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

FORM 10-K

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2017
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 001-12019

QUAKER CHEMICAL CORPORATION
(Exact name of Registrant as specified in its charter)

A Pennsylvania Corporation	**No. 23-0993790**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
One Quaker Park, 901 E. Hector Street, Conshohocken, Pennsylvania	**19428-2380**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (610) 832-4000

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

Title of each class	Name of each Exchange on which registered
Common Stock, $1.00 par value	**New York Stock Exchange**

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

None

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

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

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 x No ☐

Indicate by check mark whether the Registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files). Yes x No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or 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 x	Accelerated filer ☐
Non-accelerated filer ☐ (Do not check if smaller reporting company)	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 Act). Yes ☐ No x

State the aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant. (The aggregate market value is computed by reference to the last reported sale on the New York Stock Exchange on June 30, 2017): $1,908,157,945

Indicate the number of shares outstanding of each of the Registrant's classes of common stock as of the latest practicable date: 13,306,968 shares of Common Stock, $1.00 Par Value, as of January 31, 2018.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive Proxy Statement relating to the 2018 Annual Meeting of Shareholders are incorporated by reference into Part III.

QUAKER CHEMICAL CORPORATION
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PART I

As used in this Report, the terms "Quaker," the "Company," "we" and "our" refer to Quaker Chemical Corporation, its subsidiaries, and associated companies, unless the context otherwise requires.

Item 1. ***Business.***

General Description

Quaker develops, produces, and markets a broad range of formulated chemical specialty products and offers chemical management services ("CMS") for various heavy industrial and manufacturing applications in a global portfolio throughout its four regions: the North America region, the Europe, Middle East and Africa ("EMEA") region, the Asia/Pacific region and the South America region. The principal products and services in Quaker's global portfolio include: (i) rolling lubricants (used by manufacturers of steel in the hot and cold rolling of steel and by manufacturers of aluminum in the hot rolling of aluminum); (ii) machining and grinding compounds (used by metalworking customers in cutting, shaping, and grinding metal parts which require special treatment to enable them to tolerate the manufacturing process, achieve closer tolerance, and improve tool life); (iii) hydraulic fluids (used by steel, metalworking, and other customers to operate hydraulic equipment); (iv) corrosion preventives (used by steel and metalworking customers to protect metal during manufacture, storage, and shipment); (v) specialty greases (used in automotive and aerospace production processes and applications, the manufacturing of steel, and various other applications); (vi) metal finishing compounds (used to prepare metal surfaces for special treatments such as galvanizing and tin plating and to prepare metal for further processing); (vii) forming compounds (used to facilitate the drawing and extrusion of metal products); (viii) chemical milling maskants for the aerospace industry; (ix) temporary and permanent coatings for metal and concrete products; (x) construction products, such as flexible sealants and protective coatings, for various applications; (xi) bio-lubricants (that are mainly used in machinery in the forestry and construction industries); (xii) die casting lubricants; and (xiii) programs to provide CMS. The following are the respective contributions to consolidated net sales of each individual product line representing 10% or more of consolidated net sales for any of the past three years:

	2017	2016	2015
Rolling lubricants	17.8 %	19.0 %	18.6 %
Machining and grinding compounds	15.8 %	14.9 %	15.3 %
Hydraulic fluids	11.6 %	12.0 %	12.6 %
Corrosion preventives	11.4 %	11.8 %	12.0 %
Specialty greases	10.0 %	10.1 %	8.5 %

Acquisition Activity

On April 4, 2017, Quaker entered into a share purchase agreement with Gulf Houghton Lubricants, Ltd. ("Gulf") to purchase the entire issued and outstanding share capital of Houghton International, Inc. ("Houghton") (herein referred to as "the Combination"). The shares will be bought for aggregate purchase consideration consisting of: (i) $172.5 million in cash; (ii) a number of shares of common stock, $1.00 par value per share, of the Company comprising 24.5% of the common stock outstanding upon the closing of the Combination; and (iii) the Company's assumption of Houghton's net indebtedness as of the closing of the Combination, which was approximately $690 million at signing. At closing, the total aggregate purchase consideration is dependent on the Company's stock price and the level of Houghton's indebtedness.

The Company secured $1.15 billion in commitments from Bank of America Merrill Lynch and Deutsche Bank to fund the Combination and to provide additional liquidity, and has since replaced these commitments with a syndicated bank agreement ("the New Credit Facility") with a group of lenders for $1.15 billion. The New Credit Facility is contingent upon and will not be effective until the closing of the Combination. The New Credit Facility includes a $400.0 million multicurrency revolver, a $575.0 million USD term loan and a $175.0 million EUR equivalent term loan, each with a five-year term from the date the New Credit Facility becomes effective. The maximum amount available under the New Credit Facility can be increased by $200.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under the New Credit Facility will bear interest at a base rate or LIBOR rate plus a margin. The Company currently estimates the annual floating rate cost will be in the 3.50% to 3.75% range based on current market interest rates. The New Credit Facility will be subject to certain financial and other covenants, including covenants that the Company's consolidated net debt to adjusted EBITDA ratio cannot exceed 4.25 to 1 and the Company's consolidated adjusted EBITDA to interest expense ratio cannot be less than 3.0 to 1. Both the USD and EUR equivalent term loans will have quarterly principal amortization during their respective five-year terms, with 5% amortization of the principal balance due in years 1 and 2, 7.5% in year 3, and 10% in years 4 and 5, with the remaining principal amounts due at maturity. Until closing, the Company incurs certain interest costs paid to maintain the banks' committed capital. These interest costs began to accrue on September 29, 2017 and bear an interest rate of 0.30% per annum.

In addition, the issuance of the Company's shares at closing of the Combination was subject to approval by Quaker's shareholders under the rules of the New York Stock Exchange, and approval was received at a meeting of the Company's shareholders during the third quarter of 2017. Also, the Combination is subject to regulatory approval in the United States, Europe, China and Australia. The Company received regulatory approval from China in July 2017 and from Australia in October 2017. Depending on the remaining regulatory approvals and other customary terms and conditions set forth in the share purchase agreement, the Company currently estimates closing of the Combination will occur during the first half of 2018.

In December 2017, the Company expanded its business through the acquisition of the remaining 45% ownership interest in its India affiliate, Quaker Chemical India Private Limited ("QCIL") for approximately $31.8 million. QCIL sells products to the steel and metalworking industries in India and has associates based in various locations around India. The Company had been a joint venture partner in QCIL for 20 years. India is a market with strong growth opportunities in most of the Company's business lines and this acquisition, along with a new plant in Dahej to be completed in 2018, further strengthens the Company's position in India while also simplifying the overall corporate structure and improving organizational efficiencies. In addition, the Company acquired assets associated with a business that markets, sells and manufacturers certain metalworking fluids in North America in May 2017 for approximately $5.4 million.

Sales Revenue

A substantial portion of Quaker's sales worldwide are made directly through its own employees and its CMS programs with the balance being handled through distributors and agents. Quaker employees visit the plants of customers regularly, some work on site, and through training and experience identify production issues which can be resolved or alleviated either by adapting Quaker's existing products or by applying new formulations developed in Quaker's laboratories. Quaker's new business development relies less on the use of advertising, and more heavily upon its reputation in the markets which it serves. Generally, separate manufacturing facilities of a single customer are served by different personnel.

The Company recognizes revenue in accordance with the terms of its underlying customer agreements, when title and risk of loss have been transferred, when collectability is reasonably assured, and when pricing is fixed or determinable. This generally occurs for product sales when products are shipped or delivered to customers; for consignment-type arrangements, upon usage by the customer; and for services, when they are performed. Related to other income generation, Quaker receives license fees and royalties and includes them in other income when the amounts are recognized in accordance with their agreed-upon terms, when performance obligations are satisfied, when the amount is fixed or determinable, and when collectability is reasonably assured.

As part of the Company's CMS, certain third-party product sales to customers are managed by the Company. Where the Company acts as principal, revenues are recognized on a gross reporting basis at the selling price negotiated with its customers. Where the Company acts as an agent, such revenue is recorded using the net reporting method as service revenues at the amount of the administrative fee earned by the Company for ordering the goods. Third-party products transferred under arrangements resulting in net reporting revenue totaled $44.5 million, $43.5 million and $48.6 million for the years ended December 31, 2017, 2016 and 2015, respectively.

Competition

The chemical specialty industry comprises a number of companies of similar size as well as companies larger and smaller than Quaker. Quaker cannot readily determine its precise position in every industry it serves. Based on information available to Quaker, however, the Company estimates it holds a leading global position in the market for process fluids to produce sheet steel. The Company also believes it holds significant global positions in the markets for process fluids in portions of the automotive and industrial markets. The offerings of many of our competitors differ from those of Quaker; some offer a broad portfolio of fluids, including general lubricants, while others have more specialized product ranges. All competitors provide different levels of technical services to individual customers. Competition in the industry is based primarily on the ability to provide products that meet the needs of the customer and render technical services and laboratory assistance to the customer, and to a lesser extent on price.

Major Customers and Markets

In 2017, Quaker's five largest customers (each composed of multiple subsidiaries or divisions with semi-autonomous purchasing authority) accounted for approximately 18% of consolidated net sales, with its largest customer accounting for approximately 8% of consolidated net sales. A significant portion of Quaker's revenues are realized from the sale of process fluids and services to manufacturers of steel, automobiles, aircraft, appliances, and durable goods, and, therefore, Quaker is subject to the same business cycles as those experienced by these manufacturers and their customers. Quaker's financial performance is generally correlated to the volume of global production within the industries it serves, rather than discretely related to the financial performance of such industries. Furthermore, steel customers typically have limited manufacturing locations compared to metalworking customers and generally use higher volumes of products at a single location.

Raw Materials

Quaker uses over 1,000 raw materials including mineral oils and derivatives, animal fats and derivatives, vegetable oils and derivatives, ethylene derivatives, solvents, surface active agents, various smaller quantities of chemicals compounds that act as additives to our base formulations ("additives") and a wide variety of other organic and inorganic compounds. During the years ended December 31, 2017, 2016 and 2015, three of our larger raw material groups (mineral oils and derivatives, animal fats and derivatives, and vegetable oils and derivatives) in the aggregate accounted for approximately one third of the total cost of Quaker's raw material purchases during each period, with each being roughly proportional to the total aggregate spend. The price of mineral oil and its derivatives can be affected by the price of crude oil and industry refining capacity. Animal fat and vegetable oil prices are impacted by biodiesel consumption which is also affected by the price of crude oil. In addition, other significant raw material purchases including ethylene derivatives, solvents, surface active agents and additives are also indirectly impacted by trends in mineral oil and derivatives and, therefore, crude oil trends. Accordingly, significant fluctuations in the price of crude oil could have a material impact

on the cost of these raw materials. In addition, many of the raw materials used by Quaker are commodity chemicals which can experience significant price volatility. Accordingly, Quaker's earnings could be affected by market changes in raw material prices. Reference is made to the disclosure contained in Item 7A of this Report.

Patents and Trademarks

Quaker has a limited number of patents and patent applications, including patents issued, applied for, or acquired in the United States and in various foreign countries, some of which may prove to be material to its business. Principal reliance is placed upon Quaker's proprietary formulae and the application of its skills and experience to meet customer needs. Quaker's products are identified by trademarks that are registered throughout its marketed area.

Research and Development—Laboratories

Quaker's research and development laboratories are directed primarily toward applied research and development since the nature of Quaker's business requires continual modification and improvement of formulations to provide chemical specialties to satisfy customer requirements. Quaker maintains quality control laboratory facilities in each of its manufacturing locations. In addition, Quaker maintains laboratory facilities in Conshohocken, Pennsylvania; Santa Fe Springs, California; Batavia, New York; Aurora, Illinois; Dayton, Ohio; Uithoorn, The Netherlands; Navarra, Spain; Barcelona, Spain; Rio de Janiero, Brazil; Qingpu, China; and Kolkata, India that, in addition to quality control, are devoted primarily to applied research and development.

Research and development costs are expensed as incurred. Research and development expenses during the years ended December 31, 2017, 2016 and 2015 were $23.9 million, $22.5 million and $22.1 million, respectively.

Most of Quaker's subsidiaries and associated companies also have laboratory facilities. Although not as complete as the laboratories mentioned above, these facilities are generally sufficient for the requirements of the customers being served. If problems are encountered which cannot be resolved by local laboratories, such problems are generally referred to the laboratory staff in Conshohocken, Santa Fe Springs, Uithoorn or Qingpu.

Regulatory Matters

In order to facilitate compliance with applicable federal, state, and local statutes and regulations relating to occupational health and safety and protection of the environment, the Company has an ongoing program of site assessment for the purpose of identifying capital expenditures or other actions that may be necessary to comply with such requirements. The program includes periodic inspections of each facility by Quaker and/or independent experts, as well as ongoing inspections and training by on-site personnel. Such inspections address operational matters, record keeping, reporting requirements and capital improvements. Capital expenditures directed solely or primarily to regulatory compliance amounted to approximately $1.6 million, $0.9 million and $2.3 million during the years ended December 31, 2017, 2016 and 2015, respectively. In 2018, the Company expects to incur approximately $2.4 million for capital expenditures directed primarily to regulatory compliance.

Number of Employees

On December 31, 2017, Quaker's consolidated companies had approximately 2,110 full-time employees of whom approximately 640 were employed by the parent company and its U.S. subsidiaries, and approximately 1,470 were employed by its non-U.S. subsidiaries. Associated companies of Quaker (in which it owns 50% or less and has significant influence) employed approximately 70 people on December 31, 2017.

Company Segmentation

The Company's reportable operating segments reflect the structure of the Company's internal organization, the method by which the Company's resources are allocated and the manner by which the Company assesses and manages its performance. The Company's reportable operating segments are organized by geography as follows: North America, EMEA, Asia/Pacific and South America. See Note 4 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report and is incorporated herein by this reference.

Non-U.S. Activities

Since significant revenues and earnings are generated by non-U.S. operations, Quaker's financial results are affected by currency fluctuations, particularly between the U.S. dollar and the euro, the Brazilian real, the Mexican peso, the Chinese renminbi and the Indian rupee, and the impact of those currency fluctuations on the underlying economies. Incorporated by reference is (i) the foreign exchange risk information contained in Item 7A of this Report, (ii) the geographic information in Note 4 of Notes to Consolidated Financial Statements included in Item 8 of this Report and (iii) information regarding risks attendant to foreign operations included in Item 1A of this Report.

Quaker on the Internet

Financial results, news and other information about Quaker can be accessed from the Company's website at http://www.quakerchem.com. This site includes important information on the Company's locations, products and services, financial reports, news releases and career opportunities. The Company's periodic and current reports on Forms 10-K, 10-Q, 8-K, and other filings, including exhibits and supplemental schedules filed therewith, and amendments to those reports, filed with the Securities and

Exchange Commission ("SEC") are available on the Company's website, free of charge, as soon as reasonably practicable after they are electronically filed with or furnished to the SEC. Information contained on, or that may be accessed through, the Company's website is not incorporated by reference in this Report and, accordingly, you should not consider that information part of this Report.

Factors that May Affect Our Future Results

(Cautionary Statements under the Private Securities Litigation Reform Act of 1995)

Certain information included in this Report and other materials filed or to be filed by Quaker with the SEC (as well as information included in oral statements or other written statements made or to be made by us) contain or may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements can be identified by the fact that they do not relate strictly to historical or current facts. We have based these forward-looking statements on our current expectations about future events. These forward-looking statements include statements with respect to our beliefs, plans, objectives, goals, expectations, anticipations, intentions, financial condition, results of operations, future performance, and business, including:

- statements relating to our business strategy;
- our current and future results and plans; and
- statements that include the words "may," "could," "should," "would," "believe," "expect," "anticipate," "estimate," "intend," "plan" or similar expressions.

Such statements include information relating to current and future business activities, operational matters, capital spending, and financing sources. From time to time, forward-looking statements are also included in Quaker's other periodic reports on Forms 10-K, 10-Q and 8-K, press releases, and other materials released to, or statements made to, the public.

Any or all of the forward-looking statements in this Report, in Quaker's Annual Report to Shareholders for 2017 and in any other public statements we make may turn out to be wrong. This can occur as a result of inaccurate assumptions or as a consequence of known or unknown risks and uncertainties. Many factors discussed in this Report will be important in determining our future performance. Consequently, actual results may differ materially from those that might be anticipated from our forward-looking statements.

We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise. However, any further disclosures made on related subjects in Quaker's subsequent reports on Forms 10-K, 10-Q, 8-K and other related filings should be consulted. Our forward-looking statements are subject to risks, uncertainties and assumptions about us and our operations that are subject to change based on various important factors, some of which are beyond our control. A major risk is that the demand for the Company's products and services is largely derived from the demand for our customers' products, which subjects the Company to uncertainties related to downturns in a customer's business and unanticipated customer production shutdowns. Other major risks and uncertainties include, but are not limited to, significant increases in raw material costs, customer financial stability, worldwide economic and political conditions, foreign currency fluctuations, significant changes in applicable tax rates and regulations, future terrorist attacks and other acts of violence, each of which is discussed in greater detail in Item 1A of this Report. Furthermore, the Company is subject to the same business cycles as those experienced by steel, automobile, aircraft, appliance, and durable goods manufacturers. These risks, uncertainties, and possible inaccurate assumptions relevant to our business could cause our actual results to differ materially from expected and historical results. Other factors beyond those discussed in this Report, could also adversely affect us including, but not limited to the following related to the Combination:

- the risk that a required regulatory approval will not be obtained or is subject to conditions that are not anticipated or acceptable to us;
- the potential that regulatory authorities may require that we make divestitures in connection with the Combination of a greater amount than we anticipated, which would result in a smaller than anticipated combined business;
- the risk that a closing condition to the Combination may not be satisfied in a timely manner;
- risks associated with the financing of the Combination;
- the occurrence of any event, change or other circumstance that could give rise to the termination of the share purchase agreement;
- potential adverse effects on Quaker Chemical's business, properties or operations caused by the implementation of the Combination;
- Quaker Chemical's ability to promptly, efficiently and effectively integrate the operations of Houghton and Quaker Chemical;
- risks related to each company's distraction from ongoing business operations due to the Combination; and,
- the outcome of any legal proceedings that may be instituted against the companies related to the Combination.

Therefore, we caution you not to place undue reliance on our forward-looking statements. For more information regarding these risks and uncertainties as well as certain additional risks that we face, see refer to the Risk Factors section, which appears in Item 1A of this report, as well as the proxy statement the Company filed on July 31, 2017 and in our quarterly and other reports filed from time to time with the SEC. This discussion is provided as permitted by the Private Securities Litigation Reform Act of 1995.

Item 1A. *Risk Factors.*

Changes to the industries and markets that Quaker serves could have a material adverse effect on the Company's liquidity, financial position and results of operations.

The business environment in which the Company operates remains uncertain. The Company is subject to the same business cycles as those experienced by steel, automobile, aircraft, appliance, and durable goods manufacturers. A major risk is that demand for the Company's products and services is largely derived from the global demand for its customers' products, which subjects the Company to uncertainties related to downturns in our customers' business and unanticipated shutdowns or curtailments of our customers' production. The Company has limited ability to adjust its cost level contemporaneously with changes in sales and gross margins. Thus, a significant downturn in sales or gross margins due to reductions in global production within the industries the Company serves and/or weak end-user markets could have a material adverse effect on the Company's liquidity, financial position, and results of operations.

Changes in competition in the industries and markets Quaker serves could have a material adverse effect on the Company's liquidity, financial position, and results of operations.

The specialty chemical industry comprises a number of companies of similar size as well as companies larger and smaller than Quaker. It is estimated that Quaker holds a leading and significant global position in the markets for process fluids to produce sheet steel, and significant global positions in portions of the automotive and industrial markets. These industries are highly competitive, and a number of companies with significant financial resources and/or customer relationships compete with us to provide similar products and services. Our competitors may be positioned to offer more favorable pricing and service terms, potentially resulting in reduced profitability and/or a loss of market share for us. In addition, several competitors could potentially consolidate their businesses to gain scale to better position their product offerings, which could have a negative impact on our profitability and market share. Historically, competition in the industry has been based primarily on the ability to provide products that meet the needs of the customer and render technical services and laboratory assistance to the customer and, to a lesser extent, on price. Factors critical to the Company's business include successfully differentiating the Company's offerings from its competition, operating efficiently and profitably as a globally integrated Company, and increasing market share and customer penetration through internally developed business programs and strategic acquisitions. If the Company is unsuccessful with differentiation, it could have a material adverse effect on the Company's liquidity, financial position, and results of operations.

Our business depends on attracting and retaining qualified management and other key personnel.

The unanticipated departure of any key member of our management team or other key personnel could have an adverse effect on our business. Given the relative size of the Company and the breadth of its global operations, there are a limited number of qualified personnel to assume the responsibilities of management level or other key employees. In addition, because of the specialized and technical nature of our business, our future performance is dependent on our ability to attract, develop and retain qualified management, commercial, technical, and other key personnel. Competition for such personnel is intense, and we may be unable to continue to attract or retain such personnel. In an effort to mitigate such risks, the Company utilizes retention bonuses, offers competitive pay and maintains continuous succession planning, but there can be no assurance that these mitigating factors will be adequate to attract or retain qualified management or other key personnel.

Inability to obtain sufficient price increases or contract concessions to offset increases in the costs of raw materials could result in a loss of sales, gross margin, and/or market share and could have a material adverse effect on the Company's liquidity, financial position and results of operations. Conversely, an inability to implement timely price decreases to compensate for changes in raw material costs could result in a loss of sales, gross margin, and/or market share and could have a material adverse effect on the Company's liquidity, financial position and results of operations.

Quaker uses over 1,000 raw materials, including mineral oils and derivatives, animal fats and derivatives, vegetable oils and derivatives, ethylene derivatives, solvents, surface active agents, various smaller quantities of chemicals compounds that act as additives to our base formulations ("additives") and a wide variety of other organic and inorganic compounds. During the years ended December 31, 2017, 2016 and 2015, three of our larger raw material groups (mineral oils and derivatives, animal fats and derivatives, and vegetable oils and derivatives) in the aggregate accounted for approximately one third of the total cost of Quaker's raw material purchases during each period, with each being roughly proportional to the total aggregate spend. The price of mineral oils and its derivatives can be affected by the price of crude oil and industry refining capacity. Animal fat and vegetable oil prices are impacted by biodiesel consumption which is also affected by the price of crude oil. In addition, other significant raw material purchases including ethylene derivatives, solvents, surface active agents and additives are also indirectly impacted by trends in mineral oil and derivatives and, therefore, crude oil trends. Accordingly, significant fluctuations in the price of crude oil could have a material impact on the cost of these raw materials. In addition, many of the raw materials used by Quaker are commodity chemicals, which can experience significant price volatility.

Although the Company has been successful in the past in recovering a substantial amount of raw material cost increases while retaining its customers, there can be no assurance that the Company can continue to recover higher raw material costs or retain customers in the future. Conversely, the Company has been successful in maintaining acceptable levels of margin in periods of raw material price declines, but there can be no assurance that the Company can continue to maintain its margins through appropriate price and contract concessions while retaining its customers in the future. As a result of the Company's past pricing actions in periods of

rising and declining costs, customers may become more likely to consider competitors' products, some of which may be available at a lower cost. A significant change in margin or the loss of customers due to pricing actions could result in a material adverse effect on the Company's liquidity, financial position, and results of operations.

Lack of availability of raw materials and issues associated with sourcing from some single suppliers and some suppliers in volatile economic environments could have a material adverse effect on the Company's liquidity, financial position and results of operations.

The chemical specialty industry can experience tightness of supply for certain raw materials. In addition, in some cases, we source from a single supplier and/or suppliers in economies that have experienced instability. Any significant disruption in supply could affect our ability to obtain raw materials, or increase the cost of such raw materials, which could have a material adverse effect on our liquidity, financial position and results of operations. In addition, certain raw materials that the Company uses are subject to various regulatory laws, and a change in the ability to legally use such raw materials may impact Quaker's liquidity, financial position and results of operations.

Loss of a significant manufacturing facility may materially and adversely affect the Company's liquidity, financial position and results of operations.

Quaker has multiple manufacturing facilities throughout the world. In certain countries, such as Brazil and China, there is only one such facility. If one of the Company's facilities is damaged to such an extent that production is halted for an extended period, the Company may not be able to timely supply its customers. This could result in a loss of sales over an extended period, or permanently. The Company does take steps to mitigate against this risk, including business continuity and contingency planning and procuring property and casualty insurance (including business interruption insurance). Nevertheless, the loss of sales in any one region over an extended period of time could have a significant material adverse effect on Quaker's liquidity, financial position and results of operations.

Loss of a significant customer, bankruptcy of a major customer, or the closure of a customer site could have a material adverse effect on our liquidity, financial position and results of operations.

During 2017, our five largest customers (each composed of multiple subsidiaries or divisions with semi-autonomous purchasing authority) together accounted for approximately 18% of our consolidated net sales, with the largest customer accounting for approximately 8% of our consolidated net sales. The loss of a significant customer could have a material adverse effect on Quaker's liquidity, financial position and results of operation.

Also, a significant portion of Quaker's revenues is derived from sales to customers in the steel and automotive industries; including some of our larger customers, where a number of bankruptcies have occurred in the past and where companies have experienced financial difficulties. As part of a bankruptcy process, the Company's pre-petition receivables may not be realized and customer manufacturing sites may be closed or contracts voided. The bankruptcy of a major customer could have a material adverse effect on the Company's liquidity, financial position and results of operations. Also, steel customers typically have limited manufacturing locations compared to metalworking customers and generally use higher volumes of products at a single location. The loss or closure of one or more steel mills or other major sites of a significant customer could have a material adverse effect on Quaker's business.

Impairment evaluations of goodwill, intangible assets, investments or other long-lived assets could result in a reduction in our recorded asset values, which could have a material adverse effect on the Company's liquidity, financial position and results of operation.

The Company performs reviews of goodwill and indefinite-lived intangible assets on an annual basis, or more frequently if triggering events indicate a possible impairment. The Company tests goodwill at the reporting unit level by comparing the carrying value of the net assets of the reporting unit, including goodwill, to the unit's fair value. Similarly, the Company tests indefinite-lived intangible assets by comparing the fair value of the assets to their carrying values. If the carrying values of goodwill or indefinite-lived intangible assets exceed their fair value, the goodwill or indefinite-lived intangible assets may be considered impaired. In addition, the Company will perform a review of a definite-lived intangible asset or other long-lived asset when changes in circumstances or events indicate a possible impairment. An estimate of undiscounted cash flows produced by the asset or appropriate group of assets is compared with its carrying value to determine if an impairment charge is warranted. If any impairment or related charge is warranted, then Quaker's liquidity, financial position and results of operations could be materially affected.

Changes in tax laws could result in fluctuations in our effective tax rate and could have a material effect on the Company's liquidity, financial position and results of operation.

The Company is subject to income taxes in the U.S. and various foreign jurisdictions; with our domestic and international tax liabilities being subject to the allocation of income among these different jurisdictions. Our effective tax rate is derived from a combination of local tax rates, applicable to the Company, in the various countries, states and other jurisdictions in which we operate. Our effective tax rate and respective tax liabilities could, therefore, be materially affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in tax rates, expiration or lapses of tax credits or incentives, changes in uncertain tax positions, changes in the valuation of deferred tax assets and liabilities, or changes in tax laws, including matters such as transfer

pricing. One such example of the potential impact from changes in tax law is the impact of the U.S. Tax Cuts and Jobs Act (“U.S. Tax Reform”). The Company has made reasonable interpretations and assumptions with regard to various uncertainties and ambiguities in the application of certain provisions of U.S. Tax Reform. It is possible that the Internal Revenue Service (“IRS”) could issue subsequent guidance or take positions on audit that differ from the Company’s interpretations and assumptions. Incorporated by reference is further information regarding U.S. Tax Reform in Note 8 of Notes to Consolidated Financial Statements included in Item 8 of this Report. In addition, we are regularly under audit by tax authorities, and the final decisions of such audits could materially affect our current tax estimates and tax positions. Any of these factors, or similar tax-related risks, could cause the Company to experience an effective tax rate and tax-related payments that significantly differ from previous periods and current or future expectations, which could have a significant material adverse effect on Quaker’s liquidity, financial position and results of operations.

Failure to comply with any material provision of our primary credit facility or other debt agreements could have a material adverse effect on our liquidity, financial position and results of operations.

The Company's current primary credit facility (“the Credit Facility”) is a $300.0 million syndicated multicurrency credit agreement with a group of lenders which matures in June 2019. The amount available under this facility can be increased to $400.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. The Credit Facility provides the availability of revolving credit borrowings, and bears interest at either a base rate or LIBOR plus a margin based on the Company's consolidated leverage ratio.

The Credit Facility contains covenants that impose certain restrictions, including limitations on investments, acquisitions and liens, as well as default provisions customary for facilities of its type. While these covenants and restrictions are not currently considered to be overly restrictive, they could become more difficult to comply with as our business or financial conditions change. In addition, deterioration in the Company’s results of operations or financial position could significantly increase borrowing costs.

Quaker is exposed to market rate risk for changes in interest rates due to the variable interest rate applied to the Company’s borrowings under the Credit Facility and certain other, similar, but smaller credit facilities. Accordingly, if interest rates rise significantly, the cost of debt to Quaker will increase, perhaps significantly, depending on the extent and timing of Quaker’s borrowings under its credit facilities. As of December 31, 2017, the Company had $48.5 million in outstanding borrowings under its credit facilities. Incorporated by reference is the interest rate risk information contained in Item 7A of this Report.

Pending and future legal proceedings, including environmental matters, may materially and adversely affect the Company’s liquidity, financial position, and results of operations, as well as its reputation in the markets it serves.

The Company is a party to proceedings, cases, and requests for information from, and negotiations with, various claimants and federal and state agencies relating to various matters, including environmental matters. An adverse result in one or more pending or on-going matters or any potential future matter of a similar nature could materially and adversely affect the Company’s liquidity, financial position, and results of operations, as well as its reputation in the markets it serves. In addition, non-compliance with applicable laws and regulations, particularly the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act and other similar laws and regulations, could result in a negative impact to the Company’s reputation, potential fines or ongoing monitoring, which could also have a material adverse effect on the Company’s liquidity, financial position, and results of operations. Incorporated herein by reference is the information concerning pending asbestos-related litigation against an inactive subsidiary, amounts accrued associated with certain environmental, non-capital remediation costs and other potential commitments or contingencies highlighted in Note 23 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

Failure to comply with the complex global regulatory environment in which the Company operates could have an adverse impact on the Company’s reputation and/or a material adverse effect on the Company’s liquidity, financial position and results of operations.

Changes in the regulatory environment in which the Company operates, particularly, but not limited to, the United States, Mexico, Brazil, China, India and the European Union, could lead to heightened regulatory scrutiny, could adversely impact our ability to continue selling certain products in our domestic or foreign markets and/or could increase the cost of doing business. While the Company mitigates these risks through various actions, including receiving Responsible Care certification, on-going employee training and administering a comprehensive environmental, health and safety program, there is no guarantee these actions will prevent all potential regulatory compliance issues. For instance, failure to comply with the European Union’s Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) or other similar laws and regulations, could result in the inability to sell certain non-compliant products, fines, ongoing monitoring and other future business consequences, which could have a material adverse effect on the Company’s liquidity, financial position and results of operations.

Potential product, service or other related liability claims could have a material adverse effect on the Company’s liquidity, financial position and results of operations.

The development, manufacture and sale of specialty chemical products and other related services involve inherent exposure to potential product liability claims, service level claims, product recalls and related adverse publicity. Any of these potential product or service risks could also result in substantial and unexpected expenditures and affect customer confidence in our products and services, which could have a material adverse effect on the Company’s liquidity, financial position and results of operations. Although the

Company maintains product and other general liability insurance, there can be no assurance that the types or levels of coverage maintained are adequate to cover these potential risks. In addition, the Company may not be able to continue to maintain its existing insurance coverage or obtain comparable or additional insurance coverage at a reasonable cost, if at all, in the event a significant product or service claim arises.

We may be unable to adequately protect our proprietary rights and trade brands, which may limit the Company's ability to compete in its markets.

Quaker has a limited number of patents and patent applications, including patents issued, applied for, or acquired in the United States and in various foreign countries, some of which may prove to be material to its business. Principal reliance is placed upon Quaker's proprietary formulae and the application of its skills and experience to meet customer needs. Also, Quaker's products are identified by trademarks that are registered throughout its marketed area. Despite our efforts to protect such proprietary information through patent and trademark filings, through the use of appropriate trade secret protections and through the inability of certain products to be effectively replicated by others, it is possible that competitors or other unauthorized third parties may obtain, copy, use or disclose our technologies, products, and processes. In addition, the laws and/or judicial systems of foreign countries in which we design, manufacture, market and sell our products may afford little or no effective protection of our proprietary technology or trade brands. Also, security over our global information technology structure is subject to increasing risks associated with cyber-crime and other affiliated cyber-security threats. These potential risks to our proprietary information and trade brands could subject the Company to increased competition and negatively impact our liquidity, financial position and results of operations.

