

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, 2016  
or

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

For the transition period from \_\_\_\_\_ to \_\_\_\_\_  
Commission file number 001-12019

QUAKER CHEMICAL CORPORATION

(Exact name of Registrant as specified in its charter)

A Pennsylvania Corporation  
(State or other jurisdiction of incorporation or organization)

No. 23-0993790  
(I.R.S. Employer Identification No.)

One Quaker Park, 901 E. Hector Street,  
Conshohocken, Pennsylvania  
(Address of principal executive offices)

19428-2380  
(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  No

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 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, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

(Do not check if smaller reporting company)

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

State the aggregate market value of 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, 2016): \$1,168,154,191

Indicate the number of shares outstanding of each of the Registrant's classes of common stock as of the latest practicable date: 13,279,729 shares of Common Stock, \$1.00 Par Value, as of January 31, 2017.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive Proxy Statement relating to the 2017 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 production processes, 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:

	2016	2015	2014
Rolling lubricants	19.0 %	18.6 %	20.1 %
Machining and grinding compounds	14.9 %	15.3 %	16.3 %
Hydraulic fluids	12.0 %	12.6 %	13.0 %
Corrosion preventives	11.8 %	12.0 %	12.5 %
Specialty greases	10.1 %	8.5 %	5.3 %

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, actually work on site, and, through training and experience, identify production needs which can be resolved or alleviated either by adapting Quaker’s existing products or by applying new formulations developed in Quaker’s laboratories. Quaker 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.

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 \$43.5 million, \$48.6 million and \$46.8 million for 2016, 2015 and 2014, respectively.

The Company 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. This generally occurs for product sales when products are shipped 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.

During 2016, the Company expanded its business through the November 2016 acquisition of Lubricor, Inc. and its affiliated entities (“Lubricor”) for approximately \$11.9 million. Lubricor, based in Waterloo, Ontario, is a manufacturer of metalworking fluids, with a particular strength serving the North American automotive suppliers. Lubricor provides the Company additional offerings in synthetic coolants, hydroforming, and stamping products, as well as strong existing customer relationships. In addition, in May 2016, the Company acquired a business that is associated with dust control products for the mining industry for approximately \$1.9 million. This acquisition provides a strategic opportunity to expand Quaker’s technology and product portfolio offering in the mining industry.

### *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 a more specialized product range. 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, render technical services and laboratory assistance to the customer and, to a lesser extent, on price.

### *Major Customers and Markets*

In 2016, Quaker's five largest customers (each composed of multiple subsidiaries or divisions with semi-autonomous purchasing authority) accounted for approximately 19% 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 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 various raw materials including mineral oils and derivatives, animal fats and derivatives, vegetable oils and derivatives, ethylene derivatives, solvents, surface active agents, and a wide variety of other organic and inorganic compounds. During the years ended December 31, 2016, 2015 and 2014, three raw material groups (mineral oils and derivatives, animal fats and derivatives, and vegetable oils and derivatives) each accounted for approximately 6% to 15% of the total cost of Quaker's raw material purchases, and in the aggregate, these three raw material groups accounted for approximately one third of the total cost of Quaker's raw material purchases during each period. The price of mineral oil and its derivatives can be affected by the price of crude oil and industry refining capacity. In addition, animal fat and vegetable oil prices are impacted by biodiesel consumption which is also affected by the price of crude oil. Accordingly, significant fluctuations in the price of crude oil could have a material effect upon certain products used in the Company's business. Many of the raw materials used by Quaker are "commodity" chemicals which can have volatile prices. 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 facilities in Conshohocken, Pennsylvania; Santa Fe Springs, California; Batavia, New York; Aurora, Illinois; Dayton, Ohio; Uithoorn, The Netherlands; Navarra, Spain; Barcelona, Spain; Rio de Janeiro, 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 2016, 2015 and 2014 were \$22.5 million, \$22.1 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 \$0.9 million, \$2.3 million and \$0.8 million in 2016, 2015 and 2014, respectively. In 2017, the Company expects to incur approximately \$1.5 million for capital expenditures directed primarily to regulatory compliance.

#### *Number of Employees*

On December 31, 2016, Quaker's consolidated companies had approximately 2,020 full-time employees of whom approximately 640 were employed by the parent company and its U.S. subsidiaries and approximately 1,380 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, 2016.

#### *Company Segmentation*

The Company's reportable operating segments evidence 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: 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 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 2016 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 its 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. Therefore, we caution you not to place undue reliance on our forward-looking statements. 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 various raw materials, including mineral oils and derivatives, animal fats and derivatives, vegetable oils and derivatives, ethylene derivatives, solvents, surface active agents, and a wide variety of other organic and inorganic compounds. During the years ended December 31, 2016, 2015 and 2014, three raw material groups (mineral oils and derivatives, animal fats and derivatives, and vegetable oils and derivatives) each accounted for approximately 6% to 15% of the total cost of Quaker's raw material purchases, and in the aggregate, these three raw material groups accounted for approximately one third of the total cost of

Quaker's raw material purchases during each period. The price of mineral oils and derivatives can be affected by crude oil pricing and industry refining capacity. Animal fat and vegetable oil prices also can be impacted by biodiesel consumption which is affected by the price of crude oil. In addition, many of the raw materials used by Quaker are "commodity" chemicals, which can experience significant price volatility. Accordingly, Quaker's earnings can be impacted by market changes in raw material prices.

Although the Company has been successful in the past in recovering a substantial amount of the 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 decline, 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 loss of customers 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 any 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 2016, our five largest customers (each composed of multiple subsidiaries or divisions with semi-autonomous purchasing authority) together accounted for approximately 19% 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.

***Fluctuations in our effective tax rate 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. 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 or current expectations, which could have a significant material 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 primary credit facility is a \$300 million unsecured multicurrency credit agreement with a group of lenders which matures in June 2018. The amount available under this facility can be increased to \$400 million at the Company's option if lenders agree to increase their commitments and the Company satisfies certain conditions. This facility provides the availability of revolving credit borrowings, and, in general, bears interest at either a base rate or LIBOR plus a margin based on the Company's consolidated leverage ratio.

The 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 its 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 the credit facilities. At December 31, 2016, the Company had \$47.9 million in outstanding borrowings under its credit facilities. Incorporated by reference is the interest rate risk information contained in Item 7A of this Report.

***Environmental laws and regulations and/or pending and future legal proceedings 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. 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 22 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. For instance, the European Union's Registration, Authorization and Restriction of Chemicals ("REACH"), and analogous non-E.U. laws and regulations or other similar laws and regulations, could result in the inability to continue selling 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. In addition, non-compliance with applicable laws and regulations, particularly the U.S. Foreign Corrupt Practices Act ("FCPA"), 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.

***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 prior acquisitions, organic growth, or future acquisitions, may adversely affect the Company's liquidity, financial position and results of operations.***

Quaker has completed several 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.

In addition, the Company continues to grow organically through increased end-market growth, incremental market share gains, and extending acquired technologies through its existing channels. Such growth is dependent on prevailing market conditions and the Company's ability to execute over time.

Therefore, 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 sources inventory among its worldwide operations occasionally. 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 mitigates this risk through local sourcing efforts in the majority of its locations.

As of December 31, 2016, the Company held approximately \$86.9 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 related to currency fluctuations, tax-related impacts and other potential events due to cash being held outside of the United States.

Additional risks associated with the Company's international operations include, but are not limited to: instability in economic conditions from country to country; changes in a country's political situation; trade protection measures; longer customer payment cycles; different payment practices such as the use of banker 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.

***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, 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 events, such as these, that could have a material adverse effect on our business.

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

None.

**Item 2. Properties**

Quaker's corporate headquarters and a laboratory facility are located in its North American segment's Conshohocken, Pennsylvania location. The Company's other principal facilities in its North American 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 American 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, 2016, 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 22 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.

<b>Name, Age, and Present Position with the Company</b>	<b>Business Experience During the Past Five Years and Period Served as an Officer</b>
Michael F. Barry, 58 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, 59 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. Jeffrey Benoliel, 58 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, 45 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, 64 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.

<b>Name, Age, and Present Position with the Company</b>	<b>Business Experience During the Past Five Years and Period Served as an Officer</b>
Shane W. Hostetter, 35 Global Controller and Principal Accounting Officer	Mr. Hostetter, who has been employed by the Company since July 2011, has served as Global Controller since September 2014. He served as Corporate Controller from May 2013 to August 2014. He served as Assistant Global Controller from July 2011 to May 2013.
Dieter Laininger, 53 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, 74 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, 55 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, 55 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, 56 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	
	2016		2015		2016	2015	2016	2015
	High	Low	High	Low				
First quarter	\$ 86.92	\$ 68.20	\$ 92.72	\$ 78.03	\$ 0.320	\$ 0.300	\$ 0.320	\$ 0.300
Second quarter	93.61	81.12	90.69	80.69	0.345	0.320	0.320	0.300
Third quarter	106.61	85.93	95.74	75.04	0.345	0.320	0.345	0.320
Fourth quarter	139.92	102.82	85.99	75.42	0.345	0.320	0.345	0.320

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 primary 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, 2017, there were 927 shareholders of record of the Company's common stock, its only outstanding class of equity securities.

