated balance sheet. As the derivatives are designated and qualify as net investment hedges, changes in the fair value of the swaps attributable to changes in the spot exchange rates are recognized in cumulative translation adjustment ("CTA") within OCI and are held there until the hedged net investments are sold or substantially liquidated. Upon such sale or liquidation, the amount recognized in CTA is reclassified to earnings and reported in the same line item as the gain or loss on the liquidation of the net investments. Changes in the fair value of the swaps attributable to the cross-currency basis spread are excluded from the assessment of hedge effectiveness and are recorded in current period earnings.

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The fair values of derivative instruments held as of June 30, 2020 and December 31, 2019 are shown below:

	Balance sheet location	June 30, 2020	December 31, 2019
Derivative assets:			
Derivatives designated as net investment hedges:			
Cross-currency interest rate swaps	Prepaid and other current assets	3,992	3,928
Cross-currency interest rate swaps	Other long-term assets	1,405	—
Total derivative assets		\$ 5,397	\$ 3,928
Derivative liabilities:			
Derivatives designated as cash flow hedges:			
Natural gas swaps	Accrued liabilities	\$ 688	\$ 813
Interest rate caps	Accrued liabilities	1,636	420
Natural gas swaps	Other long-term liabilities	1	226
Interest rate caps	Other long-term liabilities	2,525	2,822
		4,850	4,281
Derivatives designated as net investment hedges:			
Cross-currency swaps	Other long-term liabilities	—	8,134
Total derivative liabilities		\$ 4,850	\$ 12,415

The following tables show the effect of the Company's derivative instruments designated as cash flow hedges on AOCI for the three and six months ended June 30, 2020 and 2019:

		Three months ended June 30,			
		2020		2019	
		Amount of gain (loss) recognized in OCI on derivatives	Amount of gain (loss) reclassified from AOCI into income	Amount of gain (loss) recognized in OCI on derivatives	Amount of gain (loss) reclassified from AOCI into income
Interest rate caps	Interest (expense) income	\$ (325)	\$ (293)	\$ (675)	\$ (169)
Natural gas swaps	Cost of goods sold	198	(494)	(1,137)	(87)
		\$ (127)	\$ (787)	\$ (1,812)	\$ (256)

		Six months ended June 30,			
		2020		2019	
		Amount of gain (loss) recognized in OCI on derivatives	Amount of gain (loss) reclassified from AOCI into income	Amount of gain (loss) recognized in OCI on derivatives	Amount of gain (loss) reclassified from AOCI into income
Interest rate caps	Interest (expense) income	\$ (920)	\$ (524)	\$ (3,048)	\$ (292)
Natural gas swaps	Cost of goods sold	(517)	(867)	(766)	104
		\$ (1,437)	\$ (1,391)	\$ (3,814)	\$ (188)

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The following tables show the effect of the Company's cash flow hedge accounting on the condensed consolidated statements of income for the three and six months ended June 30, 2020 and 2019:

	Location and amount of gain (loss) recognized in income on cash flow hedging relationships			
	Three months ended June 30,			
	2020		2019	
	Cost of goods sold	Interest (expense) income	Cost of goods sold	Interest (expense) income
Total amounts of income and expense line items presented in the statement of income in which the effects of cash flow hedges are recorded	\$ (266,686)	\$ (22,275)	\$ (316,180)	\$ (28,540)
The effects of cash flow hedging:				
Gain (loss) on cash flow hedging relationships:				
Interest contracts:				
Amount of gain (loss) reclassified from AOCI into income	—	(293)	—	(169)
Commodity contracts:				
Amount of gain (loss) reclassified from AOCI into income	(494)	—	(87)	—

	Location and amount of gain (loss) recognized in income on cash flow hedging relationships			
	Six months ended June 30,			
	2020		2019	
	Cost of goods sold	Interest (expense) income	Cost of goods sold	Interest (expense) income
Total amounts of income and expense line items presented in the statement of income in which the effects of cash flow hedges are recorded	(539,685)	(46,730)	(594,491)	(57,158)
The effects of cash flow hedging:				
Gain (loss) on cash flow hedging relationships:				
Interest contracts:				
Amount of gain (loss) reclassified from AOCI into income	—	(524)	—	(292)
Commodity contracts:				
Amount of gain (loss) reclassified from AOCI into income	(867)	—	104	—

The amount of unrealized losses in AOCI related to the Company's cash flow hedges that is expected to be reclassified to the condensed consolidated statement of income over the next twelve months is \$688 as of June 30, 2020.

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The following tables show the effect of the Company's net investment hedges on AOCI and the condensed consolidated statements of income for the three and six months ended June 30, 2020 and 2019:

	Amount of gain (loss) recognized in OCI on derivative		Location of gain (loss) reclassified from AOCI into income	Amount of gain (loss) reclassified from AOCI into income		Location of gain (loss) recognized in income on derivative (amount excluded from effectiveness testing)	Amount of gain (loss) recognized in income on derivative (amount excluded from effectiveness testing)	
	Three months ended June 30,			Three months ended June 30,			Three months ended June 30,	
	2020	2019		2020	2019		2020	2019
Cross-currency interest rate swaps	\$ (5,206)	\$ (2,613)	Gain (loss) on sale of subsidiary	\$ —	\$ —	Interest (expense) income	\$ 1,552	\$ 2,465

	Amount of gain (loss) recognized in OCI on derivative		Location of gain (loss) reclassified from AOCI into income	Amount of gain (loss) reclassified from AOCI into income		Location of gain (loss) recognized in income on derivative (amount excluded from effectiveness testing)	Amount of gain (loss) recognized in income on derivative (amount excluded from effectiveness testing)	
	Six months ended June 30,			Six months ended June 30,			Six months ended June 30,	
	2020	2019		2020	2019		2020	2019
Cross-currency interest rate swaps	\$ 9,603	\$ 5,940	Gain (loss) on sale of subsidiary	\$ —	\$ —	Interest (expense) income	\$ 3,244	\$ 3,912

15. Income Taxes:

The effective income tax rate for the three months ended June 30, 2020 was 50.0% compared to 39.8% for the three months ended June 30, 2019. The effective income tax rate for the six months ended June 30, 2020 was 51.4% compared to 40.0% for the six months ended June 30, 2019. The Company's effective income tax rate has fluctuated primarily due changes in income mix (including the effect of loss companies), the impacts of the Global Intangible Low Taxed Income ("GILTI") tax rules and changes in foreign exchange gains and losses, which create permanent differences in certain jurisdictions.

The difference between the U.S. federal statutory income tax rate and the Company's effective income tax rate for the six months ended June 30, 2020 was mainly due to the impacts of GILTI, the discrete tax impacts of the Company entering into an asset swap agreement, pre-tax losses with no associated tax benefit and state taxes.

The difference between the U.S. federal statutory income tax rate and the Company's effective income tax rate for the six months ended June 30, 2019 was mainly due to the tax effect of permanent differences related to foreign currency exchange gain or loss, the impacts of GILTI, pre-tax losses with no associated tax benefit, prior year tax refunds not previously accrued for and state taxes.

16. Benefit Plans:

The following information is provided for (1) the Company-sponsored defined benefit pension plans covering employees in the U.S. and certain employees at its foreign subsidiaries, (2) the Company-sponsored unfunded plans to provide certain health care benefits to retired employees in the U.S. and Canada, and (3) the Company's defined benefit supplementary retirement plans which provide benefits for certain U.S. employees in excess of qualified plan limitations.

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Components of net periodic expense (benefit) are as follows:

Defined Benefit Pension Plans

	U.S.		Foreign	
	Three months ended June 30,		Three months ended June 30,	
	2020	2019	2020	2019
Service cost	\$ 192	\$ 281	\$ 997	\$ 878
Interest cost	2,152	2,798	707	824
Expected return on plan assets	(3,331)	(3,064)	(810)	(990)
Amortization of net loss	—	—	41	—
Amortization of prior service cost	—	—	6	12
Net periodic expense (benefit)	\$ (987)	\$ 15	\$ 941	\$ 724

	U.S.		Foreign	
	Six months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Service cost	\$ 384	\$ 500	\$ 1,994	\$ 1,684
Interest cost	4,304	5,305	1,414	1,657
Expected return on plan assets	(6,662)	(5,821)	(1,620)	(1,593)
Amortization of net loss	—	—	82	—
Amortization of prior service cost	—	—	12	12
Net periodic expense (benefit)	\$ (1,974)	\$ (16)	\$ 1,882	\$ 1,760

Supplemental Retirement Plans

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
	Interest cost	\$ 86	\$ 122	\$ 172
Net periodic expense	\$ 86	\$ 122	\$ 172	\$ 243

Other Postretirement Benefit Plans

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
	Service cost	\$ —	\$ 4	\$ —
Interest cost	24	38	48	76
Amortization of prior service credit	(58)	(33)	(116)	(65)
Amortization of net gain	(7)	(9)	(14)	(18)
Net periodic expense (benefit)	\$ (41)	\$ —	\$ (82)	\$ —

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17. Commitments and Contingent Liabilities:

There is a risk of environmental impact in chemical manufacturing operations. The Company's environmental policies and practices are designed to comply with existing laws and regulations and to minimize the possibility of significant environmental impact. The Company is also subject to various other lawsuits and claims with respect to matters such as governmental regulations, labor and other actions arising out of the normal course of business. While management believes that the liabilities resulting from such lawsuits and claims are not probable or reasonably estimable, certain accruals have been reflected in the Company's condensed consolidated financial statements. When these matters are ultimately concluded and determined, the Company believes that there will be no material adverse effect on its consolidated financial position, results of operations or liquidity.

18. Reportable Segments:

Summarized financial information for the Company's reportable segments is shown in the following table:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Sales:				
Refining Services	\$ 90,432	\$ 117,290	\$ 191,123	\$ 223,134
Catalysts ⁽¹⁾	25,208	20,857	50,072	36,723
Performance Materials	104,203	118,872	169,772	179,961
Performance Chemicals	142,641	177,828	316,920	358,290
Eliminations ⁽²⁾	(2,959)	(3,172)	(6,764)	(7,212)
Total	\$ 359,525	\$ 431,675	\$ 721,123	\$ 790,896
Segment Adjusted EBITDA:⁽³⁾				
Refining Services	\$ 34,996	\$ 42,824	\$ 72,179	\$ 82,555
Catalysts ⁽⁴⁾	25,312	29,607	47,979	47,734
Performance Materials	27,306	29,221	40,813	39,736
Performance Chemicals	34,011	41,165	74,485	83,838
Total Segment Adjusted EBITDA⁽⁵⁾	\$ 121,625	\$ 142,817	\$ 235,456	\$ 253,863

(1) Excludes the Company's proportionate share of sales from the Zeolyst International and Zeolyst C.V. joint ventures (collectively, the "Zeolyst Joint Venture") accounted for using the equity method (see Note 11 to these condensed consolidated financial statements for further information). The proportionate share of sales is \$40,852 and \$39,124 for the three months ended June 30, 2020 and 2019, respectively. The proportionate share of sales is \$73,143 and \$68,602 for the six months ended June 30, 2020 and 2019, respectively.

(2) The Company eliminates intersegment sales when reconciling to the Company's condensed consolidated statements of income.

(3) The Company defines Adjusted EBITDA as EBITDA adjusted for certain items as noted in the reconciliation below. Management evaluates the performance of its segments and allocates resources based on several factors, of which the primary measure is Adjusted EBITDA. Adjusted EBITDA should not be considered as an alternative to net income as an indicator of the Company's operating performance. Adjusted EBITDA as defined by the Company may not be comparable with EBITDA or Adjusted EBITDA as defined by other companies.

(4) The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$16,855 for the three months ended June 30, 2020, which includes \$1,489 of equity in net income plus \$1,659 of amortization of investment in affiliate step-up and \$3,707 of joint venture depreciation, amortization and interest. The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$17,636 for the three months ended June 30, 2019, which includes \$2,264 of equity in net income plus \$1,659 of amortization of investment in affiliate step-up and \$3,713 of joint venture depreciation, amortization and interest.

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The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$30,580 for the six months ended June 30, 2020, which includes \$9,806 of equity in net income plus \$3,317 of amortization of investment in affiliate step-up and \$7,457 of joint venture depreciation, amortization and interest. The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$25,993 for the six months ended June 30, 2019, which includes \$4,300 of equity in net income plus \$4,217 of amortization of investment in affiliate step-up and \$7,476 of joint venture depreciation, amortization and interest.

(5) Total Segment Adjusted EBITDA differs from the Company's consolidated Adjusted EBITDA due to unallocated corporate expenses.

A reconciliation of net income attributable to PQ Group Holdings to Segment Adjusted EBITDA is as follows:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Reconciliation of net income attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA				
Net income attributable to PQ Group Holdings Inc.	\$ 15,926	\$ 30,574	\$ 16,150	\$ 33,725
Provision for income taxes	16,262	20,307	17,689	22,754
Interest expense, net	22,275	28,540	46,730	57,158
Depreciation and amortization	44,822	45,090	90,493	90,984
Segment EBITDA	99,285	124,511	171,062	204,621
Joint venture depreciation, amortization and interest	3,708	3,713	7,457	7,476
Amortization of investment in affiliate step-up	1,659	1,659	3,317	4,217
Debt extinguishment costs	—	—	2,513	—
Net (gain) loss on asset disposals	(1,020)	(9,653)	8,401	(8,833)
Foreign currency exchange (gain) loss	(854)	3,612	2,483	923
LIFO expense	(1,469)	122	(1,798)	10,280
Transaction and other related costs	739	975	2,801	1,055
Equity-based compensation	6,366	5,370	12,286	8,770
Restructuring, integration and business optimization expenses	3,591	(13)	5,620	719
Defined benefit pension plan (benefit) cost	(252)	552	(500)	1,545
Other	1,284	1,605	2,538	2,721
Adjusted EBITDA	113,037	132,453	216,180	233,494
Unallocated corporate expenses	8,588	10,364	19,276	20,369
Segment Adjusted EBITDA	\$ 121,625	\$ 142,817	\$ 235,456	\$ 253,863

19. Stock-Based Compensation:

The Company is authorized to issue shares for common stock awards to employees, directors and affiliates of the Company in connection with the PQ Group Holdings Inc. 2017 Omnibus Incentive Plan, as Amended and Restated (the "2017 Plan"). During the six months ended June 30, 2020, the Company granted 1,158,605 restricted stock units and 456,311 performance stock units (at target) under the 2017 Plan as part of its equity incentive compensation program. Each restricted stock unit provides the recipient with the right to receive a share of common stock subject to graded vesting terms based on service, which for the awards granted during the six months ended June 30, 2020, requires approximately one year of service for members of the Company's board of directors and approximately three years of service for employees.