We might not be able to timely develop, manufacture and gain market acceptance of new and enhanced products required to maintain or expand our business.

We believe that our continued success depends on our ability to continuously develop and manufacture new products and product enhancements on a timely and cost-effective basis, in response to customers' demands for higher performance process chemicals, coatings, greases and other product offerings. Our competitors may develop new products or enhancements to their products that offer performance, features and lower prices that may render our products less competitive or obsolete, and, as a consequence, we may lose business and/or significant market share. The development and commercialization of new products require significant expenditures over an extended period of time, and some products that we seek to develop may never become profitable. In addition, we may not be able to develop and introduce products incorporating new technologies in a timely manner that will satisfy our customers' future needs or achieve market acceptance.

An inability to appropriately capitalize on growth, including organic growth, leveraging prior acquisitions, or integrating future acquisitions, may adversely affect the Company's liquidity, financial position and results of operations.

The Company continues to grow organically through increased end-market growth, incremental market share gains, and extending previously acquired technologies through its existing channels. Such growth is dependent on prevailing market conditions and the Company's ability to execute over time. In addition, the Company has completed multiple acquisitions over the past several years and may continue to seek acquisitions to grow its business in the future. The success of the Company's growth depends on its ability to successfully integrate these acquisitions, including, but not limited to its ability to do the following:

- successfully execute the integration or consolidation of the acquired or additional business into existing processes and operations;
- develop or modify financial reporting, information systems and other related financial tools to ensure overall financial integrity and adequacy of internal control procedures;
- identify and take advantage of potential synergies, including cost reduction opportunities, while maintaining legacy business and other related attributes; and
- further penetrate existing, and expand into new, markets with the product capabilities acquired in acquisitions.

The Company may fail to derive significant benefits or may not create the appropriate infrastructure to support such additional growth from organic or acquired businesses, which could have a material adverse effect on Quaker's liquidity, financial position and results of operations.

The scope of our international operations subjects the Company to risks including, but not limited to, risks from currency fluctuations, changes in trade regulations, political and economic instability, and complex local tax environments.

Since significant revenues and earnings are generated by non-U.S. operations, Quaker's financial results are affected by currency fluctuations, particularly between the U.S. dollar and the euro, the Brazilian real, the Mexican peso, the Chinese renminbi, and the Indian rupee, and the impact of those currency fluctuations on the underlying economies. During the past three years, sales by non-U.S. subsidiaries accounted for approximately 60% of our consolidated net sales. Generally, all of the Company's operations use their local currency as their functional currency. The Company generally does not use financial instruments that expose it to significant risk involving foreign currency transactions; however, the relative size of its non-U.S. activities has a significant impact on reported operating results and the Company's net assets. Therefore, as exchange rates vary, Quaker's results can be materially affected. Incorporated by reference is the foreign exchange risk information contained in Item 7A of this Report and the geographic information in Note 4 of Notes to Consolidated Financial Statements included in Item 8 of this Report.

The Company occasionally sources inventory in a different country than that of the intended sale. This practice can give rise to foreign exchange risk. The Company mitigates this risk through local sourcing of raw materials in the majority of its locations.

As of December 31, 2017, the Company held approximately $79.0 million of its total cash and cash equivalents in its non-U.S. subsidiaries. The Company can access this cash without restriction, however, it is subject to possible risks including currency fluctuations and tax-related impacts. Additional risks associated with the Company's international operations include, but are not limited to: instability in economic conditions in certain countries; changes in a country's political situation; trade protection measures; longer customer payment cycles; different payment practices such as the use of bankers acceptance drafts or other similar credit instruments; licensing and other legal requirements; the difficulties of staffing and managing dispersed international operations; less protective foreign intellectual property laws; legal systems that may be less developed and predictable than those in the United States; and complex and dynamic local tax regulations.

The pending Houghton Combination subjects the Company to new and heightened risks which may adversely affect the Company's liquidity, financial position and results of operations.

As previously described in the Business section, in Item 1 of this report, on April 4, 2017, Quaker entered into a share purchase agreement with Gulf to purchase the entire issued and outstanding share capital of Houghton. In connection with the Combination, the Company secured $1.15 billion in commitments and has since replaced these commitments with the New Credit Facility with a group of lenders for $1.15 billion. There are several areas of risk related to the pending Houghton Combination which could negatively impact the Company's liquidity, financial position and results of operations, including, but not limited to:

- issuance of the Company's common stock as a part of the consideration paid for the Combination, equal to 24.5% of the common stock outstanding after the issuance, will have a dilutive effect on the existing holders of the Company's common stock and may result in a decline in the market price of the Company's common stock;
- the percentage of outstanding shares of the Company's common stock to be issued in connection with the Combination is not adjustable based on the market price of the Company's common stock and, as a result, the Combination consideration at closing may have greater or less implied value than at the time the share purchase agreement was signed;
- issuance of the Company's common stock to Gulf as part of the consideration paid for the Combination will provide Gulf with an almost 24.5% ownership interest in the Company, and Gulf will also have the contractual ability to nominate certain directors of the Company, which may enable Gulf to influence the direction of the Company's business, or could prevent the Company's other shareholders from determining significant corporate decisions without Gulf participation;
- the Combination will present the Company with integration and consolidation risks, and the Company may be unable to profitably operate the consolidated company, or may fail to achieve expected cost synergies or expand the Company's business into new markets and geographies;
- failure to retain key employees could diminish the benefits of the Combination and subject the Company to further integration risks;
- the Company has and will continue to incur significant transaction and integration costs in connection with the Combination, including, but not limited to, fees paid to financial advisors, legal, financial, tax and accounting advisors and filing fees;
- the potential for regulatory authorities to require divestitures in connection with the Combination of a greater amount than we anticipated, which would result in a smaller than anticipated combined business;
- the Company may fail to complete the Combination if required conditions, many of which are outside of the Company's control, are not satisfied, including various customary closing conditions as well as potential divestitures required in connection with obtaining regulatory approval;
- if the Combination has not closed by April 4, 2018, the Company and Gulf each have the right to terminate the share purchase agreement and if the Combination is not completed, the price of the Company's common stock could decline and the Company's future business and operations could be harmed, including by failing to realize the expected benefits of the Combination, costs which must be paid even if the Combination is not completed, and potential litigation relating to failure to complete the Combination;
- the Company will significantly increase its debt obligations upon closing of the Combination and execution of the New Credit Facility which requires the Company to comply with certain provisions and covenants, and while the Company does not currently anticipate the New Credit Facility provisions and covenants to be overly restrictive, they could become more difficult to comply with as business or financial conditions change;
- the Company will be subject to interest rate risk due to the variable interest rates within the New Credit Facility and if interest rates rise significantly interest costs will increase, perhaps significantly; and
- the New Credit Facility expires April 4, 2018 if the Combination has not closed by that date and the New Credit Facility has not been executed; the Company expects to negotiate an extension of the New Credit Facility, if necessary, in a timely manner, but such negotiations may result in additional fees or conditions.

Incorporated herein by reference is information concerning the Combination included in Note 2 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report. For more information regarding certain of the risks and uncertainties related to the Combination, you should refer to the proxy statement the Company filed on July 31, 2017 with the SEC.

Disruption of critical information systems or material breaches in the security of our systems may adversely affect our business and our customer relationships.

Quaker relies on information technology systems to process, transmit, and store electronic information in our day-to-day operations. The Company also relies on its technology infrastructure, among other functions, to interact with customers and suppliers, fulfill orders and bill, collect and make payments, ship products, provide support to customers, fulfill contractual obligations and otherwise conduct business. Our information technology systems are subject to potential disruptions, including significant network or power outages, cyberattacks, computer viruses, other malicious codes, and/or unauthorized access attempts, any of which, if successful, could result in data leaks or otherwise compromise our confidential or proprietary information and disrupt our operations. Cybersecurity incidents, such as these, are becoming more sophisticated and frequent, and there can be no assurance that our protective measures will prevent security breaches that could have a significant impact on our business, reputation and financial results. Failure to monitor, maintain or protect our information technology systems and data integrity effectively or to anticipate, plan for and recover from significant disruptions to these systems could have a material adverse effect on our business, results of operations or financial condition.

Terrorist attacks, other acts of violence or war, natural disasters or other uncommon global events may affect the markets in which we operate and our profitability.

Terrorist attacks, other acts of violence or war, natural disasters or other uncommon global events may negatively affect our operations. There can be no assurance that there will not be further terrorist attacks against the U.S. or other locations where we do business. Also, other uncommon global events such as earthquakes, hurricanes, fires and tsunamis cannot be predicted. Terrorist attacks, other acts of violence or armed conflicts, and natural disasters may directly impact our physical facilities and/or those of our suppliers or customers. Additional terrorist attacks or natural disasters may disrupt the global insurance and reinsurance industries with the result that we may not be able to obtain insurance at historical terms and levels, if at all, for all of our facilities. Furthermore, any of these events may make travel and the transportation of our supplies and products more difficult and more expensive, and ultimately affect the sales of our products. The consequences of terrorist attacks, other acts of violence or armed conflicts, natural disasters or other uncommon global events can be unpredictable, and we may not be able to foresee or effectively plan for these events, resulting in a material adverse effect on our business, results of operations or financial condition.

Item 1B. ***Unresolved Staff Comments.***

None.

Item 2. ***Properties.***

Quaker's corporate headquarters and a laboratory facility are located in its North America segment's Conshohocken, Pennsylvania location. The Company's other principal facilities in its North America segment are located in Aurora, Illinois; Detroit, Michigan; Middletown, Ohio; Santa Fe Springs, California; Batavia, New York; Dayton, Ohio; Waterloo, Ontario; and Monterrey, N.L., Mexico. The Company's EMEA segment has principal facilities in Uithoorn, The Netherlands; Barcelona, Spain; Navarra, Spain; Karlshamn, Sweden; and Tradate, Italy. The Company's Asia/Pacific segment operates out of its principal facilities located in Qingpu, China; Kolkata, India; and Sydney, Australia, while its South America segment operates out of its principal facility in Rio de Janeiro, Brazil. With the exception of the Conshohocken, Santa Fe Springs, Aurora, Karlshamn, and Sydney sites, which are leased, the remaining principal facilities are owned by Quaker and, as of December 31, 2017, were mortgage free. Quaker also leases sales, laboratory, manufacturing, and warehouse facilities in other locations.

Quaker's principal facilities (excluding Conshohocken) consist of various manufacturing, administrative, warehouse, and laboratory buildings. Substantially all of the buildings (including Conshohocken) are of fire-resistant construction and are equipped with sprinkler systems. All facilities are primarily of masonry and/or steel construction and are adequate and suitable for Quaker's present operations. The Company has a program to identify needed capital improvements that are implemented as management considers necessary or desirable. Most locations have various numbers of raw material storage tanks, ranging from 2 to 58, at each location with a capacity ranging from 1,000 to 82,000 gallons, and processing or manufacturing vessels ranging in capacity from 8 to 16,000 gallons.

Each of Quaker's non-U.S. associated companies (in which it owns a 50% or less interest and has significant influence) owns or leases a plant and/or sales facilities in various locations, with the exception of Primex, Ltd.

Item 3. ***Legal Proceedings.***

The Company is a party to proceedings, cases, and requests for information from, and negotiations with, various claimants and Federal and state agencies relating to various matters, including environmental matters. For information concerning pending asbestos-related litigation against an inactive subsidiary, certain environmental non-capital remediation costs and other legal-related matters, reference is made to Note 23 of Notes to Consolidated Financial Statements, included in Item 8 of this Report, which is incorporated herein by this reference. The Company is a party to other litigation which management currently believes will not have a material adverse effect on the Company's results of operations, cash flow or financial condition.

Item 4. ***Mine Safety Disclosures.***

Not Applicable

Item 4(a). ***Executive Officers of the Registrant.***

Set forth below is information regarding the executive officers of the Company, each of whom (with the exception of Ms. Hall) have been employed by the Company for more than five years, including the respective positions and offices with the Company held by each over the respective periods indicated. Each of the executive officers, with the exception of Mr. Hostetter, is elected annually to a one-year term. Mr. Hostetter is considered an executive officer in his capacity as principal accounting officer for purposes of this Item.

Name, Age, and Present Position with the Company	**Business Experience During the Past Five Years and Period Served as an Officer**
Michael F. Barry, 59 Chairman of the Board, Chief Executive Officer and President and Director	Mr. Barry, who has been employed by the Company since 1998, has served as Chairman of the Board since May 2009, in addition to his position as Chief Executive Officer and President held since October 2008. He served as interim Chief Financial Officer from October through November 2015. He served as Senior Vice President and Managing Director – North America from January 2006 to October 2008. He served as Senior Vice President and Global Industry Leader – Metalworking and Coatings from July through December 2005. He served as Vice President and Global Industry Leader – Industrial Metalworking and Coatings from January 2004 through June 2005 and Vice President and Chief Financial Officer from 1998 to August 2004.
Mary Dean Hall, 60 Vice President, Chief Financial Officer and Treasurer	Ms. Hall has served as Vice President, Chief Financial Officer and Treasurer since she joined the Company in November 2015. Prior to joining the Company, Ms. Hall served as the Vice President and Treasurer of Eastman Chemical Company from April 2009 until October 2015. Prior to that role, she held various senior-level financial positions of increasing responsibility with Eastman from 1995 through 2009, including Treasurer, Vice President and Controller, and Vice President, Finance.
D. Jeffry Benoliel, 59 Vice President and Global Leader – Metalworking, Can and Mining	Mr. Benoliel, who has been employed by the Company since 1995, has served as Global Leader – Mining since May 2014, in addition to his position as Vice President and Global Leader – Metalworking and Can since July 2013 and his role as Corporate Secretary, a position held from 1998 through March 2015. He served as Vice President – Global Metalworking and Fluid Power from June 2011 through June 2013 and served as General Counsel from 2001 to March 2012.
Joseph A. Berquist, 46 Vice President and Managing Director – North America	Mr. Berquist, who has been employed by the Company since 1997, has served as Vice President and Managing Director – North America since April 2010.
Ronald S. Ettinger, 65 Vice President – Human Resources	Mr. Ettinger, who has been employed by the Company since 2002, has served as Vice President-Human Resources since December 2011.

Name, Age, and Present Position with the Company	Business Experience During the Past Five Years and Period Served as an Officer
Shane W. Hostetter, 36 Global Controller and Principal Accounting Officer	Mr. Hostetter, who has been employed by the Company since July 2011, has served as Global Controller and Principal Accounting Officer since September 2014. He served as Corporate Controller and Principal Accounting Officer from May 2013 to August 2014. He served as Assistant Global Controller from July 2011 to May 2013.
Dieter Laininger, 54 Vice President and Managing Director – South America and Global Leader – Primary Metals	Mr. Laininger, who has been employed by the Company since 1991, has served as Vice President and Managing Director – South America, since January 2013, in addition to his position as Vice President and Global Leader – Primary Metals, to which he was appointed in June 2011.
Joseph F. Matrange, 75 Vice President and Global Leader – Coatings	Mr. Matrange, who has been employed by the Company since 2000, has served as Vice President and Global Leader – Coatings since October 2008. He has also served as President of AC Products, Inc., a California subsidiary, since October 2000, and Epmar Corporation, a California subsidiary, since April 2002.
Jan F. Nieman, 56 Vice President and Global Leader – Grease and Fluid Power, Global Strategy and Marketing	Mr. Nieman, who has been employed by the Company since 1992, has served as Vice President – Global Strategy and Marketing since May 2014, in addition to his position as Global Leader – Grease and Fluid Power since August 2013. He also served as Global Leader – Mining from August 2013 through April 2014. He served as Vice President and Managing Director – Asia/Pacific from February 2005 through July 2013.
Wilbert Platzer, 56 Vice President and Managing Director – EMEA	Mr. Platzer, who has been employed by the Company since 1995, has served as Vice President and Managing Director – EMEA since January 2006.
Adrian Steeples, 57 Vice President and Managing Director – Asia/Pacific	Mr. Steeples, who has been employed by the Company since 2010, has served as Vice President and Managing Director – Asia/Pacific since July 2013. He served as Industry Business Director – Metalworking from March 2011 through June 2013.

PART II

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

The Company's common stock is listed on the New York Stock Exchange ("NYSE") under the trading symbol KWR. The following table sets forth, for the calendar quarters during the two most recent fiscal years, the range of high and low sales prices for the common stock as reported on the NYSE composite tape (amounts rounded to the nearest penny), and the quarterly dividends declared and paid:

	Price Range				Dividends Declared		Dividends Paid	
	2017		2016					
	High	Low	High	Low	2017	2016	2017	2016
First quarter	$ 138.95	$ 124.92	$ 86.92	$ 68.20	$ 0.345	$ 0.320	$ 0.345	$ 0.320
Second quarter	153.90	127.70	93.61	81.12	0.355	0.345	0.345	0.320
Third quarter	154.38	129.98	106.61	85.93	0.355	0.345	0.355	0.345
Fourth quarter	165.93	146.48	139.92	102.82	0.355	0.345	0.355	0.345

There are no restrictions that currently limit the Company's ability to pay dividends or that the Company believes are likely to materially limit the payment of future dividends. If a default under the Company's Credit Facility were to occur and continue, the payment of dividends would be prohibited. Reference is made to the "Liquidity and Capital Resources" disclosure contained in Item 7 of this Report.

As of January 17, 2018, there were 825 shareholders of record of the Company's common stock, its only outstanding class of equity securities.

Prior to September 7, 2017, the Company's Articles of Incorporation included a time-based voting system that granted special ten-for-one-voting rights to shareholders who had beneficially owned their Quaker Chemical Corporation common stock continuously for a period of at least 36 consecutive calendar months (dating from the first day of the first full calendar month on or after the date the holder acquired beneficial ownership of such common stock) before the record date for a shareholder vote. At a meeting of the Company's shareholders on September 7, 2017, the Company's shareholders approved an amendment of the Company's Articles of Incorporation that provides that every holder of Quaker Chemical Corporation common stock will be entitled to one vote for each share of common stock of the Company. As of January 17, 2018, 13,306,564 shares of Quaker common stock were issued, outstanding and entitled to one vote per share.

Reference is made to the information in Item 12 of this Report under the caption "Equity Compensation Plans," which is incorporated herein by this reference.

The following table sets forth information concerning shares of the Company's common stock acquired by the Company during the fourth quarter of the period covered by this report:

Issuer Purchases of Equity Securities

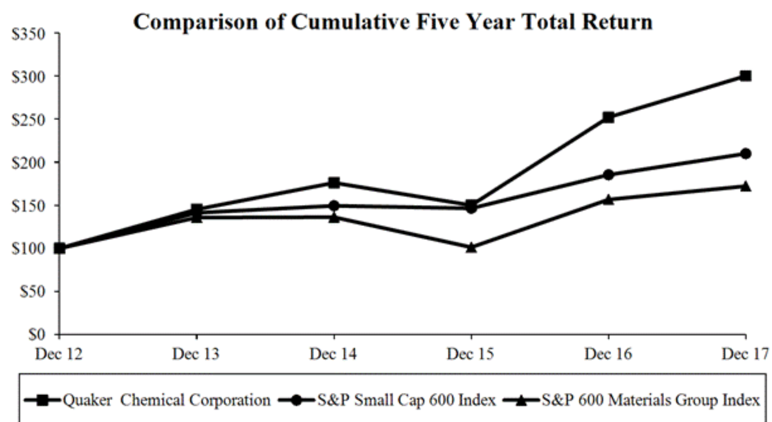
Period	(a) Total Number of Shares Purchased (1)	(b) Average Price Paid Per Share (2)	(c) Total Number of Shares Purchased as part of Publicly Announced Plans or Programs	(d) Approximate Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs (3)
October 1 - October 31	—	$ —	—	$ 86,865,026
November 1 - November 30	314	$ 155.55	—	$ 86,865,026
December 1 - December 31	—	$ —	—	$ 86,865,026
Total	314	$ 155.55	—	$ 86,865,026

(1) All of these shares were acquired from employees upon their surrender of Quaker shares in payment of the exercise price of employee stock options exercised or for the payment of taxes upon exercise of employee stock options or the vesting of restricted stock.

(2) The price paid for shares acquired from employees pursuant to employee benefit and share-based compensation plans, is, in each case, based on the closing price of the Company's common stock on the date of exercise or vesting, as specified by the plan pursuant to which the applicable option or restricted stock was granted.

(3) On May 6, 2015, the Board of Directors of the Company approved, and the Company announced, a new share repurchase program, pursuant to which the Company is authorized to repurchase up to $100,000,000 of Quaker Chemical Corporation common stock (the "2015 Share Repurchase Program"). The 2015 Share Repurchase Program, which replaced the Company's other share repurchase plans then in effect, has no expiration date. There were no shares acquired by the Company pursuant to the 2015 Share Repurchase Program during the quarter ended December 31, 2017.

The following graph compares the cumulative total return (assuming reinvestment of dividends) from December 31, 2012 to December 31, 2017 for (i) Quaker's common stock, (ii) the S&P SmallCap 600 Index (the "SmallCap Index"), and (iii) the S&P 600 Materials Group Index (the "Materials Group Index"). The graph assumes the investment of $100 on December 31, 2012 in each of Quaker's common stock, the stocks comprising the SmallCap Index and the stocks comprising the Materials Group Index.



	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
Quaker	$ 100.00	$ 145.30	$ 176.12	$ 150.05	$ 252.15	$ 300.12
SmallCap Index	100.00	141.31	149.45	146.50	185.40	209.94
Materials Group Index	100.00	135.80	136.20	101.28	156.67	172.21

Item 6. *Selected Financial Data.*

The following table sets forth selected financial data for the Company and its consolidated subsidiaries:

(in thousands, except dividends and per share data):	Year Ended December 31, 2017 (1)	2016 (2)	2015 (3)	2014 (4)	2013 (5)
Summary of Operations:					
Net sales	$ 820,082	$ 746,665	$ 737,555	$ 765,860	$ 729,395
Income before taxes and equity in net income of associated companies	60,668	84,009	70,230	78,293	72,826
Net income attributable to Quaker Chemical Corporation	20,278	61,403	51,180	56,492	56,339
Per share:					
Net income attributable to Quaker Chemical Corporation Common Shareholders - basic	$ 1.53	$ 4.64	$ 3.84	$ 4.27	$ 4.28
Net income attributable to Quaker Chemical Corporation Common Shareholders - diluted	$ 1.52	$ 4.63	$ 3.84	$ 4.26	$ 4.27
Dividends declared	1.41	1.355	1.26	1.15	0.995
Dividends paid	1.40	1.33	1.24	1.10	0.99
Financial Position					
Working capital	$ 251,843	$ 249,057	$ 233,517	$ 218,982	$ 191,222
Total assets	722,126	692,028	680,727	664,376	583,642
Long-term debt	61,068	65,769	81,439	75,328	17,321
Total equity	409,618	412,606	381,243	365,135	344,696

Notes to the above table:

(1) Net income attributable to Quaker Chemical Corporation in 2017 includes equity income from a captive insurance company of $2.5 million after tax, and a $0.6 million insurance insolvency recovery, offset by $30.8 million of Houghton combination-related expenses, which includes $0.9 million of interest costs to maintain committed capital to fund the Combination, $22.2 million of tax charges related to the U.S. Tax Cuts and Jobs Act, a $1.9 million U.S. pension plan settlement charge, $0.3 million of charges related to cost streamlining initiatives in the Company's corporate group, a $0.1 million loss on disposal of a held-for-sale asset, and after-tax charges of $0.4 million related to currency conversions at the Company's 50% owned equity affiliate in Venezuela. See the Non-GAAP Measures section, which appears in Item 7 of this report.

(2) Net income attributable to Quaker Chemical Corporation in 2016 includes equity income from a captive insurance company of $1.7 million after tax, and $0.4 million of a credit related to the Company's 2015 global restructuring program, offset by $1.5 million of Houghton combination-related expenses, and an after-tax charge of $0.1 million related to a currency conversion at the Company's 50% owned equity affiliate in Venezuela. See the Non-GAAP Measures section, which appears in Item 7 of this report.

(3) Net income attributable to Quaker Chemical Corporation in 2015 includes equity income from a captive insurance company of $2.1 million after tax, offset by an after-tax charge of $2.8 million related to a currency conversion at the Company's 50% owned equity affiliate in Venezuela, $2.8 million of Verkol transaction-related expenses, $0.2 million of charges related to cost streamlining initiatives in the Company's South America segment, $0.3 million of charges related to certain U.S. customer bankruptcies, and $6.8 million of charges related to the Company's 2015 global restructuring program. See the Non-GAAP Measures section, which appears in Item 7 of this report.

(4) Net income attributable to Quaker Chemical Corporation in 2014 includes equity income from a captive insurance company of $2.4 million after tax, offset by an after-tax charge of $0.3 million related to a currency conversion at the Company's 50% owned equity affiliate in Venezuela, $1.2 million of charges related to cost streamlining initiatives in the Company's EMEA and South America segments, a $0.9 million charge related to a U.K. pension plan amendment, and $0.8 million of charges related to certain customer bankruptcies.

(5) Net income attributable to Quaker Chemical Corporation in 2013 includes equity income from a captive insurance company of $5.5 million after tax, an increase to other income of $2.5 million related to a mineral oil excise tax refund, and an increase to other income of $0.5 million related to a change in an acquisition-related earnout liability, partially offset by an after-tax charge of $0.4 million related to a currency conversion at the Company's 50% owned equity affiliate in Venezuela, $1.4 million of charges related to cost streamlining initiatives in the Company's EMEA and South America segments, and a $0.8 million net charge related to a non-income tax contingency.

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

Executive Summary

Quaker Chemical Corporation is a leading global provider of process fluids, chemical specialties, and technical expertise to a wide range of industries, including steel, aluminum, automotive, mining, aerospace, tube and pipe, cans, and others. For nearly 100 years, Quaker has helped customers around the world achieve production efficiency, improve product quality, and lower costs through a combination of innovative technology, process knowledge, and customized services. Headquartered in Conshohocken, Pennsylvania USA, Quaker serves businesses worldwide with a network of dedicated and experienced professionals whose mission is to make a difference.

The Company delivered solid operating results in 2017 as strong volume growth and continued discipline in managing selling, general and administrative expenses ("SG&A") largely offset a decline in gross margin compared to the prior year. Specifically, net sales increased 10% to $820.1 million in 2017 compared to $746.7 million in 2016 primarily due to a 7% growth in volumes, including acquisitions. Driven by the strong 2017 volume levels, the Company's gross profit increased 4% year-over-year despite a decline in gross margin to 35.5% in 2017 compared to 37.5% in 2016. The decrease in the Company's gross margin was primarily due to higher raw material costs compared to the prior year and a change in the mix of products sold. In addition, the current year's operating income benefited from the Company's ability to significantly grow its net sales while only slightly increasing its SG&A. During 2017, the Company incurred $30.8 million, or $1.90 per diluted share, of costs associated with the Company's previously announced pending combination with Houghton International, Inc. ("Houghton") (herein referred to as "the Combination" and "combination-related expenses"), which includes $0.9 million of interest costs ("ticking fees") to maintain committed capital to fund the Combination. In 2016, the Company incurred $1.5 million, or $0.11 per diluted share, of due-diligence combination-related expenses. Including these combination-related expenses, a fourth quarter of 2017 charge of $22.2 million associated with the U.S. Tax Cuts and Jobs Act ("U.S. Tax Reform") and certain other non-core items, the Company's 2017 net income and earnings per diluted share decreased to $20.3 million and $1.52, respectively, compared to $61.4 million and $4.63, respectively, in 2016. Excluding the combination-related expenses, U.S. Tax Reform charges and other non-core items in each period, the Company's non-GAAP earnings per diluted share increased 9% to $5.01 in 2017 compared to $4.60 in the prior year. The Company's full year adjusted EBITDA was a record $115.2 million in 2017, an increase of 8% compared to $106.6 million in the prior year. See the Non-GAAP Measures section of this Item below, as well as other items discussed in the Company's Consolidated Operations Review in the Operations section of this Item, below.

From a regional perspective, the Company's 2017 operating performance was highlighted by strong volume growth and market share gains in all four of its regions, partially offset by declining gross margins in the Company's three largest regions. Both the Company's Europe, Middle East and Africa ("EMEA") and Asia/Pacific regions increased their operating earnings on strong net sales growth due to higher sales volumes, coupled with a relatively consistent level of SG&A, partially offset by lower gross margin year-over-year. Each region's decrease in gross margin was largely due to raw material cost increases and changes in price and product mix. In South America, the Company continued its year-over-year trend of improving results and was able to grow profitability through higher sales volumes, increases from selling price and product mix and an overall increase in gross margin, on relatively consistent levels of SG&A. The Company's North America region had relatively consistent operating earnings year-over-year as higher sales volumes, including contributions from the Company's 2016 acquisition of Lubricor Inc. ("Lubricor"), and increases from selling price and product mix were offset by a decline in gross margin due to similar drivers in EMEA and Asia/Pacific, noted above, and an increase in SG&A primarily as a result of the Lubricor acquisition. See the Reportable Operating Segments Review, in the Operations section of this Item, below.

The Company generated net operating cash flow of $64.8 million in 2017 compared to $73.8 million in 2016. The decrease in net operating cash flow year-over-year was primarily due to cash outflows related to certain combination-related expenses which offset the benefits from lower levels of cash invested in the Company's working capital during 2017, lower restructuring payments year-over-year and the Company's strong operating performance in 2017. The key drivers of the Company's operating cash flow and working capital are further discussed in the Company's Liquidity and Capital Resources section of this Item, below.

Overall, the Company is pleased with delivering another solid year. Specifically, the Company was able to grow organic volumes by 6% on continued market share gains and increased production in several of the Company's end markets. Also, the Company continued its disciplined approach to managing SG&A which helped offset a decline in its gross margin in 2017. While the impact of U.S. Tax Reform in the fourth quarter and combination-related expenses incurred throughout 2017 led to a decrease in reported net income and earnings per diluted share year-over-year, excluding these costs and other non-core items, the Company's strong 2017 operating performance resulted in a 9% increase in its non-GAAP earnings per diluted share compared to 2016 and drove an 8% increase year-over-year in adjusted EBITDA to a record $115.2 million during 2017.

Looking forward to 2018, the Company currently expects the closing of the Combination to occur during the first half of 2018, once regulatory approvals in the U.S. and Europe are received and other customary closing conditions are satisfied. As previously disclosed, the Combination will approximately double the Company's annual sales and adjusted EBITDA, not including estimated synergies, which are expected to meet or exceed $45 million once fully achieved by the third year. Depending upon the exact timing of the Combination's close, the Company anticipates it will realize a portion of the Houghton sales and adjusted EBITDA in 2018.

For Quaker's current business, the Company believes it will continue to grow its volumes and leverage its SG&A and remains optimistic that its gross margin will gradually rise throughout 2018 from its current 35% levels to 36%, heading toward our 37% target. The Company expects that market share gains, on-going discipline in managing SG&A and the benefits of past acquisitions will continue to help offset its gross margin and other market challenges. Overall, the Company remains confident in its future and expects 2018 to be another good year for both the current Quaker business and the combined new company post-closing of the Combination.

Critical Accounting Policies and Estimates

Quaker's discussion and analysis of its financial condition and results of operations are based upon Quaker's consolidated financial statements which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires Quaker to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, Quaker evaluates its estimates, including those related to customer sales incentives, product returns, bad debts, inventories, property, plant and equipment, investments, goodwill, intangible assets, income taxes, financing operations, business combinations, restructuring, incentive compensation plans (including equity-based compensation), pensions and other postretirement benefits, and contingencies and litigation. Quaker bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under such 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. However, actual results may differ from these estimates under different assumptions or conditions.