Every holder of Quaker common stock is entitled to one vote or ten votes for each share held of record on any record date depending on how long each share has been held. As of January 17, 2017, 13,278,331 shares of Quaker common stock were issued and outstanding. Based on reported shareholder information available to the Company on January 17, 2017, holders of record of 739,068 shares of Quaker common stock were entitled to cast ten votes for each share, or approximately 37% of the total votes that would have been entitled to be cast as of that record date, and holders of record of 12,539,263 shares of Quaker common stock would have been entitled to cast one vote for each share, or approximately 63% of the total votes that would have been entitled to be cast as of that date. The number of shares that are indicated as entitled to one vote includes those shares presumed to be entitled to only one vote. Because the holders of these shares may rebut this presumption, the total number of votes entitled to be cast as of January 17, 2017 could be more than 19,929,943.

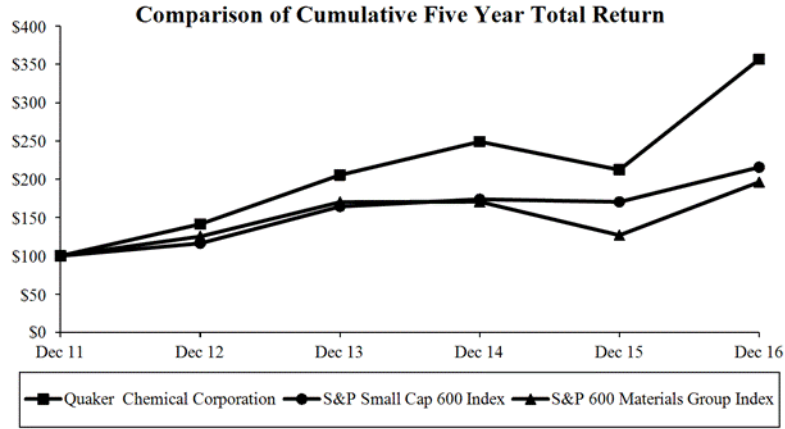
Reference is made to the information in Item 12 of this Report under the caption "Equity Compensation Plans," which is incorporated herein by this reference.

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

Period	Issuer Purchases of Equity Securities			
	(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	29,668	\$ 123.57	—	\$ 86,865,026
December 1 - December 31	3,529	\$ 131.02	—	\$ 86,865,026
Total	33,197	\$ 124.36	—	\$ 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, 2016.

The following graph compares the cumulative total return (assuming reinvestment of dividends) from December 31, 2011 to December 31, 2016 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, 2011 in each of Quaker's common stock, the stocks comprising the SmallCap Index and the stocks comprising the Materials Group Index.



	12/31/2011	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016
Quaker	\$ 100.00	\$ 141.44	\$ 205.51	\$ 249.10	\$ 212.23	\$ 356.64
SmallCap Index	100.00	116.33	164.38	173.84	170.41	215.67
Materials Group Index	100.00	125.30	170.16	170.67	126.90	196.31

## 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,				
	2016 (1)	2015 (2)(6) (re-cast)	2014 (3)(6) (re-cast)	2013 (4)(6) (re-cast)	2012 (5)(6) (re-cast)
<b>Summary of Operations:</b>					
Net sales	\$ 746,665	\$ 737,555	\$ 765,860	\$ 729,395	\$ 708,226
Income before taxes and equity in net income of associated companies	84,009	70,230	78,293	72,826	62,948
Net income attributable to Quaker Chemical Corporation	61,403	51,180	56,492	56,339	47,405
<b>Per share:</b>					
Net income attributable to Quaker Chemical Corporation Common Shareholders - basic	\$ 4.64	\$ 3.84	\$ 4.27	\$ 4.28	\$ 3.64
Net income attributable to Quaker Chemical Corporation Common Shareholders - diluted	\$ 4.63	\$ 3.84	\$ 4.26	\$ 4.27	\$ 3.63
Dividends declared	1,355	1,260	1,150	0,995	0,975
Dividends paid	1.33	1.24	1.10	0.99	0.97
<b>Financial Position</b>					
Working capital (6)	\$ 249,057	\$ 233,517	\$ 218,982	\$ 191,222	\$ 163,870
Total assets (6)	692,028	680,727	664,376	583,642	535,790
Long-term debt	65,769	81,439	75,328	17,321	30,000
Total equity	412,606	381,243	365,135	344,696	289,676

Notes to the above table:

- 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 certain uncommon transaction-related expenses incurred with the execution of, and diligence on, acquisition candidates; and an after-tax charge of \$0.1 million related to a currency conversion charge at the Company's 50% owned equity affiliate in Venezuela. See the Non-GAAP Measures section, which appears in Item 7 of this report.
- 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 charge at the Company's 50% owned equity affiliate in Venezuela; \$2.8 million of certain uncommon transaction-related expenses related to the execution of, and diligence on, acquisition candidates; \$0.2 million of charges related to cost streamlining initiatives in the Company's South American 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.
- 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 charge 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 American 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. See the Non-GAAP Measures section, which appears in Item 7 of this report.
- 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 charge 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 American segments; and a \$0.8 million net charge related to a non-income tax contingency.
- Net income attributable to Quaker Chemical Corporation in 2012 includes equity income from a captive insurance company of \$1.8 million after tax; and an increase to other income of \$1.7 million related to a change in an acquisition-related earnout liability; partially offset by a charge of \$1.3 million related to the bankruptcy of certain customers in the U.S.; and a charge of \$0.6 million related to CFO transition costs.
- The working capital and total assets for the years ended December 31, 2015, 2014, 2013 and 2012, respectively, have been re-cast to reflect the Company's early adoption in 2016 of an accounting standard update regarding the classification of deferred taxes on the balance sheet. The update requires that all deferred tax assets and liabilities, along with any related valuation allowances, be classified as noncurrent on the balance sheet. See Note 2 of Notes to Consolidated Financial statements, which appears in Item 8 of this report.

## 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 strong results in 2016, as increased organic volume, acquisition-related growth and continued discipline in managing labor-related costs in its selling, general, and administrative expenses ("SG&A") offset some gross margin contraction, continued negative impacts from foreign exchange and challenging market conditions. Specifically, net sales increased 1% to \$746.7 million for 2016 compared to \$737.6 million for 2015 on a 3% increase in organic volumes and a 2% increase from 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%. The Company's gross profit increase of \$2.6 million, or 1%, was in line with the increase in sales volumes compared to the prior year, which was partially offset by slightly lower gross margin of 37.4% in 2016 compared to 37.6% in 2015. The Company's 2016 SG&A decreased \$2.0 million from the prior year. While the Company did have higher SG&A from annual compensation increases and incremental costs associated with recent acquisitions, these were offset by decreases in foreign currency translation, lower amounts of certain uncommon transaction-related costs and lower SG&A due to past cost savings efforts, including the Company's 2015 global restructuring program. During 2016 and 2015, the Company incurred \$1.5 million, or \$0.11 per diluted share, and \$2.8 million, or \$0.15 per diluted share, respectively, for certain uncommon transaction-related costs in connection with the execution of, and diligence on, acquisition candidates. Related to the restructuring program, the Company recorded \$6.8 million in 2015 primarily to reduce its headcount by approximately 65 employees globally. During 2016, the Company substantially completed the program and recognized a restructuring credit of \$0.4 million to update its initial estimates for the remaining employee separation costs. The Company's pre-tax cost savings as a result of this program were approximately \$3 million in 2016, realized mainly over the second half of the year, and are expected to increase to \$5 million for the full year 2017. The Company's solid operating performance in 2016 drove full year net income of \$61.4 million. Excluding the restructuring costs, uncommon transaction-related costs and other non-core items, the Company's adjusted EBITDA increased 5% to \$106.6 million in 2016 compared to \$101.6 million in 2015.

The Company's earnings per diluted share increased to \$4.63 in 2016 compared to \$3.84 in 2015, with non-GAAP earnings per diluted share increasing 4% to \$4.60 in 2016 compared to \$4.43 in 2015. These reported and non-GAAP earnings per diluted share were achieved despite the negative impact of foreign exchange of approximately 4%, or \$0.18 per diluted share, as well as other challenges in some of the Company's end markets. 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 operating performance for 2016 was highlighted by continued volume growth and market share gains in the Company's three largest regions North America, Europe, Middle East and Africa ("EMEA") and Asia/Pacific, which were partially offset by negative impacts from foreign currency translation. The Asia/Pacific region increased operating earnings on organic volume growth, increased gross margins and steady SG&A levels, which were offset by decreases due to sales price and product mix and negative impacts from foreign exchange. The EMEA region increased its operating earnings on both organic volume growth and the Company's 2015 acquisition of Verkol S.A.U. ("Verkol"), partially offset by the negative impacts from foreign exchange and a lower gross margin due mainly to product mix. Also, EMEA experienced a reduction in SG&A costs largely due to cost savings efforts, including the 2015 restructuring program. The North America region had a decrease in operating earnings year-over-year as organic volume growth in the region was offset by declines due to selling price and product mix and the negative impacts from foreign exchange. In the Company's smallest region, South America, profitability declined due to the overall economic downturn experienced during 2016 which led to lower sales volumes, a decrease in gross margins and overall negative impacts from foreign exchange. However, these decreases were largely offset by increases due to selling price and product mix and lower labor-related costs as a result of various initiatives, including cost streamlining efforts in this segment in prior years. See the Reportable Operating Segments Review in the Operations section of this Item, below.