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The performance stock units granted during the six months ended June 30, 2020 provide the recipients with the right to receive shares of common stock dependent on the achievement of a Company-specific financial performance target and 50% on a total shareholder return (“TSR”) goal, and are generally subject to the provision of service through the vesting date of the award. The Company-specific financial performance target and the TSR goal are measured independently of each other, but achievement of both of the metrics is measured based on the same three-year performance period from January 1, 2020 through December 31, 2022. The TSR goal is based on the Company’s relative TSR performance against the companies included in the Russell 2000 Index over the performance period. Achievement of the Company-specific financial performance target is measured based on the average levels of achievement across the performance period. Depending on the Company’s performance against the predetermined thresholds for achievement, each performance stock unit award recipient is eligible to earn a percentage of the target number of shares granted to the recipient, ranging from zero to 200%. The performance stock units, to the extent earned, will vest on the date the Company’s compensation and governance committee certifies the achievement of the performance metrics for the three-year period ending December 31, 2022, which will occur no later than March 1, 2023.

The value of the restricted stock units granted during the six months ended June 30, 2020 was based on the average of the high and low trading prices of the Company’s common stock on the NYSE on the preceding trading day, in accordance with the Company’s policy for valuing such awards. Compensation expense related to the restricted stock units is recognized on a straight-line basis over the respective vesting period.

The value of the portion of the performance stock units granted during the six months ended June 30, 2020 eligible to be earned based on the achievement of the Company-specific financial performance target (50% of the award) was measured on the same basis as that of the restricted stock units, and based on the target number of shares granted; because the performance vesting conditions affect the ability of the recipients to vest in the awards, they are not factored into the fair value measure of the award. Compensation expense related to such performance stock units is recognized ratably over the requisite service period, and the Company must assess the probability that the performance conditions will be met each reporting period, and the level at which they are estimated to be attained. Should the probability assessment change during a given reporting period, the total compensation cost (both recognized and unrecognized) will be adjusted to reflect the revised assessment.

The TSR goal, which determines how much of the other 50% of the performance stock units granted during the six months ended June 30, 2020 may be earned, is considered a market condition as opposed to a vesting condition. Because a market condition is not considered a vesting condition, it is reflected in the grant date fair value of an award and the associated compensation cost based on the fair value of the award is recognized over the performance period, regardless of whether the Company actually achieves the market condition or the level of achievement, as long as service is provided by the recipient. The Company used a Monte Carlo simulation to estimate the fair value of the portion of the awards subject to the TSR goal. The following table provides the assumptions used to determine the grant date fair value of the market condition-dependent / TSR goal-based portion of the Company’s performance stock units granted during the six months ended June 30, 2020 using a Monte Carlo simulation:

Expected dividend yield	— %
Risk-free interest rate	1.56 %
Expected volatility	28.57 %
Expected term (in years)	2.95
Grant date fair value	\$ 24.11

The following table summarizes the activity for the Company’s restricted stock units and performance stock units for the six months ended June 30, 2020:

	Restricted Stock Units		Performance Stock Units	
	Number of Units	Weighted Average Grant Date Fair Value (per share)	Number of Units	Weighted Average Grant Date Fair Value (per share)
Nonvested as of December 31, 2019	1,628,436	\$ 15.83	550,676	\$ 15.41
Granted	1,158,605	\$ 16.60	456,311	\$ 20.38
Vested	(441,760)	\$ 15.43	—	\$ —
Forfeited	(99,667)	\$ 16.30	(31,069)	\$ 15.41
Nonvested as of June 30, 2020	<u>2,245,614</u>	<u>\$ 16.29</u>	<u>975,918</u>	<u>\$ 17.74</u>

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Total stock-based compensation expense for all of the Company's equity incentive awards was \$6,366 and \$5,370 for the three months ended June 30, 2020 and 2019, respectively, and \$12,286 and \$8,770 for the six months ended June 30, 2020 and 2019, respectively. The income tax benefit recognized in the condensed consolidated statements of income was \$1,577 and \$1,326 for the three months ended June 30, 2020 and 2019, respectively, and \$3,044 and \$2,166 for the six months ended June 30, 2020 and 2019, respectively. With the new grants of restricted stock units and performance stock units during the six months ended June 30, 2020, unrecognized compensation cost at June 30, 2020 related to nonvested awards was \$26,601 and \$12,314 for restricted stock units and performance stock units, respectively. The weighted-average period over which these costs are expected to be recognized at June 30, 2020 is 1.79 years for the restricted stock units and 2.14 years for the performance stock units. Activity related to the Company's stock options and restricted stock awards was not material for the six months ended June 30, 2020, other than the forfeiture of 560,381 of restricted stock awards subject to a performance vesting condition based upon the occurrence of a defined liquidity event. No expense had previously been recognized related to these awards, as the performance vesting condition was not achieved nor considered probable of achievement.

On April 30, 2020, the Company's stockholders approved an amendment and restatement of the 2017 Plan to increase the number of shares available under it by an additional 9,000,000 shares and include more limited share recycling provisions, resulting in fewer shares recycled subsequent to the change. At June 30, 2020, 2,174,223 shares of common stock were available for issuance under the 2017 Plan, after giving effect to the new grants, forfeitures and other activity during the six months ended June 30, 2020.

20. Earnings per Share:

Basic earnings per share is calculated as income (loss) available to common stockholders, divided by the weighted average number of common shares outstanding during the period. The weighted average number of common shares outstanding during the period for the computation of basic earnings per share excludes restricted stock awards that have legally been issued but are nonvested during the period, as the sale of these shares is prohibited pending satisfaction of certain vesting conditions by the award recipients in order to earn the rights to the shares.

Diluted earnings per share is calculated as income (loss) available to common stockholders, divided by the weighted average number of common and potential common shares outstanding during the period, if dilutive. Potential common shares reflect (1) unvested restricted stock awards and restricted stock units with service vesting conditions, (2) performance stock units with vesting conditions considered probable of achievement and (3) options to purchase common stock, all of which have been included in the diluted earnings per share calculation using the treasury stock method.

The reconciliation from basic to diluted weighted average shares outstanding is as follows:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Weighted average shares outstanding – Basic	135,083,126	134,142,552	135,278,764	134,044,972
Dilutive effect of unvested common shares and restricted stock units with service conditions, performance stock units considered probable of vesting and assumed stock option exercises and conversions	588,704	1,180,472	800,776	1,062,035
Weighted average shares outstanding – Diluted	<u>135,671,830</u>	<u>135,323,024</u>	<u>136,079,540</u>	<u>135,107,007</u>

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Basic and diluted earnings per share are calculated as follows:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Numerator:				
Net income attributable to PQ Group Holdings Inc.	\$ 15,926	\$ 30,574	\$ 16,150	\$ 33,725
Denominator:				
Weighted average shares outstanding – Basic	135,083,126	134,142,552	135,278,764	134,044,972
Weighted average shares outstanding – Diluted	135,671,830	135,323,024	136,079,540	135,107,007
Net income per share:				
Basic income per share	\$ 0.12	\$ 0.23	\$ 0.12	\$ 0.25
Diluted income per share	\$ 0.12	\$ 0.23	\$ 0.12	\$ 0.25

The table below presents the details of the Company's weighted average equity-based awards outstanding during each respective period that were excluded from the calculation of diluted earnings per share:

	Three months ended June 30,		Six months ended June 30,	
	2020	2019	2020	2019
Restricted stock awards with performance only targets not yet achieved	1,507,366	1,637,134	1,511,868	1,638,318
Stock options with performance only targets not yet achieved	509,888	586,253	516,110	586,253
Anti-dilutive restricted stock awards, restricted stock units and performance stock units	2,262,974	—	1,421,401	2,012
Anti-dilutive stock options	844,475	863,063	847,641	863,063

Restricted stock awards and stock options with performance only vesting conditions were not included in the dilution calculation, as the performance targets have not been achieved nor were probable of achievement as of the end of the respective periods. On a weighted average basis, options to purchase 603,159 and 621,747 shares of common stock at \$16.97 per share for the three months ended June 30, 2020 and 2019, respectively, and options to purchase 241,316 shares of common stock at \$17.50 per share for the three months ended June 30, 2020 and 2019, were excluded from the computation of diluted earnings per share for the respective periods, because the combination of the options' exercise price and remaining unamortized stock-based compensation expense was greater than the average market price of the common shares. On a weighted average basis, options to purchase 606,325 and 621,747 shares of common stock at \$16.97 per share for the six months ended June 30, 2020 and 2019, respectively, and options to purchase 241,316 shares of common stock at \$17.50 per share for the six months ended June 30, 2020 and 2019, were excluded from the computation of diluted earnings per share for the respective periods, because the combination of the options' exercise price and remaining unamortized stock-based compensation expense was greater than the average market price of the common shares. The stock options with an exercise price of \$16.97 per share expire on October 2, 2027, while the stock options with an exercise price of \$17.50 per share expire on August 9, 2028. Anti-dilutive awards are not included in the dilution calculation, as their inclusion would have the effect of increasing diluted income per share.

PQ GROUP HOLDINGS INC. AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)
(unaudited)

21. Supplemental Cash Flow Information:

The following table presents supplemental cash flow information for the Company:

	Six months ended June 30,	
	2020	2019
Cash paid during the period for:		
Income taxes, net of refunds	\$ 14,436	\$ 8,301
Interest ⁽¹⁾	54,248	59,035
Non-cash investing activity ⁽²⁾ :		
Capital expenditures acquired on account but unpaid as of the period end	6,716	10,405
Right-of-use assets obtained in exchange for new lease liabilities (non-cash) ⁽²⁾ :		
Operating leases	3,641	1,566

(1) Cash paid for interest is shown net of capitalized interest for the periods presented and excludes \$2,197 and \$4,478 of net interest proceeds on swaps designated as net investment hedges for the six months ended June 30, 2020 and 2019, respectively, which are included within cash flows from investing activities in the Company's condensed consolidated statements of cash flows.

(2) The Company entered into a non-monetary asset swap arrangement whereby it exchanged certain assets with a third party. Details of the associated non-cash investing activities are further described in Note 6 to these condensed consolidated financial statements. As part of the asset swap transaction, the Company assumed a lease contract that is exclusive of those summarized in the above table.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets as of June 30, 2020 and 2019 to the total of the same amounts shown in the condensed consolidated statements of cash flows for the six months then ended:

	June 30,	
	2020	2019
Cash and cash equivalents	\$ 88,640	\$ 82,200
Restricted cash included in prepaid and other current assets	1,948	1,759
Total cash, cash equivalents and restricted cash shown in the condensed consolidated statements of cash flows	\$ 90,588	\$ 83,959

22. Subsequent Events:

In July 2020, the Company completed the sale of a non-core product line within its Performance Chemicals segment for \$8,000. Concurrent with the sale, the Company entered into a tolling arrangement with the buyer through July 2025 in which the Company agreed to use its existing manufacturing facilities for the product line to manufacture the product for the buyer.

In July 2020, the Company entered into an agreement for a new senior secured term loan facility and redeemed its 6.75% Senior Secured Notes due 2022. See Note 13 to these condensed consolidated financial statements for details on the new senior secured term loan facility and the redemption of the 6.75% Senior Secured Notes due 2022.

In July 2020, the Company entered into \$400,000 notional amount of interest rate cap agreements. See Note 14 to these condensed consolidated financial statements for additional details.

Other than the sale of the non-core product line, the entry into an agreement for a new senior secured term loan facility, the redemption of the 6.75% Senior Secured Notes due 2022 and the entry into new interest rate cap agreements as set forth above, the Company has evaluated subsequent events since the balance sheet date and determined that there are no additional items to disclose.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

Unless the context requires otherwise, references in this report to "PQ Group Holdings," "the company," "we," "us" or "our" refer to PQ Group Holdings Inc. and its consolidated subsidiaries.