Quaker believes the following critical accounting policies describe the more significant judgments and estimates used in the preparation of its consolidated financial statements:

1. Accounts receivable and inventory exposures — Quaker establishes allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. If the financial condition of Quaker's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be required. As part of its terms of trade, Quaker may custom manufacture products for certain large customers and/or may ship products on a consignment basis. Further, a significant portion of Quaker's revenues is derived from sales to customers in industries where a number of bankruptcies have occurred in past years and where companies have experienced financial difficulties. When a bankruptcy occurs, Quaker must judge the amount of proceeds, if any, that may ultimately be received through the bankruptcy or liquidation process. These matters may increase the Company's exposure, should a bankruptcy occur, and may require a write down or a disposal of certain inventory. Reserves for customers filing for bankruptcy protection are generally established at 75-100% of the amount outstanding at the bankruptcy filing date. However, initially establishing a reserve and the amount thereto is dependent on the Company's evaluation of likely proceeds to be received from the bankruptcy process, which could result in the Company recognizing minimal or no reserve at the date of bankruptcy. Large and/or financially distressed customers are generally reserved for on a specific review basis, while a general reserve is maintained for other customers based on historical experience. The Company's consolidated allowance for doubtful accounts was $5.5 million and $7.2 million as of December 31, 2017 and 2016, respectively. The Company recorded expense to increase its provision for doubtful accounts by $0.1 million, $1.4 million and $1.5 million for the years ended December 31, 2017, 2016 and 2015, respectively. Changing the amount of expense recorded to the Company's provisions by 10% would have increased or decreased the Company's pre-tax earnings by less than $0.1 million, $0.1 million and $0.1 million for the years ended December 31, 2017, 2016 and 2015, respectively. See Note 10 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

2. Environmental and litigation reserves — Accruals for environmental and litigation matters are recorded when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated. Accrued liabilities are exclusive of claims against third parties and are not discounted. Environmental costs and remediation costs are capitalized if the costs extend the life, increase the capacity or improve the safety or efficiency of the property from the date acquired or constructed, and/or mitigate or prevent contamination in the future. Estimates for accruals for environmental matters are based on a variety of potential technical solutions, governmental regulations and other factors, and are subject to a wide range of potential costs for remediation and other actions. A considerable amount of judgment is required in determining the most likely estimate within the range of total costs, and the factors determining this judgment may vary over time. Similarly, reserves for litigation and similar matters are based on a range of potential outcomes and require considerable judgment in determining the most probable outcome. If no amount within the range is considered more probable than any other amount, the Company accrues the lowest amount in that range in accordance with generally accepted accounting principles. See Note 23 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

3. Realizability of equity investments — Quaker holds equity investments in various foreign companies, where it has the ability to influence, but not control, the operations of the entity and its future results. Quaker would record an impairment charge to an investment if it believed a decline in value that was other than temporary occurred. Adverse changes in market conditions, poor operating results of underlying investments, devaluation of foreign currencies or other events or circumstances could result in losses or an inability to recover the carrying value of the investments, potentially leading to an impairment charge in the future. The carrying amount of the Company's equity investments as of December 31, 2017 was $25.7 million, which included four investments: $19.5 million, for a 33% interest, in Primex, Ltd. (Barbados); approximately $5.7 million, for a 50% interest, in Nippon Quaker Chemical, Ltd. (Japan); $0.4 million, for a 50% interest, in Kelko Quaker Chemical, S.A. (Panama); and $0.1 million, for a 50% interest, in Kelko Quaker Chemical, S.A. (Venezuela), respectively. See Note 14 of Notes to Consolidated Financial Statements, which appears

in Item 8 of this Report.

4. Tax exposures, uncertain tax positions and valuation allowances — Quaker records expenses and liabilities for taxes based on estimates of amounts that will be ultimately determined to be deductible in tax returns filed in various jurisdictions. The filed tax returns are subject to audit, which often occur several years subsequent to the date of the financial statements. Disputes or disagreements may arise during audits over the timing or validity of certain items or deductions, which may not be resolved for extended periods of time. Quaker also evaluates for uncertain tax positions on all income tax positions taken on previously filed tax returns or expected to be taken on a future tax return, which prescribes the recognition threshold and measurement attributes for financial statement recognition and measurement of tax positions taken or expected to be taken on a tax return and, also, whether the benefits of tax positions will be more likely than not sustained upon audit based upon the technical merits of the tax position. For tax positions that are determined to be more likely than not sustained upon audit, the company would recognize the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement in the financial statements. For tax positions that are not determined to be more likely than not sustained upon audit, the company would not recognize any portion of the benefit in its financial statements. In addition, the Company's continuing practice is to recognize interest and/or penalties related to income tax matters in income tax expense. Also, the Company would net its liability for unrecognized tax benefits against deferred tax assets related to net operating losses or other tax credit carryforwards if the uncertain tax position were settled for the presumed amount at the balance sheet date.

Quaker also records valuation allowances when necessary to reduce its deferred tax assets to the amount that is more likely than not to be realized. While Quaker has considered future taxable income, and employs prudent and feasible tax planning strategies in assessing the need for a valuation allowance, in the event Quaker were to determine that it would be able to realize its deferred tax assets in the future in excess of its net recorded amount, an adjustment to the deferred tax asset would increase income in the period such determination was made. Likewise, should Quaker determine that it would not be able to realize all or part of its net deferred tax assets in the future, an adjustment to the deferred tax asset would be charged to income in the period such determination was made. Both determinations could have a material impact on the Company's financial statements.

On December 22, 2017, the United States enacted U.S. Tax Reform. Among other provisions, U.S. Tax Reform reduces the U.S. corporate income tax rate from 35% to 21% effective January 1, 2018, implements a new system of taxation for non-U.S. earnings which eliminates U.S. federal income taxes on dividends from certain foreign subsidiaries, and imposes a one-time tax on the deemed repatriation of undistributed earnings of certain foreign subsidiaries. The Company has made reasonable interpretations and assumptions with regard to various uncertainties and ambiguities in the application of certain provisions of U.S. Tax Reform. It is possible that the Internal Revenue Service ("IRS") could issue subsequent guidance or take positions on audit that differ from the Company's interpretations and assumptions. The Company currently believes that subsequent guidance issued or interpretations made by the IRS will not be materially different from the Company's application of the provisions of U.S. Tax Reform, and would not have a material adverse effect on the Company's tax liability, earnings, or financial condition. While the Company maintains its intention to continue to reinvest the earnings of its foreign subsidiaries for working capital needs and certain other foreign growth initiatives, provisions of U.S. Tax Reform would generally enable the Company to repatriate earnings from certain foreign subsidiaries without any additional U.S. corporate income tax expense. It is the Company's intention to continue to reinvest its undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives. The amount of such undistributed earnings at December 31, 2017 was approximately $300 million. As a result of U.S. Tax Reform, specifically the one-time tax on the deemed repatriation, the Company has provided for U.S. income taxes on these undistributed earnings, however, the Company could be subject to other taxes, such as withholding taxes and dividend distribution taxes, if these undistributed earnings were ultimately remitted to the U.S. It is currently impractical to estimate any such incremental tax expense. See Note 8 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

5. Goodwill and other intangible assets — The Company accounts for business combinations under the acquisition method of accounting. This method requires the recording of acquired assets, including separately identifiable intangible assets, at their acquisition date fair values. Any excess of the purchase price over the estimated fair value of the identifiable net assets acquired is recorded as goodwill. The determination of the estimated fair value of assets acquired requires management's judgment and often involves the use of significant estimates and assumptions, including assumptions with respect to future cash inflows and outflows, discount rates, royalty rates, asset lives and market multiples, among other items. When necessary, the Company consults with external advisors to help determine fair value. For non-observable market values, the Company may determine fair value using acceptable valuation principles, including the excess earnings, relief from royalty, lost profit or cost methods.

The Company amortizes definite-lived intangible assets on a straight-line basis over their useful lives. Goodwill and intangible assets which have indefinite lives are not amortized and are required to be assessed at least annually for impairment. The Company compares the assets' fair value to their carrying value, primarily based on future discounted cash flows, in order to determine if an impairment charge is warranted. The estimates of future cash flows involve considerable management judgment and are based upon assumptions about expected future operating performance. Assumptions used in these forecasts are consistent with internal planning, but the actual cash flows could differ from management's estimates due to changes in business conditions, operating performance, and economic conditions. The Company's assumed weighted average cost of capital and estimated future net operating profit after tax are particularly important in determining estimated future cash flows.

The Company completed its annual impairment assessment as of the end of the third quarter of 2017 by performing a qualitative

assessment. Based on the assessment performed, the Company concluded that there was no evidence of events or circumstances that would indicate a material change from the Company's prior year quantitative assessment by reporting unit. Therefore, the Company has concluded that no goodwill impairment exists in any of its reporting units as of September 30, 2017. To better align the Company's annual goodwill impairment assessment with the Company's budget process and its related timing, the Company elected to update its annual goodwill impairment assessment during the fourth quarter of 2017 and concluded no impairment charge was warranted. Going forward, the Company will complete its annual goodwill impairment assessment during the fourth quarter. See Note 13 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

6. Postretirement benefits — The Company provides certain defined benefit pension and other postretirement benefits to current employees, former employees and retirees. Independent actuaries, in accordance with accounting principles generally accepted in the United States, perform the required valuations to determine benefit expense and, if necessary, non-cash charges to equity for additional minimum pension liabilities. Critical assumptions used in the actuarial valuation include the weighted average discount rate, rates of increase in compensation levels, and expected long-term rates of return on assets. If different assumptions were used, additional pension expense or charges to equity might be required. As of December 31, 2015, the Company elected to use a split discount rate (spot-rate approach) for the U.S. plans and certain foreign plans, which includes the method used to estimate the service and interest components of net periodic benefit cost for pension and other postretirement benefits beginning in the first quarter of 2016. This change resulted in a decrease in the service and interest components for pension cost in the years ended December 31, 2017 and 2016, respectively, compared to the year ended December 31, 2015. Historically, the Company estimated service and interest cost components utilizing a single weighted-average discount rate derived from a specific yield curve used to measure the benefit obligation at the beginning of the period. Under the spot-rate approach, service and interest cost components have been estimated based on the application of the spot rates on a given yield curve at each future year to each plan's projected cash flows to measure the benefit obligation at the beginning of the period. The Company made this change to provide a more precise measurement of service and interest costs by improving the correlation between projected benefit cash flows and the corresponding spot yield curve rates. This change has been accounted for as a change in accounting estimate and, accordingly, accounted for prospectively. The Company's U.S. pension plan year-end is November 30, and the measurement date is December 31. See Note 18 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report. The following table highlights the potential impact on the Company's pre-tax earnings, due to changes in these assumptions with respect to the Company's pension plans, based on assets and liabilities as of December 31, 2017:

	1/2 Percentage Point Increase			1/2 Percentage Point Decrease		
(Amounts in millions)	**Foreign**	**Domestic**	**Total**	**Foreign**	**Domestic**	**Total**
Discount rate (1)	$ 0.5	$ 0.1	$ 0.6	$ (0.5)	$ (0.1)	$ (0.6)
Expected rate of return on plan assets (2)	0.4	0.2	0.6	(0.4)	(0.2)	(0.6)

(1) T he weighted-average discount rate used to determine net periodic benefit costs for the year ended December 31, 2017 was 2.17% for Foreign plans and 3.88% for Domestic plans.

(2) The weighted average expected rate of return on plan assets used to determine net periodic benefit costs for the year ended December 31, 2017 was 2.12% for Foreign plans and 7.0% for Domestic plans.

7. Restructuring and other related liabilities – A restructuring and related activities program may consist of charges for employee severance, rationalization of manufacturing facilities and other related expenses. To account for such, the Company applies the Financial Accounting Standards Board's guidance regarding exit or disposal cost obligations. This guidance requires that a liability for a cost associated with an exit or disposal activity be recognized when the liability is incurred, is estimable, and payment is probable. See Note 5 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

Recently Issued Accounting Standards

See Note 3 of Notes to the Consolidated Financial Statements, which appears in Item 8 of this Report for a discussion regarding recently issued accounting standards.

Liquidity and Capital Resources

Quaker's cash and cash equivalents increased to $89.9 million as of December 31, 2017 from $88.8 million as of December 31, 2016. The $1.1 million increase was the net result of $64.8 million of cash provided by operating activities and a $5.4 million positive impact due to the effect of foreign exchange rates on cash, partially offset by $13.9 million of cash used in investing activities and $55.2 million of cash used in financing activities.

Net cash provided by operating activities was $64.8 million in 2017 compared to $73.8 million 2016. The $9.0 million decrease was primarily the result of cash outflows of $25.9 million in the current year, compared to just $1.0 million in the prior year, associated with payments for combination-related expenses, described below. Partially offsetting these higher cash outflows for combination-related expenses year-over-year was lower cash invested in working capital, primarily due to a decrease in cash outflows related to accounts receivable partially offset by higher cash outflows from inventory. The Company's higher net sales year-over-year drove an increase in its accounts receivables, but this increase was largely offset by improved working capital management and, also,

a significant collection of receivables from a certain customer late in the fourth quarter of 2017 which was uncommon, did not occur during 2016, and is not expected to recur in 2018. Related to cash outflows from inventory, the Company re-stocked inventory levels throughout 2017 to a level sufficient to address its significant production and demand increases from 2016 year-end. The Company's operating cash flows during 2017 were also the result of improved operating performance year-over-year and lower restructuring payments made as part of the Company's global restructuring program initiated in the fourth quarter of 2015, described below.

Net cash used in investing activities decreased from $23.8 million in 2016 to $13.9 million in 2017, primarily due to lower payments for acquisitions in the current year. During 2017, the Company had cash outflows of $5.4 million for the acquisition of assets associated with a business that markets, sells and manufactures certain metalworking fluids. In 2016, the Company had cash outflows of $15.0 million for the acquisition of Lubricor, Inc. and its affiliated entities, the purchase of a business associated with dust control products for the mining industry and a post-closing adjustment to finalize the Company's 2015 acquisition of Verkol, S.A.U. In addition, the Company had higher proceeds from the disposition of assets during 2017, primarily as a result of the disposition of a held-for-sale asset at the Company's India affiliate during the fourth quarter of 2017. Partially offsetting these decreases in cash outflows year-over-year was an increase in capital spending during 2017 as compared to 2016, primarily due to expenditures for several small projects across all of its regions, as well as an increase in spending related to a new manufacturing facility in India that is expected to be completed in 2018. Changes in the Company's restricted cash, which is dependent upon the timing of claims and payments associated with a subsidiary's asbestos litigation, were down slightly year-over-year.

Net cash used in financing activities was $55.2 million in 2017 compared to $38.1 million in 2016. The $17.1 million increase in cash outflows was primarily due to $31.8 million of cash used in the Company's fourth quarter of 2017 purchase of the remaining noncontrolling interest in its India affiliate. This 2017 cash outflow was partially offset by lower repayments of long-term debt year-over-year, with repayments of $2.9 million during 2017 compared to repayments of $14.5 million during 2016. In addition, the Company paid $18.6 million in cash dividends during 2017, a $1.0 million increase in cash dividends compared to the prior year period. In 2016, the Company completed $5.9 million in share repurchases, with no comparable cash payments during the current year.

The Company's primary credit facility ("the Credit Facility") is a $300.0 million syndicated multicurrency credit agreement with a group of lenders which matures in June 2019. The maximum amount available under the Credit Facility can be increased to $400.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under the Credit Facility generally bear interest at a base rate or LIBOR rate plus a margin. The Credit Facility has certain financial and other covenants, with the key financial covenant requiring that the Company's consolidated net debt to adjusted EBITDA ratio cannot exceed 3.50 to 1. As of December 31, 2017 and 2016, the Company's consolidated net debt to adjusted EBITDA ratio was below 1.0 to 1, and the Company was also in compliance with all of its other covenants. As of December 31, 2017 and 2016, the Company had total credit facility borrowings of $48.5 million and $47.9 million, respectively, primarily under the Credit Facility. The Company's other debt obligations as of December 31, 2017 and 2016, respectively, were primarily industrial development bonds and municipality-related loans.

Quaker's management approved a global restructuring plan in the fourth quarter of 2015 (the "2015 Program") to reduce its operating costs. The Company substantially completed all of the initiatives under the 2015 Program during 2016 and settlement of these charges primarily occurred in 2016, with only minimal settlements and cash payments remaining after 2016, which were completed during the first half of 2017. During the years ended December 31, 2017 and 2016, the Company utilized $0.7 million and $5.3 million, respectively, of operating cash flow for the settlement of certain restructuring liabilities under the 2015 Program. The Company estimates the full year pre-tax cost savings as a result of this program was approximately $5 million during 2017 compared to approximately half of this amount realized during 2016.

On April 4, 2017, Quaker entered into a share purchase agreement with Gulf Houghton Lubricants, Ltd. to purchase the entire issued and outstanding share capital of Houghton. The shares will be bought for aggregate purchase consideration consisting of: (i) $172.5 million in cash; (ii) a number of shares of common stock, $1.00 par value per share, of the Company comprising 24.5% of the common stock outstanding upon the closing of the Combination; and (iii) the Company's assumption of Houghton's net indebtedness as of the closing of the Combination, which was approximately $690 million at signing. See Note 2 of Notes to Consolidated Financial Statements.

In connection with the Combination, the Company secured $1.15 billion in commitments from Bank of America Merrill Lynch and Deutsche Bank to fund the purchase consideration and provide additional liquidity and has since replaced these commitments with a syndicated bank agreement ("the New Credit Facility") with a group of lenders for $1.15 billion. The New Credit Facility is contingent upon and will not be effective until the closing of the Combination, and will have to be extended if the Combination does not close by April 4, 2018. The New Credit Facility includes a $400.0 million multicurrency revolver, a $575.0 million USD term loan and a $175.0 million EUR equivalent term loan, each with a five-year term from the date the New Credit Facility becomes effective. The maximum amount available under the New Credit Facility can be increased by $200.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under the New Credit Facility will bear interest at a base rate or LIBOR rate plus a margin, and the Company currently estimates the annual floating rate cost will be in the 3.50% to 3.75% range based on current market interest rates. The New Credit Facility will be subject to certain financial and other covenants, including covenants that the Company's consolidated net debt to adjusted EBITDA ratio cannot exceed 4.25 to 1 and the Company's consolidated adjusted EBITDA to interest expense ratio cannot be less than 3.0 to 1. Both the USD and EUR equivalent term loans

will have quarterly principal amortization during their respective five-year terms, with 5% amortization of the principal balance due in years 1 and 2, 7.5% in year 3, and 10% in years 4 and 5, with the remaining principal amounts due at maturity. Until closing, the Company incurs certain interest costs paid to maintain the banks' committed capital ("ticking fees"), which began to accrue on September 29, 2017. The ticking fees bear an interest rate of 0.30% per annum.

The Company incurred $30.8 million of combination-related expenses during 2017, which includes $0.9 million of ticking fees, described in the Non-GAAP measures section of this Item, below, and made cash payments of $25.9 million related to these costs. During 2018, the Company currently estimates it will have additional expenses and related similar cash outflows of approximately $30 to $35 million through closing of the Combination for similar combination-related expenses, including cash payments for bank fees which we expect to capitalize. In addition, post-closing of the combination, the Company expects it will incur significant additional costs and make associated cash payments to integrate the Company and Houghton and to begin realizing the Combination's total anticipated cost synergies, which we currently estimate to meet or exceed $45 million. The timing and an accurate range of these additional costs and cash payments post-closing are not estimable at this time. However, based on market precedent, the Company currently projects these costs and cash payments to approximate one times anticipated synergies, and, also, the Company expects them to be incurred over a three-year period post-close.

The Company received regulatory approval for the Combination from China in July 2017 and from Australia in October 2017. In addition, at a shareholder meeting held during the third quarter of 2017, the Company's shareholders approved the issuance of the new shares of the Company's common stock at closing of the Combination. Currently, the closing of the Combination is expected during the first half of 2018, and is contingent upon customary closing conditions and the remaining regulatory approvals in the United States and Europe. Given these contingencies and the overall timing of the Combination, the Company has not recorded any estimated costs for additional expenses that the Company expects, but had yet to incur as of December 31, 2017, related to the Combination.

In addition to approving the issuance of the Company's shares at closing of the Combination, at the same shareholders meeting noted above, the Company's shareholders approved an amendment of the Company's Articles of Incorporation that provides that every holder of Quaker Chemical Corporation common stock will be entitled to one vote for each share of common stock of the Company. Prior to this amendment, the Company' Articles of Incorporation included a time-based voting system that granted special ten-for-one-voting rights to shareholders who had beneficially owned their Quaker Chemical Corporation common stock continuously for a period of at least 36 consecutive calendar months.

As of December 31, 2017, the Company's gross liability for uncertain tax positions, including interest and penalties, was $8.4 million. The Company cannot determine a reliable estimate of the timing of cash flows by period related to its uncertain tax position liability. However, should the entire liability be paid, the amount of the payment may be reduced by up to $4.6 million as a result of offsetting benefits in other tax jurisdictions. Related to the impact of U.S. Tax Reform, the Company currently estimates the gross deemed repatriation transition tax ("Transition Tax") on previously untaxed accumulated and current earnings and profits of certain of the Company's foreign subsidiaries to be approximately $18.4 million, including both the estimated U.S. federal as well as state tax amounts. The Company will elect to pay the U.S. federal Transition Tax over 8 years, as allowed, $15.8 million of which is considered a long-term tax payable due after 2018 with the remainder due during 2018, along with all estimated state tax amounts, as presented in the contractual obligations table, below.

The Company believes it is capable of supporting its operating requirements and funding its business objectives, including but not limited to, payments of dividends to shareholders, costs related to the Combination, pension plan contributions, capital expenditures, other business opportunities and other potential contingencies, through internally generated funds supplemented with debt or equity as needed.

The following table summarizes the Company's contractual obligations as of December 31, 2017, and the effect such obligations are expected to have on its liquidity and cash flows in future periods. Pension and other postretirement plan contributions beyond 2018 are not determinable since the amount of any contribution is heavily dependent on the future economic environment and investment returns on pension trust assets. The timing of payments related to other long-term liabilities which consist primarily of deferred compensation agreements, also cannot be readily determined due to their uncertainty. Interest obligations on the Company's long-term debt and capital leases assume the current debt levels will be outstanding for the entire respective period and apply the interest rates in effect as of December 31, 2017.

	Payments due by period						
Contractual Obligations	**Total**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 and Beyond**
Long-term debt	$ 66,956	$ 5,736	$ 49,160	$ 694	$ 407	$ 282	$ 10,677
Interest obligations	7,108	1,716	1,001	534	526	526	2,805
Operating leases	27,600	5,345	4,494	3,708	3,208	2,812	8,033
Purchase obligations	1,893	1,893	-	-	-	-	-
Transition Tax	18,388	2,563	1,376	1,376	1,376	1,376	10,321
Pension and other postretirement plan contributions	10,329	10,329	-	-	-	-	-
Other long-term liabilities (See Note 19 of Notes to Consolidated Financial Statements)	6,529	-	-	-	-	-	6,529
Total contractual cash obligations	$ 138,803	$ 27,582	$ 56,031	$ 6,312	$ 5,517	$ 4,996	$ 38,365

Non-GAAP Measures

Included in this Form 10-K filing are two non-GAAP (unaudited) financial measures: non-GAAP earnings per diluted share and adjusted EBITDA. The Company believes these non-GAAP financial measures provide meaningful supplemental information as they enhance a reader's understanding of the financial performance of the Company, are more indicative of future operating performance of the Company, and facilitate a better comparison among fiscal periods, as the non-GAAP financial measures exclude items that are not considered core to the Company's operations. Non-GAAP results are presented for supplemental informational purposes only and should not be considered a substitute for the financial information presented in accordance with GAAP. The following tables reconcile non-GAAP earnings per diluted share (unaudited) and adjusted EBITDA (unaudited) to their most directly comparable GAAP financial measures:

	For the years ended December 31,		
	2017	**2016**	**2015**
GAAP earnings per diluted share attributable to Quaker Chemical Corporation Common Shareholders	$ 1.52	$ 4.63	$ 3.84
Equity income in a captive insurance company per diluted share (a)	(0.19)	(0.13)	(0.16)
Restructuring (credit) expense per diluted share (b)	—	(0.02)	0.36
Verkol transaction-related expenses per diluted share (c)	—	—	0.15
Houghton combination-related expenses per diluted share (d)	1.90	0.11	—
U.S. Tax Reform charges per diluted share (e)	1.67	—	—
U.S. pension plan settlement charge per diluted share (f)	0.09	—	—
Customer bankruptcy costs per diluted share (g)	—	—	0.02
Cost streamlining initiatives per diluted share (h)	0.01	—	0.01
Loss on disposal of held-for-sale asset per diluted share (i)	0.01	—	—
Insurance insolvency recovery per diluted share (j)	(0.03)	—	—
Currency conversion impact of the Venezuelan bolivar fuerte per diluted share (k)	0.03	0.01	0.21
Non-GAAP earnings per diluted share (l)	$ 5.01	$ 4.60	$ 4.43

	For the years ended December 31,		
	2017	2016	2015
Net income attributable to Quaker Chemical Corporation	$ 20,278	$ 61,403	$ 51,180
Depreciation and amortization	19,966	19,566	19,206
Interest expense (d)	3,892	2,889	2,585
Taxes on income before equity in net income of associated companies (e)	41,653	23,226	17,785
Equity income in a captive insurance company (a)	(2,547)	(1,688)	(2,078)
Restructuring (credit) expense (b)	—	(439)	6,790
Verkol transaction-related expenses (c)	—	—	2,813
Houghton combination-related expenses (d)	29,938	1,531	—
U.S. pension plan settlement charge (f)	1,860	—	—
Customer bankruptcy costs (g)	—	—	328
Cost streamlining initiatives (h)	286	—	173
Loss on disposal of held-for-sale asset (i)	125	—	—
Insurance insolvency recovery (j)	(600)	—	—
Currency conversion impact of the Venezuelan bolivar fuerte (k)	388	88	2,806
Adjusted EBITDA	$ 115,239	$ 106,576	$ 101,588
Adjusted EBITDA margin (%) (m)	14.1%	14.3%	13.8%

(a) Equity income in a captive insurance company represents the after-tax income attributable to the Company's interest in Primex, Ltd. ("Primex"), a captive insurance company. The Company holds a 33% investment in and has significant influence over Primex, and therefore accounts for this interest under the equity method of accounting. The income attributable to Primex is not indicative of the future operating performance of the Company and is not considered core to the Company's operations. See Note 14 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(b) Restructuring (credit) expense represents the charge incurred (or credit recorded) by the Company associated with a global restructuring program which was initiated in the fourth quarter of 2015. These costs are not indicative of the future operating performance of the Company. See Note 5 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(c) Verkol transaction-related expenses represent certain one-time transaction-related costs incurred in connection with the execution of the Company's 2015 Verkol acquisition. These costs are not indicative of the future operating performance of the Company. See Note 21 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(d) Houghton combination-related expenses include certain legal, environmental, financial, and other advisory and consultant costs incurred in connection with the strategic evaluation of, diligence on, and execution of the definitive agreement to combine with Houghton, as well as regulatory and shareholder approvals and integration planning associated with the Combination. These costs are not indicative of the future operating performance of the Company. Certain of these costs were considered non-deductible for the purpose of determining the Company's effective tax rate and, therefore, the earnings per diluted share amount reflects this impact. In addition, beginning in September 2017, the Company began to incur ticking fees to maintain the capital commitment related to the pending Combination. These interest costs are included in the caption Houghton combination-related expenses in the reconciliation of GAAP earnings per diluted share attributable to Quaker Chemical Corporation common shareholders to Non-GAAP earnings per diluted share above, but are included in the caption Interest expense in the reconciliation of Net income attributable to Quaker Chemical Corporation to Adjusted EBITDA above. See Note 2 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(e) U.S. Tax Reform charges represent the tax expense incurred by the Company as a result of the Tax Cuts and Jobs Act of 2017. This tax expense includes the Company's estimated impact of the Transition Tax, net of eliminating U.S. federal income taxes on dividends from certain foreign subsidiaries in the current year, of approximately $17.8 million, as well as the impact of revaluing certain of the Company's domestic deferred tax balances from 35% to the new 21% U.S. corporate tax rate of approximately $4.4 million. These tax expenses were the result of a specific one-time event and are not indicative of future operating performance of the Company. U.S. Tax Reform charges are included within Taxes on income before equity in net income of associated companies in the reconciliation of Net income attributable to Quaker Chemical Corporation to Adjusted EBITDA. See Note 8 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(f) U.S. pension plan settlement charge represents the expense recorded related to the Company's U.S. pension plan settlement to its vested terminated participants. This settlement charge represents the immediate recognition into expense of a portion of the unrecognized loss within accumulated other comprehensive loss ("AOCI") on the balance sheet in proportion to the share of the projected benefit obligation that was settled by these payments. This charge was the result of a specific one-time event and is not

indicative of the future operating performance of the Company. See Note 18 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(g) Customer bankruptcy costs represent the costs associated with reserving for trade accounts receivable of certain customers who filed for bankruptcy protection. These expenses are not indicative of the future operating performance of the Company. See Note 10 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report

(h) Cost streamlining initiatives represent expenses associated with certain actions taken to reorganize the Company's corporate staff in 2017 and certain actions taken in the Company's South America reportable operating segment in 2015 to streamline and enhance segment profitability. These costs are not indicative of the future operating performance of the Company.

(i) Loss on disposal of held-for-sale asset represents a one-time charge to write down the value of held-for-sale asset at the Company's India affiliate to its fair value. This charge was the result of a specific one-time event and is not indicative of the future operating performance of the Company.

(j) Insurance insolvency recovery represents income associated with a cash receipt from an insolvent insurance carrier for previously submitted claims by an inactive subsidiary of the Company. This other income is not indicative of the future operating performance of the Company. See Notes 7 and 23 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(k) Currency conversion impact of the Venezuelan bolivar fuerte represents losses incurred at the Company's Venezuelan affiliate as a result of changes in Venezuela's foreign exchange markets and controls and the conversion of certain bolivar fuerte to U.S. dollars. The losses were the result of specific one-time changes to Venezuela's foreign exchange controls and one-time currency conversions of certain bolivar fuerte to U.S. dollars and are not indicative of the future operating performance of the Company. See Note 14 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(l) Within the Company's calculation of Non-GAAP earnings per diluted share above, each reconciling item includes the impact of any current and deferred income tax expense (benefit) as applicable. The income tax expense (benefit) related to these items was determined utilizing the applicable rates in the taxing jurisdictions in which these adjustments occurred.

(m) The Company calculates Adjusted EBITDA margin as the percentage of Adjusted EBITDA to consolidated net sales.

Operations

Consolidated Operations Review – Comparison of 2017 with 2016

Net sales in 2017 of $820.1 million increased 10% compared to net sales of $746.7 million in 2016. The $73.4 million increase in net sales was the result of a 6% increase in organic volumes, a 1% or $10.7 million increase from sales attributable to the Company's 2016 acquisition of Lubricor, a 2% increase due to changes in selling price and product mix and the positive impact of foreign currency translation of $4.9 million or 1%.

Cost of goods sold ("COGS") in 2017 of $528.6 million increased 13% from $466.6 million in 2016. The increase in COGS was primarily due to the increase in product volumes, noted above, as well as additional COGS attributed to the Company's 2016 acquisition of Lubricor, the impact of certain raw material cost increases and changes in product mix, and the negative impact of foreign currency translation year-over-year. In addition, 2017 and 2016 COGS include reclassifications related to the Company's first quarter of 2017 adoption and retrospective application of an accounting standard update regarding the classification of certain pension costs on the income statement. See Note 3 of Notes to Consolidated Financial Statements.

Gross profit in 2017 increased $11.4 million or 4% compared to 2016, primarily driven by the increase in sales volumes, noted above, partially offset by a lower gross margin of 35.5% in 2017 compared to 37.5% in 2016. The decrease in the Company's gross margin in 2017 was primarily due to higher raw material costs compared to the prior year and a change in the mix of certain products sold.

SG&A in 2017 increased $5.1 million compared to 2016 primarily due to additional SG&A associated with the Company's prior year Lubricor acquisition, an increase due to the impact of foreign currency translation, higher labor-related costs primarily due to annual compensation increases and incentive compensation, as well as a first quarter of 2017 cost streamlining initiative, described in the Non-GAAP measures section of this Item, above. These increases to SG&A were partially offset by decreases as a result of certain cost savings efforts, including the impact of the 2015 global restructuring program in the current year. In addition, 2017 and 2016 SG&A include reclassifications related to the Company's first quarter of 2017 adoption of the pension accounting standard update noted above.

The Company substantially completed the 2015 global restructuring program during 2016, and recognized a restructuring credit of $0.4 million during the fourth quarter of 2016 to update its initial estimates for employee separation costs. There were no comparable restructuring costs or credits during 2017.

During 2017, the Company incurred $29.9 million of costs related to its previously announced Combination with Houghton, described in the Non-GAAP measures section of this Item, above. The Company incurred $1.5 million of similar combination-related expenses in 2016.

Operating income in 2017 was $62.7 million compared to $85.4 million in 2016. The decrease in operating income was primarily due to the Houghton combination-related expenses along with slightly higher levels of SG&A not related to the Houghton Combination, which more than offset gross profit increases on strong volume growth, noted above.

The Company had other expense of $0.7 million in 2017 compared to $0.5 million in 2016. The increase in other expense was primarily driven by a second quarter of 2017 U.S. pension plan settlement charge and a fourth quarter of 2017 loss on the disposal of a held-for-sale asset, partially offset by income associated with an insurance insolvency recovery in the fourth quarter of 2017, all of which are described in the Non-GAAP measures section of this Item, above. In addition, the Company had higher foreign currency transaction gains realized in 2017 compared to 2016 and an increase in receipts of local municipality-related grants in one of the Company's regions year-over-year. Also, both 2017 and 2016 other expense includes reclassifications related to the Company's first quarter of 2017 adoption of the pension accounting standard update, noted above, with non-service pension costs being consistent in 2017 compared to 2016, excluding the plan settlement charge noted above.