The Company's net operating cash flow increased 1% to \$73.8 million for 2016 compared to \$73.4 million for 2015, driven by the Company's solid operating performance and lower cash invested in working capital, partially offset by increased pension contributions, restructuring payments and tax-related payments. These cash flow changes are further discussed in the Company's Liquidity and Capital Resources section of this Item, below.

Overall, the Company is pleased with its performance in 2016, as the Company was able to grow both its net sales and earnings despite significant negative foreign exchange impacts of 3% and 4%, respectively, and continued challenges in certain geographies and global end-markets. Specifically, the Company was able to grow its net sales organically by 3%, despite an estimated global steel production increase of less than 1% year-over-year. In addition, the Company was able to increase its non-GAAP earnings per diluted share by 4%, its adjusted EBITDA by 5%, and also delivered another year of strong cash flow. This performance was highlighted by further market share gains, leveraging of past acquisitions, and controlled SG&A levels, which fell to the bottom line and produced



the Company's seventh consecutive year of non-GAAP earnings and adjusted EBITDA growth. Looking forward to 2017, while the Company anticipates a continued strong U.S. dollar and uncertain economic conditions, the Company believes its track record of market share gains and leveraging of past acquisitions will continue to offset these market challenges. Also, the Company's cost savings efforts, including its 2015 restructuring program, will provide further SG&A leverage into 2017. Finally, the Company's strong cash flow generation and balance sheet continue to be strengths that will allow for future key strategic initiatives and acquisition-related activity. Currently, the Company's 2017 plans indicate growth in both its net sales and earnings despite expected currency headwinds. Further, the Company remains confident in its future and expects 2017 to be another good year for Quaker, as it expects to increase non-GAAP earnings and adjusted EBITDA for the eighth consecutive year.

#### *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 \$7.2 million and \$7.8 million at December 31, 2016 and 2015, respectively. The decrease in the Company's consolidated allowance for doubtful accounts during the year ended December 31, 2016 includes a write off of approximately \$1.6 million related to a prior year customer bankruptcy, which was previously reserved for and settled during 2016. In addition, the Company recorded expense to increase its provision for doubtful accounts by \$1.4 million and \$1.5 million for the years ended December 31, 2016 and 2015, respectively, compared to a credit for a reduction of \$0.3 million for the year ended December 31, 2014. Changing the amount of expense or credit recorded to the Company's provisions by 10% would have increased or decreased the Company's pre-tax earnings by approximately \$0.1 million, \$0.2 million, and less than \$0.1 million in 2016, 2015 and 2014, respectively. See Note 9 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 22 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. These indicators may result in an impairment charge in the future. The

carrying amount of the Company's equity investments at December 31, 2016 was \$22.8 million, which included four investments: approximately \$17.1 million, for a 33% interest, in Primex, Ltd. (Barbados); \$5.2 million, for a 50% interest, in Nippon Quaker Chemical, Ltd. (Japan); \$0.2 million, for a 50% interest, in Kelko Quaker Chemical, S.A. (Venezuela); and \$0.3 million, for a 50% interest, in Kelko Quaker Chemical, S.A. (Panama), respectively. See Note 13 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.

In addition, U.S. income taxes have not been provided on the undistributed earnings of its non-U.S. subsidiaries since it is the Company's intention to continue to reinvest these earnings in those foreign subsidiaries for working capital needs and certain other growth initiatives. The amount of such undistributed earnings at December 31, 2016 was approximately \$220 million. However, U.S. and foreign income taxes that would be payable if such earnings were distributed may be lower than the amount computed at the U.S. statutory rate due to the availability of foreign tax credits. See Note 7 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 the useful lives of the intangible assets. 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 ("WACC") and estimated future net operating profit after tax ("NOPAT") 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 2016, and no impairment charge was warranted. Furthermore, the estimated fair value of each of the Company's reporting units substantially exceeded its carrying value, with none of the Company's reporting units at risk for failing step one of the goodwill impairment test. The Company's consolidated goodwill and indefinite-lived intangible assets at December 31, 2016 and 2015 were \$81.9 million and \$80.2 million, respectively. The Company used a WACC of approximately 10%, and at September 30, 2016, this assumption would have had to increase by more than 25.6% before any of the Company's reporting units would fail step one of the impairment analysis. Further, at September 30, 2016, the Company's estimate of future NOPAT would have had to decrease by more than 23.8% before any of the Company's reporting units would be considered potentially impaired. See Note 12 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 year ended December 31, 2016 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 17 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 at December 31, 2016:

(Amounts in millions)	1/2 Percentage Point Increase			1/2 Percentage Point Decrease		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Discount rate (1)	\$ 0.4	\$ 0.1	\$ 0.5	\$ (0.4)	\$ (0.1)	\$ (0.5)
Expected rate of return on plan assets (2)	0.3	0.2	0.5	(0.4)	(0.2)	(0.6)

(1) The weighted-average discount rate used to determine net periodic benefit costs for the year ended December 31, 2016 was 2.95% for Foreign plans and 4.07% 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, 2016 was 2.65% for Foreign plans and 7.20% 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 ("FASB") 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 3 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

#### Recently Issued Accounting Standards

See Note 2 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 \$88.8 million at December 31, 2016 from \$81.1 million at December 31, 2015. The approximate \$7.7 million increase was the net result of approximately \$73.8 million of cash provided by operating activities, \$23.8 million of cash used in investing activities, \$38.1 million of cash used in financing activities and a \$4.1 million negative impact due to the effect of foreign exchange rates on cash. At December 31, 2016, the Company held approximately \$86.9 million of its total cash and cash equivalents among its foreign subsidiaries.

Net cash flows provided by operating activities were \$73.8 million in 2016 compared to \$73.4 million in 2015. The approximately \$0.4 million increase in net cash flows provided by operating activities was primarily driven by a strong operating performance and lower cash invested in the Company's working capital. The decrease in cash invested in working capital was primarily due to improved working capital management as well as the timing of certain cash outflows from accounts payable and accruals, partially offset by an increase in accounts receivable on increased sales and timing of their receipt. These increases to operating cash flows were largely offset by a year-over-year increase in cash outflows related to pension and postretirement benefits due to timing and increased pension contributions, an increase in tax-related payments, and restructuring payments made in 2016 as part of the Company's global restructuring program initiated in the fourth quarter of 2015, described below.

Net cash flows used in investing activities decreased \$10.4 million to \$23.8 million in 2016 compared to \$34.2 million in 2015, which was primarily the result of lower payments for acquisitions. During 2016, the Company had cash outflows of \$15.0 million related to acquisitions which included a post-closing adjustment to finalize its 2015 acquisition of Verkol, the acquisition of a business associated with dust control products for the mining industry, and the acquisition of Lubricor, Inc. and its affiliated entities. During 2015, the Company had cash outflows of \$24.1 million for acquisitions which included the acquisition of Verkol and a post-closing

adjustment to finalize its 2014 acquisition of Binol AB. See Note 20 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report. The Company's capital spending related to property, plant and equipment was down slightly in 2016 compared to 2015, with the levels of spending within the Company's regional segments being relatively consistent year-over-year with no major variations to note. Lastly, there were slightly higher changes in the Company's restricted cash during 2016, which is dependent upon the timing of claims and payments associated with a subsidiary's asbestos litigation.

Net cash flows used in financing activities were \$38.1 million in 2016 compared to \$16.9 million in 2015. The \$21.2 million increase in cash outflows was due to the net impact of several factors. Specifically, repayments of long-term debt were \$14.5 million in 2016 compared to proceeds from long-term debt, net of repayments, of \$5.7 million in 2015. The \$20.2 million increase in long-term debt repayments was the result of strong net operating cash flow generated during 2016 and lower cash used in investing activities year-over-year. These increases to net cash flows used in financing activities were partially offset by increased dividend payments of \$1.1 million in 2016 compared to 2015. Also during 2016, the Company had cash outflows of \$5.9 million to repurchase approximately 84,000 shares of the Company's common stock compared to cash outflows of \$7.3 million in 2015 to repurchase approximately 87,000 shares of the Company's common stock in connection with the Company's share repurchase program. See Note 19 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

The Company's primary credit facility is a \$300 million syndicated multicurrency credit agreement, with a group of lenders which matures in June 2018. The maximum amount available under this facility can be increased to \$400 million at the Company's option if the lenders agree and the Company satisfies certain conditions. Borrowings under this facility generally bear interest at a base rate or LIBOR rate plus a margin. At December 31, 2016 and 2015, the Company had total credit facility borrowings of approximately \$47.9 million and \$62.9 million primarily under this credit facility, at weighted average borrowing rates of 1.25% and 1.38%, respectively. Access to this credit facility is dependent on meeting certain financial and other covenants, but primarily depends on the Company's consolidated leverage ratio calculation which cannot exceed 3.50 to 1. As of December 31, 2016 and 2015, the Company's consolidated leverage ratio was below 1.0 to 1, and the Company was also in compliance with all of the other covenants.