Forward-looking Statements

This periodic report on Form 10-Q ("Form 10-Q") includes statements that express our opinions, expectations, beliefs, plans, objectives, assumptions or projections regarding future events or future results and therefore are, or may be deemed to be, "forward-looking statements". The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," "should" and similar expressions are intended to identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy, short- and long-term business operations and objectives, and financial needs. Examples of forward-looking statements include, but are not limited to, statements we make regarding the impact of the novel coronavirus ("COVID-19") pandemic on our operations and financial results and our liquidity, including our belief that our existing cash, cash equivalents and cash flow from operations, combined with availability under our asset based lending revolving credit facility will be sufficient to meet our presently anticipated future cash needs for at least the next 12 months. These forward-looking statements are subject to a number of risks, uncertainties and assumptions. Moreover, we operate in a very competitive and rapidly changing environment and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed herein may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. Some of the key factors that could cause actual results to differ from our expectations include risks related to:

- the impact of the ongoing COVID-19 pandemic on the global economy and financial markets, as well as on our business and our suppliers, and the response of governments and of our company to the outbreak;
- our exposure to local business risks and regulations in different countries;
- general economic conditions;
- exchange rate fluctuations;
- legal and regulatory compliance;
- significant developments relating to the U.S. administration, U.S. courts' or the United Kingdom's exit from the European Union;
- technological or other changes in our customers' products;
- our and our competitors' research and development;
- fluctuations in prices of raw materials and relationships with our key suppliers;
- substantial competition;
- non-payment or non-performance by our customers;
- reliance on a small number of customers;
- potential early termination or non-renewal of customer contracts in our Refining Services segment;
- reductions in highway safety spending or taxes earmarked for highway safety spending;
- seasonal fluctuations in demand for some of our products;
- retention of certain key personnel;
- realization of our growth projects;
- potential product liability claims;
- existing and potential future government regulation;
- the extensive environmental, health and safety regulations to which we are subject;
- disruption of production and distribution of our products;
- risk of loss beyond our available insurance coverage;

- product quality;
- successful integration of acquisitions;
- our joint venture investments;
- our failure to protect our intellectual property and infringement on the intellectual property rights of third parties;
- information technology risks;
- potential labor disruptions;
- litigation and other administrative and regulatory proceedings;
- our substantial indebtedness; and
- other factors set forth in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2019.

The forward-looking statements included herein are made only as of the date hereof. You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Form 10-Q to conform these statements to actual results or to changes in our expectations.

Overview

We are a leading integrated and innovative global provider of specialty catalysts, materials, chemicals and services. We support customers globally through our strategically located network of manufacturing facilities. We believe that our products, which are predominantly inorganic, and services contribute to improving the sustainability of the environment.

We conduct operations through four reporting segments: (1) Refining Services, (2) Catalysts (including our 50% interest in the Zeolyst Joint Venture), (3) Performance Materials, and (4) Performance Chemicals.

Refining Services: We are the leading provider of sulfuric acid recycling services to North American refineries for the production of alkylate, an essential gasoline component for lowering vapor pressure and increasing octane to meet stringent gasoline specifications and fuel efficiency standards. We are also a leading North American producer of on-purpose virgin sulfuric acid for water treatment, mining, and industrial applications.

Catalysts: We are a global supplier of finished silica catalysts and catalyst supports necessary to produce high strength and high stiffness plastics used in packaging films, bottles, containers, and other molded applications. We are also a leading global supplier of zeolites used for catalysts that remove nitric oxide from diesel engine emissions as well as sulfur from fuels during the refining process.

Performance Materials: We are an industry leader in North America, Europe, and South America in transportation safety. Our products are used to delineate roads and runways with highly reflective markings, improving safety by enhancing visibility at night and in poor weather. Our microspheres also serve as functional additives in industrial applications, including polymers and plastics, and in abrasive applications for metal surfaces.

Performance Chemicals: We are a leading global producer of sodium silicates and downstream specialty silicas as well as other silicate derivative products. These products are used in a wide variety of industrial and consumer applications such as matting agents in surface coatings, clarifying agents for edible oils and beer, precursors for green tires, additives for dental cleaning and personal care products, and as feedstock for our additives and catalyst platforms.

Impact of COVID-19 on our Business and Results

In March 2020, the outbreak of COVID-19 was declared a national emergency by the United States. COVID-19 continues to spread throughout the world and has adversely impacted economic activity and contributed to volatility in financial markets. In response to the COVID-19 pandemic, the federal government, various states, local and foreign governments have issued decrees and orders that have disrupted many businesses and implemented social distancing, travel and other restrictions. In response to these restrictions, we have taken a variety of actions, including an international travel ban, distribution of personal protective equipment to employees, and work-at-home requirements for many of our employees who are not an integral part of our manufacturing operations. We have also implemented and refined our existing business continuity plans in an effort to minimize disruptions to our operations.

Our manufacturing operations, as well as the operations of our key vendors and the majority of our key customers, have continued to operate with limited interruptions. Some of the ways our businesses support the battle against COVID-19 include:

- In our Refining Services segment, our plants provide critical services that refineries need to produce fuel that powers vehicles that transport goods and people to essential businesses;
- In our Catalysts segment, we produce supports used to manufacture polypropylene, which is the most common material used to make surgical masks. We also produce catalysts and supports needed to manufacture polyethylene, which is used in packaging materials for detergents, bleaches, specialized medical equipment and other sanitation items that are critical to preventing COVID-19;
- In our Performance Materials segment, we produce high-quality microspheres which are used in respirators, hospital beds and protective goggles; and
- In our Performance Chemicals segment, our silicates are used in cleaning products such as soaps and detergents used in homes, businesses and hospitals.

Near Term Trends on Business Segment End Uses

The COVID-19 pandemic has led to unprecedented disruptions within the macro economy, which led to an overall lower sales volume demand during the second quarter of 2020. The timing and magnitude of the impact to sales volume demand varied across our portfolio of businesses due to the many end uses. Key end use trends in our business segments during the second quarter and expectations for the balance of the year are described below:

- **Refining Services:** This business segment was impacted the most by COVID-19. Stay-at-home mandates early in the quarter ended June 30, 2020 led to rapid and significant reductions in gasoline demand in the U.S. As stay-at-home restrictions were lifted toward the end of the second quarter, gasoline consumption recovered to approximately 90% of 2019 levels. In the second half, we expect demand to stay at, or above, this level with a blend of reopening activities as well as containment setbacks within the U.S. Our virgin sulfuric acid product group experienced demand declines within the automotive and industrial production end uses during the quarter ended June 30, 2020. We expect declines in our virgin sulfuric acid product group to align with demand declines in those industries in the second half of the year. While we believe virgin sulfuric acid demand will improve in the third quarter, we expect our regenerated sulfuric acid product group to rebound at a quicker pace.
- **Performance Materials:** We anticipate that this segment will continue to exhibit resilient performance in the second half of the year. In North America, which represents the majority of our highway safety product group demand, road striping activity has been consistent which has resulted in steady volumes and stable pricing. In Europe, we are beginning to see demand recovering as countries reopen and customers return to work on previously approved road striping projects. We expect continued robust performance for the balance of the year for our highway road safety product group. Our engineered glass materials showed weakened demand within Europe due to declines in the automotive, industrial and construction industries during the quarter ended June 30, 2020. We believe there will be modest improvement for these end uses during the second half of the year.
- **Performance Chemicals:** We experienced lower demand for sodium silicate used in industrial applications and chemical manufacturing during the quarter ended June 30, 2020. While we are starting to see some improving customer order patterns as global economic activity increases, we anticipate a slow recovery given the declines in automotive and construction spending. Consumption for our products sold to the personal care, consumer cleaning and detergents end uses exceeded our expectations during the second quarter ended June 30, 2020. We believe demand in several of our end uses, including personal care, consumer cleaning and detergents will normalize in the second half of the year.
- **Catalysts:** Our Catalysts segment delivered strong results through the second quarter ended June 30, 2020 primarily driven by increased demand for polyethylene, which is used in packaging and containers. We anticipate some easing of demand for polyethylene during the second half of the year. We experienced strong demand for hydrocracking catalysts, which is sold through our Zeolyst Joint Venture, as customer change-outs accelerated into the second quarter ended June 30, 2020. With refineries now focused on cash conservation, a number of our customers are now shifting their change-outs to the following year. Demand for our emission control catalysts used in heavy-duty diesel vehicles slumped in the second quarter as our customers temporarily closed their production facilities. We anticipate a mild recovery for our emission control catalysts with second-half sales well below the prior year.

During the quarter ended June 30, 2020 we took certain actions to mitigate the slowdown in our business as a result of the effects of COVID-19, including adjusting our production levels to meet anticipated customer demand, reducing discretionary spending, furloughs, delaying headcount additions and deferring capital maintenance expenditures.

Operations and Supply

Although the full impact of COVID-19 on our business is currently unknown, our manufacturing facilities have continued to operate and have been providing critical materials necessary to aid in combating the COVID-19 pandemic and products we manufacture for other essential businesses. Our manufacturing plants require a limited number of on-site employees in order to continue to operate effectively. We have not experienced any material production issues to date, but have had limited and temporary shutdowns or slowdowns in some of our facilities. Several of our manufacturing facilities experienced production delays as a result of employee absenteeism related to COVID-19. We have also seen limited disruptions in the availability of certain of our raw materials and other supplies, which to date have not had a material impact on production.

Liquidity

As of June 30, 2020, we had cash and cash equivalents of \$88.6 million and total available liquidity of \$285.3 million. During the quarter ended March 31, 2020, we amended our Term Loan Facility to reduce the applicable interest rate and extend the maturity of the facility to February 2027. We also amended our existing ABL Facility to reduce the applicable interest rate, extend the maturity, and increase the aggregate amount of the revolving loan commitments available by \$50.0 million to \$250.0 million.

In July 2020, we entered into an agreement for a new senior secured term loan facility of \$650.0 million, the proceeds of which were used to refinance our existing 6.75% Senior Secured Notes due 2022 and pay the associated early redemption premiums. The new senior secured term loan facility will reduce our interest expense and will mature in February 2027.

Following these actions, we have no significant debt maturities prior to November 2025 and our outstanding debt obligations do not contain material financial covenants requiring us to maintain a leverage ratio below a particular level.

Coronavirus Aid, Relief and Economic Security ("CARES") Act

On March 27, 2020, the CARES Act was signed into law. The provisions of the CARES Act provide substantial stimulus and financial assistance measures intended to mitigate the impact of the COVID-19 pandemic, including certain tax relief provisions. As permitted within the CARES Act, we began deferring payment of the employer portion of social security taxes in the second quarter and expect to continue to do so through the end of 2020, with 50% of the deferred amount due December 31, 2021 and the remaining 50% due December 31, 2022. This deferral is expected to provide approximately \$6.0 million in additional liquidity in 2020. We continue to monitor any effects that may result from the CARES Act.

The impact of the COVID-19 outbreak and associated containment and remediation efforts is rapidly evolving. We expect the duration and magnitude of the virus's impact on the levels of economic activity in the United States and globally to affect the magnitude of its impact on our results of operations, which could be material.

Key Performance Indicators

Adjusted EBITDA and Adjusted Net Income

Adjusted EBITDA and adjusted net income are financial measures that are not prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and that we use to evaluate our operating performance, for business planning purposes and to measure our performance relative to that of our competitors. Adjusted EBITDA and adjusted net income are presented as key performance indicators as we believe these financial measures will enhance a prospective investor's understanding of our results of operations and financial condition. EBITDA consists of net income (loss) attributable to PQ Group Holdings before interest, taxes, depreciation and amortization. Adjusted EBITDA consists of EBITDA adjusted for (i) non-operating income or expense, (ii) the impact of certain non-cash, nonrecurring or other items included in net income (loss) and EBITDA that we do not consider indicative of our ongoing operating performance, and (iii) depreciation, amortization and interest of our 50% share of the Zeolyst Joint Venture. Adjusted net income consists of net income (loss) attributable to PQ Group Holdings adjusted for (i) non-operating income or expense and (ii) the impact of certain non-cash, nonrecurring or other items included in net income (loss) that we do not consider indicative of our ongoing operating performance. We believe that these non-GAAP financial measures provide investors with useful financial metrics to assess our operating performance from period-to-period by excluding certain items that we believe are not representative of our core business.

You should not consider adjusted EBITDA or adjusted net income in isolation or as alternatives to the presentation of our financial results in accordance with GAAP. The presentation of adjusted EBITDA and adjusted net income financial measures may differ from similar measures reported by other companies and may not be comparable to other similarly titled measures. In evaluating adjusted EBITDA and adjusted net income, you should be aware that we are likely to incur expenses similar to those eliminated in this presentation in the future and that certain of these items could be considered recurring in nature. Our presentation of adjusted EBITDA and adjusted net income should not be construed as an inference that our future results will be unaffected by unusual or nonrecurring items. Reconciliations of adjusted EBITDA and adjusted net income to GAAP net income (loss) are included in the results of operations discussion that follows for each of the respective periods.

Key Factors and Trends Affecting Operating Results and Financial Condition

Sales

Our Refining Services and Catalysts segments' sales have grown primarily due to expansion into new end applications, including emission control catalysts, polymer catalysts, and refining catalysts, as well as continued supply share gains. Sales in our Refining Services and Catalysts segments are made on both a purchase order basis and pursuant to long-term contracts.

Historically, our Performance Materials and Performance Chemicals segments have experienced relatively stable demand throughout economic cycles due to the diverse consumer and industrial end uses that our products serve. Expansions into new applications, including personal care and consumer cleaning, as well as share gains in existing end uses, have added to our sales growth in Performance Chemicals. Product sales from our Performance Chemicals segment are made through both individual purchase orders and long-term contracts. In the Performance Materials segment, sales have been driven by the growth of spending on repair, maintenance and upgrade of existing highways and the construction of new highways and roads by governments around the world. Product sales in our Performance Materials segment are made principally on a purchase order basis. There may be modest fluctuations in timing of orders, but orders are mainly driven by demand and general economic conditions.

As discussed above under "Impact of COVID-19 on our Business and Results," we expect the ongoing COVID-19 pandemic to decrease demand for certain of our products in the near term, primarily in our Refining Services, Performance Chemicals and Catalysts segments and, to a lesser extent, in our Performance Materials segment.

Cost of Goods Sold

Cost of goods sold consists of variable product costs, fixed manufacturing expenses, depreciation expense and freight expenses. Variable product costs include all raw materials, energy and packaging costs that are directly related to the manufacturing process. Fixed manufacturing expenses include all plant employment costs, manufacturing overhead and periodic maintenance costs. The primary raw materials for our Refining Services segment include spent sulfuric acid, sulfur, acids, bases (including sodium hydroxide, or "caustic soda"), and certain metals. The primary raw materials used in the manufacture of products in our Performance Materials, Performance Chemicals and Catalysts segments include soda ash, industrial sand, aluminum trihydrate, sodium hydroxide, and cullet.