Interest expense increased $1.0 million year-over-year, primarily due to costs incurred to maintain the committed capital for the pending Houghton Combination. Interest income increased $0.5 million in 2017 compared to 2016, primarily due to an increase in the level of the Company's invested cash in certain regions with higher returns.

The Company's effective tax rates for 2017 and 2016 were 68.7% and 27.6%, respectively. The primary drivers of the increase in the Company's effective tax rate during 2017 were the current year impact of certain non-deductible Houghton combination-related expenses as well as $22.2 million of charges related to U.S. Tax Reform, described in the Non-GAAP measures section of this Item, above. The Company estimates that its 2017 effective tax rate would have been approximately 27%, without the impact of U.S. Tax Reform and non-deductible Houghton combination-related expenses. These increases to the current year effective tax rate were partially offset by the favorable impact of tax benefits for deductions in excess of compensation cost associated with stock option exercises and restricted stock vesting in the current year as a result of the Company's first quarter of 2017 adoption of an accounting standard update regarding the tax impact of certain share-based compensation. See Note 3 of Notes to Consolidated Financial Statements. In 2016, there were minimal non-deductible Houghton combination-related expenses, no charges similar to those of the 2017 U.S. Tax Reform and no comparable share-based compensation-related tax benefits. Also, in both 2017 and 2016, the Company's mix of foreign earnings in jurisdictions with lower effective tax rates impacted each year's tax expense. The Company has experienced and expects to continue to experience volatility in its effective tax rates due to several factors, including the timing of tax audits and the expiration of applicable statutes of limitations as they relate to uncertain tax positions, the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, the treatment of certain acquisition-related costs and the timing and amount of certain share-based compensation-related tax benefits, among other factors.

Equity in net income of associated companies ("equity income") increased $1.0 million in 2017 compared to the 2016. The increase in equity income was primarily due to higher earnings from the Company's interest in a captive insurance company in the current year. In addition, the Company recorded currency conversion charges in both 2017 and 2016, respectively, associated with the Company's Venezuela affiliate. The Company's interest in a captive insurance company and the currency conversion charges recorded are described in the Non-GAAP measures section of this Item, above.

The Company had a $0.4 million increase in net income attributable to noncontrolling interest in 2017 compared to 2016, primarily due to an increase in performance from certain consolidated affiliates in the Company's Asia/Pacific region partially offset by the impact of the Company's purchase of the remaining interest in its India joint venture in December 2017.

The impacts from foreign currency translation negatively impacted the Company's 2017 results by less than 1% or $0.01 per diluted share, which does not include the foreign currency transaction gains realized in other income during 2017 or the currency conversion charge associated with the Company's Venezuelan affiliate recorded in equity income noted above.

Consolidated Operations Review – Comparison of 2016 with 2015

Net sales in 2016 of $746.7 million increased 1% from $737.6 million in 2015. This increase was primarily the result of a 3% increase in organic volumes and $19.4 million or approximately 2% of sales attributable to the Company's 2016 and 2015 acquisitions, partially offset by the negative impact of foreign currency translation of $21.7 million or 3%, and declines in selling price and product mix of 1%.

COGS in 2016 of $466.6 million increased 1% from $459.8 million in 2015. The increase in COGS was primarily due to increases in product volume, including additional cost of goods sold attributed to the Company's 2016 and 2015 acquisitions, partially offset by the impact of foreign currency translation and certain changes in raw material costs and product mix. In addition, 2016 and 2015 COGS include reclassifications related to the Company's first quarter of 2017 adoption of the pension accounting standard update, noted above.

Gross profit in 2016 increased $2.3 million or 1% compared to 2015, driven by the increase in sales volumes noted above, on a slightly lower gross margin of 37.5% in 2016 compared to 37.7% in 2015.

The SG&A decrease of $2.7 million from 2015 was primarily due to a decline from foreign currency translation, one-time transaction related expenses related to the Verkol acquisition in 2015, a 2015 cost streamlining initiative in South America, and certain customer bankruptcies recorded in 2015, described in the Non-GAAP Measures section of this Item, above. The Company incurred

higher SG&A year-over-year from annual compensation increases, as well as incremental costs associated with the Company's 2015 and 2016 acquisitions, however, these costs were largely offset by certain cost savings efforts, including the 2015 global restructuring program, noted below. In addition, 2016 and 2015 SG&A includes reclassifications related to the Company's first quarter of 2017 adoption of the pension accounting standard update, noted above.

The Company had a restructuring expense of $6.8 million in 2015 related to a global restructuring program initiated in the fourth quarter of 2015, as described in the Non-GAAP Measures section of this Item, above. During 2016, the Company recognized a restructuring credit of $0.4 million to update its initial estimates for employee separation costs.

During 2016, the Company incurred $1.5 million of costs related to its previously announced Combination with Houghton, described in the Non-GAAP measures section of this Item, above. There were no comparable costs incurred during 2015.

Operating income in 2016 was $85.4 million compared to $74.6 million in 2015. The $10.8 million increase in operating income was primarily due to an increase in sales volumes, as well as lower SG&A and restructuring expenses year-over-year, partially offset by the slight decline in gross margin during 2016.

Other expense decreased $2.9 million in 2016 compared to 2015. The decrease was primarily driven by foreign currency transaction gains realized in 2016 compared to foreign currency transaction losses in 2015 as well as higher receipts of local municipality-related grants in one of the Company's regions year-over-year. In addition, 2016 and 2015 other expense includes reclassifications related to the Company's first quarter of 2017 adoption of the pension accounting standard update, noted above, with lower non-service related pension costs incurred in 2016 compared to 2015.

Interest expense was $0.3 million higher in 2016 compared to 2015, primarily due to increased average borrowings outstanding during 2016 as a result of the Company's acquisition activity. Interest income was $0.4 million higher in 2016 compared to 2015, primarily due to an increase in the level of the Company's invested cash in certain regions with higher returns and increased interest received on certain tax-related credits in 2016.

The Company's effective tax rates for 2016 and 2015 were 27.6% and 25.3%, respectively. The primary contributors to the difference between the 2016 and 2015 effective tax rates were certain one-time items recorded during 2015, including the accelerated recognition of certain tax-related incentives due to changes in local tax regulations and adjustments related to previous years' tax estimates. Also, in both 2015 and 2016, the Company's mix of foreign earnings in jurisdictions with lower effective tax rates impacted each year's tax expense.

Equity income increased $2.0 million in 2016 compared to 2015. The increase in equity income was primarily due to a smaller currency conversion charge recorded at the Company's Venezuela affiliate partially offset by lower equity income from the Company's interest in a captive insurance company, described in the Non-GAAP Measures section of this Item, above.

The $0.1 million increase in net income attributable to noncontrolling interest in 2016 compared to 2015 was primarily due to a stronger performance at the Company's India affiliate.

The impacts from foreign currency translation negatively impacted the Company's 2016 results by approximately 4% or $0.19 per diluted share, which does not include the foreign currency transaction gains realized in other income during 2016 or the currency conversion charge associated with the Company's Venezuelan affiliate recorded in equity income, noted above.

Reportable Operating Segment Review – Comparison of 2017 with 2016

The Company sells its industrial process fluids, chemical specialties and technical expertise to a wide range of industries in a global product portfolio throughout its four segments: (i) North America, (ii) EMEA, (iii) Asia/Pacific and (iv) South America.

North America

North America represented approximately 43% of the Company's consolidated net sales in 2017. The segment's net sales were $356.6 million, an increase of $20.4 million or 6% compared to 2016. The increase in net sales was primarily due to increased volumes of 3%, including acquisitions, and an increase in selling price and product mix of 3%. The negative impact of foreign currency translation on net sales year-over-year was less than 1%, driven primarily by a slight weakening of the Mexican peso against the U.S. dollar year-over-year. This reportable segment's operating earnings, excluding indirect expenses, were $77.7 million, a decrease of $0.1 million compared to 2016. North America's relatively consistent operating earnings were the net result of a decline in gross margin and higher levels of SG&A, which offset higher gross profit on the increase in net sales, noted above. The decline in gross margin was due to increases in certain raw material costs and changes in product mix. The higher SG&A was primarily due to increases in labor costs primarily associated with annual merit increases and additional SG&A associated with the Lubricor acquisition.

EMEA

EMEA represented approximately 28% of the Company's consolidated net sales in 2017. The segment's net sales were $226.2 million, an increase of $25.3 million or 13% compared to 2016. The increase in net sales was primarily due to higher volumes of 7%, an increase in selling price and product mix of 4% and the positive impact of foreign currency translation of 2%. The foreign exchange impact was primarily due to a strengthening of the euro against the U.S. dollar, as this exchange rate averaged approximately 1.13 in 2017 compared to approximately 1.10 in 2016. This reportable segment's operating earnings, excluding indirect expenses, were $35.4 million, an increase of $1.5 million or 5% compared to 2016. The increase in EMEA's operating earnings was driven by higher gross profit on the increase in net sales, partially offset by a lower gross margin due to increases in certain raw material costs and product mix and slightly higher SG&A year-over-year due to increases in labor costs primarily associated with annual merit increases and improved segment performance.

Asia/Pacific

Asia/Pacific represented approximately 25% of the Company's consolidated net sales in 2017. The segment's net sales were $201.0 million, an increase of $21.9 million or 12% compared to 2016. The increase in net sales was primarily due to higher volumes of 16% partially offset by a decrease in selling price and product mix of 4% and the negative impact of foreign currency translation of less than 1%. The foreign exchange impact was primarily due to a weakening of the Chinese renminbi against the U.S. dollar, which offset a strengthening of the Indian rupee against the U.S. dollar, year-over-year. These exchange rate averaged 6.75 and 65.1 in 2017 compared to 6.64 and 67.18 in 2016, respectively. This reportable segment's operating earnings, excluding indirect expenses, were $48.3 million, an increase of $2.5 million or 5% compared to 2016. The increase in Asia/Pacific's operating earnings was driven by higher gross profit on the increase in net sales, noted above, partially offset by a lower gross margin due to increases in certain raw material costs and product mix and slightly higher SG&A year-over-year due to increases in labor costs primarily associated with annual merit increases and improved segment performance.

South America

South America represented approximately 4% of the Company's consolidated net sales in 2017. The segment's net sales were $36.2 million, an increase of $5.8 million or 19% compared to 2016. The increase in net sales was primarily due to higher volumes of 6%, an increase in selling price and product mix of 7% and the positive impact of foreign currency translation of 6%. The foreign exchange impact was primarily due to a strengthening of the Brazilian real against the U.S. dollar, which offset a weakening of the Argentinian peso against the U.S. dollar, year-over-year. These exchange rates averaged 3.19 and 16.50 in 2017 compared 3.47 and 14.73 in 2016, respectively. This reportable segment's operating earnings, excluding indirect expenses, were $3.9 million, an increase of $2.5 million or 183% compared to 2016. The increase in South America's operating earnings was driven by higher gross profit on the increase in net sales, as well as a higher gross margin primarily due to lower raw material costs. These increases to operating earnings year-over-year were partially offset by slightly higher SG&A due to increases in labor costs primarily associated with annual merit increases and improved segment performance.

Reportable Operating Segment Review – Comparison of 2016 with 2015

North America

North America represented approximately 45% of the Company's consolidated net sales in 2016. The segment's net sales were $336.2 million, a decrease of $8.1 million or 2% compared to 2015. The decrease in net sales was primarily due to the negative impact of foreign currency translation of 2% and a decrease in selling price and product mix of approximately 1%, partially offset by higher volumes of 1%. The foreign exchange impact was primarily due to the weakening of the Mexican peso against the U.S. dollar, as this exchange rate averaged 18.64 in 2016 compared to 15.83 in 2015. This reportable segment's operating earnings, excluding indirect expenses, were $77.8 million, a decrease of $2.4 million or 3% compared to 2015. The decrease was mainly due to lower sales, noted above, partially offset by increased gross margin on lower raw material costs and product mix. This segment had relatively consistent levels of SG&A year-over-year as normal annual compensation increases were offset by lower segment performance and the Company's cost savings efforts.

EMEA

EMEA represented approximately 27% of the Company's consolidated net sales in 2016. The segment's net sales were $200.9 million, an increase of $21.2 million or 12% compared to 2015. The increase in net sales was primarily due to higher volumes, including acquisitions, of 13%, partially offset by the negative impact of foreign currency translation of 1%. The foreign exchange impact was primarily due to a weakening of the euro against the U.S. dollar, as this exchange rate averaged approximately 1.10 in 2016 compared to 1.11 in 2015. This reportable segment's operating earnings, excluding indirect expenses, were $33.8 million, an increase of $5.6 million or 20% compared to 2015. The increase was mainly driven by higher gross profit on the increased net sales, noted above, partially offset by a slightly lower gross margin due primarily to product mix. In addition, the segment had relatively consistent levels of SG&A as incremental operating costs from the 2015 Verkol acquisition, increased labor-related costs on improved segment performance and normal annual compensation increases were offset by the Company's cost savings efforts.

Asia/Pacific

Asia/Pacific represented approximately 24% of the Company's consolidated net sales in 2016. The segment's net sales were $179.1 million, a decrease of approximately $1.9 million or 1% compared to 2015. The decrease in net sales was primarily due to the negative impact of foreign currency translation of 5% and a decrease in selling price and product mix of 3%, partially offset by higher product volumes of 7%. The foreign exchange impact was primarily due to a weakening of the Chinese renminbi and Indian rupee against the U.S. dollar, as these exchange rates averaged 6.64 and 67.18 in 2016 compared to 6.23 and 64.07 in 2015, respectively. This reportable segment's operating earnings, excluding indirect expenses, were $45.9 million, an increase of $0.8 million or 2% compared to 2015. The increase was mainly driven by gross margin expansion due to lower raw material costs and product mix, which was partially offset by the decrease in net sales, noted above. SG&A was relatively consistent year-over-year as annual compensation increases were offset by the Company's cost savings efforts.

South America

South America represented approximately 4% of the Company's consolidated net sales in 2016. The segment's net sales were $30.4 million, a decrease of $2.1 million or 6% compared to 2015. The decrease in net sales was primarily due to the negative impact of foreign currency translation of 14% and lower product volumes of approximately 3%, partially offset by an increase in selling price and product mix of 11%. The foreign exchange impact was primarily due to a weakening of the Brazilian real and Argentinian peso against the U.S. dollar, as these exchange rates averaged 3.47 and 14.73 in 2016 compared 3.28 and 9.19 in 2015, respectively. This reportable segment's operating earnings, excluding indirect expenses, were $1.4 million, a decrease of $0.4 million or 22% compared to 2015. The decrease was mainly driven by the decrease in net sales, noted above, and lower gross margin due to higher raw material costs, which were partially offset by lower overall labor-related costs due to the segment's decreased performance and the positive effects of various cost savings efforts, including the Company's prior years' streamlining efforts in this segment.

Environmental Clean-up Activities

The Company is involved in environmental clean-up activities in connection with an existing plant location and former waste disposal sites. In 1992, the Company identified certain soil and groundwater contamination at AC Products, Inc. ("ACP"), a wholly owned subsidiary. In voluntary coordination with the Santa Ana California Regional Water Quality Board ("SACRWQB"), ACP has been remediating the contamination. In 2007, ACP agreed to operate two groundwater treatment systems, so as to hydraulically contain groundwater contamination emanating from ACP's site until such time as the concentrations of contaminants are below the current Federal maximum contaminant level for four consecutive quarterly sampling events. In 2014, ACP ceased operation at one of its two groundwater treatment systems, as it had met the above condition for closure. As of December 31, 2017, ACP believes it is close to meeting the conditions for closure of the remaining groundwater treatment system, but continues to operate this system while in discussions with the relevant authorities and believes that the range of potential-known liabilities associated with the balance of ACP's water remediation program is approximately $0.1 million to $1.0 million. The low and high ends of the range are based on the length of operation of the treatment system as required by the conditions noted above, as determined by groundwater modeling. Notwithstanding the foregoing, the Company cannot be certain that future liabilities in the form of remediation expenses and damages will not be in excess of the high end of the range. See Note 23 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

General

See Item 7A of this Report, below, for further discussion of certain quantitative and qualitative disclosures about market risk.

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

Quaker is exposed to the impact of interest rates, foreign currency fluctuations, changes in commodity prices, and credit risk.

Interest Rate Risk. Quaker's exposure to changes in interest rates relates primarily to its credit facilities. Interest rates for Quaker's credit facilities are generally based on a base rate or LIBOR plus a spread. Accordingly, if interest rates rise significantly, the cost of debt to Quaker will increase. This can have an adverse effect on Quaker, depending on the extent of Quaker's borrowings throughout a given year. As of December 31, 2017, Quaker had $48.5 million outstanding under its credit facilities at a weighted average borrowing rate of approximately 1.88%. If interest rates had changed by 10%, the Company's interest expense on its credit facilities for the year ended December 31, 2017 would have correspondingly increased or decreased by approximately $0.1 million. Quaker's other long-term and short-term debt consists primarily of fixed rate bonds and loans which are not exposed to interest rate fluctuations. The Company previously used derivative financial instruments primarily for the purposes of hedging exposures to fluctuations in interest rates. The Company did not use any similar instruments in 2017 or 2016, and has not entered into derivative contracts for trading or speculative purposes. See the information included under the caption "Derivatives" in Note 1 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report and is incorporated herein by reference.

Foreign Exchange Risk. A significant portion of Quaker's revenues and earnings are generated by its foreign operations. These foreign operations also represent a significant portion of Quaker's assets and liabilities. Generally, all of these foreign operations use the local currency as their functional currency. Accordingly, Quaker's financial results are affected by foreign currency fluctuations, particularly between the U.S. dollar and the euro, the Brazilian real, the Mexican peso, the Chinese renminbi and the Indian rupee. Quaker's results can be materially affected depending on the volatility and magnitude of foreign exchange rate changes. If the euro, the Brazilian real, the Mexican peso, the Chinese renminbi and the Indian rupee had all strengthened or weakened by 10% against the U.S. dollar, the Company's 2017 revenues and pre-tax earnings would have correspondingly increased or decreased approximately $42.6 million and $5.8 million, respectively.

The Company generally does not use financial instruments that expose it to significant risk involving foreign currency transactions. However, the size of its non-U.S. activities has a significant impact on reported operating results and the attendant net assets. During the past three years, sales by its non-U.S. subsidiaries accounted for approximately 60% of our consolidated net sales.

In addition, the Company occasionally sources inventory among its worldwide operations. This practice can give rise to foreign exchange risk resulting from the varying cost of inventory to the receiving location, as well as from the revaluation of intercompany balances. The Company primarily mitigates this risk through local sourcing efforts.

Commodity Price Risk. Many of the raw materials used by Quaker are commodity chemicals and derivatives of such, which can experience significant price volatility, and therefore Quaker's earnings can be materially affected by market changes in raw material prices. At times, Quaker has entered into fixed-price purchase contracts to manage this risk. These contracts provide protection to Quaker if the prices for the contracted raw materials rise; however, in certain limited circumstances, Quaker will not realize the benefit if such prices decline. A gross margin change of one percentage point, would correspondingly have increased or decreased the Company's pre-tax earnings by approximately $8.2 million.

Credit Risk. Quaker establishes allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. If the financial condition of Quaker's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances might be required. Downturns in the overall economic climate may also exacerbate specific customer financial issues. A significant portion of Quaker's revenues is derived from sales to customers in the steel and automotive industries, including some of our larger customers, where a number of bankruptcies have occurred in past years and where companies have experienced financial difficulty. When a bankruptcy occurs, Quaker must judge the amount of proceeds, if any, that may ultimately be received through the bankruptcy or liquidation process. In addition, as part of its terms of trade, Quaker may custom manufacture products for certain large customers and/or may ship product on a consignment basis. These practices may increase the Company's exposure should a bankruptcy occur, and may require a write-down or disposal of certain inventory due to its estimated obsolescence or limited marketability. Customer returns of products or disputes may also result in similar issues related to the realizability of recorded accounts receivable or returned inventory. The Company recorded expense to increase its provision for doubtful accounts by $0.1 million, $1.4 million and $1.5 million for the years ended December 31, 2017, 2016 and 2015, respectively. A change of 10% to the expense recorded to the Company's provision would have increased or decreased the Company's pre-tax earnings by less than $0.1 million, $0.1 million and $0.1 million for the years ended December 31, 2017, 2016 and 2015, respectively.

Item 8. *Financial Statements and Supplementary Data.*

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Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of Quaker Chemical Corporation:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Quaker Chemical Corporation and its subsidiaries (the "Company") as of December 31, 2017 and 2016 and the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2017, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 28, 2018

We have served as the Company's auditor since at least 1972.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF INCOME
(Dollars in thousands, except per share data)

	Year Ended December 31,		
	2017	**2016**	**2015**
Net sales	$ 820,082	$ 746,665	$ 737,555
Costs and expenses			
Cost of goods sold	528,587	466,555	459,810
Selling, general and administrative expenses	198,813	193,665	196,387
Restructuring and related activities	—	(439)	6,790
Combination-related expenses	29,938	1,531	—
	757,338	661,312	662,987
Operating income	62,744	85,353	74,568
Other expense, net	(718)	(492)	(3,377)
Interest expense	(3,892)	(2,889)	(2,585)
Interest income	2,534	2,037	1,624
Income before taxes and equity in net income of associated companies	60,668	84,009	70,230
Taxes on income before equity in net income of associated companies	41,653	23,226	17,785
Income before equity in net income of associated companies	19,015	60,783	52,445
Equity in net income of associated companies	3,285	2,256	261
Net income	22,300	63,039	52,706
Less: Net income attributable to noncontrolling interest	2,022	1,636	1,526
Net income attributable to Quaker Chemical Corporation	$ 20,278	$ 61,403	$ 51,180
Earnings per common share data:			
Net income attributable to Quaker Chemical Corporation Common Shareholders – basic	$ 1.53	$ 4.64	$ 3.84
Net income attributable to Quaker Chemical Corporation Common Shareholders – diluted	$ 1.52	$ 4.63	$ 3.84

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

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Dollars in thousands)

	Year Ended December 31,		
	2017	**2016**	**2015**
Net income	$ 22,300	$ 63,039	$ 52,706
Other comprehensive gain (loss), net of tax			
Currency translation adjustments	21,076	(13,772)	(24,869)
Defined benefit retirement plans			
Net (loss) gain arising during the period, other	(96)	(2,990)	3,821
Amortization of actuarial loss	2,255	2,155	2,561
Amortization of prior service gain	(84)	(82)	(82)
Unrealized (loss) gain on available-for-sale securities	(130)	537	(978)
Other comprehensive gain (loss)	23,021	(14,152)	(19,547)
Comprehensive income	45,321	48,887	33,159
Less: Comprehensive income attributable to noncontrolling interest	(2,736)	(1,575)	(889)
Comprehensive income attributable to Quaker Chemical Corporation	$ 42,585	$ 47,312	$ 32,270

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

QUAKER CHEMICAL CORPORATION
CONSOLIDATED BALANCE SHEETS
(Dollars in thousands, except par value and share amounts)

	December 31,	
	2017	**2016**
ASSETS		
Current assets		
Cash and cash equivalents	$ 89,879	$ 88,818
Accounts receivable, net	208,358	195,225
Inventories, net	87,221	77,082
Prepaid expenses and other current assets	21,128	15,343
Total current assets	406,586	376,468
Property, plant and equipment, net	86,704	85,734
Goodwill	86,034	80,804
Other intangible assets, net	71,603	73,071
Investments in associated companies	25,690	22,817
Non-current deferred tax assets	15,460	24,382
Other assets	30,049	28,752
Total assets	$ 722,126	$ 692,028
LIABILITIES AND EQUITY		
Current liabilities		
Short-term borrowings and current portion of long-term debt	$ 5,736	$ 707
Accounts payable	93,008	77,583
Dividends payable	4,724	4,581
Accrued compensation	22,846	19,356
Accrued restructuring	—	670
Accrued pension and postretirement benefits	1,108	1,086
Other current liabilities	27,321	23,428
Total current liabilities	154,743	127,411
Long-term debt	61,068	65,769
Non-current deferred tax liabilities	9,653	12,008
Non-current accrued pension and postretirement benefits	35,548	38,348
Other non-current liabilities	51,496	35,886
Total liabilities	312,508	279,422
Commitments and contingencies (Note 23)		
Equity		
Common stock $1 par value; authorized 30,000,000 shares; issued and outstanding 2017 – 13,307,976 shares; 2016 – 13,277,832 shares	13,308	13,278
Capital in excess of par value	93,528	112,475
Retained earnings	365,936	364,414
Accumulated other comprehensive loss	(65,100)	(87,407)
Total Quaker shareholders' equity	407,672	402,760
Noncontrolling interest	1,946	9,846
Total equity	409,618	412,606
Total liabilities and equity	$ 722,126	$ 692,028

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

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Dollars in thousands)

	Year Ended December 31,		
	2017	**2016**	**2015**
Cash flows from operating activities			
Net income	$ 22,300	$ 63,039	$ 52,706
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	12,598	12,557	12,395
Amortization	7,368	7,009	6,811
Equity in undistributed (earnings) losses of associated companies, net of dividends	(2,895)	(1,969)	578
Deferred income taxes	3,754	5,488	(2,401)
Uncertain tax positions (non-deferred portion)	(817)	(3,206)	(1,122)
Non-current income taxes payable	15,825	—	—
Deferred compensation and other, net	1,074	(424)	14
Share-based compensation	4,190	6,349	5,919
Restructuring and related activities	—	(439)	6,790
Loss (gain) on disposal of property, plant and equipment and other assets	79	(18)	(12)
Insurance settlement realized	(762)	(1,023)	(760)
Combination-related expenses, net of payments	4,952	503	—
Pension and other postretirement benefits	(123)	(3,420)	2,591
(Decrease) increase in cash from changes in current assets and current liabilities, net of acquisitions:			
Accounts receivable	(1,941)	(11,705)	(188)
Inventories	(6,135)	(1,870)	1,292
Prepaid expenses and other current assets	(2,932)	(703)	(721)
Accounts payable and accrued liabilities	12,381	14,063	(9,040)
Restructuring liabilities	(675)	(5,252)	(490)
Estimated taxes on income	(3,479)	(5,226)	(930)
Net cash provided by operating activities	64,762	73,753	73,432
Cash flows from investing activities			
Investments in property, plant and equipment	(10,872)	(9,954)	(11,033)
Payments related to acquisitions, net of cash acquired	(5,363)	(15,024)	(24,058)
Proceeds from disposition of assets	1,577	186	135
Insurance settlement interest earned	50	32	35
Change in restricted cash, net	712	991	725
Net cash used in investing activities	(13,896)	(23,769)	(34,196)
Cash flows from financing activities			
Proceeds from long-term debt	—	—	6,163
Repayment of long-term debt	(2,853)	(14,513)	(477)
Dividends paid	(18,613)	(17,625)	(16,513)
Stock options exercised, other	(1,956)	(811)	1,048
Payments for repurchase of common stock	—	(5,859)	(7,276)
Excess tax benefit related to stock option exercises	—	678	384
Purchase of noncontrolling interest in affiliates, net	(31,787)	—	—
Payment of acquisition-related liabilities	—	—	(226)
Net cash used in financing activities	(55,209)	(38,130)	(16,897)
Effect of exchange rate changes on cash	5,404	(4,089)	(6,017)
Net increase in cash and cash equivalents	1,061	7,765	16,322
Cash and cash equivalents at beginning of period	88,818	81,053	64,731
Cash and cash equivalents at end of period	$ 89,879	$ 88,818	$ 81,053
Supplemental cash flow disclosures:			
Cash paid during the year for:			
Income taxes	$ 21,544	$ 25,043	$ 20,996
Interest	2,767	2,481	2,223
Non-cash activities:			
Change in accrued purchases of property, plant and equipment, net	$ (240)	$ 363	$ 209

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

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY
(Dollars in thousands, except per share amounts)

	Common stock	Capital in excess of par value	Retained earnings	Accumulated other comprehensive loss	Noncontrolling interest	Total
Balance as of December 31, 2014	$ 13,301	$ 99,056	$ 299,524	$ (54,406)	$ 7,660	$ 365,135
Net income	—	—	51,180	—	1,526	52,706
Amounts reported in other comprehensive loss	—	—	—	(18,910)	(637)	(19,547)
Repurchases of common stock	(87)	—	(7,189)	—	—	(7,276)
Dividends ($1.26 per share)	—	—	(16,775)	—	—	(16,775)
Disposition of noncontrolling interest	—	—	—	—	(351)	(351)
Shares issued upon exercise of stock options and other	17	602	—	—	—	619
Shares issued for employee stock purchase plan	6	423	—	—	—	429
Equity based compensation plans	51	5,868	—	—	—	5,919
Excess tax benefit from stock option exercises	—	384	—	—	—	384
Balance as of December 31, 2015	13,288	106,333	326,740	(73,316)	8,198	381,243
Net income	—	—	61,403	—	1,636	63,039
Amounts reported in other comprehensive loss	—	—	—	(14,091)	(61)	(14,152)
Repurchases of common stock	(84)	—	(5,775)	—	—	(5,859)
Dividends ($1.355 per share)	—	—	(17,954)	—	—	(17,954)
Acquisition of noncontrolling interest	—	—	—	—	73	73
Shares issued upon exercise of stock options and other	11	(1,313)	—	—	—	(1,302)
Shares issued for employee stock purchase plan	6	485	—	—	—	491
Equity based compensation plans	57	6,292	—	—	—	6,349
Excess tax benefit from stock option exercises	—	678	—	—	—	678
Balance as of December 31, 2016	13,278	112,475	364,414	(87,407)	9,846	412,606
Net income	—	—	20,278	—	2,022	22,300
Amounts reported in other comprehensive loss	—	—	—	22,307	714	23,021
Dividends ($1.41 per share)	—	—	(18,756)	—	—	(18,756)
Acquisition of noncontrolling interest	—	(21,151)	—	—	(10,636)	(31,787)
Shares issued upon exercise of stock options and other	5	(2,456)	—	—	—	(2,451)
Shares issued for employee stock purchase plan	4	491	—	—	—	495
Equity based compensation plans	21	4,169	—	—	—	4,190
Balance as of December 31, 2017	$ 13,308	$ 93,528	$ 365,936	$ (65,100)	$ 1,946	$ 409,618

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

Note 1 – Significant Accounting Policies

Principles of consolidation: All majority-owned subsidiaries are included in the Company's consolidated financial statements, with appropriate elimination of intercompany balances and transactions. Investments in associated companies (less than majority-owned and in which the Company has significant influence) are accounted for under the equity method. The Company's share of net income or losses in these investments in associated companies is included in the Consolidated Statements of Income. The Company periodically reviews these investments for impairments and, if necessary, would adjust these investments to their fair value when a decline in market value or other impairment indicators are deemed to be other than temporary. See Note 14 of Notes to Consolidated Financial Statements. The Company is not the primary beneficiary of any variable interest entities ("VIEs") and therefore the Company's consolidated financial statements do not include the accounts of any VIEs.

Translation of foreign currency: Assets and liabilities of non-U.S. subsidiaries and associated companies are translated into U.S. dollars at the respective rates of exchange prevailing at the end of the year. Income and expense accounts are translated at average exchange rates prevailing during the year. Translation adjustments resulting from this process are recorded directly in equity as accumulated other comprehensive (loss) income ("AOCI") and will be included as income or expense only upon sale or liquidation of the underlying investment. Generally, all of the Company's non-U.S. subsidiaries use their local currency as their functional currency.

Cash and cash equivalents: The Company invests temporary and excess funds in money market securities and financial instruments having maturities typically within 90 days. The Company considers all highly liquid investments with original maturities of three months or less to be cash equivalents. The Company has not experienced losses from the aforementioned investments.

Inventories: Inventories are valued at the lower of cost or net realizable value, and are valued using the first-in, first-out method. See Note 11 of Notes to Consolidated Financial Statements.

Long-lived assets: Property, plant and equipment are stated at cost. Depreciation is computed using the straight-line method on an individual asset basis over the following estimated useful lives: buildings and improvements, 10 to 45 years; and machinery and equipment, 1 to 15 years. The carrying values of long-lived assets are evaluated whenever changes in circumstances or current events indicate the carrying amount of such assets may not be recoverable. An estimate of undiscounted cash flows produced by the asset, or the appropriate group of assets, is compared with the carrying value to determine whether an impairment exists. If necessary, the Company recognizes an impairment loss for the difference between the carrying amount of the assets and their estimated fair value. Fair value is based on current and anticipated future cash flows. Upon sale or other dispositions of long-lived assets, the applicable amounts of asset cost and accumulated depreciation are removed from the accounts and the net amount, less proceeds from disposals, is recorded in the Consolidated Statements of Income. Expenditures for renewals or improvements that increase the estimated useful life or capacity of the assets are capitalized, whereas expenditures for repairs and maintenance are expensed when incurred. See Note 12 of Notes to Consolidated Financial Statements.