Quaker's management approved a global restructuring plan (the "2015 Program") in the fourth quarter of 2015 to reduce its operating costs. The Company substantially completed all of the initiatives under the 2015 Program in 2016 and settlement of these charges primarily occurred in 2016 as well, including \$5.3 million of cash payments utilizing operating cash flows for the settlement of restructuring liabilities. During 2016, the Company realized cost savings related to this program in line with original expectations, and projects full year pre-tax cost savings as a result of this program to approximate \$5 million in 2017.

At December 31, 2016, the Company's gross liability for uncertain tax positions, including interest and penalties, was \$8.6 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 impact of the payment may be reduced by up to \$4.4 million as a result of offsetting benefits in other tax jurisdictions.

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, pension plan contributions, capital expenditures, acquisitions and other business opportunities, other potential contingencies and share repurchases, through internally generated funds supplemented with debt or equity as needed.

The following table summarizes the Company's contractual obligations at December 31, 2016, 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 2017 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 at December 31, 2016.

Contractual Obligations	Payments due by period						
	Total	2017	2018	2019	2020	2021	2022 and Beyond
Long-term debt	\$ 66,564	\$ 649	\$ 53,364	\$ 645	\$ 641	\$ 341	\$ 10,924
Interest obligations	7,501	1,434	1,107	551	540	532	3,337
Capital lease obligations	58	58	-	-	-	-	-
Non-cancelable operating leases	24,804	5,279	2,967	2,613	2,225	1,962	9,758
Purchase obligations	1,205	1,205	-	-	-	-	-
Pension and other postretirement plan contributions	8,249	8,249	-	-	-	-	-
Other long-term liabilities (See Note 18 of Notes to Consolidated Financial Statements)	6,070	-	-	-	-	-	6,070
Total contractual cash obligations	<u>\$ 114,451</u>	<u>\$ 16,874</u>	<u>\$ 57,438</u>	<u>\$ 3,809</u>	<u>\$ 3,406</u>	<u>\$ 2,835</u>	<u>\$ 30,089</u>

*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:

	<b>For the years ended December 31,</b>		
	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>GAAP earnings per diluted share attributable to Quaker Chemical Corporation Common Shareholders</b>	<b>\$ 4.63</b>	<b>\$ 3.84</b>	<b>\$ 4.26</b>
Equity income in a captive insurance company per diluted share (a)	(0.13)	(0.16)	(0.18)
Restructuring (credit) expense per diluted share (b)	(0.02)	0.36	—
Certain uncommon transaction-related expenses per diluted share (c)	0.11	0.15	—
U.K. pension plan amendment per diluted share (d)	—	—	0.05
Customer bankruptcy costs per diluted share (e)	—	0.02	0.05
Cost streamlining initiatives per diluted share (f)	—	0.01	0.06
Currency conversion impact of the Venezuelan bolivar fuerte per diluted share (g)	0.01	0.21	0.02
<b>Non-GAAP earnings per diluted share</b>	<b>\$ 4.60</b>	<b>\$ 4.43</b>	<b>\$ 4.26</b>

	<b>For the years ended December 31,</b>		
	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Net income attributable to Quaker Chemical Corporation</b>	<b>\$ 61,403</b>	<b>\$ 51,180</b>	<b>\$ 56,492</b>
Depreciation and amortization	19,566	19,206	16,631
Interest expense	2,889	2,585	2,371
Taxes on income before equity in net income of associated companies	23,226	17,785	23,539
Equity income in a captive insurance company (a)	(1,688)	(2,078)	(2,412)
Restructuring (credit) expense (b)	(439)	6,790	—
Certain uncommon transaction-related expenses (c)	1,531	2,813	—
U.K. pension plan amendment (d)	—	—	902
Customer bankruptcy costs (e)	—	328	825
Cost streamlining initiatives (f)	—	173	1,166
Currency conversion impact of the Venezuelan bolivar fuerte (g)	88	2,806	321
<b>Adjusted EBITDA</b>	<b>\$ 106,576</b>	<b>\$ 101,588</b>	<b>\$ 99,835</b>
Adjusted EBITDA margin (%)	14.3%	13.8%	13.0%

- (a) Equity income in a captive insurance company represents the 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 considered core to the Company's operations. See Note 13 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 3 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (c) Certain uncommon transaction-related expenses represent certain transaction-related costs incurred in connection with the execution of, and diligence on, acquisition candidates. These costs are not indicative of the future operating performance of the Company.
- (d) U.K. pension plan amendment represents prior service costs and interest costs associated with the Company's pension plan in the U.K. to properly reflect a plan amendment related to the retirement age equalization law, which occurred prior to 2014. These costs are not indicative of the future operating performance of the Company. See Note 17 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

- (e) Customer bankruptcies 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 9 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report
- (f) Cost streamlining initiatives represent expenses associated with certain actions taken in the Company's South America and EMEA reportable operating segments to streamline and enhance segment profitability. These costs are not indicative of the future operating performance of the Company.
- (g) 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 or 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 13 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

#### *Operations*

##### ***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%.

Cost of goods sold ("COGS") in 2016 of \$467.1 million increased 1% from \$460.5 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.

Gross profit in 2016 increased \$2.6 million or 1% compared to 2015, driven by the increase in sales volumes noted above, on a slightly lower gross margin of 37.4% in 2016 compared to 37.6% in 2015.

The SG&A decrease of \$2.0 million from 2015 was primarily due to a decline from foreign currency translation, a decrease in certain uncommon transaction-related expenses year-over-year, 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. In addition, the Company incurred higher SG&A 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.

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, driving approximately \$3 million of savings during 2016, 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.

Operating income in 2016 was \$83.1 million compared to \$71.3 million in 2015. The \$11.8 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 income increased \$1.9 million in 2016 compared to 2015. The increase 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.

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 recent 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. While generally not impacting the year-over-year effective tax rate comparison, the Company's fourth quarter of 2016 effective tax rate was lower than prior quarters during 2016 primarily due to the receipt of a 15% concessionary tax rate in one of its subsidiaries. Specifically, the Company recorded the cumulative full year benefit of this concessionary tax rate during the fourth quarter of 2016, however, this concessionary tax rate was available to the subsidiary throughout each quarter of 2015. 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, and the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, among other factors. Going into 2017, we expect the full year effective tax rate will be between 28% and 30%.

Equity in net income of associated companies ("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 Company realized a minimal impact to its 2016 net income from its current year acquisitions, as their operating results were largely offset by normal acquisition-related costs and initial adjustments related to fair value accounting.

Changes in foreign exchange rates, excluding the currency conversion effects of the Venezuelan bolivar fuerte, noted above, negatively impacted 2016 net income by approximately 4%, or \$0.18 per diluted share.

#### ***Consolidated Operations Review – Comparison of 2015 with 2014***

Net sales in 2015 of \$737.6 million decreased 4% from \$765.9 million in 2014. This decrease in the Company's net sales was primarily due to the negative impact of foreign currency translation of \$53.6 million or 7%, and declines in selling price and product mix of 1%, which collectively offset a 4% increase in product volume, including \$39.1 million of sales attributed to the Company's 2015 and 2014 acquisitions.

COGS in 2015 of \$460.5 million decreased 7% from \$492.7 million in 2014. This decrease was primarily due to the impact of foreign currency translation, a decrease in raw material costs and a change in product mix. These decreases to cost of goods sold were partially offset by increases in product volume, including additional cost of goods sold attributed to the Company's 2015 and 2014 acquisitions.

Gross profit in 2015 increased \$3.8 million or 1% compared to 2014, driven by an expansion of gross margin to 37.6% for 2015 compared to 35.7% for 2014, partially offset by the negative impact of foreign currency translation. The increase in gross margin was mainly due to the timing of certain raw material cost decreases in 2015 compared to 2014.

SG&A increased \$3.1 million from 2014, which was due to the net impact of several factors, including higher overall labor-related costs, incremental costs associated with the Company's recent acquisitions, including certain uncommon transaction-related expenses, and other one-time 2015 charges related to certain customer bankruptcies, a cost streamlining initiative in South America, and a charge related to events at the Company's Venezuela affiliate, as described in the Non-GAAP Measures section of this Item, above. These increases to SG&A were partially offset by decreases from foreign currency translation and certain one-time 2014 charges related to an amendment to the Company's pension plan in the U.K., certain customer bankruptcies, and expenses related to the Company's cost streamlining activities in South America, also described in the Non-GAAP Measures section of this Item, above.

In the fourth quarter of 2015, the Company had restructuring expenses of \$6.8 million, or \$0.36 per diluted share, related to the initiation of a global restructuring program. This program included restructuring and associated costs to reduce total headcount by approximately 65 people globally and to close certain non-manufacturing locations. There were no analogous restructuring expenses in 2014. See the Non-GAAP Measures section of this Item, above.

Operating income decreased \$6.1 million in 2015 compared to 2014. The decrease in operating income was primarily due to restructuring expenses, partially offset by an increase in sales volumes during 2015 and higher gross margin year-over-year.

Other income decreased \$0.8 million in 2015 compared to 2014. The decrease was primarily due to lower receipts of local municipality-related grants in one of the Company's regions, lower third party license fees, and higher foreign exchange transaction losses incurred during 2015 compared to 2014.

Interest expense was \$0.2 million higher in 2015 compared to 2014, primarily due to higher average borrowings outstanding during 2015 to fund the Company's past acquisition activity. Interest income was \$0.9 million lower in 2015 compared to 2014, primarily due to a decrease in the level of cash invested in certain regions with higher returns during 2015 and higher interest received on certain tax-related credits during 2014.