Most of our Refining Services contracts feature take-or-pay volume protection and/or quarterly price adjustments for commodity inputs, labor, the Chemical Engineering Index (U.S. chemical plant construction cost index) and natural gas. Spent acid for our Refining Services segment is supplied by customers for a nominal charge as part of their contracts. Over 90% of our Refining Services segment sales for the year ended December 31, 2019 were under contracts featuring quarterly price adjustments. The price adjustments generally reflect actual costs for producing acid and tend to protect us from volatility in labor, fixed costs and raw material pricing. The take-or-pay volume protection allows us to cover fixed costs through intermittent, temporary production issues at customer refineries.

For the year ended December 31, 2019, approximately 50% of our Americas silicate sales, which is a significant portion of our Performance Chemicals segment sales, were derived from contracts that included raw material pass-through clauses. Under these contracts, there generally is a time lag of three to nine months for price changes to pass through, depending on the magnitude of the change in cost and other market dynamics. Freight expenses are generally passed through directly to customers.

While natural gas is not a direct feedstock for any product, all businesses use natural gas powered furnaces to heat raw materials and create the chemical reactions necessary to produce end-products. We maintain multiple suppliers wherever possible, hedge exposure to fluctuations in prices for natural gas purchases in the United States, make forward purchases of natural gas in the United States, Canada, and Europe to mitigate our exposure to price volatility, and structure our customer contracts when possible to allow for the pass-through of raw material and natural gas costs.

Joint Ventures

We account for our investments in our equity joint ventures under the equity method. Our largest joint venture, the Zeolyst Joint Venture, manufactures high performance, specialty, zeolite-based catalysts for use in the packaging and engineered plastics, emission control, refining and petrochemical industries and other areas of the broader chemicals industry. We share proportionally in the management of our joint ventures with the other parties to each such joint venture.

Seasonality

Seasonal changes and weather conditions typically affect our Performance Materials and Refining Services segments. In particular, our Performance Materials segment generally experiences lower sales and profit in the first and fourth quarters of the year because highway striping projects typically occur during warmer weather months. Our Refining Services segment typically experiences similar seasonal fluctuations as a result of higher demand for gasoline products in the summer months. As a result, working capital requirements tend to be higher in the first and second quarters of the year, which can adversely affect our liquidity and cash flows. Because of this seasonality associated with certain of our segments, results for any one quarter are not necessarily indicative of the results that may be achieved for any other quarter or for the full year.

Foreign Currency

As a global business, we are subject to the impact of gains and losses on currency translations, which occur when the financial statements of foreign operations are translated into U.S. dollars. We operate a geographically diverse business with approximately 40% of our sales for the six months ended June 30, 2020 and the year ended December 31, 2019 in currencies other than the U.S. dollar. Because our consolidated financial results are reported in U.S. dollars, sales or earnings generated in currencies other than the U.S. dollar can result in a significant increase or decrease in the amount of those sales and earnings when translated to U.S. dollars. The foreign currencies to which we have the most significant exchange rate exposure include the Euro, British pound, Canadian dollar, Brazilian real and the Mexican peso.

Results of Operations

Three Months Ended June 30, 2020 Compared to the Three Months Ended June 30, 2019

Highlights

The following is a summary of our financial performance for the three months ended June 30, 2020 compared with the three months ended June 30, 2019.

Sales

- Sales decreased \$72.2 million to \$359.5 million. The decrease in sales was primarily due to lower sales volumes and the unfavorable effects of foreign currency translation of \$10.0 million.

Gross Profit

- Gross profit decreased \$22.7 million to \$92.8 million. The decrease in gross profit was primarily due to the decline in sales volumes, partially offset by lower production costs.

Operating Income

- Operating income decreased by \$29.1 million to \$41.2 million. The decrease in operating income was due to the decrease in gross profit and an \$11.4 million gain on the sale of a non-core product line in the prior year period, which was partly offset by reduced selling, general and administrative expenses.

Equity in Net Income of Affiliated Companies

- Equity in net income of affiliated companies for the three months ended June 30, 2020 was \$11.5 million, compared to \$12.3 million for the three months ended June 30, 2019. The decrease of \$0.8 million was due to lower earnings generated by the Zeolyst Joint Venture for the three months ended June 30, 2020.

The following is our unaudited condensed consolidated statements of income and a summary of financial results for the three months ended June 30, 2020 and 2019:

	Three months ended		Change	
	June 30,		\$	%
	2020	2019		
	(in millions, except percentages)			
Sales	\$ 359.5	\$ 431.7	\$ (72.2)	(16.7)%
Cost of goods sold	266.7	316.2	(49.5)	(15.7)%
Gross profit	92.8	115.5	(22.7)	(19.7)%
Gross profit margin	25.8 %	26.8 %		
Selling, general and administrative expenses	38.9	43.4	(4.5)	(10.4)%
Other operating expense, net	12.7	1.8	10.9	605.6 %
Operating income	41.2	70.3	(29.1)	(41.4)%
Operating income margin	11.5 %	16.3 %		
Equity in net (income) from affiliated companies	(11.5)	(12.3)	0.8	(6.5)%
Interest expense, net	22.3	28.5	(6.2)	(21.8)%
Other (income) expense, net	(2.1)	3.1	(5.2)	(167.7)%
Income before income taxes and noncontrolling interest	32.5	51.0	(18.5)	(36.3)%
Provision for income taxes	16.3	20.3	(4.0)	(19.7)%
Effective tax rate	50.0 %	39.8 %		
Net income	16.2	30.7	(14.5)	(47.2)%
Less: Net income attributable to the noncontrolling interest	0.3	0.1	0.2	200.0 %
Net income attributable to PQ Group Holdings Inc.	\$ 15.9	\$ 30.6	\$ (14.7)	(48.0)%

Sales

	Three months ended		Change	
	June 30,		\$	%
	2020	2019		
	(in millions, except percentages)			
Sales:				
Refining Services	\$ 90.4	\$ 117.3	\$ (26.9)	(22.9)%
Catalysts	25.2	20.9	4.3	20.6 %
Performance Materials	104.3	118.9	(14.6)	(12.3)%
Performance Chemicals	142.6	177.8	(35.2)	(19.8)%
Eliminations	(3.0)	(3.2)	0.2	
Total sales	\$ 359.5	\$ 431.7	\$ (72.2)	(16.7)%

Refining Services: Sales in Refining Services for the three months ended June 30, 2020 were \$90.4 million, a decrease of \$26.9 million, or 22.9%, compared to sales of \$117.3 million for the three months ended June 30, 2019. The decrease in sales was primarily due to lower volumes of \$21.4 million and lower average selling prices of \$5.5 million.

The decline in sales was a result of lower gasoline consumption as a result of stay-at-home orders enacted to combat the COVID-19 pandemic, weakness in the automotive market and the pass-through of lower sulfur pricing of \$5.8 million in our virgin sulfuric acid product group.

Catalysts: Sales in Catalysts for the three months ended June 30, 2020 were \$25.2 million, an increase of \$4.3 million, or 20.6%, compared to sales of \$20.9 million for the three months ended June 30, 2019. The increase in sales was primarily due to an increase in volumes of \$5.5 million, which was partially offset by the unfavorable effects of foreign currency translation of \$0.7 million.

The increase in sales was due to growth in chemical catalyst and polyolefin catalysts, which benefited partially from an acceleration of orders.

Performance Materials: Sales in Performance Materials for the three months ended June 30, 2020 were \$104.3 million, a decrease of \$14.6 million, or 12.3%, compared to sales of \$118.9 million for the three months ended June 30, 2019. The decrease in sales was primarily due to lower volumes of \$15.9 million and the unfavorable effects of foreign currency translation of \$1.5 million, which were offset by higher average selling price and favorable customer mix of \$2.8 million.

The decrease in sales volumes was a result of lower European demand for our highway safety products, lower industrial application demand for our engineered glass products and an absence of thermoplastic sales as a result of the first quarter asset swap. This was offset by higher average selling prices for highway safety products sold in North America.

Performance Chemicals: Sales in Performance Chemicals for the three months ended June 30, 2020 were \$142.6 million, a decrease of \$35.2 million, or 19.8%, compared to sales of \$177.8 million for the three months ended June 30, 2019. The decrease in sales was primarily due to lower sales volumes of \$31.1 million and the unfavorable effects of foreign currency translation of \$7.9 million, which were partially offset by favorable sales mix of \$3.8 million.

The decrease in sales was a result of lower volumes of sodium silicate sold across multiple applications as a result of COVID-19 related customer slowdowns in production, which more than offset stable sales in global specialty silicas. The unfavorable effects of foreign currency translation were driven by the stronger U.S. dollar.

Gross Profit

Gross profit for the three months ended June 30, 2020 was \$92.8 million, a decrease of \$22.7 million, or 19.7%, compared with \$115.5 million for the three months ended June 30, 2019. The decrease in gross profit was due to lower volumes of \$32.6 million, unfavorable product mix of \$4.1 million and the unfavorable effects of foreign currency translation of \$2.8 million, which were partially offset by favorable manufacturing costs of \$16.8 million.

The decrease in volumes was a result of lower demand for regeneration services due to lower gasoline consumption as a result of stay-at-home orders enacted to combat the COVID-19 pandemic and lower volumes of product sold to the industrial and process chemicals and consumer products end uses. The unfavorable product mix was a result of increased sales of lower-margin products sold in our North American highway product group. The unfavorable effects of foreign currency were driven by the stronger U.S. dollar. The favorable change in manufacturing costs was a result of the timing of plant maintenance projects and lower production costs related to our European operations.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for the three months ended June 30, 2020 were \$38.9 million, a decrease of \$4.5 million compared with \$43.4 million for the three months ended June 30, 2019. The decrease in selling, general and administrative expenses was due to reductions in discretionary spending and hiring delays.

Other Operating Expense, Net

Other operating expense, net for the three months ended June 30, 2020 was \$12.7 million, an increase of \$10.9 million, compared with \$1.8 million for the three months ended June 30, 2019. The increase in other operating expense, net was due to changes in gains and losses on asset disposals. During the three months ended June 30, 2020, other operating expense, net was driven by asset dispositions related the sale of various non-core assets during the quarter. During the three months ended June 30, 2019, asset disposals were offset by a net gain on disposition of assets related to a non-core product line.

Equity in Net Income of Affiliated Companies

Equity in net income of affiliated companies for the three months ended June 30, 2020 was \$11.5 million, compared to \$12.3 million for the three months ended June 30, 2019. The decrease was primarily due to \$0.8 million of lower earnings from the Zeolyst Joint Venture during the three months ended June 30, 2020 as compared to the three months ended June 30, 2019. The decrease in earnings from the Zeolyst Joint Venture was due to lower demand for emission control catalyst.

Interest Expense, Net

Interest expense, net for the three months ended June 30, 2020 was \$22.3 million, a decrease of \$6.2 million, as compared with \$28.5 million for the three months ended June 30, 2019. The decrease in interest expense, net was due to lower outstanding balances and lower interest rates on our variable rate debt during the three months ended June 30, 2020 as compared to the three months ended June 30, 2019.

Other Expense, Net

Other expense, net for the three months ended June 30, 2020 was income of \$2.1 million, a decrease of \$5.2 million, as compared with an expense of \$3.1 million for the three months ended June 30, 2019. The change in other expense, net primarily consisted of foreign currency activity related to the non-permanent intercompany debt denominated in local currency and translated to the U.S. dollar. During the three months ended June 30, 2020, the foreign currency activity resulted in gains and, during the three months ended June 30, 2019, the foreign currency activity resulted in losses.

Provision for Income Taxes

The provision for income taxes for the three months ended June 30, 2020 was \$16.3 million compared to a \$20.3 million provision for the three months ended June 30, 2019. The effective income tax rate for the three months ended June 30, 2020 was 50.0% compared to 39.8% for the three months ended June 30, 2019.

The Company's effective income tax rate fluctuates based primarily on changes in income mix (including the effect of loss companies), the impacts of the Global Intangible Low Taxed Income ("GILTI") tax rules and changes in foreign exchange gains and losses, which create permanent differences in certain jurisdictions.

The difference between the U.S. federal statutory income tax rate and the Company's effective income tax rate for the three months ended June 30, 2020 was mainly due to the tax effect of permanent differences related to foreign currency exchange gain or loss, the inclusion of foreign earnings in U.S. taxable income, pre-tax losses with no associated tax benefit and state taxes.

Net Income Attributable to PQ Group Holdings

For the foregoing reasons and after the effect of the non-controlling interest in earnings of subsidiaries for each period presented, net income attributable to PQ Group Holdings was \$15.9 million for the three months ended June 30, 2020 compared with net income of \$30.6 million for the three months ended June 30, 2019.

Adjusted EBITDA

Summarized Segment Adjusted EBITDA information is shown below in the following table:

	Three months ended June 30,		Change	
	2020	2019	\$	%
	(in millions, except percentages)			
Segment Adjusted EBITDA ⁽¹⁾				
Refining Services	\$ 35.0	\$ 42.8	\$ (7.8)	(18.2)%
Catalysts ⁽²⁾	25.3	29.6	(4.3)	(14.5)%
Performance Materials	27.3	29.2	(1.9)	(6.5)%
Performance Chemicals	34.0	41.2	(7.2)	(17.5)%
Total Segment Adjusted EBITDA ⁽³⁾	121.6	142.8	(21.2)	(14.8)%
Unallocated corporate expenses	(8.6)	(10.3)	1.7	16.5 %
Total Adjusted EBITDA	\$ 113.0	\$ 132.5	\$ (19.5)	(14.7)%

(1) We define Segment Adjusted EBITDA as EBITDA adjusted for certain items as noted in the reconciliation below. Our management evaluates the performance of our segments and allocates resources based primarily on Segment Adjusted EBITDA. Segment Adjusted EBITDA does not represent cash flow for periods presented and should not be considered as an alternative to net income as an indicator of our operating performance or as an alternative to cash flows as a source of liquidity. Segment Adjusted EBITDA may not be comparable with EBITDA or Adjusted EBITDA as defined by other companies.