Capitalized software: The Company capitalizes certain costs in connection with developing or obtaining software for internal use, depending on the associated project. These costs are amortized over a period of 3 to 5 years once the assets are ready for their intended use. In connection with the implementations and upgrades to the Company's global transaction, consolidation and other related systems, approximately $1.3 million and $1.4 million of net costs were capitalized in property, plant and equipment on the Company's December 31, 2017 and 2016 Consolidated Balance Sheets, respectively.

Goodwill and other intangible assets: The Company records goodwill, definite-lived intangible assets and indefinite-lived intangible assets at fair value at the date of acquisition. Goodwill and indefinite-lived intangible assets are not amortized, but tested for impairment at least annually. These tests will be performed more frequently if triggering events indicate potential impairment. Definite-lived intangible assets are amortized over their estimated useful lives, generally for periods ranging from 4 to 20 years. The Company continually evaluates the reasonableness of the useful lives of these assets, consistent with the discussion of long-lived assets, above. See Note 13 of Notes to Consolidated Financial Statements.

Revenue recognition: The Company currently recognizes revenue in accordance with the terms of the underlying agreements, when title and risk of loss have been transferred, when collectability is reasonably assured, and when pricing is fixed or determinable. For the Company, this generally occurs when products are shipped or delivered to customers or, for consignment-type arrangements, upon usage by the customer and when services are performed. License fees and royalties are included in other income when recognized in accordance with their agreed-upon terms, when performance obligations are satisfied, when the amount is fixed or determinable, and when collectability is reasonably assured.

During the first quarter of 2018, the Company will adopt the provisions of the Financial Accounting Standards Board's ("FASB's") new revenue recognition guidance, which will require the Company to recognize revenue to depict the transfer of

promised goods or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. To do this, the Company will apply the five-step model in the FASB's guidance, which requires the Company to: (i) identify the contract with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when, or as, the Company satisfies a performance obligation. See Note 3 of Notes to Consolidated Financial Statements.

As part of the Company's chemical management services, certain third-party product sales to customers are managed by the Company. Where the Company acts as a principal, revenues are recognized on a gross reporting basis at the selling price negotiated with its customers. Where the Company acts as an agent, such revenue is recorded using net reporting as service revenue at the amount of the administrative fee earned by the Company for ordering the goods. Third-party products transferred under arrangements resulting in net reporting totaled $44.5 million, $43.5 million and $48.6 million for the years ended December 31, 2017, 2016 and 2015, respectively.

Accounts receivable and allowance for doubtful accounts: Trade accounts receivable subject the Company to credit risk. Trade accounts receivable are recorded at the invoiced amount and generally do not bear interest. The allowance for doubtful accounts is the Company's best estimate of the amount of probable credit losses with its existing accounts receivable. Reserves for customers filing for bankruptcy protection are generally established at 75-100% of the amount outstanding at the bankruptcy filing date. However, initially establishing a reserve and the amount thereto is dependent on the Company's evaluation of likely proceeds to be received from the bankruptcy process, which could result in the Company recognizing minimal or no reserve at the date of bankruptcy. Large and/or financially distressed customers are generally reserved for on a specific review basis while a general reserve is established for other customers based on historical experience. The Company performs a formal review of its allowance for doubtful accounts quarterly. Account balances are charged off against the allowance when the Company deems it is probable the receivable will not be recovered. The Company does not have any off-balance-sheet credit exposure related to its customers. During the year ended December 31, 2017, the Company's five largest customers accounted for approximately 18% of its consolidated net sales with the largest customer accounting for approximately 8% of the Company's consolidated net sales. See Note 10 of Notes to Consolidated Financial Statements.

Research and development costs: Research and development costs are expensed as incurred and are included in selling, general and administrative expenses ("SG&A"). Research and development expenses were $23.9 million, $22.5 million and $22.1 million for the years ended December 31, 2017, 2016 and 2015, respectively.

Environmental liabilities and expenditures: Accruals for environmental matters are recorded when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated. If there is a range of estimated liability and no amount in that range is considered more probable than another, then the Company records the lowest amount in the range in accordance with generally accepted accounting principles. Accrued liabilities are exclusive of claims against third parties and are not discounted. Environmental costs and remediation costs are capitalized if the costs extend the life, increase the capacity or improve safety or efficiency of the property from the date acquired or constructed, and/or mitigate or prevent contamination in the future. See Note 23 of Notes to Consolidated Financial Statements.

Asset retirement obligations: The Company follows the FASB's guidance regarding asset retirement obligations, which addresses the accounting and reporting for obligations associated with the retirement of tangible long-lived assets and the associated retirement costs. Also, the Company follows the FASB's guidance for conditional asset retirement obligations ("CARO"), which relates to legal obligations to perform an asset retirement activity in which the timing and (or) method of settlement are conditional on a future event that may or may not be within the control of the entity. In accordance with this guidance, the Company records a liability when there is enough information regarding the timing of the CARO to perform a probability-weighted discounted cash flow analysis. As of December 31, 2017 and 2016, the Company had limited exposure to such obligations and had immaterial liabilities recorded for such on its Consolidated Balance Sheets.

Pension and other postretirement benefits: The Company maintains various noncontributory retirement plans, the largest of which is in the U.S., covering a portion of its employees in the U.S. and certain other countries. The plans of the Company's subsidiaries in the Netherlands, the United Kingdom, Mexico and Sweden are subject to the provisions of FASB's guidance regarding employers' accounting for defined benefit pension plans. The plans of the remaining non-U.S. subsidiaries are, for the most part, either fully insured or integrated with the local governments' plans and are not subject to the provisions of the guidance. The guidance requires that employers recognize on a prospective basis the funded status of their defined benefit pension and other postretirement plans on their consolidated balance sheet and, also, recognize as a component of other comprehensive income, net of tax, the gains or losses and prior service costs or credits that arise during the period but are not recognized as components of net periodic benefit cost. The Company's U.S. pension plan year ends on November 30 and the measurement date is December 31. The measurement date for the Company's other postretirement benefits plan is December 31.

The Company's global pension investment policies are designed to ensure that pension assets are invested in a manner consistent with meeting the future benefit obligations of the pension plans and maintaining compliance with various laws and regulations including the Employee Retirement Income Security Act of 1974. The Company establishes strategic asset allocation percentage targets and appropriate benchmarks for significant asset classes with the aim of achieving a prudent balance between return and risk. The Company's investment horizon is generally long term, and, accordingly, the target asset allocations encompass a long-term perspective of capital markets, expected risk and return and perceived future economic conditions while also considering the profile of plan liabilities. To the extent feasible, the short-term investment portfolio is managed to immunize the short-term obligations, the intermediate portfolio duration is immunized to reduce the risk of volatility in intermediate plan distributions, and the total return portfolio is expected to maximize the long-term real growth of plan assets. The critical investment principles of diversification, assessment of risk and targeting the optimal expected returns for given levels of risk are applied. The Company's investment guidelines prohibit use of securities such as letter stock and other unregistered securities, commodities or commodity contracts, short sales, margin transactions, private placements (unless specifically addressed by addendum), or any derivatives, options or futures for the purpose of portfolio leveraging.

The target asset allocation is reviewed periodically and is determined based on a long-term projection of capital market outcomes, inflation rates, fixed income yields, returns, volatilities and correlation relationships. The interaction between plan assets and benefit obligations is periodically studied to assist in establishing such strategic asset allocation targets. Asset performance is monitored with an overall expectation that plan assets will meet or exceed benchmark performance over rolling five-year periods. The Company's pension committee, as authorized by the Company's Board of Directors, has discretion to manage the assets within established asset allocation ranges approved by senior management of the Company. As of December 31, 2017, the plan's investments were in compliance with all approved ranges of asset allocations. See Note 18 of Notes to Consolidated Financial Statements.

Comprehensive income (loss): The Company presents other comprehensive income (loss) in its Statements of Comprehensive Income. The Company follows the FASB's guidance regarding the disclosure of reclassifications from AOCI which requires the disclosure of significant amounts reclassified from each component of AOCI, the related tax amounts and the income statement line items affected by such reclassifications. See Note 20 of Notes to Consolidated Financial Statements.

Income taxes and uncertain tax positions: The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. The provision for income taxes represents income taxes paid or payable for the current year and the change in deferred taxes during the year. Deferred taxes result from differences between the financial and tax bases of the Company's assets and liabilities and are adjusted for changes in tax rates and tax laws when changes are enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. The FASB's guidance regarding accounting for uncertainty in income taxes prescribes the recognition threshold and measurement attributes for financial statement recognition and measurement of tax positions taken or expected to be taken on a tax return. The guidance further requires the determination of whether the benefits of tax positions will be more likely than not sustained upon audit based upon the technical merits of the tax position. For tax positions that are determined to be more likely than not sustained upon audit, a company recognizes the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement in the financial statements. For tax positions that are not determined to be more likely than not sustained upon audit, a company does not recognize any portion of the benefit in the financial statements. Additionally, the Company monitors and adjusts for derecognition, classification, and penalties and interest in interim periods, with appropriate disclosure and transition thereto. Also, the amount of interest expense and income related to uncertain tax positions is computed by applying the applicable statutory rate of interest to the difference between the tax position recognized, including timing differences, and the amount previously taken or expected to be taken in a tax return. The Company's continuing practice is to recognize interest and/or penalties related to income tax matters in income tax expense. Finally, when applicable, the Company nets its liability for unrecognized tax benefits against deferred tax assets related to net operating losses or other tax credit carryforwards that would apply if the uncertain tax position were settled for the presumed amount at the balance sheet date. See Note 8 of Notes to Consolidated Financial Statements.

Derivatives: The Company is exposed to the impact of changes in interest rates, foreign currency fluctuations, changes in commodity prices and credit risk. The Company is currently not using derivative instruments to mitigate the risks associated with foreign currency fluctuations, changes in commodity prices or credit risk, but has used derivative financial instruments primarily for purposes of hedging exposures to fluctuations in interest rates in the past. If used in the future, the Company will recognize the entire change in the fair value of the hedging instrument in the same income statement line as the hedged item. The Company currently uses no derivative instruments designated as hedges and, also, has not entered into derivative contracts for trading or speculative purposes.

Fair value measurements: The Company utilizes the FASB's guidance regarding fair value measurements, which establishes a common definition for fair value to be applied to guidance requiring use of fair value, establishes a framework for measuring fair value and expands disclosure about such fair value measurements. Specifically, the guidance utilizes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. See Notes 18 and 22 of Notes to Consolidated Financial Statements. The following is a brief description of those three levels:

- Level 1: Observable inputs such as quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.
- Level 3: Unobservable inputs that reflect the reporting entity's own assumptions.

Share-based compensation: The Company applies the FASB's guidance regarding share-based payments, which requires the recognition of the fair value of share-based compensation as a component of expense. The Company has a long-term incentive program ("LTIP") for key employees which provides for the granting of options to purchase stock at prices not less than its market value on the date of the grant. Most options become exercisable between one and three years after the date of the grant for a period of time determined by the Company, but not to exceed seven years from the date of grant. Restricted stock awards and restricted stock units ("RSU") issued under the LTIP program are generally subject to time vesting over a one to five-year period. In addition, as part of the Company's Global Annual Incentive Plan ("GAIP"), nonvested shares may be issued to key employees, which generally vest over a two to five-year period. In addition, while the FASB's guidance permits the Company to make an accounting policy election to account for forfeitures as they occur for service condition aspects of certain share-based awards, the Company has decided not to elect this accounting policy and instead has elected to continue utilizing a forfeiture rate assumption. Based on historical experience, the Company has assumed a forfeiture rate of 13% on certain of its nonvested stock awards. The Company will record additional expense if the actual forfeiture rate is lower than estimated, and will record a recovery of prior expense if the actual forfeiture is higher than estimated. See Note 6 of Notes to Consolidated Financial Statements.

Earnings per share: The Company follows the FASB's guidance regarding the calculation of earnings per share for nonvested stock awards with rights to non-forfeitable dividends. The guidance requires nonvested stock awards with rights to non-forfeitable dividends to be included as part of the basic weighted average share calculation under the two-class method. See Note 9 of Notes to Consolidated Financial Statements.

Segments: The Company's reporting segments are the same as the Company's operating segments. The Company's reportable operating segments reflect the structure of the Company's internal organization, the method by which the Company's resources are allocated and the manner by which the Company assesses its performance. The Company's reportable operating segments are organized by geography as follows: (i) North America, (ii) Europe, Middle East and Africa ("EMEA"), (iii) Asia/Pacific and (iv) South America. See Note 4 of Notes to Consolidated Financial Statements.

Business combinations: The Company accounts for business combinations under the acquisition method of accounting. This method requires the recording of acquired assets, including separately identifiable intangible assets and assumed liabilities at their respective acquisition date estimated fair values. Any excess of the purchase price over the estimated fair value of the identifiable net assets acquired is recorded as goodwill. The determination of the estimated fair value of assets acquired and liabilities assumed requires significant estimates and assumptions. Based on the assessment of additional information during the measurement period, which may be up to one year from the acquisition date, the Company may record adjustments to the estimated fair value of assets acquired and liabilities assumed. See Note 21 of Notes to Consolidated Financial Statements.

Restructuring activities: Restructuring programs consist of employee severance, rationalization of manufacturing or other facilities and other related items. To account for such programs, the Company applies FASB's guidance regarding exit or disposal cost obligations. This guidance requires that a liability for a cost associated with an exit or disposal activity be recognized when the liability is incurred, is estimable, and payment is probable. See Note 5 of Notes to Consolidated Financial Statements.

Reclassifications: Certain information has been reclassified to conform to the current year presentation. During the first quarter of 2017, the Company early adopted an accounting standard update regarding the classification of pension costs. The guidance in this accounting standard update was required to be applied retrospectively, which resulted in a reclassification to the Company's Consolidated Statements of Income for the years ended December 31, 2016 and 2015, respectively. See Note 3 of Notes to Consolidated Financial Statements. In addition, the Company has made certain reclassifications to prior year disclosures regarding combination-related items to conform with the current period presentation. See Note 2 of Notes to Consolidated Financial Statements.

Accounting estimates: The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and disclosure of

contingencies at the date of the financial statements and the reported amounts of net sales and expenses during the reporting period. Actual results could differ from such estimates.

Note 2 – Houghton Combination

On April 4, 2017, Quaker entered into a share purchase agreement with Gulf Houghton Lubricants, Ltd. to purchase the entire issued and outstanding share capital of Houghton International, Inc. ("Houghton") (herein referred to as "the Combination"). The shares will be bought for aggregate purchase consideration consisting of: (i) $172.5 million in cash; (ii) a number of shares of common stock, $1.00 par value per share, of the Company comprising 24.5% of the common stock outstanding upon the closing of the Combination; and (iii) the Company's assumption of Houghton's net indebtedness as of the closing of the Combination, which was approximately $690 million at signing. At closing, the total aggregate purchase consideration is dependent on the Company's stock price and the level of Houghton's indebtedness.

The Company secured $1.15 billion in commitments from Bank of America Merrill Lynch and Deutsche Bank to fund the Combination and to provide additional liquidity, and has since replaced these commitments with a syndicated bank agreement ("the New Credit Facility") with a group of lenders for $1.15 billion. The New Credit Facility is contingent upon and will not be effective until the closing of the Combination. The New Credit Facility includes a $400.0 million multicurrency revolver, a $575.0 million USD term loan and a $175.0 million EUR equivalent term loan, each with a five-year term from the date the New Credit Facility becomes effective. The maximum amount available under the New Credit Facility can be increased by $200.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under the New Credit Facility will bear interest at a base rate or LIBOR rate plus a margin. The Company currently estimates the annual floating rate cost will be in the 3.50% to 3.75% range based on current market interest rates. The New Credit Facility will be subject to certain financial and other covenants, including covenants that the Company's consolidated net debt to adjusted EBITDA ratio cannot exceed 4.25 to 1 and the Company's consolidated adjusted EBITDA to interest expense ratio cannot be less than 3.0 to 1. Both the USD and EUR equivalent term loans will have quarterly principal amortization during their respective five-year terms, with 5% amortization of the principal balance due in years 1 and 2, 7.5% in year 3, and 10% in years 4 and 5, with the remaining principal amounts due at maturity. Until closing, the Company incurs certain interest costs paid to maintain the banks' committed capital ("ticking fees"), which began to accrue on September 29, 2017 and bear an interest rate of 0.30% per annum.

In addition, the issuance of the Company's shares at closing of the Combination was subject to approval by Quaker's shareholders under the rules of the New York Stock Exchange. This approval was received at a meeting of the Company's shareholders during the third quarter of 2017. Also, the Combination is subject to regulatory approval in the United States, Europe, China and Australia. The Company received regulatory approval from China in July 2017 and from Australia in October 2017. Depending on the remaining regulatory approvals and other customary terms and conditions set forth in the share purchase agreement, the Company currently estimates closing of the Combination to occur during the first half of 2018.

The Company incurred costs of $30.8 million during the year ended December 31, 2017 for certain legal, environmental, financial, and other advisory and consultant costs related to due diligence, regulatory and shareholder approvals, integration planning associated with the Combination and ticking fees. The Company incurred $1.5 million during the year ended December 31, 2016 for certain legal, environmental, financial, and other advisory and consultant costs related to due diligence. There were no similar costs incurred during the year ended December 31, 2015. As of December 31, 2017 and 2016, the Company had current liabilities related to the Combination of $5.5 million and $0.5 million, respectively, primarily recorded within other current liabilities on its Consolidated Balance Sheets. In addition, the Company has made certain reclassifications to prior year disclosures regarding combination-related items to conform with the current period presentation.

Note 3 – Recently Issued Accounting Standards

The FASB issued an accounting standard update in August 2017 to increase transparency of the economics related to risk management activities within the financial statements and enhance transparency and understandability of hedge results. This accounting standard update eliminates the requirement to separately measure and report hedge ineffectiveness and requires the entire change in the fair value of a hedging instrument to be presented in the same income statement line as the hedged item. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2018. All transition requirements and elections should be applied to hedging relationships existing on the date of adoption. For cash flow and net investment hedges existing at the date of adoption, the Company should apply a cumulative-effect adjustment related to eliminating the separate measurement of ineffectiveness to AOCI with a corresponding adjustment to the opening balance of retained earnings as of the beginning of the fiscal year that the Company adopts. The amended presentation and disclosure guidance is required only prospectively. Early adoption is permitted including adoption in any interim period for which financial statements have not been issued or made available for issuance. The Company has elected to early adopt the guidance in this accounting standard update during

the fourth quarter of 2017, with no impact to its financial statements. The Company does not currently use any derivative instruments designated as hedges, but may choose to in the future.

The FASB issued an accounting standard update in May 2017 to clarify when changes to the terms or conditions of a share-based payment award must be accounted for as modifications. This accounting standard update will reduce diversity in practice and result in fewer changes to the terms of an award being accounted for as modifications. This accounting standard update will allow companies to make certain changes to awards without accounting for them as modifications and an entity is not required to estimate the value of the award immediately before and after the change if the change doesn't affect any of the inputs to the model used to value the award. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2017. The guidance within this accounting standard update should be applied prospectively to awards modified on or after the adoption date. Early adoption is permitted including adoption in any interim period for which financial statements have not been issued or made available for issuance. During the second quarter of 2017, the Company elected to early adopt this guidance with no impact to its financial statements.

The FASB issued an accounting standard update in March 2017 to improve the presentation of net periodic pension and postretirement benefit cost. Defined benefit pension and postretirement benefit costs ("net benefit cost") comprise several components that reflect different aspects of an employer's financial arrangements as well as the cost of benefits provided to employees. This accounting standard update requires that an employer disaggregate the service cost component from the other components of net benefit cost, provides explicit guidance on how to present the service cost component and the other components of net benefit cost in the income statement and allows only the service cost component of net benefit cost to be eligible for capitalization. The guidance within this accounting standard update should be applied retrospectively for the presentation of the service cost component and the other components of net periodic benefit cost in the income statement and prospectively for the capitalization of the service cost component of net periodic benefit in assets. This accounting standard update is effective for annual periods beginning after December 15, 2017, including interim periods within those annual periods. Early adoption is permitted as of the beginning of an annual period for which financial statements (interim or annual) have not been issued or made available for issuance. During the first quarter of 2017, the Company elected to early adopt the guidance within this accounting standard update, including the use of a practical expedient which allows the Company to use amounts previously disclosed in its pension and other postretirement benefits note for the prior period as the estimation basis for applying the required retrospective presentation. Adoption of this guidance resulted in a reclassification to the Company's Consolidated Statements of Income for the years ended December 31, 2016 and 2015, as previously reported cost of goods sold ("COGS") were reduced by $0.5 and $0.7 million, respectively, and SG&A were reduced by $1.8 million and $2.6 million, respectively, with a corresponding increase to other expense, net, of $2.3 million and $3.3 million, respectively. In addition, these required retrospective reclassifications resulted in an immaterial adjustment to previously reported direct operating earnings within the Company's reportable operating segment disclosures for the years ended December 31, 2016 and 2015, respectively, as well as reclassifications to the Company's quarterly results for the year ended December 31, 2016. See Note 4, Note 7, Note 18 and Note 24 of Notes to Consolidated Financial Statements.

The FASB issued an accounting standard update in January 2017 simplifying the test for goodwill impairment by eliminating the Step 2 computation. The accounting standard update modifies the concept of impairment from the condition that exists when the carrying amount of goodwill exceeds its implied fair value to the condition that exists when the carrying amount of a reporting unit exceeds its fair value. The guidance removes the requirement to determine a goodwill impairment by calculating the implied fair value of goodwill by assigning the fair value of a reporting unit to all of its assets and liabilities as if that reporting unit had been acquired in a business combination. The guidance within this accounting standard update should be applied on a prospective basis, and is effective for annual or interim goodwill impairment tests in fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. During the third quarter of 2017, in connection with the Company's 2017 annual goodwill impairment test, the Company elected to early adopt this guidance with no impact to its financial statements.

The FASB issued an accounting standard update in January 2017 to clarify the definition of a business with the objective of adding guidance to assist companies with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The amendments in this accounting standard update provide a more robust framework to use in determining when a set of assets and activities is a business. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2017. Early adoption is permitted in limited circumstances, and the amendments in this accounting standard update should be applied prospectively, with no disclosures required at transition. The Company does not currently meet the criteria for early application of the amendments and therefore has not early adopted the guidance. The Company will evaluate the potential impact of this guidance on future transactions, as applicable.

The FASB issued an accounting standard update in November 2016 requiring that the statement of cash flows explain both the

change in the total cash and cash equivalents, and, also, the amounts generally described as restricted cash or restricted cash equivalents. This will require amounts generally described as restricted cash or restricted cash equivalents be included with cash and cash equivalents when reconciling the beginning and ending amounts shown on the statement of cash flows. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2017. Early adoption is permitted and the guidance requires application using a retrospective transition method to each period presented when adopted. While permitted, the Company has not early adopted the guidance and is currently evaluating the appropriate implementation strategy. Adoption of the guidance will not have an impact on the Company's earnings or balance sheet but will result in changes to certain disclosures within the statement of cash flows, notably cash flows from investing activities.

The FASB issued an accounting standard update in August 2016 to standardize how certain transactions are classified in the statement of cash flows. Specific transactions covered by the accounting standard update include debt prepayment or debt extinguishment costs, settlement of zero-coupon debt instruments, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate and bank owned life insurance policies, distributions received from equity method investments and beneficial interest in securitization transactions. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2017. Early adoption is permitted, provided that all of the amendments are adopted in the same period. The guidance requires application using a retrospective transition method. While permitted, the Company has not early adopted the guidance and is currently evaluating the appropriate implementation strategy. Adoption of the guidance will not have an impact on the Company's earnings or balance sheet but may result in certain reclassifications on the statement of cash flows, including reclassifications between cash flows from operating activities, investing activities and financing activities, respectively.

The FASB issued an accounting standard update in March 2016 involving several aspects of the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, use of a forfeiture rate, and classification on the statement of cash flows. The guidance within this accounting standard update was effective for annual and interim periods beginning after December 15, 2016. When adopted, application of the guidance will vary based on each aspect of the update, including adoption under retrospective, modified retrospective or prospective approaches. Early adoption was permitted. During the first quarter of 2017, the Company adopted the guidance within the accounting standard update as required. The impact of adoption for the Company included the elimination of recording the tax effects of deductions in excess of compensation cost through equity as the guidance in this accounting standard update requires all tax effects related to share-based payments to now be recorded through the income statement. The tax effects of awards are required to be treated as discrete items in the interim reporting period in which the share-based compensation-related tax benefits occur. In addition, when applying the treasury stock method for computing diluted earnings per share, there are no longer assumed proceeds from the share-based compensation-related tax benefits and as a result, there are fewer shares considered to be repurchased in the calculation. This results in an assumption of more incremental shares being issued upon the exercise of share-based payment awards; therefore, equity awards will have a more dilutive effect on earnings per share. As required, the Company has applied these changes in the guidance prospectively, beginning in the first quarter of 2017. The result of these changes was a tax benefit of $1.4 million recorded during the year ended December 31, 2017 and an immaterial number of dilutive shares added to the Company's earnings per share calculation for the year ended December 31, 2017. In addition, all tax-related cash flows resulting from share-based payments are now required to be reported as operating activities in the statement of cash flows under this new guidance. Either prospective or retrospective transition of this provision was permitted, and the Company has elected to apply the cash flow classification guidance on a prospective basis, consistent with the prospective transition for the treatment of excess tax benefits in the income statement. Lastly, the accounting standard update permitted Companies to make an accounting policy election to account for forfeitures as they occur for service condition aspects of certain share-based awards, rather than estimating forfeitures each period. While permitted, the Company has decided not to elect this accounting policy change, and instead has elected to continue utilizing a forfeiture rate assumption. Based on historical experience, the Company has assumed a forfeiture rate of 13% on certain of its nonvested stock awards. See Note 6, Note 8 and Note 9 of Notes to Consolidated Financial Statements.

The FASB issued an accounting standard update in February 2016 regarding the accounting and disclosure for leases. Specifically, the update will require entities that lease assets to recognize the assets and liabilities for the rights and obligations created by those leases on the balance sheet, in most instances. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2018, and should be applied on a modified retrospective basis for the reporting periods presented. Early adoption is permitted. The Company has not early adopted and is currently evaluating the potential impact of this guidance and an appropriate implementation strategy. The Company has begun its impact assessment, including taking an inventory of its outstanding leases globally. While the Company's evaluation of this guidance is in the early stages, the Company currently expects adoption of this guidance to have an impact on its balance sheet.

The FASB issued an accounting standard update in May 2014 regarding the accounting for and disclosure of revenue recognition. Specifically, the update outlined a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers, which will be common to both U.S. GAAP and International Financial Reporting Standards. The guidance was effective for annual and interim periods beginning after December 15, 2016, and allowed for full retrospective adoption of prior period data or a modified retrospective adoption. Early adoption was not permitted. In August 2015, the FASB issued an accounting standard update to delay the effective date of the new revenue standard by one year, or, in other words, to be effective for annual and interim periods beginning after December 15, 2017. Entities are permitted to adopt the new revenue standard early but not before the original effective date. During 2016 and 2017, the FASB issued a series of accounting standard updates to clarify and expand on the implementation guidance, including principal versus agent considerations, identification of performance obligations, licensing, other technical corrections and adding certain practical expedients. The amendments in these 2016 and 2017 updates did not change the core principles of the guidance previously issued in May 2014.

During 2016, the Company reviewed its historical accounting policies and practices to identify potential differences with the requirements of the new revenue recognition standard, as it related to the Company's contracts and sales arrangements. As of December 31, 2017, the Company has completed its impact assessment for the implementation of the new revenue recognition guidance. This impact assessment and work performed included global and cross functional interviews and questionnaires, sales agreement and other sales document reviews, as well as technical considerations for the Company's future transactional accounting, financial reporting and disclosure requirements. The Company expects to adopt the guidance in the first quarter of 2018, as required, using a modified retrospective adoption approach applied to those contracts which will not be completed as of December 31, 2017. In addition, the Company will elect to apply certain of the permitted practical expedients within the revenue recognition guidance, including practical expedients around significant financing components, sales taxes and shipping and handling activities.

Based on information reviewed to date and the impact assessment conclusions reached so far, the Company does not expect the adoption of this revenue recognition guidance to have a material impact on its reported earnings, cash flows, or balance sheet; however, the Company does expect the adoption to increase the amount and level of disclosures concerning the Company's net sales. In addition, the Company has begun preliminary considerations for how the new revenue recognition guidance may impact Houghton, as it pertains to the potential Combination.

Note 4 – Business Segments

The Company's reportable operating segments are organized by geography as follows: (i) North America, (ii) EMEA, (iii) Asia/Pacific and (iv) South America. Operating earnings, excluding indirect operating expenses, for the Company's reportable operating segments is comprised of revenues less COGS and SG&A directly related to the respective region's product sales. The indirect operating expenses consist of SG&A not directly attributable to the product sales of each respective reportable operating segment. Other items not specifically identified with the Company's reportable operating segments include interest expense, interest income, license fees from non-consolidated affiliates, amortization expense and other expense, net.

The following tables present information about the performance of the Company's reportable operating segments for the years ended December 31, 2017, 2016 and 2015:

	2017	2016	2015
Net sales			
North America	$ 356,598	$ 336,174	$ 344,248
EMEA	226,243	200,917	179,717
Asia/Pacific	201,008	179,131	181,056
South America	36,233	30,443	32,534
Total net sales	$ 820,082	$ 746,665	$ 737,555

	2017	2016	2015
Operating earnings, excluding indirect operating expenses			
North America	$ 77,694	$ 77,833	$ 80,239
EMEA	35,350	33,810	28,236
Asia/Pacific	48,342	45,866	45,107
South America	3,927	1,386	1,785
Total operating earnings, excluding indirect operating expenses	165,313	158,895	155,367
Non-operating charges	(65,142)	(65,316)	(66,999)
Restructuring and related activities	—	439	(6,790)
Combination-related expenses	(29,938)	(1,531)	—
Depreciation of corporate assets and amortization	(7,489)	(7,134)	(7,010)
Operating income	62,744	85,353	74,568
Other expense, net	(718)	(492)	(3,377)
Interest expense	(3,892)	(2,889)	(2,585)
Interest income	2,534	2,037	1,624
Income before taxes and equity in net income of associated companies	$ 60,668	$ 84,009	$ 70,230

The following tables present information regarding the Company's reportable segments' assets and long-lived assets as of December 31, 2017, 2016 and 2015:

	2017	2016	2015
Segment assets			
North America (including Corporate)	$ 324,260	$ 321,404	$ 317,082
EMEA	177,267	147,021	162,647
Asia/Pacific	196,891	200,218	181,389
South America	23,708	23,385	19,609
Total segment assets	$ 722,126	$ 692,028	$ 680,727

	2017	2016	2015
Segment long-lived assets			
North America (including Corporate)	$ 88,818	$ 86,775	$ 87,421
EMEA	28,507	25,630	27,101
Asia/Pacific	22,427	22,040	23,096
South America	2,691	2,858	2,573
Total segment long-lived assets	$ 142,443	$ 137,303	$ 140,191

The following tables present information regarding the Company's reportable segments' capital expenditures and depreciation for the years ended December 31, 2017, 2016 and 2015:

	2017	2016	2015
Capital expenditures			
North America (including Corporate)	$ 3,919	$ 2,918	$ 4,166
EMEA	3,936	3,263	3,081
Asia/Pacific	2,458	3,269	3,169
South America	559	504	617
Total segment capital expenditures	$ 10,872	$ 9,954	$ 11,033

	2017	2016	2015
Depreciation			
North America	$ 5,791	$ 5,672	$ 5,577
EMEA	3,368	3,323	2,975
Asia/Pacific	2,669	2,765	2,812
South America	649	672	832
Total segment depreciation	$ 12,477	$ 12,432	$ 12,196

The following table presents information regarding the Company's product lines that represent more than 10% of consolidated revenues for the years ended December 31, 2017, 2016 and 2015, with the remaining product sales being immaterial to present:

	2017	2016	2015
Rolling lubricants	17.8 %	19.0 %	18.6 %
Machining and grinding compounds	15.8 %	14.9 %	15.3 %
Hydraulic fluids	11.6 %	12.0 %	12.6 %
Corrosion preventives	11.4 %	11.8 %	12.0 %
Specialty greases	10.0 %	10.1 %	8.5 %

During the years ended December 31, 2017, 2016 and 2015, the North America segment had approximately $49.2 million, $35.8 million and $34.0 million of net sales, respectively, which were attributable to non-domestic operations. As of December 31, 2017, 2016 and 2015, the North America segment had approximately $4.9 million, $4.9 million and $2.7 million of long-lived assets, respectively, which were attributable to non-domestic operations.

Inter-segment revenue for the years ended December 31, 2017, 2016 and 2015 was $9.4 million, $8.3 million and $9.1 million for North America, $22.0 million, $18.1 million and $17.8 million for EMEA, $0.4 million, $0.7 million and $1.0 million for Asia/Pacific and less than $0.1 million for the years ended December 31, 2017, 2016 and 2015 for South America, respectively. However, all inter-segment transactions have been eliminated from each reportable operating segment's net sales and earnings for all periods presented in the above tables.