The Company's effective tax rates for 2015 and 2014 were 25.3% and 30.1%, respectively. The primary contributors to the decrease in the 2015 effective tax rate were the mix of earnings in lower tax jurisdictions, accelerated recognition of certain tax-related incentives due to changes in local tax regulations, adjustments related to previous years' tax estimates, and, also, certain one-time items that inflated the 2014 effective tax rate.

Equity income decreased \$3.3 million in 2015 compared to 2014. The decrease was primarily due to a currency conversion charge at the Company's Venezuela affiliate and lower related earnings from this affiliate during 2015, which was partially offset by a similar 2014 expense related to the conversion of Venezuelan bolivar fuerte to the U.S. dollar, as described in the Non-GAAP Measures section of this Item, above. Excluding these charges, the primary component of equity income is earnings attributable to the Company's interest in a captive insurance company, which were slightly lower in 2015 as compared to 2014, as described in the Non-GAAP Measures section of this Item, above.

The \$0.3 million decrease in net income attributable to noncontrolling interest in 2015 compared to 2014 was primarily due to the Company's June 2014 acquisition of the noncontrolling interest in its Australia affiliate.

Outside the uncommon transaction-related expenses mentioned above, the Company realized a minimal impact to its 2015 net income from its 2015 Verkol acquisition, as its operating results were largely offset by normal acquisition-related costs and initial adjustments related to fair value accounting.

Changes in foreign exchange rates, excluding the currency conversion effects of the Venezuelan bolivar fuerte, noted above, negatively impacted 2015 net income by approximately 7%, or \$0.31 per diluted share.

#### **Reportable Operating Segment Review – Comparison of 2016 with 2015**

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 45% of the Company's consolidated net sales in 2016, and the region's sales decreased \$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, decreased \$2.3 million, or 3%, compared to 2015, which 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, and the region's sales increased \$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, increased \$5.7 million, or 20%, compared to 2015. The 2016 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 region 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, and the region's sales decreased 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, increased \$0.8 million, or 2%, compared to 2015. The increase in 2016 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, and the region's sales decreased \$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, decreased \$0.4 million, or 22%, compared to 2015. The 2016 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.



## **Reportable Operating Segment Review – Comparison of 2015 with 2014**

### **North America**

North America represented approximately 47% of the Company's consolidated net sales in 2015, and the region's sales increased \$9.8 million, or 3%, compared to 2014. The increase in net sales was generally due to higher product volumes, including acquisitions, of 5%, partially offset by the negative impact of foreign currency translation of 2%. The foreign exchange impact was primarily due to a weaker Mexican peso against the U.S. dollar, as this exchange rate averaged 15.83 in 2015 compared to 13.29 in 2014. This reportable segment's operating earnings, excluding indirect expenses, increased \$11.5 million, or 17%, compared to 2014. The 2015 increase was mainly due to the increase in net sales, noted above, and an increase in gross margin due to the timing of certain raw material cost decreases and product mix. These increases to operating earnings were partially offset by higher overall labor-related costs on improved segment performance and incremental SG&A from its 2014 acquisition activity.

### **EMEA**

EMEA represented approximately 24% of the Company's consolidated net sales in 2015, and the region's sales decreased approximately \$15.6 million, or 8%, compared to 2014. The decrease in net sales was primarily due to the negative impact of foreign currency translation of 16% and a decrease in selling price and product mix of 2%, partially offset by higher product volumes, including acquisitions, of 10%. The foreign exchange impact was primarily due to a weakening of the euro against the U.S. dollar, as this exchange rate averaged 1.11 in 2015 compared to 1.33 in 2014. This reportable segment's operating earnings, excluding indirect expenses, decreased \$4.6 million, or 14%, compared to 2014. The 2015 decrease was mainly driven by lower gross profit on the decrease in net sales, noted above, on relatively flat gross margin, and, also, incremental SG&A from its 2015 and 2014 acquisition activity. These decreases to operating earnings were partially offset by the impact of the weaker euro on the segment's operating costs.

### **Asia/Pacific**

Asia/Pacific represented approximately 25% of the Company's consolidated net sales in 2015, and the region's sales decreased approximately \$4.9 million, or 3%, compared to 2014. The decrease in net sales was primarily due to the negative impact of foreign currency translation of 3% and a decrease in selling price and product mix of 2%, partially offset by higher product volumes of 2%. The foreign exchange impact was primarily due to a weakening of the Chinese renminbi, Indian rupee and Australian dollar against the U.S. dollar, as these exchange rates averaged 6.23, 64.07 and 0.75 in 2015 compared to 6.15, 60.95 and 0.90 in 2014, respectively. This reportable segment's operating earnings, excluding indirect expenses, increased \$1.3 million, or 3%, compared to 2014. The increase in 2015 was mainly driven by higher gross profit on increased product volumes and higher gross margins due to the timing of certain raw material cost decreases and product mix, and lower costs due to the weaker Chinese renminbi, Indian rupee and Australian dollar to U.S. dollar exchange rates. These increases to operating earnings were partially offset by higher overall labor-related costs.

### **South America**

South America represented approximately 4% of the Company's consolidated net sales in 2015, and the region's sales decreased \$17.6 million, or 35%, compared to 2014. The decrease in net sales was generally attributable to the negative impact of foreign currency translation of 22% and lower product volumes of approximately 16%, partially offset by an increase in selling price and product mix of 3%. 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 3.28 and 9.19 in 2015 compared to 2.35 and 8.09 in 2014, respectively. This reportable segment's operating earnings, excluding indirect expenses, decreased \$2.5 million, or 58%, compared to 2014. The 2015 decrease was mainly due to the decrease in net sales, noted above, and lower gross margin due to raw material cost increases and product mix, partially offset by lower labor-related costs. The decrease in labor-related costs is primarily due to the segment's lower performance, the positive effects from the cost streamlining initiatives taken in this segment during 2013, 2014, and 2015, and the weaker Brazilian real and Argentinian peso to U.S. dollar exchange rates.

### **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 February 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, 2016, 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, 2016, 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. 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 22 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

*General*

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

*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 2016 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 demand for the Company’s products and services is largely derived from the demand for its 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. 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 could also adversely affect us. Therefore, we caution you not to place undue reliance on our forward-looking statements. This discussion is provided as permitted by the Private Securities Litigation Reform Act of 1995.

**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, 2016, Quaker had \$47.9 million outstanding under its credit facilities at a weighted average borrowing rate of approximately 1.25%. If interest rates had changed by 10%, the Company's interest expense for the year ended December 31, 2016 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 2016 or 2015, 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 2016 revenues and pre-tax earnings would have correspondingly increased or decreased approximately \$37.8 million and \$5.5 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 often 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, 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. If the Company's gross margin had changed by one percentage point, the Company's 2016 pre-tax earnings would have correspondingly increased or decreased by approximately \$7.5 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 \$1.4 million and \$1.5 million for the years ended December 31, 2016 and 2015, respectively, compared to a credit for a reduction of \$0.3 million for the year ended December 31, 2014. A change of 10% to the expense or credit recorded to the Company's provision would have increased or decreased the Company's pre-tax earnings by approximately \$0.1 million, \$0.2 million, and less than \$0.1 million for the years ended December 31, 2016, 2015 and 2014, 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:

In our opinion, the accompanying consolidated balance sheets and the related consolidated statements of income, comprehensive income, changes in equity, and cash flows present fairly, in all material respects, the financial position of Quaker Chemical Corporation and its subsidiaries (the "Company") at December 31, 2016 and 2015, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2016 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, 2016, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's management is responsible for these 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 appearing under Item 9A. Our responsibility is to express opinions on these financial statements and on the Company's internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. 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.

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it classifies deferred taxes in 2016 and 2015 due to the adoption of Accounting Standards Update 2015-17, Balance Sheet Classification of Deferred Taxes.

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.

As described in Management's Report on Internal Control over Financial Reporting appearing under Item 9A, management has excluded Lubricor Inc. and its affiliated entities from its assessment of internal control over financial reporting as of December 31, 2016 because this entity was acquired by the Company in a purchase business combination in November 2016. We have also excluded Lubricor Inc. and its affiliated entities from our audit of internal control over financial reporting. Lubricor Inc. and its affiliated entities are wholly owned subsidiaries of the Company, whose total assets and total revenues represent 2% and less than 1%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2016.