(2) The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$16.9 million for the three months ended June 30, 2020, which includes \$11.5 million of equity in net income, excluding \$1.7 million of amortization of investment in affiliate step-up plus \$3.7 million of joint venture depreciation, amortization and interest. The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$17.6 million for the three months ended June 30, 2019, which includes \$12.3 million of equity in net income, excluding \$1.7 million of amortization of investment in affiliate step-up plus \$3.7 million of joint venture depreciation, amortization and interest.

(3) Our total Segment Adjusted EBITDA differs from our total consolidated Adjusted EBITDA due to unallocated corporate expenses.

Refining Services: Adjusted EBITDA for the three months ended June 30, 2020 was \$35.0 million, a decrease of \$7.8 million, or 18.2%, compared with \$42.8 million for the three months ended June 30, 2019. The decrease in Adjusted EBITDA was a result of reduced sales volumes partially offset by cost cutting initiatives.

Catalysts: Adjusted EBITDA for the three months ended June 30, 2020 was \$25.3 million, a decrease of \$4.3 million, or 14.5%, compared with \$29.6 million for the three months ended June 30, 2019. The decrease in Adjusted EBITDA was primarily a result of unfavorable fixed cost absorption as production was reduced to meet anticipated lower demand and product mix.

Performance Materials: Adjusted EBITDA for the three months ended June 30, 2020 was \$27.3 million, a decrease of \$1.9 million, or 6.5%, compared with \$29.2 million for the three months ended June 30, 2019. The decrease in Adjusted EBITDA was a result of lower sales volumes offset by operational optimization and efforts to reduce costs.

Performance Chemicals: Adjusted EBITDA for the three months ended June 30, 2020 was \$34.0 million, a decrease of \$7.2 million, or 17.5%, compared with \$41.2 million for the three months ended June 30, 2019. The decrease in Adjusted EBITDA was due to decreased volumes of sodium silicate across multiple applications.

A reconciliation of net income attributable to PQ Group Holdings to Segment Adjusted EBITDA is as follows:

	Three months ended June 30,	
	2020	2019
(in millions)		
Reconciliation of net income attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA		
Net income attributable to PQ Group Holdings Inc.	\$ 15.9	\$ 30.6
Provision for income taxes	16.3	20.3
Interest expense, net	22.3	28.5
Depreciation and amortization	44.8	45.1
EBITDA	99.3	124.5
Joint venture depreciation, amortization and interest ^(a)	3.7	3.7
Amortization of investment in affiliate step-up ^(b)	1.7	1.7
Net gain on asset disposals ^(c)	(1.0)	(9.7)
Foreign currency exchange (gain) loss ^(d)	(0.9)	3.6
LIFO (benefit) expense ^(e)	(1.5)	0.1
Transaction and other related costs ^(f)	0.7	1.0
Equity-based compensation	6.4	5.4
Restructuring, integration and business optimization expenses ^(g)	3.6	—
Defined benefit pension plan (benefit) cost ^(h)	(0.3)	0.6
Other ⁽ⁱ⁾	1.3	1.6
Adjusted EBITDA	113.0	132.5
Unallocated corporate expenses	8.6	10.3
Segment Adjusted EBITDA	\$ 121.6	\$ 142.8

- (a) We use Adjusted EBITDA as a performance measure to evaluate our financial results. Because our Catalysts segment includes our 50% interest in the Zeolyst Joint Venture, we include an adjustment for our 50% proportionate share of depreciation, amortization and interest expense of the Zeolyst Joint Venture.
- (b) Represents the amortization of the fair value adjustments associated with the equity affiliate investment in the Zeolyst Joint Venture as a result of the combination of the businesses of PQ Holdings Inc. and Eco Services Operations LLC in May 2016 (the “Business Combination”). We determined the fair value of the equity affiliate investment and the fair value step-up was then attributed to the underlying assets of the Zeolyst Joint Venture. Amortization is primarily related to the fair value adjustments associated with fixed assets and intangible assets, including customer relationships and technical know-how.
- (c) When asset disposals occur, we remove the impact of net gain/loss of the disposed asset because such impact primarily reflects the non-cash write-off of long-lived assets no longer in use.

- (d) Reflects the exclusion of the foreign currency transaction gains and losses in the statements of income which primarily relates to the non-permanent intercompany debt denominated in local currency translated to U.S. dollars.
- (e) Represents non-cash adjustments to the Company's LIFO reserves for certain inventories in the U.S. that are valued using the LIFO method, which we believe provides a means of comparison to other companies that may not use the same basis of accounting for inventories.
- (f) Relates to certain transaction costs, including debt financing, due diligence and other costs related to transactions that are completed, pending or abandoned, that we believe are not representative of our ongoing business operations.
- (g) Includes the impact of restructuring, integration and business optimization expenses which are incremental costs that are not representative of our ongoing business operations.
- (h) Represents adjustments for defined benefit pension plan (benefit) costs in our statements of income. More than two-thirds of our defined benefit pension plan obligations are under defined benefit pension plans that are frozen, and the remaining obligations primarily relate to plans operated in certain of our non-U.S. locations that, pursuant to jurisdictional requirements, cannot be frozen. As such, we do not view such expenses as core to our ongoing business operations.
- (i) Other costs consist of certain expenses that are not core to our ongoing business operations, including environmental remediation-related costs associated with the legacy operations of our business prior to the Business Combination, capital and franchise taxes, non-cash asset retirement obligation accretion and the initial implementation of procedures to comply with Section 404 of the Sarbanes-Oxley Act. Included in this line-item are rounding discrepancies that may arise from rounding from dollars (in thousands) to dollars (in millions).

Adjusted Net Income

Summarized adjusted net income information is shown below in the following table:

	Three months ended June 30,					
	2020			2019		
	Pre-tax	Tax expense (benefit)	After-tax	Pre-tax	Tax expense (benefit)	After-tax
	(in millions)					
Reconciliation of net income attributable to PQ Group Holdings Inc. to Adjusted Net Income⁽¹⁾⁽²⁾						
Net income before non-controlling interest	\$ 32.5	\$ 16.3	\$ 16.2	\$ 51.0	\$ 20.3	\$ 30.7
Less: Net income attributable to non-controlling interest	0.3	—	0.3	0.1	—	0.1
Net income attributable to PQ Group Holdings Inc.	32.2	16.3	15.9	50.9	20.3	30.6
Amortization of investment in affiliate step-up ^(b)	1.7	0.7	1.0	1.7	0.7	1.0
Net (gain) loss on asset disposals ^(c)	(1.0)	0.1	(1.1)	(9.7)	(2.3)	(7.4)
Foreign currency exchange loss (gain) ^(d)	(0.9)	(1.4)	0.5	3.6	(0.5)	4.1
LIFO expense ^(e)	(1.5)	(0.6)	(0.9)	0.1	(0.1)	0.2
Transaction and other related costs ^(f)	0.7	0.4	0.3	1.0	0.4	0.6
Equity-based compensation	6.4	2.7	3.7	5.4	1.9	3.5
Restructuring, integration and business optimization expenses ^(g)	3.6	1.5	2.1	—	—	—
Defined benefit pension plan (benefit) cost ^(h)	(0.3)	(0.1)	(0.2)	0.6	0.2	0.4
Other ⁽ⁱ⁾	1.3	0.5	0.8	1.6	0.6	1.0
Adjusted Net Income, including non-cash GILTI tax	\$ 42.2	\$ 20.1	\$ 22.1	\$ 55.2	\$ 21.2	\$ 34.0
Impact of non-cash GILTI tax ⁽³⁾	—	(7.9)	7.9	—	(7.5)	7.5
Adjusted Net Income	<u>\$ 42.2</u>	<u>\$ 12.2</u>	<u>\$ 30.0</u>	<u>\$ 55.2</u>	<u>\$ 13.7</u>	<u>\$ 41.5</u>

(1) We define adjusted net income as net income attributable to PQ Group Holdings adjusted for non-operating income or expense and the impact of certain non-cash or other items that are included in net income that we do not consider indicative of our ongoing operating performance. Adjusted net income is presented as a key performance indicator as we believe it will enhance a

prospective investor's understanding of our results of operations and financial condition. Adjusted net income may not be comparable with net income or adjusted net income as defined by other companies.

- (2) Refer to the Adjusted EBITDA notes above for more information with respect to each adjustment.
- (3) Amount represents the impact to tax expense in net income before non-controlling interest and the related adjustments to net income associated with the GILTI provisions of the Tax Cuts and Jobs Act of 2017 ("TCJA"). Beginning January 1, 2018, GILTI results in taxation of "excess of foreign earnings," which is defined as amounts greater than a 10% rate of return on applicable foreign tangible asset basis. The Company is required to record incremental tax provision impact with respect to GILTI as a result of having historical U.S. net operating loss ("NOL") amounts to offset the GILTI taxable income inclusion. This NOL utilization precludes us from recognizing foreign tax credits ("FTCs") which would otherwise help offset the tax impacts of GILTI. No FTCs will be recognized with respect to GILTI until our cumulative NOL balance has been exhausted. Because the GILTI provision does not impact our cash taxes (given available U.S. NOLs), and given that we expect to recognize FTCs to offset GILTI impacts once the NOLs are exhausted, we do not view this item as a component of core operations.

The adjustments to net income attributable to PQ Group Holdings Inc. are shown net of applicable tax rates as determined by the calculation of our quarterly tax provision under interim financial reporting for the three months ended June 30, 2020 and June 30, 2019, except for the foreign currency exchange loss and the effects of our sale of a non-core product line for which the taxes are calculated as discrete items using the applicable statutory income tax rates.

Results of Operations

Six Months Ended June 30, 2020 Compared to the Six Months Ended June 30, 2019

Highlights

The following is a summary of our financial performance for the six months ended June 30, 2020 compared with the six months ended June 30, 2019.

Sales

- Sales decreased \$69.8 million to \$721.1 million. The decrease in sales was primarily due to lower sales volumes and the unfavorable effects of foreign currency translation of \$15.7 million.

Gross Profit

- Gross profit decreased \$15.0 million to \$181.4 million. The decrease in gross profit was primarily due to the decrease in sales volumes and unfavorable product mix, partially offset by lower manufacturing costs.

Operating Income

- Operating income decreased by \$35.2 million to \$64.5 million. The decrease in operating income was due to the decrease in gross profit during the current year period and an \$11.4 million gain on the sale of a non-core product line in the prior year period.

Equity in Net Income of Affiliated Companies

- Equity in net income of affiliated companies for the six months ended June 30, 2020 was \$19.8 million, compared with \$14.4 million for the six months ended June 30, 2019. The increase of \$5.4 million was due to increased earnings generated by the Zeolyst Joint Venture for the six months ended June 30, 2020.

The following is our unaudited condensed consolidated statements of income and a summary of financial results for the six months ended June 30, 2020 and 2019:

	Six months ended June 30,		Change	
	2020	2019	\$	%
	(in millions, except percentages)			
Sales	\$ 721.1	\$ 790.9	\$ (69.8)	(8.8)%
Cost of goods sold	539.7	594.5	(54.8)	(9.2)%
Gross profit	181.4	196.4	(15.0)	(7.6)%
Gross profit margin	25.2 %	24.8 %		
Selling, general and administrative expenses	82.2	84.1	(1.9)	(2.3)%
Other operating expense, net	34.7	12.6	22.1	175.4 %
Operating income	64.5	99.7	(35.2)	(35.3)%
Operating income margin	8.9 %	12.6 %		
Equity in net (income) from affiliated companies	(19.8)	(14.4)	(5.4)	37.5 %
Interest expense, net	46.7	57.2	(10.5)	(18.4)%
Debt extinguishment costs	2.5	—	2.5	— %
Other (income) expense, net	0.6	—	0.6	— %
Income before income taxes and noncontrolling interest	34.5	56.9	(22.4)	(39.4)%
Provision for income taxes	17.7	22.8	(5.1)	(22.4)%
Effective tax rate	51.4 %	40.0 %		
Net income	16.8	34.1	(17.3)	(50.7)%
Less: Net income attributable to the noncontrolling interest	0.6	0.4	0.2	50.0 %
Net income attributable to PQ Group Holdings Inc.	\$ 16.2	\$ 33.7	\$ (17.5)	(51.9)%

Sales

	Six months ended June 30,		Change	
	2020	2019	\$	%
	(in millions, except percentages)			
Sales:				
Refining Services	\$ 191.1	\$ 223.1	\$ (32.0)	(14.3)%
Catalysts	50.1	36.7	13.4	36.5 %
Performance Materials	169.8	180.0	(10.2)	(5.7)%
Performance Chemicals	316.9	358.3	(41.4)	(11.6)%
Eliminations	(6.8)	(7.2)	0.4	
Total sales	\$ 721.1	\$ 790.9	\$ (69.8)	(8.8)%

Refining Services: Sales in Refining Services for the six months ended June 30, 2020 were \$191.1 million, a decrease of \$32.0 million, or 14.3%, compared to sales of \$223.1 million for the six months ended June 30, 2019. The decrease in sales was due to lower sales volumes of \$19.2 million and lower average selling prices of \$12.8 million.

The decline in sales was a result of lower gasoline consumption as a result of stay-at-home orders enacted to combat the COVID-19 pandemic and the pass-through of lower sulfur pricing in our virgin sulfuric acid product group.