Note 5 – Restructuring and Related Activities

In response to weak economic conditions and market declines in many regions, Quaker's management approved a global restructuring plan (the "2015 Program") in the fourth quarter of 2015 to reduce its operating costs. The 2015 Program included the re-organization of certain commercial functions, the consolidation of certain distribution, laboratory and administrative offices, and other related severance charges. In addition to these actions, during the fourth quarter of 2015 the Company made a decision to make available-for-sale certain technology of one of its existing businesses, which also resulted in employee severance and $0.3 million of intangible assets being reclassified to other current assets as of December 31, 2015. During the fourth quarter of 2016, the Company made a decision to no longer market or make available-for-sale this technology, which resulted in $0.3 million of other current assets being reclassified back to intangible assets as of December 31, 2016.

The 2015 Program included provisions for the reduction of total headcount by approximately 65 employees globally. As a result of this program, the Company recognized a $6.8 million restructuring charge in the fourth quarter of 2015. Employee separation costs varied depending on local regulations within certain foreign countries and included severance and other benefits. The Company substantially completed all of the initiatives under the 2015 Program in 2016 and settlement of these charges occurred primarily in

2016 as well. During the fourth quarter of 2016, the Company recognized a restructuring credit of $0.4 million in connection with the 2015 Program, due to customary and routine adjustments to initial estimates for employee separation costs, as well as the reversal of certain accrued employee separation costs as a result of the change in available-for-sale technology, noted above. The Company completed all of the remaining initiatives under the 2015 Program during the first half of 2017 and does not expect to incur further restructuring charges under this program.

Restructuring activity recognized in each reportable operating segment in connection with the 2015 Program during the years ended December 31, 2017, 2016 and 2015 is as follows:

	North America	EMEA	Asia/Pacific	South America	Total
Accrued restructuring as of December 31, 2014	$ —	$ —	$ —	$ —	$ —
Restructuring charges	2,025	4,390	338	37	6,790
Cash payments	(158)	(130)	(202)	—	(490)
Currency translation adjustments	—	5	(1)	(1)	3
Accrued restructuring as of December 31, 2015	1,867	4,265	135	36	6,303
Restructuring credits	—	(439)	—	—	(439)
Cash payments	(1,671)	(3,404)	(138)	(39)	(5,252)
Currency translation adjustments	—	52	3	3	58
Accrued restructuring as of December 31, 2016	196	474	—	—	670
Restructuring charges and adjustments	(126)	126	—	—	—
Cash payments	(70)	(605)	—	—	(675)
Currency translation adjustments	—	5	—	—	5
Accrued restructuring as of December 31, 2017	$ —	$ —	$ —	$ —	$ —

Note 6 – Share-Based Compensation

The Company recognized the following share-based compensation expense in SG&A in its Consolidated Statements of Income for the years ended December 31, 2017, 2016 and 2015:

	2017	2016	2015
Stock options	$ 958	$ 848	$ 730
Nonvested stock awards and restricted stock units	2,935	3,121	2,937
Employee stock purchase plan	88	87	75
Non-elective and elective 401(k) matching contribution in stock	72	2,124	2,052
Director stock ownership plan	137	169	125
Total share-based compensation expense	$ 4,190	$ 6,349	$ 5,919

During the first quarter of 2017, the Company began matching non-elective and elective 401(k) contributions in cash rather than stock. Also, the Company’s estimated tax payable as of December 31, 2016 and 2015, was sufficient to fully recognize $0.7 million and $0.4 million, respectively, of excess tax benefits related to stock option exercises as cash inflows from financing activities in its Consolidated Statements of Cash Flows.

Stock option activity under all plans is as follows:

	Number of Options	Weighted Average Exercise Price (per option)	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Options outstanding as of January 1, 2017	117,220	$ 75.34		
Options granted	42,477	134.60		
Options exercised	(48,442)	75.94		
Options outstanding as of December 31, 2017	111,255	$ 97.71	5.3	$ 6,013
Options expected to vest after December 31, 2017	99,484	$ 100.64	5.5	$ 5,086
Options exercisable as of December 31, 2017	11,771	$ 72.95	3.9	$ 928

The total intrinsic value of options exercised during the years ended December 31, 2017, 2016 and 2015 was approximately $3.4 million, $2.9 million and $0.9 million, respectively. Intrinsic value is calculated as the difference between the current market price of the underlying security and the strike price of a related option.

A summary of the Company's outstanding stock options as of December 31, 2017 is as follows:

Range of Exercise Prices	Number of Options Outstanding	Weighted Average Remaining Contractual Term (years)	Weighted Average Exercise Price (per option)	Number of Options Exercisable	Weighted Average Exercise Price (per option)
$ 30.01 - $ 40.00	552	1.2	$ 38.13	552	$ 38.13
$ 40.01 - $ 50.00	—	—	—	—	—
$ 50.01 - $ 60.00	874	2.2	58.26	874	58.26
$ 60.01 - $ 70.00	—	—	—	—	—
$ 70.01 - $ 80.00	52,946	5.0	72.21	7,984	72.72
$ 80.01 - $ 90.00	14,406	4.2	87.30	2,361	87.30
$ 90.01 - $ 130.00	—	—	—	—	—
$ 130.01 - $ 140.00	42,477	6.2	134.60	—	—
	111,255	5.3	97.71	11,771	72.95

As of December 31, 2017, unrecognized compensation expense related to options granted in 2015, 2016 and 2017 was less than $0.1 million, $0.4 million and $0.8 million, respectively, to be recognized over a weighted average period of 1.78 years.

Consistent with prior years, the Company granted stock options under its LTIP plan that are subject only to time vesting over a three-year period in the first quarters of 2014, 2015, 2016 and 2017. For the purposes of determining the fair value of stock option awards, the Company uses the Black-Scholes option pricing model and the assumptions set forth in the table below:

	2017	2016	2015	2014
Number of stock options granted	42,477	67,444	38,698	37,048
Dividend yield	1.49 %	1.49 %	1.55 %	2.00 %
Expected volatility	25.52 %	28.39 %	36.32 %	43.34 %
Risk-free interest rate	1.67 %	1.08 %	1.22 %	1.22 %
Expected term (years)	4.0	4.0	4.0	4.0

These awards are being amortized on a straight-line basis over the respective vesting period of each award. The compensation expense recorded on each award during the years ended December 31, 2017, 2016 and 2015, respectively, is as follows:

	2017	2016	2015
2017 Stock option awards	$ 308	$ —	$ —
2016 Stock option awards	$ 332	$ 282	$ —
2015 Stock option awards	$ 276	$ 276	$ 232
2014 Stock option awards	$ 42	$ 254	$ 257

Activity of nonvested shares granted under the Company's LTIP plan is shown below:

	Number of Shares	Weighted Average Grant Date Fair Value (per share)
Nonvested awards, December 31, 2016	109,083	$ 76.23
Granted	17,315	$ 136.18
Vested	(53,749)	$ 75.68
Forfeited	(485)	$ 76.41
Nonvested awards, December 31, 2017	72,164	$ 91.03

The fair value of the nonvested stock is based on the trading price of the Company's common stock on the date of grant. The Company adjusts the grant date fair value for expected forfeitures based on historical experience for similar awards. As of December 31, 2017, unrecognized compensation expense related to these awards was $2.1 million, to be recognized over a weighted average remaining period of 1.61 years.

Activity of nonvested restricted stock units granted under the Company's LTIP plan is shown below:

	Number of Units	Weighted Average Grant Date Fair Value (per unit)
Nonvested awards, December 31, 2016	5,771	$ 78.69
Granted	1,332	$ 134.60
Vested	(2,702)	$ 78.37
Forfeited	(124)	$ 105.38
Nonvested awards, December 31, 2017	4,277	$ 95.53

The fair value of the nonvested restricted stock units is based on the trading price of the Company's common stock on the date of grant. The Company adjusts the grant date fair value for expected forfeitures based on historical experience for similar awards. As of December 31, 2017, unrecognized compensation expense related to these awards was $0.2 million, to be recognized over a weighted average remaining period of 1.82 years.

Employee Stock Purchase Plan

In 2000, the Board adopted an Employee Stock Purchase Plan ("ESPP") whereby employees may purchase Company stock through a payroll deduction plan. Purchases are made from the plan and credited to each participant's account at the end of each month (the "Investment Date"). The purchase price of the stock is 85% of the fair market value on the Investment Date. The plan is compensatory and the 15% discount is expensed on the Investment Date. All employees, including officers, are eligible to participate in this plan. A participant may withdraw all uninvested payment balances credited to a participant's account at any time. An employee whose stock ownership of the Company exceeds five percent of the outstanding common stock is not eligible to participate in this plan.

2013 Director Stock Ownership Plan

In 2013, the Company adopted the 2013 Director Stock Ownership Plan (the "Plan"), to encourage the Directors to increase their investment in the Company, which was approved at the Company's May 2013 shareholders' meeting. The Plan authorizes the issuance of up to 75,000 shares of Quaker common stock in accordance with the terms of the Plan in payment of all or a portion of the annual cash retainer payable to each of the Company's non-employee directors in 2013 and subsequent years during the term of the Plan. Under the Plan, each director who, on May 1 of the applicable calendar year, owns less than 400% of the annual cash retainer for the applicable calendar year, divided by the average of the closing price of a share of Quaker Common Stock as reported by the composite tape of the New York Stock Exchange for the previous calendar year (the "Threshold Amount"), is required to receive 75% of the annual cash retainer in Quaker common stock and 25% of the retainer in cash, unless the director elects to receive a greater percentage of Quaker common stock, up to 100% of the annual cash retainer for the applicable year. Each director who owns more than the Threshold Amount may elect to receive common stock in payment of a percentage (up to 100%) of the annual cash retainer. The annual retainer is $0.1 million and the retainer payment date is June 1.

Note 7 – Other Expense, net

The components of other expense, net for the years ended December 31, 2017, 2016 and 2015 are as follows:

	2017	2016	2015
Income from third party license fees	$ 861	$ 978	$ 875
Foreign exchange gains (losses), net	891	172	(1,184)
(Loss) gain on fixed asset disposals, net	(79)	50	6
Non-income tax refunds and other related credits	1,015	398	141
Pension and postretirement benefit costs, non-service components	(4,234)	(2,302)	(3,308)
Insurance insolvency recovery	600	—	—
Other non-operating income	380	338	261
Other non-operating expense	(152)	(126)	(168)
Other expense, net	$ (718)	$ (492)	$ (3,377)

Insurance insolvency recovery during the year ended December 31, 2017 represents cash proceeds from an insolvent insurance carrier with respect to previously filed recovery claim by an inactive subsidiary of the Company.

Note 8 – Taxes on Income and Uncertain Tax Positions

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act ("U.S. Tax Reform"). U.S. Tax Reform includes multiple changes to the U.S. tax code with varying effects on the Company's 2017 results, including, but not limited to, (i) a revaluation of the Company's domestic deferred tax assets and liabilities based upon the reduction of the U.S. federal statutory corporate income tax rate from 35% to 21% and (ii) implementing a new system of taxation for non-U.S. earnings which eliminates U.S. federal income taxes on dividends from certain foreign subsidiaries and imposes a one-time transition tax on the deemed repatriation of undistributed earnings of certain foreign subsidiaries that is payable over eight years. U.S. Tax Reform also makes changes to the U.S. tax code that will affect 2018 and future years, including, but not limited to, (i) reduction of the U.S. federal statutory corporate tax rate; (ii) elimination of the corporate alternative minimum tax; (iii) the creation of the base erosion anti-abuse tax, a new minimum tax; (iv) a general elimination of U.S. federal income taxes on dividends from foreign subsidiaries; (v) a new provision designed to tax global intangible low-taxed income ("GILTI"), which allows for the possibility of using foreign tax credits ("FTCs") and a deduction of up to 50 percent to offset the income tax liability (subject to some limitations); (vi) a new limitation on deductible interest expense; (vii) the repeal of the domestic production activity deduction; (viii) limitations on the deductibility of certain executive compensation; (ix) limitations on the use of FTCs to reduce the U.S. income tax liability; (x) a reduction in the dividends received deduction from 70% to 50% (in the case of less-than-20%-owned subsidiaries), and from 80% to 65% (in the case of less-than-80%-owned subsidiaries); and (xi) limitations on net operating losses ("NOLs") generated after December 31, 2017, to 80 percent of taxable income.

The SEC staff issued guidance on accounting for the tax effects of U.S. Tax Reform and provided a one-year measurement period for companies to complete the accounting. Companies are required to reflect the income tax effects of those aspects of U.S. Tax Reform for which the accounting is complete. To the extent that a company's accounting for certain income tax effects of U.S. Tax Reform are incomplete but the company is able to determine a reasonable estimate, it must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should

continue to use the applicable accounting guidance on the basis of the provisions of the tax laws that were in effect immediately before the enactment of U.S. Tax Reform.

In connection with the Company's initial analysis of the impact of U.S. Tax Reform, the Company has recorded incremental tax expense of $22.2 million for the year ended December 31, 2017, which includes deferred tax expense of approximately $4.5 million and current tax expense of approximately $17.8 million, net of the impact of eliminating U.S. federal income taxes on dividends from certain foreign subsidiaries in the current year, the details of which are described below. The Company has made reasonable interpretations and assumptions with regard to various uncertainties and ambiguities in the application of certain provisions of U.S. Tax Reform. It is possible that the Internal Revenue Service ("IRS") could issue subsequent guidance or take positions on audit that differ from the Company's interpretations and assumptions. The Company currently believes subsequent guidance issued or interpretations made by the IRS will not be materially different from the Company's application of the provisions of U.S. Tax Reform.

U.S. Tax Reform reduced the U.S. federal statutory corporate tax rate from 35% to 21%, effective January 1, 2018. Consequently, the Company has recorded a decrease in domestic net deferred tax assets of approximately $4.5 million with a corresponding net adjustment to deferred income tax expense for the year ended December 31, 2017. The deemed repatriation transition tax ("Transition Tax") is a tax on previously untaxed accumulated and current earnings and profits ("E&P") of certain of the Company's foreign subsidiaries. To determine the amount of the Transition Tax, the Company must determine, in addition to other factors, the amount of E&P of its relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings after 1986. The Company made a reasonable estimate of its Transition Tax and recorded a gross provisional Transition Tax obligation of $18.4 million in its December 31, 2017 financial statements. The Company will elect to pay its Transition Tax in installments over eight years as provided for in U.S. Tax Reform.

In addition, U.S. Tax Reform creates a new requirement that GILTI earned by controlled foreign corporations ("CFCs") must be included currently in the gross income of the CFCs' U.S. shareholder. GILTI is the excess of the shareholder's net CFC tested income over the net deemed tangible income return, which is currently defined as the excess of (i) 10 percent of the aggregate of the U.S. shareholder's pro-rata share of the qualified business asset investment of each CFC with respect to which it is a U.S. shareholder over (ii) the amount of certain interest expense taken into account in the determination of net CFC-tested income. Based upon the most recent information, the Company does not believe that it will be subject to the new GILTI tax rules. The Company is continuing to evaluate this provision of U.S. Tax Reform and expects to finalize its assessment during the one-year measurement period provided for by the SEC to complete the accounting for U.S. Tax Reform.

Taxes on income for the years ended December 31, 2017, 2016 and 2015 are as follows:

	2017	2016	2015
Current:			
Federal	$ 21,265	$ 4,680	$ 8,924
State	2,529	518	188
Foreign	14,105	12,540	11,074
	37,899	17,738	20,186
Deferred:			
Federal	6,889	4,601	404
State	(36)	104	(16)
Foreign	(3,099)	783	(2,789)
Total	$ 41,653	$ 23,226	$ 17,785

The components of earnings before income taxes for the years ended December 31, 2017, 2016 and 2015 are as follows:

	2017	2016	2015
Domestic	$ 10,468	$ 31,175	$ 25,219
Foreign	50,200	52,834	45,011
Total	$ 60,668	$ 84,009	$ 70,230

Total deferred tax assets and liabilities are composed of the following as of December 31, 2017 and 2016:

	2017	2016
Retirement benefits	$ 5,472	$ 8,236
Allowance for doubtful accounts	1,134	1,925
Insurance and litigation reserves	497	707
Postretirement benefits	1,056	1,623
Supplemental retirement benefits	2,679	3,670
Performance incentives	3,779	5,197
Equity-based compensation	1,071	2,088
Insurance settlement	4,581	7,755
Operating loss carryforward	8,602	7,343
Foreign tax credit and other credits	3,043	—
Uncertain tax positions	(410)	(101)
Restructuring	—	217
Other	2,816	2,834
	34,320	41,494
Valuation allowance	(7,401)	(6,344)
Total deferred tax assets, net	$ 26,919	$ 35,150
Depreciation	4,444	5,709
Europe pension and other	1,295	1,055
Amortization and other	15,373	16,012
Total deferred tax liabilities	$ 21,112	$ 22,776

The following are the changes in the Company's deferred tax asset valuation allowance for the years ended December 31, 2017, 2016 and 2015:

	Balance at Beginning of Period	Additional Valuation Allowance	Allowance Utilization and Other	Effect of Exchange Rate Changes	Balance at End of Period
Valuation Allowance					
Year ended December 31, 2017	$ 6,344	$ 1,127	$ (61)	$ (9)	$ 7,401
Year ended December 31, 2016	$ 6,259	$ 294	$ (187)	$ (22)	$ 6,344
Year ended December 31, 2015	$ 7,345	$ 86	$ (802)	$ (370)	$ 6,259

The Company's net deferred tax assets and liabilities are classified in the Consolidated Balance Sheets as of December 31, 2017 and 2016 as follows:

	2017	2016
Non-current deferred tax assets	$ 15,460	$ 24,382
Non-current deferred tax liabilities	9,653	12,008
Net deferred tax asset	$ 5,807	$ 12,374

The following is a reconciliation of income taxes at the Federal statutory rate with income taxes recorded by the Company for the years ended December 31, 2017, 2016 and 2015:

	2017	2016	2015
Income tax provision at the Federal statutory tax rate	$ 21,229	$ 29,403	$ 24,578
Transition Tax	18,388	—	—
Revaluation of U.S. deferred tax assets and liabilities	4,470	—	—
Non-deductible acquisition expenses	4,779	696	122
Share-based compensation	(1,419)	—	—
Differences in tax rates on foreign earnings and remittances	(2,663)	(2,862)	(5,097)
Foreign dividends	—	2,939	2,690
Excess foreign tax credit utilization	(2,761)	(5,493)	(4,141)
Research and development activities credit utilization	(235)	(238)	(245)
Uncertain tax positions	(651)	(833)	226
Domestic production activities deduction	(1,155)	(875)	(910)
State income tax provisions, net	569	357	133
Non-deductible entertainment and business meals expense	248	238	249
Miscellaneous items, net	854	(106)	180
Taxes on income	$ 41,653	$ 23,226	$ 17,785

As of December 31, 2017, the Company domestically had a net deferred tax asset of $0.3 million. In addition, the Company has foreign tax loss carryforwards of $8.9 million of which $0.2 million expires in 2018, $0.3 million expires in 2019, $0.1 million expires in 2020, $0.2 million expires in 2021, $0.1 million expires in 2022, and $0.8 million expires thereafter. The remaining foreign tax losses have no expiration dates. A partial valuation allowance has been established with respect to the tax benefit of these losses for $0.8 million.

It is the Company's intention to continue to reinvest its undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives. The amount of such undistributed earnings at December 31, 2017 was approximately $300.0 million. As a result of U.S. Tax Reform, specifically the Transition Tax, the Company has provided for U.S. income taxes on these undistributed earnings, however, the Company could be subject to other taxes, such as withholding taxes and dividend distribution taxes if these undistributed earnings were ultimately remitted to the U.S. It is currently impractical to estimate any such incremental tax expense.

As of December 31, 2017, the Company's cumulative liability for gross unrecognized tax benefits was $6.8 million. The Company had accrued approximately $1.0 million for cumulative penalties and $0.6 million for cumulative interest as of December 31, 2017. As of December 31, 2016, the Company's cumulative liability for gross unrecognized tax benefits was $6.2 million. The Company had accrued $1.6 million for cumulative penalties and $0.7 million for cumulative interest as of December 31, 2016.

The Company continues to recognize interest and penalties associated with uncertain tax positions as a component of tax expense on income before equity in net income of associated companies in its Consolidated Statements of Income. The Company recognized a credit of $0.7 million for penalties and a credit of $0.2 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2017, a credit of $0.2 million for penalties and a credit of $0.7 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2016, and $0.2 million for penalties and a credit of $0.2 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2015.

The Company estimates that during the year ending December 31, 2018, it will reduce its cumulative liability for gross unrecognized tax benefits by approximately $1.0 million due to the expiration of the statute of limitations with regard to certain tax positions. This estimated reduction in the cumulative liability for unrecognized tax benefits does not consider any increase in liability for unrecognized tax benefits with regard to existing tax positions or any increase in cumulative liability for unrecognized tax benefits with regard to new tax positions for the year ending December 31, 2018.

A reconciliation of the beginning and ending amounts of unrecognized tax benefits for the years ended December 31, 2017, 2016 and 2015, respectively, is as follows:

	2017	2016	2015
Unrecognized tax benefits as of January 1	$ 6,240	$ 11,032	$ 11,845
Decrease in unrecognized tax benefits taken in prior periods	(308)	(869)	(416)
Increase in unrecognized tax benefits taken in current period	2,347	1,921	2,512
Decrease in unrecognized tax benefits due to lapse of statute of limitations	(2,116)	(5,744)	(1,924)
Increase (decrease) due to foreign exchange rates	598	(100)	(985)
Unrecognized tax benefits as of December 31	$ 6,761	$ 6,240	$ 11,032

The amount of unrecognized tax benefits above that, if recognized, would impact the Company's tax expense and effective tax rate is $2.2 million, $1.8 million and $1.1 million for the years ended December 31, 2017, 2016 and 2015, respectively.

The Company and its subsidiaries are subject to U.S. Federal income tax, as well as the income tax of various state and foreign tax jurisdictions. Tax years that remain subject to examination by major tax jurisdictions include Brazil from 2000, Italy from 2007, the Netherlands from 2011, the United Kingdom and Mexico from 2012, Spain and China from 2013, India from fiscal year beginning April 1, 2013 and ending March 31, 2014, the United States from 2014, and various domestic state tax jurisdictions from 2008.

As previously reported, the Italian tax authorities have assessed additional tax due from the Company's subsidiary, Quaker Italia S.r.l., relating to the tax years 2007 through 2013. The Company has filed for competent authority relief from these assessments under the Mutual Agreement Procedures of the Organization for Economic Co-Operation and Development for all years except 2007. As of December 31, 2017, the Company believes it has adequate reserves, where merited, for uncertain tax positions with respect to these and all other audits.

Note 9 – Earnings Per Share

The following table summarizes earnings per share calculations for the years ended December 31, 2017, 2016 and 2015:

	2017	2016	2015
Basic earnings per common share			
Net income attributable to Quaker Chemical Corporation	$ 20,278	$ 61,403	$ 51,180
Less: income allocated to participating securities	(137)	(515)	(443)
Net income available to common shareholders	$ 20,141	$ 60,888	$ 50,737
Basic weighted average common shares outstanding	13,204,872	13,136,138	13,199,630
Basic earnings per common share	$ 1.53	$ 4.64	$ 3.84
Diluted earnings per common share			
Net income attributable to Quaker Chemical Corporation	$ 20,278	$ 61,403	$ 51,180
Less: income allocated to participating securities	(137)	(514)	(443)
Net income available to common shareholders	$ 20,141	$ 60,889	$ 50,737
Basic weighted average common shares outstanding	13,204,872	13,136,138	13,199,630
Effect of dilutive securities	41,074	24,331	15,219
Diluted weighted average common shares outstanding	13,245,946	13,160,469	13,214,849
Diluted earnings per common share	$ 1.52	$ 4.63	$ 3.84

Certain stock options and restricted stock units are not included in the diluted earnings per share calculation since the effect would have been anti-dilutive. The calculated amount of anti-diluted shares not included were 3,671 in 2017, 678 in 2016 and 6,684 in 2015.

Note 10 – Accounts Receivable and Allowance for Doubtful Accounts

As of December 31, 2017 and 2016, the Company had gross trade accounts receivable totaling $213.8 million and $202.4 million with trade accounts receivable greater than 90 days past due of $15.2 million and $18.0 million, respectively. The following are changes in the allowance for doubtful accounts during the years ended December 31, 2017, 2016 and 2015:

	Balance at Beginning of Period	Changes to Costs and Expenses	Write-Offs Charged to Allowance	Exchange Rate Changes and Other Adjustments	Balance at End of Period
Allowance for Doubtful Accounts					
Year ended December 31, 2017	$ 7,220	$ 137	$ (2,206)	$ 306	$ 5,457
Year ended December 31, 2016	$ 7,818	$ 1,375	$ (1,949)	$ (24)	$ 7,220
Year ended December 31, 2015	$ 6,498	$ 1,460	$ (261)	$ 121	$ 7,818

During the year ended December 31, 2015, the Company recorded a charge of $0.3 million to its allowance for doubtful accounts and SG&A, due to the bankruptcies of certain customers. There were no similar charges during the years ended December 31, 2017 or 2016, respectively. Included in write-offs charged to allowance during the years ended December 31, 2017 and 2016 were outstanding receivables related to certain prior year customer bankruptcies, which the Company previously reserved for, but settled during 2017 and 2016, respectively.

Included in exchange rate changes and other adjustments for the years ended December 31, 2016 and 2015, are allowance for doubtful accounts of less than $0.1 million and $0.4 million acquired in 2016 and 2015 business acquisitions, respectively. There was no similar adjustment in 2017.

Note 11 – Inventories

Total inventories as of December 31, 2017 and 2016 were as follows:

	2017	2016
Raw materials and supplies	$ 44,439	$ 37,772
Work in process and finished goods	42,782	39,310
Total inventories	$ 87,221	$ 77,082

Note 12 – Property, Plant and Equipment

Property, plant and equipment as of December 31, 2017 and 2016 were as follows:

	2017	2016
Land	$ 10,635	$ 9,707
Building and improvements	87,111	80,740
Machinery and equipment	153,312	140,595
Construction in progress	4,932	4,964
	255,990	236,006
Less accumulated depreciation	(169,286)	(150,272)
	$ 86,704	$ 85,734

As of December 31, 2017, the Company has no capital leases or future minimum lease payments.

Note 13 – Goodwill and Other Intangible Assets

The Company has historically completed its annual goodwill impairment test as of the end of the third quarter of each year, or more frequently if triggering events indicate a possible impairment in one or more of its reporting units. The Company continually evaluates financial performance, economic conditions and other relevant developments in assessing if an interim period impairment test for one or more of its reporting units is necessary. The Company completed its annual impairment assessment as of the end of the third quarter of 2017 and no impairment charge was warranted. In addition, the Company has recorded no impairment charges in its past. To better align the Company's annual goodwill impairment assessment with the Company's budget process and its related timing, the Company elected to update its annual goodwill impairment assessment during the fourth quarter of 2017 and concluded no

impairment charge was warranted. Going forward, the Company will complete its annual goodwill impairment assessment during the fourth quarter.

Changes in the carrying amount of goodwill for the years ended December 31, 2017 and 2016 were as follows:

	North America	EMEA	Asia/Pacific	South America	Total
Balance as of December 31, 2015	$ 42,443	$ 19,280	$ 15,244	$ 2,144	$ 79,111
Goodwill additions (reductions)	3,311	(114)	—	—	3,197
Currency translation adjustments	(264)	(977)	(678)	415	(1,504)
Balance as of December 31, 2016	45,490	18,189	14,566	2,559	80,804
Goodwill additions	1,832	—	—	—	1,832
Currency translation adjustments	249	2,315	890	(56)	3,398
Balance as of December 31, 2017	$ 47,571	$ 20,504	$ 15,456	$ 2,503	$ 86,034

Gross carrying amounts and accumulated amortization for definite-lived intangible assets as of December 31, 2017 and 2016 were as follows:

	Gross Carrying Amount		Accumulated Amortization	
	2017	2016	2017	2016
Customer lists and rights to sell	$ 76,581	$ 71,454	$ 25,394	$ 20,043
Trademarks, formulations and product technology	33,025	31,436	14,309	11,748
Other	6,114	6,023	5,514	5,151
Total definite-lived intangible assets	$ 115,720	$ 108,913	$ 45,217	$ 36,942

The Company recorded $7.4 million, $7.0 million and $6.8 million of amortization expense during the years ended December 31, 2017, 2016 and 2015, respectively. Estimated annual aggregate amortization expense for the subsequent five years is as follows:

For the year ended December 31, 2018	$ 7,348
For the year ended December 31, 2019	7,244
For the year ended December 31, 2020	6,956
For the year ended December 31, 2021	6,576
For the year ended December 31, 2022	6,449

The Company has two indefinite-lived intangible assets totaling $1.1 million for trademarks as of December 31, 2017 and 2016.

Note 14 – Investments in Associated Companies

As of December 31, 2017, the Company held a 50% investment in and had significant influence over Nippon Quaker Chemical, Ltd. (Japan), Kelko Quaker Chemical, S.A. (Panama) and Kelko Quaker Chemical, S.A. (Venezuela) and held a 33% investment in and had significant influence over Primex, Ltd. (Barbados).

The carrying amount of the Company's equity investments as of December 31, 2017 was $25.7 million, which includes its investments of $19.5 million in Primex, Ltd. (Barbados); approximately $5.7 million in Nippon Quaker Chemical, Ltd. (Japan); $0.4 million in Kelko Quaker Chemical, S.A. (Panama); and $0.1 million in Kelko Quaker Chemical, S.A. (Venezuela).

Venezuela's economy has been considered hyper inflationary under U.S. GAAP since 2010, at which time the Company's Venezuela equity affiliate, Kelko Quaker Chemical, S.A. ("Kelko Venezuela"), changed its functional currency from the bolivar fuerte ("BsF") to the U.S. dollar. Accordingly, all gains and losses resulting from the remeasurement of Kelko Venezuela's monetary assets and liabilities to published exchange rates are required to be recorded directly to the Consolidated Statements of Income. As of December 31, 2014, there were three legally available exchange rates in Venezuela, the CADIVI (or the official rate, 6.3 BsF per U.S. dollar), the SICAD 1 and the SICAD II. Kelko Venezuela had access to the CADIVI for imported goods, had not been invited to participate in any SICAD I auctions and had limited access to the SICAD II mechanism. Accordingly, the Company measured its equity investment and other related assets with Kelko Venezuela at the CADIVI exchange rate as of December 31, 2014. During the first quarter of 2015, the Venezuela government announced changes to its foreign exchange controls. There continued to be three exchange mechanisms, however, they consisted of the CADIVI, a combined SICAD I and SICAD II auction mechanism (the

"SICAD") and a newly created, marginal currency system (the "SIMADI"). In light of the first quarter of 2015 changes to Venezuela's foreign exchange controls and the on-going economic challenges in Venezuela, the Company re-assessed Kelko Venezuela's access to U.S. dollars, the impact on the operations of Kelko Venezuela, and the impact on the Company's equity investment and other related assets, which resulted in revaluing its equity investment in Kelko Venezuela and other related assets to the SIMADI exchange rate of approximately 193 BsF per U.S. dollar as of March 31, 2015. This resulted in a charge of $2.8 million in the first quarter of 2015.

During the first quarter of 2016, the Venezuela government announced further changes to its foreign exchange controls, including eliminating the CADIVI, SICAD and SIMADI exchange rate mechanisms and replacing them with a new dual foreign exchange rate system, which consists of a protected "DIPRO" exchange rate, with a rate fixed at 10 BsF per U.S. dollar and, also, a floating supplementary market exchange rate known as the "DICOM." The DIPRO rate is only available for payment of certain imports of essential goods in the food and health sectors while the DICOM governs all other transactions not covered by the DIPRO. In light of these changes to the foreign exchange controls during the first quarter of 2016, the Company again re-assessed Kelko Venezuela's access to U.S. dollars, the impact on the operations of Kelko Venezuela, and the impact on the Company's equity investment and other related assets. The Company did not believe it had access to the DIPRO and, therefore, believed the DICOM to be the exchange rate system available to Kelko Venezuela, which resulted in a currency conversion charge of $0.1 million in the first quarter of 2016. Due to ongoing economic and political instability in Venezuela, the DICOM BsF per U.S. dollar exchange rate has continued to devalue during 2017. This resulted in the Company recording currency conversion charges totaling $0.4 million during the year ended December 31, 2017 to write down the Company's equity investment to the current DICOM exchange rate. These currency conversion charges were recorded through equity in net income of associated companies in the Company's Consolidated Statements of Income. As of December 31, 2017, the Company's equity investment in Kelko Venezuela was valued at the DICOM exchange rate of approximately 3,341 BsF per U.S. dollar.