/s/ PricewaterhouseCoopers LLP  
Philadelphia, PA  
February 28, 2017

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

	Year Ended December 31,		
	2016	2015	2014
Net sales	\$ 746,665	\$ 737,555	\$ 765,860
Costs and expenses			
Cost of goods sold	467,072	460,515	492,654
Selling, general and administrative expenses	196,981	198,990	195,850
Restructuring and related activities	(439)	6,790	—
	663,614	666,295	688,504
Operating income	83,051	71,260	77,356
Other income (expense), net	1,810	(69)	767
Interest expense	(2,889)	(2,585)	(2,371)
Interest income	2,037	1,624	2,541
Income before taxes and equity in net income of associated companies	84,009	70,230	78,293
Taxes on income before equity in net income of associated companies	23,226	17,785	23,539
Income before equity in net income of associated companies	60,783	52,445	54,754
Equity in net income of associated companies	2,256	261	3,543
Net income	63,039	52,706	58,297
Less: Net income attributable to noncontrolling interest	1,636	1,526	1,805
Net income attributable to Quaker Chemical Corporation	\$ 61,403	\$ 51,180	\$ 56,492
Earnings per common share data:			
Net income attributable to Quaker Chemical Corporation Common			
Shareholders – basic	\$ 4.64	\$ 3.84	\$ 4.27
Net income attributable to Quaker Chemical Corporation Common			
Shareholders – diluted	\$ 4.63	\$ 3.84	\$ 4.26

*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,		
	2016	2015	2014
Net income	\$ 63,039	\$ 52,706	\$ 58,297
Other comprehensive loss, net of tax			
Currency translation adjustments	(13,772)	(24,869)	(15,701)
Defined benefit retirement plans			
Net (loss) gain arising during the period, other	(2,990)	3,821	(6,210)
Amortization of actuarial loss	2,155	2,561	2,162
Amortization of prior service gain	(82)	(82)	(70)
Unrealized gain (loss) on available-for-sale securities	537	(978)	(124)
Other comprehensive loss	(14,152)	(19,547)	(19,943)
Comprehensive income	48,887	33,159	38,354
Less: Comprehensive income attributable to noncontrolling interest	(1,575)	(889)	(1,568)
Comprehensive income attributable to Quaker Chemical Corporation	<u>\$ 47,312</u>	<u>\$ 32,270</u>	<u>\$ 36,786</u>

*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,	
	2016	2015
<b>ASSETS</b>		
Current assets		
Cash and cash equivalents	\$ 88,818	\$ 81,053
Accounts receivable, net	195,225	188,297
Inventories, net	77,082	75,099
Prepaid expenses and other current assets	15,343	13,582
Total current assets	<u>376,468</u>	<u>358,031</u>
Property, plant and equipment, net	85,734	87,619
Goodwill	80,804	79,111
Other intangible assets, net	73,071	73,287
Investments in associated companies	22,817	20,354
Non-current deferred tax assets	24,382	30,107
Other assets	28,752	32,218
Total assets	<u>\$ 692,028</u>	<u>\$ 680,727</u>
<b>LIABILITIES AND EQUITY</b>		
Current liabilities		
Short-term borrowings and current portion of long-term debt	\$ 707	\$ 662
Accounts payable	77,583	67,291
Dividends payable	4,581	4,252
Accrued compensation	19,356	19,166
Accrued restructuring	670	6,303
Accrued pension and postretirement benefits	1,086	1,144
Other current liabilities	23,428	25,696
Total current liabilities	<u>127,411</u>	<u>124,514</u>
Long-term debt	65,769	81,439
Non-current deferred tax liabilities	12,008	10,258
Non-current accrued pension and postretirement benefits	38,348	40,689
Other non-current liabilities	35,886	42,584
Total liabilities	<u>279,422</u>	<u>299,484</u>
Commitments and contingencies (Note 22)		
Equity		
Common stock \$1 par value; authorized 30,000,000 shares; issued and outstanding		
2016 – 13,277,832 shares; 2015 – 13,288,113 shares	13,278	13,288
Capital in excess of par value	112,475	106,333
Retained earnings	364,414	326,740
Accumulated other comprehensive loss	(87,407)	(73,316)
Total Quaker shareholders' equity	<u>402,760</u>	<u>373,045</u>
Noncontrolling interest	9,846	8,198
Total equity	<u>412,606</u>	<u>381,243</u>
Total liabilities and equity	<u>\$ 692,028</u>	<u>\$ 680,727</u>

*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,		
	2016	2015	2014
<b>Cash flows from operating activities</b>			
Net income	\$ 63,039	\$ 52,706	\$ 58,297
Adjustments to reconcile net income to net cash provided by operating activities			
Depreciation	12,557	12,395	12,306
Amortization	7,009	6,811	4,325
Equity in undistributed (earnings) losses of associated companies, net of dividends	(1,969)	578	(3,180)
Deferred income taxes	5,488	(2,401)	1,007
Uncertain tax positions (non-deferred portion)	(3,206)	(1,122)	(1,256)
Deferred compensation and other, net	(424)	14	3,174
Stock-based compensation	6,349	5,919	5,309
Restructuring and related activities	(439)	6,790	—
Gain on disposal of property, plant and equipment and other assets	(18)	(12)	(86)
Insurance settlement realized	(1,023)	(760)	(1,907)
Pension and other postretirement benefits	(3,420)	2,591	1,265
(Decrease) increase in cash from changes in current assets and current liabilities, net of acquisitions:			
Accounts receivable	(11,705)	(188)	(24,944)
Inventories	(1,870)	1,292	(5,484)
Prepaid expenses and other current assets	(703)	(721)	2,003
Accounts payable and accrued liabilities	14,566	(9,040)	2,999
Change in restructuring liabilities	(5,252)	(490)	—
Estimated taxes on income	(5,226)	(930)	862
Net cash provided by operating activities	<u>73,753</u>	<u>73,432</u>	<u>54,690</u>
<b>Cash flows from investing activities</b>			
Investments in property, plant and equipment	(9,954)	(11,033)	(13,052)
Payments related to acquisitions, net of cash acquired	(15,024)	(24,058)	(73,527)
Proceeds from disposition of assets	186	135	201
Insurance settlement interest earned	32	35	44
Change in restricted cash, net	991	725	1,863
Net cash used in investing activities	<u>(23,769)</u>	<u>(34,196)</u>	<u>(84,471)</u>
<b>Cash flows from financing activities</b>			
Proceeds from long-term debt	—	6,163	58,771
Repayment of long-term debt	(14,513)	(477)	(1,368)
Dividends paid	(17,625)	(16,513)	(14,562)
Stock options exercised, other	(811)	1,048	804
Payments for repurchase of common stock	(5,859)	(7,276)	—
Excess tax benefit related to stock option exercises	678	384	453
Purchase of noncontrolling interest in affiliates, net	—	—	(7,422)
Payment of acquisition-related liabilities	—	(226)	(4,709)
Distributions to noncontrolling affiliate shareholders	—	—	(1,806)
Net cash (used in) provided by financing activities	<u>(38,130)</u>	<u>(16,897)</u>	<u>30,161</u>
Effect of exchange rate changes on cash	(4,089)	(6,017)	(4,141)
Net increase (decrease) in cash and cash equivalents	7,765	16,322	(3,761)
Cash and cash equivalents at beginning of period	81,053	64,731	68,492
Cash and cash equivalents at end of period	<u>\$ 88,818</u>	<u>\$ 81,053</u>	<u>\$ 64,731</u>
<b>Supplemental cash flow disclosures:</b>			
Cash paid during the year for:			
Income taxes	\$ 25,043	\$ 20,996	\$ 22,713
Interest	2,481	2,223	1,894
Non-cash activities:			
Change in accrued purchases of property, plant and equipment, net	\$ 363	\$ 209	\$ (1,158)

*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 at December 31, 2013	\$ 13,196	\$ 99,038	\$ 258,285	\$ (34,700)	\$ 8,877	\$ 344,696
Net income	—	—	56,492	—	1,805	58,297
Amounts reported in other comprehensive loss	—	—	—	(19,706)	(237)	(19,943)
Dividends (\$1.15 per share)	—	—	(15,253)	—	—	(15,253)
Distributions to noncontrolling affiliate shareholders	—	—	—	—	(1,806)	(1,806)
Acquisition of noncontrolling interests, net	—	(6,443)	—	—	(979)	(7,422)
Shares issued upon exercise of stock options and other	19	369	—	—	—	388
Shares issued for employee stock purchase plan	6	410	—	—	—	416
Equity based compensation plans	80	5,229	—	—	—	5,309
Excess tax benefit from stock option exercises	—	453	—	—	—	453
Balance at 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 at 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 interests	—	—	—	—	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 at December 31, 2016	\$ 13,278	\$ 112,475	\$ 364,414	\$ (87,407)	\$ 9,846	\$ 412,606

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

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**  
**(Dollars in thousands, except share and per share amounts, unless otherwise stated)**

**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 13 of Notes to Consolidated Financial Statements.

The Financial Accounting Standards Board's ("FASB's") guidance regarding the consolidation of certain Variable Interest Entities ("VIEs") generally requires that assets, liabilities and results of the activities of a VIE be consolidated into the financial statements of the enterprise that is considered the primary beneficiary. The consolidated financial statements include the accounts of the Company and all of its subsidiaries in which a controlling interest is maintained and would include any VIEs if the Company was the primary beneficiary pursuant to the provisions of the applicable guidance.

**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 ("FIFO") method. See Note 10 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 11 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 \$1.4 million and \$1.3 million of net costs were capitalized in property, plant and equipment on the Company's December 31, 2016 and 2015 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 12 of Notes to Consolidated Financial Statements.