Catalysts: Sales in Catalysts for the six months ended June 30, 2020 were \$50.1 million, an increase of \$13.4 million, or 36.5%, compared to sales of \$36.7 million for the six months ended June 30, 2019. The increase in sales was primarily due to an increase in sales volumes of \$14.5 million due to higher customer demand for our polyolefin catalysts and timing of customer orders in our chemical catalysts product lines.

Performance Materials: Sales in Performance Materials for the six months ended June 30, 2020 were \$169.8 million, a decrease of \$10.2 million, or 5.7%, compared with sales of \$180.0 million for the six months ended June 30, 2019. The decrease in sales was primarily due to lower sales volumes of \$11.1 million and the unfavorable effects of foreign currency translation of \$2.9 million, which were partially offset by higher average selling prices and favorable customer mix of \$3.8 million.

The decrease in sales volumes was a result of lower European demand for our highway safety products and lower industrial application demand for our engineered glass products, which was partially offset by higher North American highway safety product sales. The unfavorable effects of foreign currency translation were driven by the stronger U.S. dollar.

Performance Chemicals: Sales in Performance Chemicals for the six months ended June 30, 2020 were \$316.9 million, a decrease of \$41.4 million, or 11.6%, compared to sales of \$358.3 million for the six months ended June 30, 2019. The decrease in sales was primarily due to lower sales volumes of \$35.4 million and the unfavorable effects of foreign currency translation of \$12.1 million, which were partially offset by higher average selling price and favorable mix of \$6.1 million.

The decrease in sales was a result of lower volumes of sodium silicate sold across multiple applications as a result of COVID-19 related customer slowdowns in production, which more than offset stable sales in global specialty silicas. The unfavorable effects of foreign currency translation were driven by the stronger U.S. dollar.

Gross Profit

Gross profit for the six months ended June 30, 2020 was \$181.4 million, a decrease of \$15.0 million, or 7.6%, compared with \$196.4 million for the six months ended June 30, 2019. The decrease in gross profit was due to lower sales volumes of \$18.2 million, unfavorable product mix of \$9.8 million and the unfavorable effects of foreign currency translation of \$4.0 million, which was partially offset by lower manufacturing costs of \$20.9 million.

Sales volumes declined as a result of lower volumes of product sold for industrial and process chemicals and consumer products end uses and lower gasoline consumption as a result of stay-at-home orders enacted to combat the COVID-19 pandemic. The unfavorable product mix was a result of increased sales of lower-margin products sold in our North American highway product group. The unfavorable effects of foreign currency were driven by the stronger U.S. dollar. The change in manufacturing costs was a result of the timing of plant maintenance projects and lower production costs related to our European operations.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for the six months ended June 30, 2020 was \$82.2 million, a decrease of \$1.9 million as compared to \$84.1 million for the six months ended June 30, 2019. The decrease in selling, general and administrative expenses was due to reductions in discretionary spending partially offset by an increase in stock compensation expense.

Other Operating Expense, Net

Other operating expense, net for the six months ended June 30, 2020 was \$34.7 million, an increase of \$22.1 million, compared with \$12.6 million for the six months ended June 30, 2019. During the six months ended June 30, 2020, other operating expense, net was driven by transaction-related costs associated with the sale of various non-core assets and the resulting write-off of those non-core assets. During the six months ended June 30, 2019, asset disposals were offset by a net gain on disposition of assets related to a non-core product line.

Equity in Net Income of Affiliated Companies

Equity in net income of affiliated companies for the six months ended June 30, 2020 was \$19.8 million, compared to \$14.4 million for the six months ended June 30, 2019. The increase was primarily due to \$5.5 million of higher earnings from the Zeolyst Joint Venture during the six months ended June 30, 2020, which was due to timing of customer orders for product sold to the packaging and engineered plastics industry.

Interest Expense, Net

Interest expense, net for the six months ended June 30, 2020 was \$46.7 million, a decrease of \$10.5 million, as compared with \$57.2 million for the six months ended June 30, 2019. The decrease in interest expense was due to lower average debt balances and lower interest rates, mainly due to prior year prepayments on our Term Loan Facility.

Debt Extinguishment Costs

Debt extinguishment costs for the six months ended June 30, 2020 were \$2.5 million. On February 7, 2020, we amended our existing senior secured term loan facility to reduce the applicable interest rates and extend the maturity of the facility to February 2027. We recorded \$2.2 million of new creditor and third-party financing fees as debt extinguishment costs for the six months ended June 30, 2020. In addition, previously unamortized deferred financing costs of \$0.1 million and original issue discount of \$0.2 million associated with the existing senior secured term loan facility were written off as debt extinguishment costs for the six months ended June 30, 2020.

Other Expense, Net

Other expense, net for the six months ended June 30, 2020 was an expense of \$0.6 million, an increase of \$0.6 million, as compared with income of \$0.0 million for the six months ended June 30, 2019. The change in other expense, net primarily consisted of an increase in foreign currency losses for the six months ended June 30, 2020 as compared to the six months ended June 30, 2019 partially offset by gains related to our defined benefit plan assets. The foreign currency losses are primarily driven by the fluctuations in our non-permanent intercompany debt denominated in local currency and translated to U.S. dollars.

Provision for Income Taxes

The provision for income taxes for the six months ended June 30, 2020 was \$17.7 million compared to a \$22.8 million provision for the six months ended June 30, 2019. The effective income tax rate for the six months ended June 30, 2020 was 51.4% compared to 40.0% for the six months ended June 30, 2019.

The Company's effective income tax rate fluctuates primarily due to income mix (including the effect of loss companies), the impacts of GILTI and changes in foreign exchange gains and losses, which create permanent differences in certain jurisdictions.

The difference between the U.S. federal statutory income tax rate and the Company's effective income tax rate for the six months ended June 30, 2020 was mainly due to the impacts of GILTI, the discrete tax impacts related to the asset swap agreement, pre-tax losses with no associated tax benefit and state taxes.

Net Income Attributable to PQ Group Holdings

For the foregoing reasons and after the effect of the non-controlling interest in earnings of subsidiaries for each period presented, net income attributable to PQ Group Holdings was \$16.2 million for the six months ended June 30, 2020 compared with net income of \$33.7 million for the six months ended June 30, 2019.

Adjusted EBITDA

Summarized Segment Adjusted EBITDA information is shown below in the following table:

	Six months ended June 30,		Change	
	2020	2019	\$	%
	(in millions, except percentages)			
Segment Adjusted EBITDA ⁽¹⁾				
Refining Services	\$ 72.2	\$ 82.6	\$ (10.4)	(12.6)%
Catalysts ⁽²⁾	48.0	47.7	0.3	0.6 %
Performance Materials	40.8	39.7	1.1	2.8 %
Performance Chemicals	74.5	83.8	(9.3)	(11.1)%
Total Segment Adjusted EBITDA ⁽³⁾	235.5	253.8	(18.3)	(7.2)%
Unallocated corporate expenses	(19.3)	(20.3)	1.0	4.9 %
Total Adjusted EBITDA	<u>\$ 216.2</u>	<u>\$ 233.5</u>	<u>\$ (17.3)</u>	<u>(7.4)%</u>

(1) We define Segment Adjusted EBITDA as EBITDA adjusted for certain items as noted in the reconciliation below. Our management evaluates the performance of our segments and allocates resources based primarily on Segment Adjusted EBITDA. Segment Adjusted EBITDA does not represent cash flow for periods presented and should not be considered as an alternative to net income as an indicator of our operating performance or as an alternative to cash flows as a source of liquidity. Segment Adjusted EBITDA may not be comparable with EBITDA or Adjusted EBITDA as defined by other companies.

(2) The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$30.6 million for the six months ended June 30, 2020, which includes \$19.8 million of equity in net income, excluding \$3.3 million of amortization of investment

in affiliate step-up plus \$7.5 million of joint venture depreciation, amortization and interest. The Adjusted EBITDA from the Zeolyst Joint Venture included in the Catalysts segment is \$26.0 million for the six months ended June 30, 2019, which includes \$14.3 million of equity in net income, excluding \$4.2 million of amortization of investment in affiliate step-up plus \$7.5 million of joint venture depreciation, amortization and interest.

- (3) Our total Segment Adjusted EBITDA differs from our total consolidated Adjusted EBITDA due to unallocated corporate expenses. Rounding discrepancies may arise when rounding segment results from dollars (in thousands) to dollars (in millions).

Refining Services: Adjusted EBITDA for the six months ended June 30, 2020 was \$72.2 million, a decrease of \$10.4 million, or 12.6%, compared with \$82.6 million for the six months ended June 30, 2019. The decrease in Adjusted EBITDA was related to reduced sales driven by lower gasoline consumption partially offset by the timing of plant maintenance projects.

Catalysts: Adjusted EBITDA for the six months ended June 30, 2020 was \$48.0 million, an increase of \$0.3 million, or 0.6%, compared with \$47.7 million for the six months ended June 30, 2019. The increase in Adjusted EBITDA was a result of the timing of customer order patterns partially offset by unfavorable fixed cost absorption and product mix.

Performance Materials: Adjusted EBITDA for the six months ended June 30, 2020 was \$40.8 million, an increase of \$1.1 million, or 2.8%, compared with \$39.7 million for the six months ended June 30, 2019. The increase in Adjusted EBITDA was a result of favorable pricing for our North American highway safety products and operating and cost optimization, partially offset by lower industrial application demand for engineered glass materials.

Performance Chemicals: Adjusted EBITDA for the six months ended June 30, 2020 was \$74.5 million, a decrease of \$9.3 million, or 11.1%, compared with \$83.8 million for the six months ended June 30, 2019. The decrease in Adjusted EBITDA was due to decreased volumes of sodium silicate across multiple applications.

A reconciliation of net income attributable to PQ Group Holdings to Segment Adjusted EBITDA is as follows:

	Six months ended June 30,	
	2020	2019
	(in millions)	
Reconciliation of net income attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA		
Net income attributable to PQ Group Holdings Inc.	\$ 16.2	\$ 33.7
Provision for income taxes	17.7	22.8
Interest expense, net	46.7	57.2
Depreciation and amortization	90.5	91.0
EBITDA	171.1	204.7
Joint venture depreciation, amortization and interest ^(a)	7.5	7.5
Amortization of investment in affiliate step-up ^(b)	3.3	4.2
Debt extinguishment costs	2.5	—
Net (gain) loss on asset disposals ^(c)	8.4	(8.8)
Foreign currency exchange loss ^(d)	2.5	0.9
LIFO (benefit) expense ^(e)	(1.8)	10.3
Transaction and other related costs ^(f)	2.8	1.1
Equity-based compensation	12.3	8.8
Restructuring, integration and business optimization expenses ^(g)	5.6	0.7
Defined benefit pension plan (benefit) cost ^(h)	(0.5)	1.5
Other ⁽ⁱ⁾	2.5	2.6
Adjusted EBITDA	216.2	233.5
Unallocated corporate expenses	19.3	20.3
Segment Adjusted EBITDA	\$ 235.5	\$ 253.8

(a) We use Adjusted EBITDA as a performance measure to evaluate our financial results. Because our Catalysts segment includes our 50% interest in the Zeolyst Joint Venture, we include an adjustment for our 50% proportionate share of depreciation, amortization and interest expense of the Zeolyst Joint Venture.

- (b) Represents the amortization of the fair value adjustments associated with the equity affiliate investment in the Zeolyst Joint Venture as a result of the Business Combination. We determined the fair value of the equity affiliate investment and the fair value step-up was then attributed to the underlying assets of the Zeolyst Joint Venture. Amortization is primarily related to the fair value adjustments associated with fixed assets and intangible assets, including customer relationships and technical know-how.
- (c) When asset disposals occur, we remove the impact of net gain/loss of the disposed asset because such impact primarily reflects the non-cash write-off of long-lived assets no longer in use.
- (d) Reflects the exclusion of the foreign currency transaction gains and losses in the statements of income primarily related to the non-permanent intercompany debt denominated in local currency translated to U.S. dollars.
- (e) Represents non-cash adjustments to the Company's LIFO reserves for certain inventories in the U.S. that are valued using the LIFO method, which we believe provides a means of comparison to other companies that may not use the same basis of accounting for inventories.
- (f) Relates to certain transaction costs, including debt financing, due diligence and other costs related to transactions that are completed, pending or abandoned, that we believe are not representative of our ongoing business operations.
- (g) Includes the impact of restructuring, integration and business optimization expenses which are incremental costs that are not representative of our ongoing business operations.
- (h) Represents adjustments for defined benefit pension plan (benefit) costs in our statements of income. More than two-thirds of our defined benefit pension plan obligations are under defined benefit pension plans that are frozen, and the remaining obligations primarily relate to plans operated in certain of our non-U.S. locations that, pursuant to jurisdictional requirements, cannot be frozen. As such, we do not view such income or expenses as core to our ongoing business operations.
- (i) Other costs consist of certain expenses that are not core to our ongoing business operations, including environmental remediation-related costs associated with the legacy operations of our business prior to a business combination consummated in a prior year period, capital and franchise taxes, non-cash asset retirement obligation accretion and the initial implementation of procedures to comply with Section 404 of the Sarbanes-Oxley Act. Included in this line-item are rounding discrepancies that may arise from rounding from dollars (in thousands) to dollars (in millions).