Summarized financial information of Nippon Quaker Chemical, Ltd. (Japan), Kelko Quaker Chemical, S.A. (Panama) and Kelko Quaker Chemical, S.A. (Venezuela), in the aggregate, is as follows:

	As of December 31,	
	2017	2016
Current Assets	$ 37,683	$ 37,998
Noncurrent Assets	936	1,244
Current Liabilities	24,858	26,683
Noncurrent Liabilities	1,457	1,166

	Year Ended December 31,		
	2017	2016	2015
Net Sales	$ 42,555	$ 41,448	$ 40,282
Gross Margin	13,440	13,082	12,887
Income Before Income Taxes	2,900	2,289	(2,843)
Net Income	1,471	1,210	(3,631)

Summarized financial information of Primex, Ltd. is as follows:

	As of December 31,	
	2017	2016
Total Assets	$ 120,154	$ 116,742
Total Liabilities	54,258	58,775

	Year Ended December 31,		
	2017	2016	2015
Revenue	$ 14,042	$ 5,632	$ 7,058
Income Before Income Taxes	11,705	5,622	8,407
Net Income	7,788	5,148	6,334

Note 15 – Other Assets

Other assets as of December 31, 2017 and 2016 were as follows:

	2017	2016
Restricted insurance settlement	$ 21,171	$ 21,883
Uncertain tax positions	4,543	3,892
Supplemental retirement income program	1,594	1,410
Pension assets	1,184	—
Other	1,557	1,567
Total other assets	$ 30,049	$ 28,752

As of December 31, 2017, one of the Company's U.S. pension plan's fair value of plan assets exceeded its gross benefit obligation and was therefore over-funded, which is represented by the line Pension assets in the table above. See also Notes 18 of Notes to Consolidated Financial Statements.

Previously, an inactive subsidiary of the Company executed separate settlement and release agreements with two of its insurance carriers for $35.0 million, of which $21.2 million remains. The proceeds of both settlements are restricted and can only be used to pay claims and costs of defense associated with the subsidiary's asbestos litigation. The proceeds of the settlement and release agreements have been deposited into interest bearing accounts which earned less than $0.1 million in the years ended December 31, 2017 and 2016, respectively, offset by $0.8 million and $1.0 million of net payments in 2017 and 2016, respectively. Due to the restricted nature of the proceeds, a corresponding deferred credit was established in "Other non-current liabilities" for an equal and offsetting amount, and will remain until the restrictions lapse or the funds are exhausted via payments of claims and costs of defense. See also Notes 19 and 23 of Notes to Consolidated Financial Statements.

Note 16 – Other Current Liabilities

Other current liabilities as of December 31, 2017 and 2016 were as follows:

	2017	2016
Non-income taxes	$ 9,196	$ 9,278
Professional fees	5,019	1,980
Selling expenses	2,846	2,699
Customer advances	1,507	492
Freight	1,780	2,212
Legal	1,169	754
Accrued interest	884	5
Current income taxes payable	841	2,753
Accrued rent and facilities	775	500
Other	3,304	2,755
Total other current liabilities	$ 27,321	$ 23,428

Note 17 – Debt

Debt as of December 31, 2017 and 2016 includes the following:

	2017	2016
Credit facilities	$ 48,514	$ 47,948
Industrial development bonds	15,000	15,000
Municipality-related loans	3,290	3,470
Other debt obligations (including capital leases)	—	58
	66,804	66,476
Short-term debt (including capital leases)	—	(58)
Current portion of long-term debt	(5,736)	(649)
	$ 61,068	$ 65,769

Credit facilities

The Company's primary credit facility ("the Credit Facility") is a $300.0 million syndicated multicurrency credit agreement with a group of lenders which matures in June 2019. The maximum amount available under the Credit Facility can be increased to $400.0 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under the Credit Facility generally bear interest at a base rate or LIBOR rate plus a margin. The Credit Facility has certain financial and other covenants, with the key financial covenant requiring that the Company's consolidated net debt to adjusted EBITDA ratio cannot exceed 3.50 to 1. As of December 31, 2017 and 2016, the Company's consolidated net debt to adjusted EBITDA ratio was below 1.0 to 1, and the Company was also in compliance with all of its other covenants. As of December 31, 2017 and 2016, the Company had total credit facility borrowings of approximately $48.5 million and $47.9 million, primarily under the Credit Facility, at weighted average borrowing rates of 1.88% and 1.25%, respectively.

Industrial development bonds

The Company has two fixed rate, industrial development authority demand bonds, with $5.0 million due in 2018 bearing interest at a rate of 5.60%, and $10.0 million due in 2028 bearing interest at a rate of 5.26%. These bonds have similar covenants to the Credit Facility noted above.

Municipality-related loans

As part of a past expansion project at the Company's Middletown, Ohio facility, it agreed to a low interest rate $3.5 million loan with the Ohio Department of Development. Principal repayment on this loan began in September 2010 with its final maturity being in February 2021. The current interest rate of 2% will rise to 3% beginning March 2019 until final maturity. As of December 31, 2017 and 2016, there was $1.1 million and $1.5 million, respectively, outstanding on this loan.

The Company's Verkol S.A.U. ("Verkol") subsidiary has certain loans issued by the local government which are either interest-free or bear interest at a subsidized rate. These loans mature periodically, with the last maturity occurring in 2028. The Company records these loans at fair value based on market interest rates on the date of acquisition and continues to measure the loans at amortized cost, recognizing the implicit interest incurred. As of December 31, 2017 and 2016, there was $2.2 and $2.0 million, respectively, outstanding for these loans.

During the next five years, payments on the Company's debt are due as follows:

2018	$	5,736
2019		49,160
2020		694
2021		407
2022		282

As of December 31, 2017 and 2016, the amounts at which the Company's debt is recorded are not materially different from their fair market value.

Note 18 – Pension and Other Postretirement Benefits

The following table shows the Company's plans' funded status reconciled with amounts reported in the Consolidated Balance Sheets as of December 31, 2017 and 2016:

	Pension Benefits						Other Post-Retirement Benefits	
	2017			2016			2017	2016
Change in benefit obligation	**Foreign**	**Domestic**	**Total**	**Foreign**	**Domestic**	**Total**	**Domestic**	**Domestic**
Gross benefit obligation at beginning of year	$ 103,491	$ 67,254	$ 170,745	$ 92,406	$ 66,862	$ 159,268	$ 4,730	$ 5,422
Service cost	3,219	337	3,556	2,378	298	2,676	8	10
Interest cost	2,066	1,932	3,998	2,314	2,114	4,428	144	142
Employee contributions	68	—	68	71	—	71	—	—
Plan settlements	—	(4,341)	(4,341)	—	—	—	—	—
Benefits paid	(2,503)	(4,031)	(6,534)	(1,583)	(4,522)	(6,105)	(448)	(443)
Plan expenses and premiums paid	(210)	—	(210)	(155)	(275)	(430)	—	—
Actuarial (gain) loss	(1,164)	1,826	662	14,848	2,777	17,625	295	(401)
Translation differences and other	13,385	—	13,385	(6,788)	—	(6,788)	—	—
Gross benefit obligation at end of year	$ 118,352	$ 62,977	$ 181,329	$ 103,491	$ 67,254	$ 170,745	$ 4,729	$ 4,730
Change in plan assets								
Fair value of plan assets at year beginning of year	$ 86,844	$ 49,197	$ 136,041	$ 76,156	$ 46,701	$ 122,857	$ —	$ —
Actual return on plan assets	116	6,865	6,981	14,472	2,516	16,988	—	—
Employer contributions	2,867	4,574	7,441	3,103	4,777	7,880	448	443
Employee contributions	68	—	68	71	—	71	—	—
Plan settlements	—	(4,341)	(4,341)	—	—	—	—	—
Benefits paid	(2,503)	(4,031)	(6,534)	(1,583)	(4,522)	(6,105)	(448)	(443)
Plan expenses and premiums paid	(210)	(300)	(510)	(155)	(275)	(430)	—	—
Translation differences	11,440	—	11,440	(5,220)	—	(5,220)	—	—
Fair value of plan assets at end of year	$ 98,622	$ 51,964	$ 150,586	$ 86,844	$ 49,197	$ 136,041	$ —	$ —
Net benefit obligation recognized	$ (19,730)	$ (11,013)	$ (30,743)	$ (16,647)	$ (18,057)	$ (34,704)	$ (4,729)	$ (4,730)
Amounts recognized in the balance sheet consist of:								
Non-current assets	$ —	$ 1,184	$ 1,184	$ —	$ —	$ —	$ —	$ —
Current liabilities	(89)	(560)	(649)	(61)	(574)	(635)	(459)	(451)
Non-current liabilities	(19,641)	(11,637)	(31,278)	(16,586)	(17,483)	(34,069)	(4,270)	(4,279)
Net benefit obligation recognized	$ (19,730)	$ (11,013)	$ (30,743)	$ (16,647)	$ (18,057)	$ (34,704)	$ (4,729)	$ (4,730)
Amounts not yet reflected in net periodic benefit costs and included in accumulated other comprehensive loss:								
Prior service credit (cost)	$ 1,744	$ (59)	$ 1,685	$ 1,687	$ (122)	$ 1,565	$ —	$ —
Accumulated loss	(22,598)	(27,133)	(49,731)	(20,214)	(33,147)	(53,361)	(823)	(581)
AOCI	(20,854)	(27,192)	(48,046)	(18,527)	(33,269)	(51,796)	(823)	(581)
Cumulative employer contributions in excess of or (below) net periodic benefit cost	1,124	16,179	17,303	1,880	15,212	17,092	(3,906)	(4,149)
Net benefit obligation recognized	$ (19,730)	$ (11,013)	$ (30,743)	$ (16,647)	$ (18,057)	$ (34,704)	$ (4,729)	$ (4,730)

The accumulated benefit obligation for all defined benefit pension plans was $176.3 million ($62.2 million Domestic and approximately $114.1 million Foreign) and $167.1 million ($66.7 million Domestic and $100.4 million Foreign) as of December 31, 2017 and 2016, respectively.

Information for pension plans with an accumulated benefit obligation in excess of plan assets:

	2017			2016		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Projected benefit obligation	$ 118,352	$ 12,197	$ 130,549	$ 103,491	$ 67,254	$ 170,745
Accumulated benefit obligation	114,069	11,456	125,525	100,463	66,676	167,139
Fair value of plan assets	98,622	—	98,622	86,844	49,197	136,041

Information for pension plans with a projected benefit obligation in excess of plan assets:

	2017			2016		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Projected benefit obligation	$ 118,352	$ 12,197	$ 130,549	$ 103,491	$ 67,254	$ 170,745
Fair value of plan assets	98,622	—	98,622	86,844	49,197	136,041

Components of net periodic benefit costs – pension plans:

	2017			2016		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Service cost	$ 3,219	$ 337	$ 3,556	$ 2,378	$ 298	$ 2,676
Interest cost	2,066	1,932	3,998	2,314	2,114	4,428
Expected return on plan assets	(1,994)	(3,067)	(5,061)	(2,026)	(3,316)	(5,342)
Settlement loss	—	1,946	1,946	—	—	—
Actuarial loss amortization	862	2,396	3,258	839	2,336	3,175
Prior service (credit) cost amortization	(167)	63	(104)	(164)	63	(101)
Net periodic benefit cost	$ 3,986	$ 3,607	$ 7,593	$ 3,341	$ 1,495	$ 4,836

	2015		
	Foreign	Domestic	Total
Service cost	$ 2,799	$ 250	$ 3,049
Interest cost	2,476	2,541	5,017
Expected return on plan assets	(2,092)	(3,453)	(5,545)
Settlement loss	170	—	170
Actuarial loss amortization	1,136	2,353	3,489
Prior service (credit) cost amortization	(164)	63	(101)
Net periodic benefit cost	$ 4,325	$ 1,754	$ 6,079

Other changes recognized in other comprehensive income – pension plans:

	2017			2016		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Net loss (gain) arising during the period	$ 715	$ (1,672)	$ (957)	$ 2,401	$ 3,576	$ 5,977
Recognition of amortization in net periodic benefit cost						
Prior service credit (cost)	167	(63)	104	164	(63)	101
Actuarial loss	(862)	(4,342)	(5,204)	(839)	(2,336)	(3,175)
Effect of exchange rates on amounts included in AOCI	2,308	—	2,308	(1,347)	—	(1,347)
Total recognized in other comprehensive loss (income)	2,328	(6,077)	(3,749)	379	1,177	1,556
Total recognized in net periodic benefit cost and other comprehensive loss (income)	$ 6,314	$ (2,470)	$ 3,844	$ 3,720	$ 2,672	$ 6,392

	2015		
	Foreign	Domestic	Total
Net (gain) loss arising during period	$ (3,537)	$ 1,134	$ (2,403)
Recognition of amortization in net periodic benefit			
Prior service credit (cost)	164	(63)	101
Actuarial loss	(1,306)	(2,353)	(3,659)
Effect of exchange rates on amounts included in AOCI	(2,353)	—	(2,353)
Total recognized in other comprehensive income	(7,032)	(1,282)	(8,314)
Total recognized in net periodic benefit cost and other comprehensive (income) loss	$ (2,707)	$ 472	$ (2,235)

Components of net periodic benefit costs – other postretirement plan:

	2017	2016	2015
Service cost	$ 8	$ 10	$ 17
Interest cost	144	142	195
Actuarial loss amortization	54	—	83
Net periodic benefit costs	$ 206	$ 152	$ 295

Other changes recognized in other comprehensive income – other postretirement benefit plans:

	2017	2016	2015
Net loss (gain) arising during period	$ 295	$ (401)	$ (302)
Amortization of actuarial loss in net periodic benefit costs	(54)	—	(83)
Total recognized in other comprehensive loss (income)	241	(401)	(385)
Total recognized in net periodic benefit cost and other comprehensive loss (income)	$ 447	$ (249)	$ (90)

Estimated amounts that will be amortized from accumulated other comprehensive loss over the next fiscal year:

	Pension Plans			Other Post-Retirement Benefits
	Foreign	Domestic	Total	
Actuarial loss	$ 890	$ 2,283	$ 3,173	$ 58
Prior service (credit) cost	(177)	59	(118)	—
	$ 713	$ 2,342	$ 3,055	$ 58

Weighted-average assumptions used to determine benefit obligations as of December 31, 2017 and 2016:

	Pension Benefits		Other Postretirement Benefits	
	2017	2016	2017	2016
U.S. Plans:				
Discount rate	3.44 %	3.88 %	3.39 %	3.73 %
Rate of compensation increase	3.63 %	3.63 %	N/A	N/A
Foreign Plans:				
Discount rate	2.31 %	2.17 %	N/A	N/A
Rate of compensation increase	2.89 %	2.48 %	N/A	N/A

Weighted-average assumptions used to determine net periodic benefit costs for the years ended December 31, 2017 and 2016:

	Pension Benefits		Other Postretirement Benefits	
	2017	2016	2017	2016
U.S. Plans:				
Discount rate	3.88 %	4.07 %	3.73 %	3.88 %
Expected long-term return on plan assets	7.00 %	7.20 %	N/A	N/A
Rate of compensation increase	3.63 %	3.63 %	N/A	N/A
Foreign Plans:				
Discount rate	2.17 %	2.95 %	N/A	N/A
Expected long-term return on plan assets	2.12 %	2.65 %	N/A	N/A
Rate of compensation increase	2.48 %	2.41 %	N/A	N/A

The long-term rates of return on assets were selected from within the reasonable range of rates determined by (a) historical real returns for the asset classes covered by the investment policy and (b) projections of inflation over the long-term period during which benefits are payable to plan participants. See Note 1 of Notes to Consolidated Financial Statements for further information.

Assumed health care cost trend rates as of December 31, 2017 and 2016:

	2017	2016
Health care cost trend rate for next year	6.40 %	6.70 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.50 %	4.50 %
Year that the rate reaches the ultimate trend rate	2037	2037

Assumed health care cost trend rates could have a significant effect on the amounts reported for the health care plans. A one-percentage-point change in assumed health care cost trend rates would have the following effects:

	1% Point Increase	1% Point Decrease
Effect on total service and interest cost	$ 16	$ (14)
Effect on postretirement benefit obligations	356	(311)

Plan Assets and Fair Value

The Company's pension plan target asset allocation and the weighted-average asset allocations as of December 31, 2017 and 2016 by asset category were as follows:

Asset Category	**Target**	**2017**	**2016**
U.S. Plans			
Equity securities	56%	59%	60%
Debt securities	43%	40%	39%
Other	1%	1%	1%
Total	100%	100%	100%
Foreign Plans			
Equity securities and other	25%	25%	24%
Debt securities	75%	75%	76%
Total	100%	100%	100%

As of December 31, 2017 and 2016, "Other" consisted principally of cash and cash equivalents (approximately 1% of plan assets in each respective period).

The following is a description of the valuation methodologies used for the investments measured at fair value, including the general classification of such instruments pursuant to the valuation hierarchy, where applicable:

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and money market funds and are classified as Level 1 investments.

Common Stock

Common stock is valued based on quoted market prices on an exchange in an active market and is classified as Level 1 investments.

Commingled Funds

Investments in the U.S. pension plan and foreign pension plan commingled funds represent pooled institutional investments, including primarily collective investment trusts. These commingled funds are not available on an exchange or in an active market and these investments are valued using their net asset value ("NAV"), which is generally based on the underlying asset values of the pooled investments held in the trusts.

As of December 31, 2017, the U.S. pension plan commingled funds included approximately 60 percent of investments in equity securities and 40 percent of investments in fixed income securities. As of December 31, 2017, foreign pension plan commingled funds included approximately 31 percent of investments in equity securities, 57 percent of investments in fixed income securities, and 12 percent of other non-related investments, primarily real estate.

Pooled Separate Accounts

Investments in the U.S. pension plan pooled separate accounts consist of insurance annuity contracts and are valued based on the reported unit value at year end. Units of the pooled separate account are not traded on an exchange or in an active market and these investments are valued using their NAV.

Insurance Contract

Investments in the foreign pension plan insurance contract are valued at the highest value available for the Company at year end, either the reported cash surrender value of the contract or the vested benefit obligation. Both the cash surrender value and

the vested benefit obligation are determined based on unobservable inputs, which are contractually or actuarially determined, regarding returns, fees, the present value of the future cash flows of the contract and benefit obligations. The contract is classified as a Level 3 investment.

Diversified Equity Securities - Registered Investment Companies

Investments in the foreign pension plan diversified equity securities of registered investment companies are based upon the quoted redemption value of shares in the fund owned by the plan at year end. The shares of the fund are not available on an exchange or in an active market; however, the fair value is determined based on the underlying investments in the fund as traded on an exchange in an active market and are classified as Level 2 investments.

Fixed Income – Foreign Registered Investment Companies

Investments in the foreign pension plan fixed income securities of foreign registered investment companies are based upon the quoted redemption value of shares in the fund owned by the plan at year end. The shares of the fund are not available on an exchange or in an active market; however, the fair value is determined based on the underlying investments in the fund as traded on an exchange in an active market and are classified as Level 2 investments.

Real Estate

The foreign pension plan's investment in real estate consists of an investment in a property fund. The fund's underlying investments consist of real property, which are valued using unobservable inputs. The property fund is classified as a Level 3 investment.

As of December 31, 2017 and 2016, the U.S. and foreign plans' investments measured at fair value on a recurring basis were as follows:

	Total	Fair Value Measurements at December 31, 2017 Using Fair Value Hierarchy		
U.S. Pension Assets	**Fair Value**	**Level 1**	**Level 2**	**Level 3**
Cash and cash equivalents	$ 449	$ 449	$ —	$ —
Small capitalization common stock	1,508	1,508	—	—
Subtotal U.S. pension plan assets in fair value hierarchy	$ 1,957	$ 1,957	$ —	$ —
Commingled funds measured at NAV	48,527			
Pooled separate accounts measured at NAV	1,480			
Total U.S. pension plan assets	$ 51,964			
Foreign Pension Assets				
Cash and cash equivalents	$ 26	$ 26	$ —	$ —
Insurance contract	82,092	—	—	82,092
Diversified equity securities - registered investment companies	9,002	—	9,002	—
Fixed income - foreign registered investment companies	2,951	—	2,951	—
Real estate - registered investment companies	2,428	—	—	2,428
Sub-total of foreign pension assets in fair value hierarchy	$ 96,499	$ 26	$ 11,953	$ 84,520
Commingled funds measured at NAV	2,123			
Total foreign pension assets	$ 98,622			
Total pension assets in fair value hierarchy	$ 98,456	$ 1,983	$ 11,953	$ 84,520
Total pension assets measured at NAV	52,130			
Total pension assets	$ 150,586			

	Total	Fair Value Measurements at December 31, 2016 Using Fair Value Hierarchy		
U.S. Pension Assets	**Fair Value**	**Level 1**	**Level 2**	**Level 3**
Cash and cash equivalents	$ 302	$ 302	$ —	$ —
Small capitalization common stock	1,279	1,279	—	—
Subtotal U.S. pension plan assets in fair value hierarchy	$ 1,581	$ 1,581	$ —	$ —
Commingled funds measured at NAV	46,185			
Pooled separate accounts measured at NAV	1,431			
Total U.S. pension plan assets	$ 49,197			
Foreign Pension Assets				
Cash and cash equivalents	$ 130	$ 130	$ —	$ —
Insurance contract	72,778	—	—	72,778
Diversified equity securities - registered investment companies	7,308	—	7,308	—
Fixed income - foreign registered investment companies	2,753	—	2,753	—
Real estate - registered investment companies	2,041	—	—	2,041
Subtotal foreign pension assets in fair value hierarchy	$ 85,010	$ 130	$ 10,061	$ 74,819
Commingled funds measured at NAV	1,834			
Total foreign pension plan assets	$ 86,844			
Total pension assets in fair value hierarchy	$ 86,591	$ 1,711	$ 10,061	$ 74,819
Total pension assets measured at NAV	49,450			
Total pension assets	$ 136,041			

Certain investments that are measured at fair value using the NAV per share (or its equivalent) have not been classified in the fair value hierarchy. The fair value amounts presented for these investments in the preceding tables are intended to permit reconciliation of the fair value hierarchies to the line items presented in the statements of net assets available for benefits.

Changes in the fair value of the foreign plans' Level 3 investments during the years ended December 31, 2017 and 2016 were as follows:

	Insurance Contract	Real Estate Fund	Total
Balance as of December 31, 2015	$ 62,409	$ 2,388	$ 64,797
Purchases	2,584	—	2,584
Settlements	(1,350)	—	(1,350)
Unrealized gains	12,005	56	12,061
Currency translation adjustment	(2,870)	(403)	(3,273)
Balance as of December 31, 2016	72,778	2,041	74,819
Purchases	2,350	—	2,350
Settlements	(1,661)	—	(1,661)
Unrealized (losses) gains	(1,425)	188	(1,237)
Currency translation adjustment	10,050	199	10,249
Balance as of December 31, 2017	$ 82,092	$ 2,428	$ 84,520

U.S. pension assets include Company common stock in the amounts of $1.5 million (3% of total U.S. plan assets) and $1.3 million (3% of total U.S. plan assets) as of December 31, 2017 and 2016, respectively.

During the second quarter of 2017, the Company's U.S. pension plan offered a cash settlement to its vested terminated participants, which allowed them to receive the value of their pension benefits as a single lump sum payment. As payments from the U.S. pension plan for this cash out offering exceeded the service and interest cost components of the U.S. pension plan expense for the year ended December 31, 2017, the Company recorded a settlement charge of approximately $1.9 million. This settlement charge represented the immediate recognition into expense of a portion of the unrecognized loss within AOCI on the balance sheet in proportion to the share of the projected benefit obligation that was settled by these payments. The gross pension benefit obligation

was reduced by approximately $4.0 million as a result of these payments. The settlement charge was recognized through other expense, net, on the Company's Consolidated Statements of Income.

Cash Flows

Contributions

The Company expects to make minimum cash contributions of $9.9 million to its pension plans ($4.6 million Domestic and $5.3 million Foreign) and approximately $0.4 million to its other postretirement benefit plan in 2018.

Estimated Future Benefit Payments

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid:

	Pension Benefits			Other Post-Retirement
	Foreign	Domestic	Total	Benefits
2018	$ 2,205	$ 4,473	$ 6,678	$ 459
2019	2,384	4,420	6,804	441
2020	2,623	4,187	6,810	416
2021	3,322	4,159	7,481	489
2022	3,346	4,165	7,511	364
2023 to 2027	19,491	22,218	41,709	1,502

The Company maintains a plan under which supplemental retirement benefits are provided to certain officers. Benefits payable under the plan are based on a combination of years of service and existing postretirement benefits. Included in total pension costs are charges of $1.4 million, $0.9 million and $0.9 million for the years ended December 31, 2017, 2016 and 2015, respectively, representing the annual accrued benefits under this plan.

Defined Contribution Plan

The Company has a 401(k) plan with an employer match covering a majority of its domestic employees. The plan allows for and the Company previously paid a nonelective contribution on behalf of participants who have completed one year of service equal to 3% of the eligible participants' compensation in the form of Company common stock. During the first quarter of 2017, the Company began matching both non-elective and elective 401(k) contributions in cash, rather than stock. Total Company contributions were $2.9 million, $2.7 million and $2.6 million for the years ended December 31, 2017, 2016 and 2015, respectively.

Note 19 – Other Non-Current Liabilities

Other non-current liabilities as of December 31, 2017 and 2016 were as follows:

	2017	2016
Restricted insurance settlement	$ 21,171	$ 21,883
Non-current income taxes payable	15,825	—
Uncertain tax positions (includes interest and penalties)	7,970	7,933
Deferred and other long-term compensation	5,905	5,550
Other	625	520
Total other non-current liabilities	$ 51,496	$ 35,886

See also Notes 8, 15 and 23 of Notes to Consolidated Financial Statements.

Note 20 – Equity and Accumulated Other Comprehensive Loss

In May 2015, the Company's Board of Directors authorized a share repurchase program for the repurchase of up to $100.0 million of Quaker Chemical Corporation common stock (the "2015 Share Repurchase Program"). The 2015 Share Repurchase Program has no expiration date. The 2015 Share Repurchase Program provides a framework of conditions under which management can repurchase shares of the Company's common stock. These purchases may be made in the open market or in private and negotiated transactions and will be in accordance with applicable laws, rules and regulations. In connection with the 2015 Share Repurchase Program, the remaining unutilized 1995 and 2005 Board of Directors authorized share repurchase programs were terminated.

In connection with the 2015 Share Repurchase Program, the Company acquired 83,879 shares of common stock for $5.9 million, during the year ended December 31, 2016, and 87,386 shares of common stock for $7.3 million during the year ended December 31,

2015. There were no share repurchases under the 2015 Share Repurchase Program during the year ended December 31, 2017. The Company has elected not to hold treasury shares and therefore has retired the shares as they are repurchased. It is the Company's accounting policy to record the excess paid over par value as a reduction in retained earnings for all shares repurchased.

Prior to September 7, 2017, the Company's Articles of Incorporation included a time-based voting system that granted special ten-for-one-voting rights to shareholders who had beneficially owned their Quaker Chemical Corporation common stock continuously for a period of at least 36 consecutive calendar months (dating from the first day of the first full calendar month on or after the date the holder acquired beneficial ownership of such common stock) before the record date for a shareholder vote. At a meeting of the Company's shareholders on September 7, 2017, the Company's shareholders approved an amendment of the Company's Articles of Incorporation that provides that every holder of Quaker Chemical Corporation common stock will be entitled to one vote for each share of common stock of the Company.

The Company has 30,000,000 shares of common stock authorized with a par value of $1, and 13,307,976 and 13,277,832 shares issued and outstanding as of December 31, 2017 and 2016, respectively. The change in shares issued and outstanding during 2017 was primarily related to 20,915 shares issued for equity-based compensation plans, 4,091 shares issued for the ESPP and 4,878 shares issued for the exercise of stock options and other employee and director-related share activity.

The Company is authorized to issue 10,000,000 shares of preferred stock with $1 par value, subject to approval by the Board of Directors. The Board of Directors may designate one or more series of preferred stock and the number of shares, rights, preferences, and limitations of each series. As of December 31, 2017, no preferred stock had been issued.

The following table shows the reclassifications from and resulting balances of AOCI for the years ended December 31, 2017, 2016 and 2015:

	Currency Translation Adjustments	Defined Benefit Pension Plans	Unrealized Gain (Loss) in Available-for-Sale Securities	Total
Balance as of December 31, 2014	$ (14,312)	$ (41,551)	$ 1,457	$ (54,406)
Other comprehensive (loss) income before reclassifications	(24,232)	5,057	(850)	(20,025)
Amounts reclassified from AOCI	—	3,642	(632)	3,010
Related tax amounts	—	(2,399)	504	(1,895)
Balance as of December 31, 2015	(38,544)	(35,251)	479	(73,316)
Other comprehensive (loss) income before reclassifications	(13,711)	(4,229)	834	(17,106)
Amounts reclassified from AOCI	—	3,075	(17)	3,058
Related tax amounts	—	237	(280)	(43)
Balance as of December 31, 2016	(52,255)	(36,168)	1,016	(87,407)
Other comprehensive income (loss) before reclassifications	20,362	(1,646)	2,299	21,015
Amounts reclassified from AOCI	—	5,154	(2,494)	2,660
Related tax amounts	—	(1,433)	65	(1,368)
Balance as of December 31, 2017	$ (31,893)	$ (34,093)	$ 886	$ (65,100)

Approximately 25% and 75% of the amounts reclassified from accumulated other comprehensive loss to the Consolidated Statements of Income for defined benefit retirement plans during the years ended December 31, 2017, 2016 and 2015 were recorded in COGS and SG&A, respectively. See Note 18 of Notes to Consolidated Financial Statements for further information. All reclassifications related to unrealized gain (loss) in available-for-sale securities relate to the Company's equity interest in a captive insurance company and are recorded in equity in net income of associated companies. The amounts reported on the Consolidated Statements of Changes in Equity for non-controlling interest are related to currency translation adjustments.

Note 21 – Business Acquisitions

In December 2017, the Company acquired the remaining 45% ownership interest in its India affiliate, Quaker Chemical India Private Limited ("QCIL") for 2,025.0 million INR, or approximately $31.8 million, from its joint venture partner, Asianol Lubricants Private Limited. QCIL sells products to the steel and metalworking industries in India and has associates based in various locations around India. The Company had been a joint venture partner in QCIL for 20 years. QCIL is a part of the Company's Asia/Pacific reportable operating segment. As this acquisition was a change in an existing controlling ownership, the Company recorded $21.2 million of excess purchase price over the carrying value of the noncontrolling interest in Capital in excess of par value.

In May 2017, the Company acquired assets associated with a business that markets, sells and manufactures certain metalworking fluids for its North America reportable operating segment for 7.3 million CAD, or approximately $5.4 million. The Company allocated approximately $3.0 million of the purchase price to intangible assets, comprised of trademarks and formulations, to be amortized over 15 years; a non-competition agreement, to be amortized over 5 years; and customer relationships, to be amortized over 10 years. In addition, the Company recorded an other current asset of approximately $0.6 million acquired with the business, and approximately $1.8 million of goodwill related to expected value not allocated to other acquired assets, all of which will be tax deductible.

In November 2016, the Company acquired Lubricor Inc. and its affiliated entities ("Lubricor"), a metalworking fluids manufacturer headquartered in Waterloo, Ontario for its North America reportable operating segment for 16.0 million CAD, or approximately $12.0 million. In May 2016, the Company acquired assets of a business that is associated with dust control products for the mining industry for its North America reportable operating segment for $1.9 million.

During the first quarter of 2017, the Company identified and recorded an adjustment to the allocation of the purchase price for the Lubricor acquisition. The adjustment was the result of finalizing a post-closing settlement based on the Company's assessment of additional information related to assets acquired and liabilities assumed. As of December 31, 2017, the allocation of the purchase price for all of the Company's 2016 acquisitions have been finalized. The following table presents the final allocation of the purchase price of the assets acquired and liabilities assumed in all of the Company's acquisitions in 2016:

2016 Acquisitions		
Current assets (includes cash acquired)	$	3,443
Property, plant and equipment		2,574
Intangibles		
Customer lists and rights to sell		5,041
Trademarks, formulations and product technology		2,543
Other intangibles		127
Goodwill		3,355
Total assets purchased		17,083
Current liabilities		(1,198)
Other long-term liabilities		(2,019)
Total liabilities assumed		(3,217)
Gross cash paid for acquisition	$	13,866
Less: cash acquired		105
Net cash paid for acquisition	$	13,761

In July 2015, the Company acquired Verkol, a leading specialty grease and other lubricants manufacturer based in northern Spain, included in its EMEA reportable operating segment, for 37.7 million EUR, or approximately $41.4 million. This includes a post-closing adjustment of 1.3 million EUR, or approximately $1.4 million that was accrued as of December 31, 2015 and paid during the first quarter of 2016. The purchase included cash acquired of 14.1 million EUR, or approximately $15.4 million, and assumed long-term debt of 2.2 million EUR, or approximately $2.4 million. In addition, the Company incurred $2.8 million of one-time transaction expenses in the third quarter of 2015, related to this acquisition.