**Revenue recognition:** The Company 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 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

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
**(Dollars in thousands, except share and per share amounts, unless otherwise stated)**

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 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 \$43.5 million, \$48.6 million and \$46.8 million for the years ended December 31, 2016, 2015 and 2014, 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 feels 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, 2016, the Company's five largest customers accounted for approximately 19% of its consolidated net sales with the largest customer accounting for approximately 8% of the Company's consolidated net sales. See Note 9 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 \$22.5 million, \$22.1 million and \$22.1 million for the years ended December 31, 2016, 2015 and 2014, 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 22 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. At December 31, 2016 and 2015, 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 ("U.K."), 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 ("ERISA"). 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

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
**(Dollars in thousands, except share and per share amounts, unless otherwise stated)**

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, 2016, the plan's investments were in compliance with all approved ranges of asset allocations. See Note 17 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 19 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 7 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.

When used, the Company recognized all derivatives on its balance sheet at fair value. For derivative instruments designated as cash flow hedges, the effective portion of any hedge would be reported in AOCI until it was cleared to earnings during the same period in which the hedged item affected earnings. The Company currently uses no derivative instruments designated as hedges and, also, has not entered into derivative contracts for trading or speculative purposes.

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
**(Dollars in thousands, except share and per share amounts, unless otherwise stated)**

**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 17 and 21 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.

**Stock-based compensation:** The Company applies the FASB's guidance regarding share-based payments, which requires the recognition of the fair value of stock-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. Based on historical experience, the Company has assumed a forfeiture rate of 13% on 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 5 of Notes to Consolidated Financial Statements.

**Earnings per share:** The Company follows the FASB's guidance regarding the calculation of earnings per share ("EPS") 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 8 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 evidence 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 20 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 3 of Notes to Consolidated Financial Statements.

**Reclassifications:** Certain information has been reclassified to conform to the current year presentation. During the first quarter of 2016, the Company revised its Consolidated Balance Sheet for December 31, 2015, reducing non-current deferred tax assets and non-current deferred tax liabilities by \$3.6 million each, to correct for offsetting deferred tax balances within related taxing jurisdictions. The Company considers such revision to be immaterial and the revision had no impact on reported equity, net income or net cash provided by operating activities. In addition, during the fourth quarter of 2016, the Company early adopted an accounting standard update issued by the FASB in November 2015 regarding the classification of deferred taxes on the balance sheet. The Company applied the guidance in this accounting standard update retrospectively. 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.

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
**(Dollars in thousands, except share and per share amounts, unless otherwise stated)**

**Note 2 – Recently Issued Accounting Standards**

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. The Company is still evaluating the guidance but currently anticipates early adoption of the accounting standard update for its next annual goodwill impairment test during 2017, and does not expect a material impact to its financial statements.

The FASB issued an accounting standard update in January 2017, amending and adding certain requirements regarding disclosure of the impact that specific recently issued accounting standards will have on the financial statements of a registrant when such standards are adopted in a future period. This update is based on recent SEC announcements regarding the staff's view that a registrant should evaluate accounting standard updates that have not yet been adopted to determine the appropriate financial statement disclosures about the potential material effects of those accounting standard updates on the financial statements when adopted, particularly regarding the accounting for and disclosure of revenue recognition. The requirements of this accounting standard update are effective immediately and the Company has reviewed and considered this accounting standard update when revising certain disclosures, as applicable.

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 is effective for annual and interim periods beginning after December 15, 2016. Early adoption is permitted, however, if early adoption is elected, all amendments in the update must be adopted in the same period. When adopted, application of the guidance will vary based on each aspect of the update, including adoption under retrospective, modified retrospective or prospective approaches. The Company has not

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early adopted and is currently evaluating the potential impact of this guidance and an appropriate implementation strategy. The Company will adopt the guidance in this accounting standard update during the first quarter of 2017, as required.

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 November 2015 regarding the classification of deferred taxes on the balance sheet. The update requires that all deferred tax assets and liabilities, along with any related valuation allowance, be classified as noncurrent on the balance sheet. The update does not change the existing requirement that only permits offsetting within a jurisdiction. The guidance within this accounting standard update is effective for annual and interim periods beginning after December 15, 2016, and may be applied either prospectively, for all deferred tax assets and liabilities, or retrospectively. Early adoption is permitted. During the fourth quarter of 2016, the Company early adopted the guidance of this accounting standard update and applied the guidance in this accounting standard update retrospectively. Including the first quarter of 2016 revision noted in Note 1 of Notes to Consolidated Financial Statements, adoption of the accounting standard update resulted in a reclassification to the Company's Consolidated Balance Sheet as of December 31, 2015, reducing current deferred tax assets by \$7.8 million, current deferred tax liabilities by less than \$0.1 million, and non-current deferred tax liabilities by \$4.7 million, and increasing non-current deferred tax assets by \$3.0 million. Adoption of the guidance had no impact on the Company's earnings or cash flow. See Note 7 of Notes to Consolidated Financial Statements.

The FASB issued an accounting standard update in July 2015 regarding simplifying the measurement of inventory. The guidance is applicable for entities that measure inventory using the FIFO or average cost methods. Specifically, the update requires that inventory be measured at lower of cost or net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. The amendments in this update are effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. This guidance should be applied prospectively with early adoption permitted. During the first quarter of 2016, the Company elected to early adopt this guidance without a material impact.

The FASB issued an accounting standard update in May 2015 regarding the required disclosures for entities that elect to measure the fair value of certain investments using the net asset value ("NAV") per share (or its equivalent) practical expedient in accordance with the fair value measurement authoritative guidance. The update removes the requirement to categorize within the fair value hierarchy, and also limits the requirement to make certain other disclosures, for all such investments. The amendments in this update are effective for fiscal years beginning after December 15, 2015, and interim periods within those fiscal years, and should be applied on a retrospective basis for the periods presented. Early adoption was permitted. During the first quarter of 2016, the Company adopted this guidance without a material impact. See Note 17 of Notes to Consolidated Financial Statements.

The FASB issued an accounting standard update in April 2015 regarding the presentation of debt issuance costs on the balance sheet. The update requires capitalized debt issuance costs be presented on the balance sheet as a reduction to debt, rather than recorded as a separate asset. The amendments in this update are effective for annual and interim periods beginning after December 15, 2015 and should be applied on a retrospective basis for the periods presented. Early adoption was permitted. Also, in June 2015, the SEC staff announced that the guidance within this accounting standard update was not applicable to revolving debt arrangements or credit facilities. During the first quarter of 2016, the Company adopted this guidance without a material impact.

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 ("IFRS"). 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 will be permitted to adopt the new revenue standard early but not before the original effective date. During 2016, 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 updates do not change the core principle of the previously issued guidance in May 2014.



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During 2016, the Company reviewed its historical accounting policies and practices to identify potential differences with the requirements of the new revenue standard, as it relates to the Company's contracts and sales arrangements. As of December 31, 2016, the Company has progressed its impact assessment for the implementation of the new revenue recognition guidance, including contract reviews and preliminary considerations for the Company's future financial reporting and disclosure requirements. While the impact assessment continues, the Company has not yet selected a method, and, also, has yet to conclude on the impact of the accounting standard update. The Company currently expects its determination will be near completion during the first half of 2017. The Company is still assessing the materiality and the potential impact on its earnings, cash flows, and balance sheet, however; the Company does expect its adoption to increase the amount and level of disclosures concerning the Company's net sales.

**Note 3 – Restructuring and Related Activities**

In response to continued 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, or \$0.36 per diluted share, 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, or \$0.02 per diluted share, 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. At this time, the Company does not expect to incur material additional restructuring charges or credits under the 2015 Program.

Restructuring activity recognized in each reportable operating segment in connection with the 2015 Program during the years ended December 31, 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	<u>\$ 196</u>	<u>\$ 474</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 670</u>

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**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 costs of goods sold 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 income (expense).

The following tables present information about the performance of the Company's reportable operating segments for the years ended December 31, 2016, 2015 and 2014:

	2016	2015	2014
<b>Net sales</b>			
North America	\$ 336,174	\$ 344,248	\$ 334,400
EMEA	200,917	179,717	195,309
Asia/Pacific	179,131	181,056	185,974
South America	30,443	32,534	50,177
<b>Total net sales</b>	<u>\$ 746,665</u>	<u>\$ 737,555</u>	<u>\$ 765,860</u>
	2016	2015	2014
<b>Operating earnings, excluding indirect operating expenses</b>			
North America	\$ 77,492	\$ 79,791	\$ 68,296
EMEA	33,634	27,979	32,589
Asia/Pacific	45,866	45,107	43,847
South America	1,386	1,785	4,292
<b>Total operating earnings, excluding indirect operating expenses</b>	158,378	154,662	149,024
Non-operating charges	(68,632)	(69,602)	(67,110)
Restructuring and related activities	439	(6,790)	—
Depreciation of corporate assets and amortization	(7,134)	(7,010)	(4,558)
Consolidated operating income	83,051	71,260	77,356
Other income (expense), net	1,810	(69)	767
Interest expense	(2,889)	(2,585)	(2,371)
Interest income	2,037	1,624	2,541
<b>Consolidated income before taxes and equity in net income of associated companies</b>	<u>\$ 84,009</u>	<u>\$ 70,230</u>	<u>\$ 78,293</u>

The following tables present information regarding the Company's reportable segments' assets and long-lived assets as of December 31, 2016, 2015 and 2014:

	2016	2015	2014
<b>Segment assets</b>			
North America (including Corporate)	\$ 321,404	\$ 317,082	\$ 340,139
EMEA	147,021	162,647	123,916
Asia/Pacific	200,218	181,389	170,444
South America	23,385	19,609	29,877
<b>Total segment assets</b>	<u>\$ 692,028</u>	<u>\$ 680,727</u>	<u>\$ 664,376</u>

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During the fourth quarter of 2016, the Company early adopted an accounting standard update regarding the classification of deferred taxes on the balance sheet. The Company applied the guidance in this accounting standard update retrospectively. See Note 2 of Notes to Consolidated Financial Statements. As a result of adopting this guidance, the Company revised its December 31, 2015 and 2014 segment asset detail, decreasing its previously published amounts in North America by approximately \$3.2 million and \$0.2 million, respectively, in EMEA by approximately \$1.1 million and \$0.4 million, respectively, in Asia/Pacific by approximately \$0.3 million and \$0.1 million, respectively, and in South America by approximately \$0.2 million and \$0.4 million, respectively.