Adjusted Net Income

Summarized adjusted net income information is shown below in the following table:

	Six months ended June 30,					
	2020			2019		
	Pre-tax	Tax expense (benefit)	After-tax	Pre-tax	Tax expense (benefit)	After-tax
	(in millions)					
Reconciliation of net income attributable to PQ Group Holdings Inc. to Adjusted Net Income⁽¹⁾⁽²⁾						
Net income before non-controlling interest	\$ 34.5	\$ 17.7	\$ 16.8	\$ 56.9	\$ 22.8	\$ 34.1
Less: Net income attributable to non-controlling interest	0.6	—	0.6	0.4	—	0.4
Net income attributable to PQ Group Holdings Inc.	33.9	17.7	16.2	56.5	22.8	33.7
Amortization of investment in affiliate step-up ^(b)	3.3	1.3	2.0	4.2	1.5	2.7
Debt extinguishment costs	2.5	1.0	1.5	—	—	—
Net (gain) loss on asset disposals ^(c)	8.4	2.4	6.0	(8.8)	(1.9)	(6.9)
Foreign currency exchange loss ^(d)	2.5	1.0	1.5	0.9	(1.2)	2.1
LIFO (benefit) expense ^(e)	(1.8)	(0.7)	(1.1)	10.3	3.7	6.6
Transaction and other related costs ^(f)	2.8	1.1	1.7	1.1	0.4	0.7
Equity-based compensation	12.3	4.8	7.5	8.8	3.2	5.6
Restructuring, integration and business optimization expenses ^(g)	5.6	2.2	3.4	0.7	0.2	0.5
Defined benefit pension plan (benefit) cost ^(h)	(0.5)	(0.2)	(0.3)	1.5	0.5	1.0
Other ⁽ⁱ⁾	2.5	1.0	1.5	2.6	0.9	1.7
Adjusted Net Income, including non-cash GILTI tax	\$ 71.5	\$ 31.6	\$ 39.9	\$ 77.8	\$ 30.1	\$ 47.7
Impact of non-cash GILTI tax ⁽³⁾	—	(11.8)	11.8	—	(11.2)	11.2
Adjusted Net Income	\$ 71.5	\$ 19.8	\$ 51.7	\$ 77.8	\$ 18.9	\$ 58.9

(1) We define adjusted net income as net income attributable to PQ Group Holdings adjusted for non-operating income or expense and the impact of certain non-cash or other items that are included in net income that we do not consider indicative of our ongoing operating performance. Adjusted net income is presented as a key performance indicator as we believe it will enhance a prospective investor's understanding of our results of operations and financial condition. Adjusted net income may not be comparable with net income or adjusted net income as defined by other companies.

(2) Refer to the Adjusted EBITDA notes above for more information with respect to each adjustment.

(3) Amount represents the impact to tax expense in net income before non-controlling interest and the related adjustments to net income associated with the GILTI provisions of the TCJA. As of January 1, 2018, GILTI results in taxation of "excess of foreign earnings," which is defined as amounts greater than a 10% rate of return on applicable foreign tangible asset basis. The Company is required to record incremental tax provision impact with respect to GILTI as a result of having historical U.S. NOLs to offset the GILTI taxable income inclusion. This NOL utilization precludes us from recognizing FTCs which would otherwise help offset the tax impacts of GILTI. No FTCs will be recognized with respect to GILTI until our cumulative NOL balance has been exhausted. Because the GILTI provision does not impact our cash taxes (given available U.S. NOLs), and given that we expect to recognize FTCs to offset GILTI impacts once the NOLs are exhausted, we do not view this item as a component of core operations.

The adjustments to net income attributable to PQ Group Holdings Inc. are shown net of applicable tax rates of 39.4% and 35.6% for the six months ended June 30, 2020 and 2019, respectively, except for the foreign currency exchange loss for which the taxes are calculated as discrete items using the applicable statutory income tax rates.

Financial Condition, Liquidity and Capital Resources

Our primary sources of liquidity consist of cash flow from operations, existing cash balances as well as funds available under our asset based lending revolving credit facility. We expect that ongoing requirements for debt service and capital expenditures will be funded from these sources of funds. Our primary liquidity requirements include funding working capital requirements (primarily inventory and accounts receivable, net of accounts payable and other accrued liabilities), debt service requirements and capital expenditures. Our capital expenditures include both maintenance of business, which include spending on maintenance and health, safety and environmental initiatives as well as growth, which includes spending to drive organic sales growth and cost savings initiatives.

We believe that our existing cash, cash equivalents and cash flows from operations, combined with availability under our asset based lending revolving credit facility, will be sufficient to meet our presently anticipated future cash needs for at least the next twelve months. We may also pursue strategic acquisition or divestiture opportunities, which may impact our future cash requirements. We may, from time to time, increase borrowings under our asset based lending revolving credit facility to meet our future cash needs. As of June 30, 2020, we had cash and cash equivalents of \$88.6 million and availability of \$196.7 million under our asset based lending revolving credit facility, after giving effect to \$18.3 million of outstanding letters of credit, for a total available liquidity of \$285.3 million. We did not have any revolving credit facility borrowings as of June 30, 2020. As of June 30, 2020, we were in compliance with all covenants under our debt agreements.

Included in our cash and cash equivalents balance as of June 30, 2020 was \$57.5 million of cash and cash equivalents held in foreign jurisdictions. We repatriate cash held outside of the United States from certain foreign subsidiaries in order to meet domestic liquidity needs. Depending on domestic and foreign cash balances, we have certain flexibility to repatriate funds in order to meet those needs. Specifically, we have an intercompany loan structure in place with several of our foreign subsidiaries that allows us to repatriate foreign cash in a tax efficient manner from those subsidiaries. In certain cases, the repatriation of foreign cash under previous U.S. tax law had generally been subject to U.S. income taxes at the time of cash distribution. Due to the enactment of the TCJA in December 2017, future overseas earnings repatriation will generally no longer be subject to U.S. federal income taxes at the time of cash distribution. However, future foreign earnings may still be taxed for state income tax purposes, as well as subject to certain foreign withholding tax obligations, when cash amounts are distributed back to the U.S.

Our liquidity requirements are significant, primarily due to debt service requirements. As reported, our cash interest paid for the six months ended June 30, 2020 and 2019 was approximately \$54.2 million and \$59.0 million, respectively. Before any impact of hedges, a one percent change in assumed interest rates for our variable interest credit facilities would have an annual impact of approximately \$9.6 million on interest expense. We hedge the interest rate fluctuations on debt obligations through interest rate cap agreements. As of June 30, 2020, we had interest rate caps on \$1.0 billion of notional variable debt with a cap rate of 3.00% through July 2020 and, beginning in July 2020, have interest rate caps on \$500.0 million of notional variable debt with a cap rate of 0.84% through July 2022. In July 2020, we entered into additional interest rate cap agreements to mitigate interest rate volatility from August 2020 to August 2023, with a cap rate of 1.00% on \$400.0 million of notional variable-rate debt.

Cash Flow

	Six months ended June 30,	
	2020	2019
	(in millions)	
Net cash provided by (used in):		
Operating activities	\$ 62.1	\$ 60.0
Investing activities	(36.2)	(33.9)
Financing activities	(5.9)	(0.3)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(3.3)	(1.5)
Net change in cash, cash equivalents and restricted cash	16.7	24.3
Cash, cash equivalents and restricted cash at beginning of period	73.9	59.7
Cash, cash equivalents and restricted cash at end of period	\$ 90.6	\$ 84.0

	Six months ended June 30,	
	2020	2019
	(in millions)	
Net income	\$ 16.8	\$ 34.1
Non-cash and non-working capital related activities ⁽¹⁾	110.9	90.4
Changes in working capital	(64.4)	(60.2)
Other operating activities	(1.2)	(4.3)
Net cash provided by operating activities	<u>\$ 62.1</u>	<u>\$ 60.0</u>

⁽¹⁾ Includes depreciation, amortization, amortization of deferred financing costs and original issue discount, debt extinguishment costs, foreign currency exchange gains and losses, pension and postretirement healthcare benefit expense and funding, deferred income tax provision (benefit), net (gains) losses on asset disposals, stock compensation expense, net interest proceeds on swaps designated as net investment hedges (which is reflected below in net cash used in investing activities) and equity in net income and dividends received from affiliated companies.

	Six months ended June 30,	
	2020	2019
	(in millions)	
Working capital changes that provided (used) cash:		
Receivables	\$ (24.6)	\$ (46.3)
Inventories	(9.3)	(12.2)
Prepays and other current assets	—	2.2
Accounts payable	(15.3)	(0.2)
Accrued liabilities	(15.2)	(3.7)
	<u>\$ (64.4)</u>	<u>\$ (60.2)</u>

	Six months ended June 30,	
	2020	2019
	(in millions)	
Purchases of property, plant and equipment	\$ (50.5)	\$ (65.5)
Net interest proceeds on swaps designated as net investment hedges	2.2	4.5
Proceeds from sale of product line	—	26.7
Proceeds from sale of assets	10.3	—
Proceeds from sale of investment	1.8	—
Other, net	—	0.4
Net cash used in investing activities	<u>\$ (36.2)</u>	<u>\$ (33.9)</u>

	Six months ended June 30,	
	2020	2019
	(in millions)	
Net revolving credit facilities borrowings	\$ 0.8	\$ 2.6
Net cash repayments on debt obligations	—	(5.0)
Other financing activities	(6.7)	2.1
Net cash used in financing activities	<u>\$ (5.9)</u>	<u>\$ (0.3)</u>

Net cash provided by operating activities was \$62.1 million for the six months ended June 30, 2020, compared to \$60.0 million provided for the six months ended June 30, 2019. Cash generated by operating activities, other than changes in working capital, was higher during the six months ended June 30, 2020 by \$6.4 million compared to the same period in the prior year. The change in working capital during the six months ended June 30, 2020 was unfavorable compared to the six months ended June 30, 2019. Cash used to fund working capital was \$64.4 million and \$60.2 million for the six months ended June 30, 2020 and 2019, respectively.

The increase in cash generated by operating activities, other than changes in working capital, was higher by \$6.4 million as compared to the prior year period primarily due to an increase in dividends received from affiliated companies partially offset by lower net interest income on our cross currency swaps.

The decrease in cash from working capital of \$4.2 million as compared to the prior year was primarily due to unfavorable changes in accounts payable and accrued liabilities partially offset by favorable changes in accounts receivable.

The unfavorable change in accounts payable was a result of lower current production and the timing of plant maintenance expenditures. The unfavorable change in accrued liabilities relates to the timing of various expense accruals. The favorable change in accounts receivable was driven by the decline in sales volumes within our Performance Chemicals and Refining Services segments.

Net cash used in investing activities was \$36.2 million for the six months ended June 30, 2020, compared to cash used of \$33.9 million during the same period in 2019. Cash used in investing activities primarily consisted of utilizing \$50.5 million and \$65.5 million to fund capital expenditures during the six months ended June 30, 2020 and 2019, respectively. We received \$2.2 million and \$4.5 million in interest proceeds related to our cross-currency swaps during the six months ended June 30, 2020 and 2019, respectively. We received proceeds of \$12.1 million related to the sale of non-core assets and investments and \$26.7 million related to the sale of a non-core product line during the six months ended June 30, 2020 and 2019, respectively.

Net cash used in financing activities was \$5.9 million for the six months ended June 30, 2020, compared to net cash used of \$0.4 million during the same period in 2019. Net cash used in financing activities was primarily driven by \$3.0 million in debt issuance costs related to our Term Loan Facility amendment and \$3.9 million of stock buybacks during the six months ended June 30, 2020. Net cash used in financing activities was primarily driven by \$5.0 million of long-term debt repayments partially offset by \$2.6 million of net borrowings under our revolving credit facilities made through the six months ended June 30, 2019.

Debt

	June 30, 2020	December 31, 2019
	(in millions)	
Term Loan Facility	\$ 947.5	\$ 947.5
6.75% Senior Secured Notes due 2022	625.0	625.0
5.75% Senior Unsecured Notes due 2025	295.0	295.0
ABL Facility	—	—
Other	65.5	64.6
Total debt	1,933.0	1,932.1
Original issue discount	(14.4)	(13.4)
Deferred financing costs	(11.0)	(11.7)
Total debt, net of original issue discount and deferred financing costs	1,907.5	1,907.0
Less: current portion	(8.6)	(7.8)
Total long-term debt, excluding current portion	\$ 1,898.9	\$ 1,899.2

As of June 30, 2020, our total debt was \$1,933.0 million, including \$13.7 million of other foreign debt and \$51.8 million of notes payable for the New Market Tax Credit financing and excluding the original issue discount of \$14.4 million and deferred financing fees of \$11.0 million for our senior secured credit facilities and notes. Our net debt as of June 30, 2020 was \$1,844.4 million, including cash and cash equivalents of \$88.6 million. We may seek, subject to market conditions and other factors, opportunities to repurchase, refinance or otherwise reprice our debt.

Capital Expenditures

Maintenance capital expenditures include spending on maintenance of business, health, safety and environmental initiatives. Growth capital expenditures include spending to drive organic sales growth and cost savings initiatives. These capital expenditures represent our “book” capital expenditures for which the company has recorded, but not necessarily paid for the capital expenditures.

	Six months ended June 30,	
	2020	2019
	(in millions)	
Maintenance capital expenditures	\$ 25.4	\$ 36.3
Growth capital expenditures	8.3	15.1
Total capital expenditures	<u>\$ 33.7</u>	<u>\$ 51.4</u>

Capital expenditures remained at a level sufficient for required maintenance and certain expansion growth initiatives during these periods. Maintenance capital expenditures are lower in the six months ended June 30, 2020 as compared to the six months ended June 30, 2019 due to fewer plant maintenance projects incurred during the period. Growth capital expenditures are lower in the six months ended June 30, 2020 as compared to the six months ended June 30, 2019 due to decreased spending at our production facilities.

Pension Funding

We paid \$4.2 million and \$3.6 million in cash contributions into our defined benefit pension plans and other post-retirement plans during the six months ended June 30, 2020 and 2019, respectively. The net periodic pension benefit was \$0.0 million and net periodic pension expense was \$2.2 million for those same periods, respectively.

Off-Balance Sheet Arrangements

We had \$18.3 million of outstanding letters of credit on our ABL Facility as of June 30, 2020.