In December 2014, the Company acquired a business that is principally concerned with safety fluid applications for mining sites in its Asia/Pacific reportable operating segment for net consideration of approximately 2.9 million AUD, or approximately $2.4 million. The Company also assumed an additional 0.3 million AUD, or approximately $0.2 million hold-back of consideration, which was paid out and settled during the fourth quarter of 2015.

In November 2014, the Company acquired Binol AB, a leading bio-lubricants producer primarily serving the Nordic region, included in it EMEA reportable operating segment, for 136.5 million SEK, or approximately $18.5 million, which is net of 4.4 million SEK, or approximately $0.5 million, received by the Company as part of a post-closing adjustment in the first quarter of 2015.

The results of operations of the acquired businesses and assets are included in the Consolidated Statements of Income from their respective acquisition dates. Transaction expenses associated with these acquisitions are included in SG&A in the Company's Consolidated Statements of Income. Certain pro forma and other information is not presented, as the operations of the acquired businesses are not material to the overall operations of the Company for the periods presented.

Note 22 – Fair Value Measures

The Company's assets subject to fair value measurement were as follows:

		Fair Value Measurements at December 31, 2017 Using Fair Value Hierarchy		
Assets	Total Fair Value	Level 1	Level 2	Level 3
Company-owned life insurance	$ 1,594	$ —	$ 1,594	$ —
Total	$ 1,594	$ —	$ 1,594	$ —

		Fair Value Measurements at December 31, 2016 Using Fair Value Hierarchy		
Assets	Total Fair Value	Level 1	Level 2	Level 3
Company-owned life insurance	$ 1,410	$ —	$ 1,410	$ —
Total	$ 1,410	$ —	$ 1,410	$ —

The fair values of Company-owned life insurance are based on quotes for like instruments with similar credit ratings and terms. The Company did not have liabilities subject to fair value measurement and did not hold Level 3 investments as of December 31, 2017 or 2016, respectively, so related disclosures have not been included.

Note 23 – Commitments and Contingencies

In 1992, the Company identified certain soil and groundwater contamination at AC Products, Inc. ("ACP"), a wholly owned subsidiary. In voluntary coordination with the Santa Ana California Regional Water Quality Board ("SACRWQB"), ACP has been remediating the contamination, the principal contaminant of which is perchloroethylene ("PERC"). In 2004, the Orange County Water District ("OCWD") filed a civil complaint against ACP and other parties seeking to recover compensatory and other damages related to the investigation and remediation of the contamination in the groundwater. Pursuant to a settlement agreement with OCWD, ACP agreed, among other things, to operate the two groundwater treatment systems to hydraulically contain groundwater contamination emanating from ACP's site until the concentrations of PERC released by ACP fell below the current Federal maximum contaminant level for four consecutive quarterly sampling events. In 2014, ACP ceased operation at one of its two groundwater treatment systems, as it had met the above condition for closure. As of December 31, 2017, ACP believes it is close to meeting the conditions for closure of the remaining groundwater treatment system, but continues to operate this system while in discussions with the relevant authorities.

As of December 31, 2017, the Company believes that the range of potential-known liabilities associated with the balance of ACP water remediation program is approximately $0.1 million to $1.0 million. The low and high ends of the range are based on the length of operation of the treatment system as required by the conditions noted above, as determined by groundwater modeling. Costs of operation include the operation and maintenance of the extraction well, groundwater monitoring and program management.

The Company believes, although there can be no assurance regarding the outcome of other unrelated environmental matters, that it has made adequate accruals for costs associated with other environmental problems of which it is aware. Approximately $0.2 million was accrued as of December 31, 2017 and 2016, respectively, to provide for such anticipated future environmental assessments and remediation costs.

An inactive subsidiary of the Company that was acquired in 1978 sold certain products containing asbestos, primarily on an installed basis, and is among the defendants in numerous lawsuits alleging injury due to exposure to asbestos. The subsidiary discontinued operations in 1991 and has no remaining assets other than proceeds received from insurance settlements. To date, the overwhelming majority of these claims have been disposed of without payment and there have been no adverse judgments against the subsidiary. Based on a continued analysis of the existing and anticipated future claims against this subsidiary, it is currently projected that the subsidiary's total liability over the next 50 years for these claims is approximately $1.9 million (excluding costs of defense). Although the Company has also been named as a defendant in certain of these cases, no claims have been actively pursued against the Company, and the Company has not contributed to the defense or settlement of any of these cases pursued against the subsidiary. These cases were handled by the subsidiary's primary and excess insurers who had agreed in 1997 to pay all defense costs and be responsible for all damages assessed against the subsidiary arising out of existing and future asbestos claims up to the aggregate limits of their policies. A significant portion of this primary insurance coverage was provided by an insurer that is insolvent, and the other primary insurers asserted that the aggregate limits of their policies have been exhausted. The subsidiary challenged the applicability of these limits to the claims being brought against the subsidiary. In response, two of the three carriers entered into separate settlement and release agreements with the subsidiary in 2005 and 2007 for $15.0 million and $20.0 million, respectively. The proceeds of both settlements are restricted and can only be used to pay claims and costs of defense associated with the subsidiary's

asbestos litigation. In 2007, the subsidiary and the remaining primary insurance carrier entered into a Claim Handling and Funding Agreement, under which the carrier is paying 27% of defense and indemnity costs incurred by or on behalf of the subsidiary in connection with asbestos bodily injury claims. The agreement continues until terminated and can only be terminated by either party by providing a minimum of two years prior written notice. As of December 31, 2017, no notice of termination has been given under this agreement. At the end of the term of the agreement, the subsidiary may choose to again pursue its claim against this insurer regarding the application of the policy limits. The Company believes that, if the coverage issues under the primary policies with the remaining carrier are resolved adversely to the subsidiary and all settlement proceeds were used, the subsidiary may have limited additional coverage from a state guarantee fund established following the insolvency of one of the subsidiary's primary insurers. Nevertheless, liabilities in respect of claims may exceed the assets and coverage available to the subsidiary.

If the subsidiary's assets and insurance coverage were to be exhausted, claimants of the subsidiary may actively pursue claims against the Company because of the parent-subsidiary relationship. The Company does not believe that such claims would have merit or that the Company would be held to have liability for any unsatisfied obligations of the subsidiary as a result of such claims. After evaluating the nature of the claims filed against the subsidiary and the small number of such claims that have resulted in any payment, the potential availability of additional insurance coverage at the subsidiary level, the additional availability of the Company's own insurance and the Company's strong defenses to claims that it should be held responsible for the subsidiary's obligations because of the parent-subsidiary relationship, the Company believes it is not probable that the Company will incur losses. The Company has been successful to date having any claims naming it dismissed during initial proceedings. Since the Company may be in this stage of litigation for some time, it is not possible to estimate additional losses or range of loss, if any.

The Company is party to other litigation which management currently believes will not have a material adverse effect on the Company's results of operations, cash flows or financial condition.

The Company leases certain manufacturing and office facilities and equipment under non-cancelable operating leases with various terms from 1 to 15 years expiring in 2027. Rent expense for the years ended December 31, 2017, 2016 and 2015 was $6.4 million, $5.6 million, and $5.9 million, respectively.

The Company's minimum rental commitments under operating leases as of December 31, 2017 for future years were approximately:

2018	$	5,345
2019		4,494
2020		3,708
2021		3,208
2022		2,812
2023 and beyond		8,033

Note 24 – Quarterly Results (unaudited)

	First Quarter (1)	Second Quarter (2)	Third Quarter (3)	Fourth Quarter (4)
2017				
Net sales	$ 194,909	$ 201,183	$ 212,918	$ 211,072
Gross profit	70,887	71,835	74,776	73,997
Operating income	13,758	17,903	14,009	17,074
Net income (loss) attributable to Quaker Chemical Corporation	6,992	11,906	11,142	(9,762)
Net income (loss) attributable to Quaker Chemical Corporation Common Shareholders - Basic (5)	$ 0.53	$ 0.90	$ 0.84	$ (0.73)
Net income (loss) attributable to Quaker Chemical Corporation Common Shareholders - Diluted (5)	$ 0.52	$ 0.89	$ 0.83	$ (0.73)
2016				
Net sales	$ 178,077	$ 186,915	$ 190,428	$ 191,245
Gross profit	67,981	71,401	70,897	69,831
Operating income	19,838	22,701	21,863	20,951
Net income attributable to Quaker Chemical Corporation	12,946	15,015	16,008	17,434
Net income attributable to Quaker Chemical Corporation Common Shareholders - Basic (5)	$ 0.98	$ 1.13	$ 1.21	$ 1.31
Net income attributable to Quaker Chemical Corporation Common Shareholders - Diluted (5)	$ 0.98	$ 1.13	$ 1.21	$ 1.31

(1) Net income attributable to Quaker Chemical Corporation for both the first quarter of 2017 and 2016 includes earnings from the Company's equity interest in a captive insurance company of $0.6 million and $0.1 million, respectively. Net income attributable to Quaker Chemical Corporation for the first quarter of 2017 includes Houghton combination-related expenses of $9.1 million and $0.3 million of cost streamlining expenses associated with certain actions taken to reorganize the Company's corporate staff. Net income attributable to Quaker Chemical Corporation for the first quarter of 2016 includes a currency conversion charge of $0.1 million related to the Company's 50% owned equity affiliate in Venezuela.

(2) Net income attributable to Quaker Chemical Corporation for both the second quarter of 2017 and 2016 includes earnings from the Company's equity interest in a captive insurance company of $0.4 million and $0.3 million, respectively. Net income attributable to Quaker Chemical Corporation for the second quarter of 2017 includes Houghton combination-related expenses of $4.3 million, a $1.9 million charge for the Company's U.S. pension plan settlement of its vested terminated participants and a currency conversion charge of $0.3 million related to the Company's 50% owned equity affiliate in Venezuela.

(3) Net income attributable to Quaker Chemical Corporation for both the third quarter of 2017 and 2016 includes earnings from the Company's equity interest in a captive insurance company of $0.4 million and $0.6 million, respectively and charges of $9.7 million and $1.2 million, respectively, for Houghton combination-related expenses. Net income attributable to Quaker Chemical Corporation for the third quarter of 2017 includes a currency conversion charge of less than $0.1 million related to the Company's 50% owned equity affiliate in Venezuela.

(4) Net income attributable to Quaker Chemical Corporation for both the fourth quarter of 2017 and 2016 includes earnings from the Company's equity interest in a captive insurance company of $1.1 million and $0.7 million, respectively and charges of $7.7 million and $0.4 million, respectively, for Houghton combination-related expenses, including ticking fees in the fourth quarter of 2017. Net income attributable to Quaker Chemical Corporation for the fourth quarter of 2017 includes a charge of $22.2 million related to the impact of U.S. Tax Reform, a charge of $0.1 million related to a loss on disposal of a held-for-sale asset, other income of $0.6 million related to cash proceeds from an insolvent insurance carrier with respect to previously filed recovery claims by an inactive subsidiary of the Company and a currency conversion charge of less than $0.1 million related to the Company's 50% owned equity affiliate in Venezuela. Net income attributable to Quaker Chemical Corporation for the fourth quarter of 2016 includes credits of $0.4 million, related to a global restructuring plan.

(5) Basic and diluted per share amounts of net income attributable to Quaker Chemical Corporation common shareholders for all four quarters above may not total to the full year amounts presented in the Company's consolidated financial statements for the years ended December 31, 2017 and 2016, respectively, due to rounding.

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

Not Applicable.

Item 9A. *Controls and Procedures.*

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

As required by Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), our management, including our principal executive officer and principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this report. Based on that evaluation, our principal executive officer and our principal financial officer have concluded that as of the end of the period covered by this report our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Exchange Act) were effective.

Management's Report on Internal Control over Financial Reporting

The management of Quaker is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Rule 13a-15(f) promulgated under the Exchange Act. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Our management, with the participation of our principal executive officer and principal financial officer, assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2017. In making this assessment, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in *Internal Control—Integrated Framework (2013).* Based on its assessment, Quaker's management has concluded that as of December 31, 2017, the Company's internal control over financial reporting is effective based on those criteria.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2017 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included in "Item 8. Financial Statements and Supplementary Data."

Changes in Internal Controls Over Financial Reporting

As required by Rule 13a-15(d) under the Exchange Act, our management, including our principal executive officer and principal financial officer, has evaluated our internal control over financial reporting to determine whether any changes to our internal control over financial reporting occurred during the fourth quarter of the year ended December 31, 2017 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, no such changes to our internal control over financial reporting occurred during the fourth quarter of the year ended December 31, 2017.

Item 9B. *Other Information.*

None.

PART III

Item 10. ***Directors, Executive Officers and Corporate Governance.***

Incorporated by reference is (i) the information beginning with and including the caption "Proposal 1—Election of Directors and Nominee Biographies" in Quaker's definitive Proxy Statement relating to the 2018 Annual Meeting of Shareholders, to be filed with the SEC no later than 120 days after the close of its fiscal year ended December 31, 2017 (the "2018 Proxy Statement") to, but not including, the sub-caption "Governance Committee Procedures for Selecting Director Nominees ," (ii) the information appearing in Item 4(a) of this Report, (iii) the information in the 2018 Proxy Statement beginning with and including the caption, "Section 16(a) Beneficial Ownership Reporting Compliance" to, but not including, the caption "Certain Relationships and Related Transactions," (iv) the information in the 2018 Proxy Statement beginning with and including the sub-caption "Code of Conduct" to, but not including, the caption "Compensation Committee Interlocks and Insider Participation," and (v) the information in the 2018 Proxy Statement beginning with and including the sub-caption "Shareholder Nominations and Recommendations" to, but not including, the sub-caption "Board Oversight of Risk."

Item 11. ***Executive Compensation.***

Incorporated by reference is (i) the information in the 2018 Proxy Statement beginning with and including the caption "Compensation Committee Interlocks and Insider Participation" to, but not including the caption "Stock Ownership of Certain Beneficial Owners and Management."

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

Incorporated by reference is the information in the 2018 Proxy Statement beginning with and including the caption "Stock Ownership of Certain Beneficial Owners and Management" to, but not including, the caption "Section 16(a) Beneficial Ownership Reporting Compliance."

Equity Compensation Plans

The following table sets forth certain information relating to the Company's equity compensation plans as of December 31, 2017. Each number of securities reflected in the table is a reference to shares of Quaker common stock.

	Equity Compensation Plan Information			
Plan Category	**Number of securities to be issued upon exercise of outstanding options, warrants and rights**	**Weighted-average exercise price of outstanding options, warrants and rights**	**Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))**	
	(a)	**(b)**	**(c)**	
Equity compensation plans approved by security holders	111,255	$ 97.71	905,890	(1)
Equity compensation plans not approved by security holders	—	—	—	
Total	111,255	$ 97.71	905,890	(1)

(1) As of December 31, 2017, 304,900 of these shares were available for issuance as restricted stock awards under the Company's 2001 Global Annual Incentive Plan, 533,032 shares were available for issuance upon the exercise of stock options and/or as restricted stock awards and/or restricted stock unit awards under the Company's 2016 Long-Term Performance Incentive Plan, and 67,958 shares were available for issuance under the 2013 Director Stock Ownership Plan.

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

Incorporated by reference is (i) the information in the 2018 Proxy Statement beginning with and including the caption "Certain Relationships and Related Transactions" to, but not including, the caption "Proposal 2—Ratification of Appointment of Independent Registered Public Accounting Firm," (ii) the information in the 2018 Proxy Statement beginning with and including the sub-caption "Director Independence" to, but not including, the sub-caption "Governance Committee Procedures for Selecting Director Nominees," and (iii) the information in the 2018 Proxy Statement beginning with and including the caption "Meetings and Committees of the Board" to, but not including, the caption "Compensation Committee Interlocks and Insider Participation."

Item 14. ***Principal Accountant Fees and Services.***

Incorporated by reference is the information in the 2018 Proxy Statement beginning with and including the sub-caption “Audit Fees” to, but not including, the statement recommending a vote for ratification of the appointment of PricewaterhouseCoopers LLP as the Company’s independent registered public accounting firm for the year ending December 31, 2018.

PART IV

Item 15. *Exhibits and Financial Statement Schedules.*

(a) Exhibits and Financial Statement Schedules

1. Financial Statements and Supplementary Data

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2. Financial Statement Schedules

All schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto. Financial statements of 50% or less owned companies have been omitted because none of the companies meets the criteria requiring inclusion of such statements.

3. Exhibits - filed pursuant to, and numbered in accordance with Item 601 of Regulation S-K (all of which are under Commission File number 001-12019, except as otherwise noted):

3(i)(a) —	Articles of Incorporation (as amended through July 31, 2013). Incorporated by reference to Exhibit 3.1 as filed by Registrant with Form 8-K filed on July 31, 2013.
3(i)(b) —	Articles of Amendment dated September 7, 2017, to the Articles of Incorporation. Incorporated by reference to Exhibit 3.1 as filed by Registrant with Form 8-K filed on September 11, 2017.
3(ii) —	By-laws (as amended and restated, effective May 6, 2015). Incorporated by reference to Exhibit 3.2 as filed by Registrant with Form 8-K filed on May 8, 2015.
10.1 —	Settlement Agreement and Release between Registrant, an inactive subsidiary of the Registrant, and Hartford Accident and Indemnity Company dated December 12, 2005. Incorporated by reference to Exhibit 10 (nnn) as filed by the Registrant with Form 10-K for the year 2005.
10.2 —	Employment Agreement by and between L. Willem Platzer and Quaker Chemical B.V., a Netherlands corporation and a subsidiary of Registrant, dated August 21, 2006. Incorporated by reference to Exhibit 10 as filed by the Registrant with Form 8-K filed on August 22, 2006. *
10.3 —	Financing Agreement by and among Montgomery County Industrial Development Authority and Registrant and Brown Brothers Harriman & Co. dated February 1, 2007. Incorporated by reference to Exhibit 10(yyy) as filed by the Registrant with Form 10-K for the year ended 2006.
10.4 —	Settlement Agreement and Release between Registrant, an inactive subsidiary of Registrant and Federal Insurance Company dated March 26, 2007. Incorporated by reference to Exhibit 10(zzz) as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2007.
10.5 —	Change in Control Agreement by and between Registrant and L. Willem Platzer dated April 2, 2007, effective January 1, 2007. Incorporated by reference to Exhibit 10(aaaa) as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2007. *
10.6 —	Change in Control Agreement by and between Registrant and Jan F. Nieman dated June 27, 2007, effective January 1, 2007. Incorporated by reference to Exhibit 10(cccc) as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2007. *

10.7 —	Claim Handling and Funding Agreement between SB Decking, Inc., an inactive subsidiary of Registrant, and Employers Insurance Company of Wausau dated September 25, 2007. Incorporated by reference to Exhibit 10(ffff) as filed by the Registrant with Form 10-Q for the quarter ended September 30, 2007.
10.8 —	Settlement Agreement and Mutual Release entered into between AC Products, Inc., wholly owned subsidiary of Registrant, and Orange County Water District, effective November 8, 2007. Incorporated by reference to Exhibit 10.47 as filed by the Registrant with Form 10-K for the year ended 2007.
10.9 —	Financing Agreement by and among Butler County Port Authority and Registrant and Brown Brothers Harriman & Co. dated May 15, 2008. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2008.
10.10 —	Employment Agreement by and between Registrant and Michael F. Barry dated July 1, 2008. Incorporated by reference to Exhibit 10.5 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2008. *
10.11 —	Change in Control Agreement by and between Registrant and Michael F. Barry dated July 1, 2008. Incorporated by reference to Exhibit 10.6 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2008. *
10.12 —	Butler County Port Authority Industrial Development Revenue Bond dated May 15, 2008. Incorporated by reference to Exhibit 10.7 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2008.
10.13 —	Memorandum of Employment by and between Registrant and Joseph F. Matrange dated September 30, 2008. Incorporated by reference to Exhibit 10.48 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.14 —	Memorandum of Employment by and between Registrant and D. Jeffry Benoliel dated October 1, 2008. Incorporated by reference to Exhibit 10.49 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.15 —	Change in Control Agreement by and between Registrant and D. Jeffry Benoliel dated November 19, 2008, effective January 1, 2008. Incorporated by reference to Exhibit 10.54 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.16 —	Change in Control Agreement by and between Registrant and Joseph F. Matrange dated November 19, 2008, effective October 1, 2008. Incorporated by reference to Exhibit 10.55 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.17 —	Change in Control Agreement by and between Registrant and Ronald S. Ettinger dated November 19, 2008, effective October 1, 2008. Incorporated by reference to Exhibit 10.56 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.18 —	Supplemental Retirement Income Program (as amended and restated effective January 1, 2008), approved November 19, 2008. Incorporated by reference to Exhibit 10.58 as filed by the Registrant with Form 10-K for the year ended 2008. *
10.19 —	Memorandum of Employment by and between Registrant and Joseph Berquist dated April 1, 2010. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2010. *
10.20 —	Change in Control Agreement by and between Registrant and Joseph Berquist dated April 1, 2010. Incorporated by reference to Exhibit 10.3 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2010. *
10.21 —	Employment Agreement by and between Dieter Laininger and Quaker Chemical B.V., a subsidiary of the registrant, dated June 1, 2011, effective June 15, 2011. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2011. *
10.22 —	Change in Control Agreement by and between Registrant and Dieter Laininger dated May 31, 2011, effective June 15, 2011. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2011. *

10.23 — 2011 Long-Term Performance Incentive Plan. Incorporated by reference to Appendix C to the Registrant's definitive proxy statement filed on March 31, 2011. *

10.24 — Form of Restricted Stock Unit Agreement for executive officers and other employees under Registrant's 2011 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2012. *

10.25 — Expatriate Agreement by and between the Registrant and Adrian Steeples, dated January 29, 2013, effective July 1, 2013. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2013. *

10.26 — 2013 Director Stock Ownership Plan as approved May 8, 2013. Incorporated by reference to Appendix B to the Registrant's definitive proxy statement filed on March 28, 2013. *

10.27 — Amended and Restated Multicurrency Credit Agreement by and between Registrant and Bank of America, N.A. and certain other lenders dated June 14, 2013. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2013.

10.28 — Memorandum of Employment and Addendum by and between Registrant and Jan F. Nieman, effective August 1, 2013. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2013. *

10.29 — Expatriate Agreement by and between the Registrant and Dieter Laininger, dated and effective February 27, 2014. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2014. *

10.30 — Memorandum of Employment by and between Registrant and Mary Dean Hall, dated and effective November 30, 2015. Incorporated by reference to Exhibit 10.60 as filed by the Registrant with Form 10-K for the year ended 2015. *

10.31 — Change in control agreement by and between Registrant and Mary Dean Hall, dated and effective November 30, 2015. Incorporated by reference to Exhibit 10.61 as filed by the Registrant with Form 10-K for the year ended 2015. *

10.32 — Retirement Savings Plan, as amended and restated effective January 1, 2016. Incorporated by reference to Exhibit 10.62 as filed by the Registrant with Form 10-K for the year ended 2015. *

10.33 — Global Annual Incentive Plan (as amended and restated effective February 24, 2016). Incorporated by reference to Appendix B to the Registrant's definitive proxy statement filed on March 28, 2016. *

10.34 — 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Appendix C to the Registrant's definitive proxy statement filed on March 28, 2016. *

10.35 — Form of Restricted Stock Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.3 as filed by Registrant with Form 8-K filed on May 6, 2016. *

10.36 — Form of Restricted Stock Unit Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.4 as filed by Registrant with Form 8-K filed on May 6, 2016. *

10.37— Share Purchase Agreement, dated April 4, 2017, by and among Quaker Chemical Corporation, a Pennsylvania corporation, Gulf Houghton Lubricants, Ltd., an exempted company incorporated under the laws of the Cayman Islands, Global Houghton Ltd., an exempted company incorporated under the laws of the Cayman Islands, and certain members of the management of Global Houghton Ltd. and Gulf Houghton Lubricants, Ltd., as agent for the Sellers. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K, filed on April 5, 2017. **

10.38— Senior Secured Credit Facilities Commitment Letter, dated April 4, 2017, by and among Quaker Chemical Corporation, Bank of America, N.A., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Deutsche Bank AG New York Branch and Deutsche Bank Securities Inc. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K, filed on April 7, 2017.

10.39—	Amendment No. 1, dated as of May 23, 2017, to the Amended and Restated Multicurrency Credit Agreement, dated as of June 14, 2013. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K, filed on May 25, 2017.
21 —	Subsidiaries and Affiliates of the Registrant
23 —	Consent of Independent Registered Public Accounting Firm
31.1 —	Certification of Chief Executive Officer of the Company pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934.
31.2 —	Certification of Chief Financial Officer of the Company pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934.
32.1 —	Certification of Michael F. Barry pursuant to 18 U.S.C. Section 1350.
32.2 —	Certification of Mary Dean Hall pursuant to 18 U.S.C. Section 1350.
101.INS —	XBRL Instance Document
101.SCH—	XBRL Extension Schema Document
101.CAL—	XBRL Calculation Linkbase Document
101.DEF —	XBRL Definition Linkbase Document
101.LAB—	XBRL Label Linkbase Document
101.PRE—	XBRL Presentation Linkbase Document

* This exhibit is a management contract or compensation plan or arrangement required to be filed as an exhibit to this Report.

** Certain exhibits and schedules have been omitted and the Company agrees to furnish supplementally to the Securities and Exchange Commission a copy of any omitted exhibits and schedules upon request.

(b) *Exhibits required by Regulation 601 S-K*

See (a) 3 of this Item 15.

(c) *Financial Statement Schedules*

See (a) 2 of this Item 15.

Item 16. *Form 10-K Summary.*

The Company has elected not to include a Form 10-K summary under this Item 16.

SIGNATURES

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

QUAKER CHEMICAL CORPORATION
Registrant

By: /s/ MICHAEL F. BARRY

Michael F. Barry
Chairman of the Board, Chief Executive Officer and Presid

Date: February 28, 2018

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

Signatures	Capacity	Date
/s/ MICHAEL F. BARRY **Michael F. Barry** **Chairman of the Board, Chief Executive Officer and President**	Principal Executive Officer and Director	February 28, 2018
/s/ MARY DEAN HALL **Mary Dean Hall** **Vice President, Chief Financial Officer and Treasurer**	Principal Financial Officer	February 28, 2018
/s/ SHANE W. HOSTETTER **Shane W. Hostetter** **Global Controller**	Principal Accounting Officer	February 28, 2018
/s/ DONALD R. CALDWELL **Donald R. Caldwell**	Director	February 28, 2018
/s/ ROBERT E. CHAPPELL **Robert E. Chappell**	Director	February 28, 2018
/s/ WILLIAM R. COOK **William R. Cook**	Director	February 28, 2018
/s/ MARK A. DOUGLAS **Mark A. Douglas**	Director	February 28, 2018
/s/ JEFFRY D. FRISBY **Jeffry D. Frisby**	Director	February 28, 2018
/s/ WILLIAM H. OSBORNE **William H. Osborne**	Director	February 28, 2018
/s/ ROBERT H. ROCK **Robert H. Rock**	Director	February 28, 2018
/s/ FAY WEST **Fay West**	Director	February 28, 2018

EXHIBIT 21

SUBSIDIARIES AND AFFILIATES OF THE REGISTRANT

Name	Jurisdiction of Incorporation	Percentage of Voting Securities Owned Directly or Indirectly by Quaker
* Quaker Chemical Corporation	Delaware, U.S.A.	100%
+* SB Decking, Inc. (formerly Selby, Battersby & Co.)	Delaware, U.S.A.	100%
* AC Products, Inc.	California, U.S.A.	100%
* Epmar Corporation	California, U.S.A.	100%
* Summit Lubricants, Inc.	New York, U.S.A.	100%
* Tecniquimia Mexicana S.A. de C.V.	Mexico	100%
* Unitek Servicios De Asesoria Especializad S.A	Mexico	100%
+* Quaker Chemical Europe B.V.	Holland	100%
* Quaker Chemical B.V.	Holland	100%
+* Quaker Russia B.V. (formerly KWR Holdings B.V.)	Holland	100%
* Quaker Chemical (China) Co. Ltd.	China	100%
+* Quaker China Holdings B.V.	Holland	100%
* Quaker Chemical Canada Limited	Ontario, Canada	100%
* Quaker Chemical Limited	United Kingdom	100%
* Quaker Chemical, S.A.	France	100%
* Quaker Chemical, S.A.	Spain	100%
+* Quaker Denmark ApS	Denmark	100%
* Quaker Chemical, S.A.	Argentina	100%
+* Quaker Chemical Participacoes, Ltda.	Brazil	100%
* Quaker Chemical Limited	Hong Kong	100%
+* Quaker Chemical Holdings South Africa (Pty) Limited	Republic of South Africa	100%
* Quaker Italia S.r.l.	Italy	100%
* Quaker Chemical S.r.l.	Italy	100%
+* Quaker Australia Holdings Pty. Limited	Victoria, Australia	100%
* Quaker Shanghai Trading Company Limited	China	100%
* Quaker Chemical Industria e Comercio Ltda.	Brazil	100%
* Quaker Chemical Operacoes, Ltda.	Brazil	100%
* Quaker Chemical India Private Limited	India	100%
* Quaker Chemical (Australasia) Pty. Limited	New South Wales, Australia	100%
* Quaker (Thailand) Ltd.	Thailand	100%
* Quaker Chemical South Africa (Pty.) Limited	Republic of South Africa	51%
* Quaker Chemical Corporation Mexico, S.A. de C.V.	Mexico	100%
* Quaker Chemical HR Mexico, S.A. de C.V.	Mexico	100%
* ECLI Products, LLC	Illinois, U.S.A.	100%
* Engineered Custom Lubricants GmbH	Germany	100%
* Binol AB	Sweden	100%
* Binol Biosafe OY	Finland	100%
* Quaker Chemical MEA FZE	Dubai	100%
* Verkol S.A.U.	Spain	100%
+* Quaker Spain Holding, SLU	Spain	100%
+* Quaker Chemical Investment Management Co., Ltd.	China	100%
* Wuhan Quaker Technology Co., Ltd	China	60%
* Lubricor USA, Inc.	Ohio, U.S.A	100%
+* Quaker Canada Holding	Canada	100%
* Lubricor, Inc.	Canada	100%
+* B&A Banner Holdings, Inc.	Canada	100%

EXHIBIT 21

SUBSIDIARIES AND AFFILIATES OF THE REGISTRANT, *continued*

Name	Jurisdiction of Incorporation	Percentage of Voting Securities Owned Directly or Indirectly by Quaker
* Lubricor Investments, Inc.	Canada	100%
+* Lubricor Holdings, Inc.	Canada	100%
* Lubricor Mexicana S.A. de C.V.	Mexico	100%
* Quaker Sales Europe, BV	Netherlands	100%
+* Quaker International Holdings, LLC	Delaware, U.S.A.	100%
+* Quaker Chemical, CV	Netherlands	100%
+* MIH Acquisition Company, LLC	Delaware, U.S.A.	100%
** Nippon Quaker Chemical, Ltd.	Japan	50%
** Kelko Quaker Chemical, S.A.	Venezuela	50%
** Kelko Quaker Chemical, S.A.	Panama	50%
** Primex, Ltd.	Barbados	33%

+ A non-operating company
* Included in the consolidated financial statements
** Accounted for in the consolidated financial statements under the equity method

EXHIBIT 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (Registration No. 333-155607) and on Forms S-8 (Registration Nos. 333-48130, 033-54158, 333-58676, 333-115713, 333-159513, 333-174145, 333-208188, 333-188594 and 333-211238) of Quaker Chemical Corporation of our report dated February 28, 2018 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 28, 2018

EXHIBIT 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER OF THE COMPANY PURSUANT TO RULE 13a-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934

I, Michael F. Barry, certify that:

1. I have reviewed this Annual Report on Form 10-K of Quaker Chemical Corporation;
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: February 28, 2018

/s/ MICHAEL F. BARRY

Michael F. Barry

Chief Executive Officer

EXHIBIT 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER OF THE COMPANY PURSUANT TO RULE 13a-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934

I, Mary Dean Hall, certify that:

1. I have reviewed this Annual Report on Form 10-K of Quaker Chemical Corporation;
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: February 28, 2018

/s/ MARY DEAN HALL

Mary Dean Hall

Chief Financial Officer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350

The undersigned hereby certifies that the Form 10-K Annual Report of Quaker Chemical Corporation (the “Company”) for the annual period ended December 31, 2017 filed with the Securities and Exchange Commission (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 28, 2018

/s/ MICHAEL F. BARRY

Michael F. Barry

Chief Executive Officer of Quaker Chemical Corporation

EXHIBIT 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350

The undersigned hereby certifies that the Form 10-K Annual Report of Quaker Chemical Corporation (the "Company") for the annual period ended December 31, 2017 filed with the Securities and Exchange Commission (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 28, 2018

/s/ MARY DEAN HALL

Mary Dean Hall

Chief Financial Officer of Quaker Chemical Corporation