Contractual Obligations

Information related to our contractual obligations at December 31, 2019 can be found in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in our Annual Report on Form 10-K for the year ended December 31, 2019, filed with the SEC on February 27, 2020, which we refer to as our Annual Report on Form 10-K. During the six months ended June 30, 2020, there have been no significant changes to our contractual obligations as disclosed in our Annual Report on Form 10-K, other than the following items.

During the quarter ended March 31, 2020, we amended our Term Loan Facility to reduce the applicable interest rate to LIBOR (with a 0% floor) plus 2.25% per annum and extend the maturity of the facility to February 2027. We anticipate that the reduction in interest rates will result in a \$2.4 million reduction in interest payments per year at current interest rates. During the quarter ended March 31, 2020, we amended our ABL Facility to increase the aggregate amount of the revolving loan commitments to \$250.0 million, reduce the interest rate and extend the maturity to March 2025.

In July 2020, we redeemed our existing 6.75% Senior Secured Notes due 2022 with the proceeds from a new senior secured term loan facility in an aggregate principal amount of \$650.0 million with an original issue discount of 1.5% and interest at a floating rate of LIBOR (with a 1.0% minimum LIBOR floor) plus 3.0% per annum.

Refer to Note 13, “Long-term Debt,” to our condensed consolidated financial statements under Item 1, “Financial Statements,” in this Quarterly Report on Form 10-Q for additional information.

Critical Accounting Policies and Estimates

We prepare our condensed consolidated financial statements in conformity with GAAP and our significant accounting policies are described in Note 2 to our audited consolidated financial statements included in our Annual Report on Form 10-K. The preparation of financial statements in conformity with GAAP requires us to make estimates and assumptions that affect reported amounts and related disclosures. We base our estimates and judgments on historical experience and other relevant factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We evaluate our critical accounting estimates, assumptions and judgments on an ongoing basis.

There has been no material change in our critical accounting policies and use of estimates from those described in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” included in our Annual Report on Form 10-K, other than the following item.

Goodwill and Intangible Assets

Goodwill and intangible assets with indefinite lives are not amortized, but are tested for impairment annually or more frequently if events occur or circumstances change that would more likely than not reduce the fair value of the reporting unit below its carrying amount. We perform our annual impairment tests of goodwill and indefinite-lived intangible assets as of October 1 of each year.

For the purposes of the quantitative goodwill impairment test, we determine the fair value of our reporting units using a combination of a market approach and an income, or discounted cash flow, approach. Estimating the fair value of a reporting unit requires various assumptions including the use of projections of future cash flows and discount rates that reflect the risks associated with achieving those cash flows. The key assumptions used in estimating the fair value are operating margin growth rates, revenue growth rates, the weighted average cost of capital, the perpetual growth rate, and the estimated earnings market multiples of each reporting unit. The market value is estimated using publicly traded comparable company values by applying their most recent annual EBITDA multiples to the reporting unit's EBITDA for the trailing twelve months. The income approach value is estimated using a discounted cash flow approach. The assumptions about future cash flows and growth rates are based on our assessment of a number of factors including the reporting unit's recent performance against budget as well as management's ability to execute on planned future strategic initiatives. Discount rate assumptions are based on an assessment of the risk inherent in those future cash flows. The fair values of the Company's four reporting units exceeded their respective carrying amounts as of the last annual goodwill impairment test date on October 1, 2019 by the following percentages: 179% for Refining Services, 67% for Catalysts, 27% for Performance Materials and 18% for Performance Chemicals.

Based on the operating results for the three and six months ended June 30, 2020 and other considerations, we believe that it is more likely than not that the fair values for each of our reporting units and of our indefinite-lived intangible assets are still greater than their respective carrying values. Accordingly, no interim goodwill or intangible asset impairment assessments were considered necessary at June 30, 2020. The Company will continue to monitor business plans throughout 2020 to determine if an interim goodwill and intangible assets impairment evaluation should be conducted. Changes in assumptions regarding future business performance and macroeconomic conditions, particularly those associated with the COVID-19 pandemic, may have a significant impact on future cash flows and reporting unit or intangible asset valuations. A significant downturn in global economic growth, or recessionary conditions in the U.S., Europe, South America and Asia for prolonged periods, may lead to reduced customer demand for the Company's reporting units, or material supply chain interruptions or product shortages. To the extent that such developing economic conditions negatively impact customer demand for our products or product availability over an extended period, our businesses, results of operations and financial condition could be significantly and adversely affected, which could result in future impairments of goodwill and intangible assets.

Accounting Standards Not Yet Adopted

See Note 2 to our unaudited condensed consolidated financial statements for a discussion of recently issued accounting standards and their effect on us.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Our major market risk exposure is potential losses arising from changing rates and prices regarding foreign currency exchange rate risk, interest rate risk, commodity price risk and credit risk. The audit committee of our board of directors regularly reviews foreign exchange, interest rate and commodity hedging activity and monitors compliance with our hedging policy. We do not use financial instruments for speculative purposes, and we limit our hedging activity to the underlying economic exposure.

There have been no material changes in the foreign exchange risk, interest rate risk, commodity risk or credit risk discussed in Item 7A., "Quantitative and Qualitative Disclosures about Market Risk," included in our Annual Report on Form 10-K other than the following items:

Interest Rate Risk

In February 2020, we restructured our \$500.0 million notional interest rate cap agreements from July 31, 2020 through July 31, 2022 to lower the interest cap rate to 2.50% with a \$0.1 million premium annuitized during the effective period. In March 2020, we further restructured our \$500.0 million notional interest rate cap agreements from July 31, 2020 through July 31, 2022 to lower the interest cap rate to 0.84% with a \$0.9 million premium annuitized during the effective period. Including the premiums on the original November 2018 agreement and the February and March 2020 restructurings, the total cumulative annuitized premium of \$4.4 million will be paid through July 31, 2022 on our interest rate cap agreements.

In July 2020, we entered into additional interest rate cap agreements to mitigate interest rate volatility from August 2020 to August 2023, with a cap rate of 1.00% on \$400.0 million of notional variable-rate debt.

ITEM 4. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of June 30, 2020, the end of the period covered by this Quarterly Report on Form 10-Q.

The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (“Exchange Act”), means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at a reasonable assurance level.

Changes in Internal Control Over Financial Reporting

Starting with the last few weeks of the quarter ended March 31, 2020 and continuing through the quarter ended June 30, 2020, the majority of our office and management personnel have been working remotely as a result of the COVID-19 pandemic. Included within this group are individuals responsible for the execution of the Company’s set of internal controls over financial reporting. We have provided these individuals with what we believe to be the appropriate resources to continue to perform their duties on a remote basis, and are not aware of any impediments or other issues that materially affected, or which are reasonably likely to materially affect, our internal control over financial reporting. We will continue to monitor and assess the COVID-19 situation for any potential impact on the design and operating effectiveness of our internal control over financial reporting. There were no other changes in our internal control over financial reporting during the quarter ended June 30, 2020 that materially affected, or which are reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS.

From time to time we may be subject to various legal claims and proceedings incidental to the normal conduct of business, relating to such matters as personal injury, product liability and warranty claims, waste disposal practices, release of chemicals into the environment and other matters that may arise in the ordinary course of our business. We currently believe that there is no litigation pending that is likely to have a material adverse effect on our business. Regardless of the outcome, legal proceedings can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

ITEM 1A. RISK FACTORS.

“Item 1A, Risk Factors” in our Annual Report on Form 10-K includes a discussion of our risk factors. The information presented below updates, and should be read in conjunction with, the risk factors disclosed in our Annual Report on Form 10-K. The effects of the events and circumstances described in the following risk factor may have the additional effect of heightening many of the risks noted in our Annual Report on Form 10-K. Except as presented below, there have been no material changes from the risk factors described in our Annual Report on Form 10-K.

The recent COVID-19 pandemic has adversely affected the Company’s operations and it is likely that there will be future negative effects that we cannot presently predict, including near term effects. The longer the pandemic persists, the more material the ultimate effects are likely to be.

Economic and health conditions across most of the globe continue to change rapidly in response to the ongoing COVID-19 pandemic. COVID-19 is affecting our customers, suppliers, vendors and other business partners, and has adversely impacted, and is expected to continue to adversely impact, our operations. We are unable to predict how long the COVID-19 pandemic will persist and the responses by the government, private parties or society that may have an impact on our business. The impact of the COVID-19 pandemic and associated containment and remediation efforts is rapidly evolving. We expect the duration and magnitude of the virus’s impact on the levels of economic activity in the United States and globally to affect the magnitude of its impact on our results of operations, which could be material. Any extended disruption to our sales, supply or distribution channels or extended decrease in the demand for our products may substantially impact our results of operations.

The COVID-19 pandemic has led to unprecedented disruptions within the macro economy, which led to an overall lower sales volume demand during the second quarter of 2020. The timing and magnitude of the impact to sales volume demand varied across our portfolio of businesses due to the many end uses, as further described under “Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations-Overview-Impact of COVID-19 on our Business and Results-Near Term Trends on Business Segment End Uses” in this Form 10-Q. We expect decreased demand for certain of our products in the near term, primarily in our Refining Services, Performance Chemicals and Catalysts segments, and, to a lesser extent, in our Performance Materials segment, as a result of stay-at-home decrees and other government restrictions. In particular, we expect lower demand in our Catalysts segment due to delays in customer orders as well as lower emission control catalyst demand due to slower heavy-duty diesel production. As a result of this slowdown in our business, we took certain actions during the second quarter of 2020, including adjusting production levels to meet anticipated customer demand, reducing discretionary spending, furloughing certain employees, delaying headcount additions and deferring capital maintenance expenditures. These actions may extend into the second half of the year as a result of any continued slowdown in our business.

We have also experienced disruptions in the availability of certain of our raw materials and other supplies, and any additional disruptions may adversely impact our production. For example, during the second quarter, glass cullet suppliers in Canada, France and the United Kingdom suspended operations, which caused short-term delays in acquiring raw materials used in our manufacturing process.

Further, our employees are being affected by the COVID-19 pandemic. Nearly all of our office and management personnel are working remotely and those employees engaged in manufacturing operations have been provided with equipment in response to local governmental orders. Due to local government imposed quarantines, we have had limited and temporary shutdowns or slowdowns in some of our manufacturing facilities, which have not caused a material disruption in operations. In addition, during the second quarter, we experienced production delays at several of our manufacturing facilities as a result of employee absenteeism related to the COVID-19 pandemic. We may need to enact further precautionary measures to help minimize the risk of our employees being exposed to the coronavirus, which would result in further production delays. In the event that an outbreak of COVID-19 occurs at a manufacturing facility or if national, state or local governments impose additional orders that require the suspension of manufacturing at our facilities, we would experience additional delays in production.

ITEM 6. EXHIBITS.

The following exhibits are being filed or furnished as part of this Quarterly Report on Form 10-Q:

<u>Exhibit No.</u>	<u>Description</u>
10.1	<u>New Term Loan Credit Agreement, dated as of July 22, 2020 among CPO Midco I Corporation, PQ Corporation, Eco Services Operations Corp., Credit Suisse AG, Cayman Islands Branch, as administrative agent and collateral agent, and the lenders from time to time party thereto (incorporated by reference to Exhibit 10.1 to the Company's Form 8-K, filed July 28, 2020)</u>
31.1	<u>Certification of Chief Executive Officer of PQ Group Holdings Inc. pursuant to Section 302 of the Sarbanes-Oxley Act of 2002</u>
31.2	<u>Certification of Chief Financial Officer of PQ Group Holdings Inc. pursuant to Section 302 of the Sarbanes-Oxley Act of 2002</u>
32.1	<u>Certification of Chief Executive Officer of PQ Group Holdings Inc. pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002</u>
32.2	<u>Certification of Chief Financial Officer of PQ Group Holdings Inc. pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002</u>
101	The following materials from the Quarterly Report on Form 10-Q of PQ Group Holdings Inc. for the quarter ended June 30, 2020, formatted in Inline XBRL: (i) Condensed Consolidated Statements of Income, (ii) Condensed Consolidated Statements of Comprehensive Income, (iii) Condensed Consolidated Balance Sheets, (iv) Condensed Consolidated Statements of Stockholders' Equity, (v) Condensed Consolidated Statements of Cash Flows, (vi) Notes to Condensed Consolidated Financial Statements and (vii) document and entity information, tagged as blocks of text and including detailed tags
104	The cover page from the Quarterly Report on Form 10-Q of PQ Group Holdings Inc. for the quarter ended June 30, 2020, formatted in Inline XBRL and included as Exhibit 101

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

PQ GROUP HOLDINGS INC.

Date: August 3, 2020

By: /s/ MICHAEL CREWS

Michael Crews

Executive Vice President and Chief Financial Officer

(Duly Authorized Officer and Principal Financial and Accounting Officer)

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Belgacem Chariag, certify that:

1. I have reviewed this quarterly report on Form 10-Q of PQ Group Holdings Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 3, 2020

/s/ BELGACEM CHARIAG

Belgacem Chariag
Chairman of the Board, President and Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Michael Crews, certify that:

1. I have reviewed this quarterly report on Form 10-Q of PQ Group Holdings Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 3, 2020

/s/ MICHAEL CREWS

Michael Crews
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the quarterly report of PQ Group Holdings Inc. (the "Company") on Form 10-Q for the quarterly period ended June 30, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Belgacem Chariag, Chairman of the Board, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 3, 2020

/s/ BELGACEM CHARIAG

Belgacem Chariag

Chairman of the Board, President and Chief Executive Officer

(Principal Executive Officer)

**CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the quarterly report of PQ Group Holdings Inc. (the "Company") on Form 10-Q for the quarterly period ended June 30, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Michael Crews, Executive Vice President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 3, 2020

/s/ MICHAEL CREWS

Michael Crews

Executive Vice President and Chief Financial Officer

(Principal Financial Officer)