	2016	2015	2014
<b>Segment long-lived assets</b>			
North America (including Corporate)	\$ 86,775	\$ 87,421	\$ 92,319
EMEA	25,630	27,101	20,634
Asia/Pacific	22,040	23,096	24,392
South America	2,858	2,573	3,911
<b>Total segment long-lived assets</b>	<b>\$ 137,303</b>	<b>\$ 140,191</b>	<b>\$ 141,256</b>

The following tables present information regarding the Company's reportable segments' capital expenditures and depreciation as of December 31, 2016, 2015 and 2014:

	2016	2015	2014
<b>Capital expenditures</b>			
North America (including Corporate)	\$ 2,918	\$ 4,166	\$ 3,658
EMEA	3,263	3,081	4,811
Asia/Pacific	3,269	3,169	3,202
South America	504	617	1,381
<b>Total segment capital expenditures</b>	<b>\$ 9,954</b>	<b>\$ 11,033</b>	<b>\$ 13,052</b>

	2016	2015	2014
<b>Depreciation</b>			
North America	\$ 5,672	\$ 5,577	\$ 5,231
EMEA	3,323	2,975	3,069
Asia/Pacific	2,765	2,812	2,713
South America	672	832	1,060
<b>Total segment depreciation</b>	<b>\$ 12,432</b>	<b>\$ 12,196</b>	<b>\$ 12,073</b>

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, 2016, 2015 and 2014, with the remaining product sales being impractical to present:

	2016	2015	2014
Rolling lubricants	19.0 %	18.6 %	20.1 %
Machining and grinding compounds	14.9 %	15.3 %	16.3 %
Hydraulic fluids	12.0 %	12.6 %	13.0 %
Corrosion preventives	11.8 %	12.0 %	12.5 %
Specialty greases	10.1 %	8.5 %	5.3 %

During the years ended December 31, 2016, 2015 and 2014, the North American segment had approximately \$35.8 million, \$34.0 million and \$35.5 million of net sales, respectively, which were attributable to non-domestic operations. At December 31, 2016, 2015 and 2014, the North American segment had approximately \$4.9 million, \$2.7 million and \$3.1 million of long-lived assets, respectively, which were attributable to non-domestic operations.

Inter-segment revenue for the years ended December 31, 2016, 2015 and 2014 was \$8.3 million, \$9.1 million and \$8.0 million for North America, \$18.1 million, \$17.8 million and \$22.3 million for EMEA, \$0.7 million, \$1.0 million and \$0.4 million for Asia/Pacific and less than \$0.1 million for the years ended December 31, 2016, 2015 and 2014 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.

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**Note 5 – Stock-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, 2016, 2015 and 2014:

	2016	2015	2014
Stock options	\$ 848	\$ 730	\$ 663
Nonvested stock awards and restricted stock units	3,121	2,937	2,473
Employee stock purchase plan	87	75	73
Non-elective and elective 401(k) matching contribution in stock	2,124	2,052	1,975
Director stock ownership plan	169	125	125
Total share-based compensation expense	<u>\$ 6,349</u>	<u>\$ 5,919</u>	<u>\$ 5,309</u>

As of December 31, 2016, 2015 and 2014, the Company recorded \$0.7 million, \$0.4 million and \$0.5 million, respectively, of excess tax benefits in capital in excess of par value on its Consolidated Balance Sheets related to stock option exercises. The Company also recognized these benefits as a cash inflow from financing activities in its Consolidated Statements of Cash Flows, which represents the Company's estimate of cash savings during the years ended December 31, 2016, 2015 and 2014, respectively.

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 at January 1, 2016	99,671	\$ 71.73		
Options granted	67,444	72.12		
Options exercised	(49,895)	63.78		
Options outstanding at December 31, 2016	<u>117,220</u>	\$ 75.34	5.5	\$ 6,203
Options expected to vest after December 31, 2016	<u>103,040</u>	\$ 75.82	5.7	\$ 5,403
Options exercisable at December 31, 2016	<u>14,180</u>	\$ 71.87	4.1	\$ 800

The total intrinsic value of options exercised during the years ended December 31, 2016, 2015 and 2014 was approximately \$2.9 million, \$0.9 million and \$1.1 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, 2016 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	2.2	\$ 38.13	552	\$ 38.13
\$ 40.01 - \$ 50.00	—	—	—	—	—
\$ 50.01 - \$ 60.00	3,714	3.2	58.26	3,714	52.26
\$ 60.01 - \$ 70.00	—	—	—	—	—
\$ 70.01 - \$ 80.00	85,009	5.7	72.40	6,060	73.47
\$ 80.01 - \$ 90.00	27,945	5.1	87.30	3,854	87.30
	<u>117,220</u>	5.5	75.34	<u>14,180</u>	71.87

As of December 31, 2016, unrecognized compensation expense related to options granted in 2014, 2015 and 2016 was less than \$0.1 million, \$0.3 million and \$0.7 million, respectively.

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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 2013, 2014, 2015 and 2016. 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:

	2016	2015	2014	2013
Number of stock options granted	67,444	38,698	37,048	29,302
Dividend yield	1.49 %	1.55 %	2.00 %	2.49 %
Expected volatility	28.39 %	36.32 %	43.34 %	57.28 %
Risk-free interest rate	1.08 %	1.22 %	1.22 %	0.63 %
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, 2016, 2015 and 2014, respectively, is as follows:

	2016	2015	2014
2016 Stock option awards	\$ 282	\$ —	\$ —
2015 Stock option awards	\$ 276	\$ 232	\$ —
2014 Stock option awards	\$ 254	\$ 257	\$ 227
2013 Stock option awards	\$ 36	\$ 200	\$ 213

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, 2015	113,910	\$ 72.91
Granted	29,271	\$ 76.33
Vested	(32,604)	\$ 64.84
Forfeited	(1,494)	\$ 73.07
Nonvested awards, December 31, 2016	109,083	\$ 76.23

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, 2016, unrecognized compensation expense related to these awards was \$2.8 million, to be recognized over a weighted average remaining period of 1.44 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, 2015	6,174	\$ 74.14
Granted	2,141	\$ 77.10
Vested	(2,252)	\$ 64.54
Forfeited	(292)	\$ 79.96
Nonvested awards, December 31, 2016	5,771	\$ 78.69

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, 2016, unrecognized compensation expense related to these awards was \$0.2 million, to be recognized over a weighted average remaining period of 1.75 years.

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**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 6 – Other Income (Expense), net**

The components of other income (expense), net for the years ended December 31, 2016, 2015 and 2014 are as follows:

	2016	2015	2014
Non-income tax refunds and other related credits	\$ 398	\$ 141	\$ 582
Income from third party license fees	978	875	1,063
Foreign exchange gains (losses), net	172	(1,184)	(1,039)
Gain on fixed asset disposals, net	50	6	128
Other non-operating income	338	261	329
Other non-operating expense	(126)	(168)	(296)
Total other income (expense), net	<u>\$ 1,810</u>	<u>\$ (69)</u>	<u>\$ 767</u>

**Note 7 – Taxes on Income and Uncertain Tax Positions**

Taxes (benefit) on income for the years ended December 31, 2016, 2015 and 2014 are as follows:

	2016	2015	2014
Current:			
Federal	\$ 4,680	\$ 8,924	\$ 8,086
State	518	188	796
Foreign	12,540	11,074	13,650
	<u>17,738</u>	<u>20,186</u>	<u>22,532</u>
Deferred:			
Federal	4,601	404	2,548
State	104	(16)	57
Foreign	783	(2,789)	(1,598)
Total	<u>\$ 23,226</u>	<u>\$ 17,785</u>	<u>\$ 23,539</u>

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The components of earnings before income taxes for the years ended December 31, 2016, 2015 and 2014 are as follows:

	2016	2015	2014
Domestic	\$ 31,175	\$ 25,219	\$ 32,391
Foreign	52,834	45,011	45,902
<b>Total</b>	<b>\$ 84,009</b>	<b>\$ 70,230</b>	<b>\$ 78,293</b>

Total deferred tax assets and liabilities are composed of the following as of December 31, 2016 and 2015:

	2016	2015
Retirement benefits	\$ 8,236	\$ 9,621
Allowance for doubtful accounts	1,925	2,367
Insurance and litigation reserves	707	787
Postretirement benefits	1,623	1,863
Supplemental retirement benefits	3,670	3,220
Performance incentives	5,197	4,777
Equity-based compensation	2,088	1,823
Insurance settlement	7,755	8,100
Operating loss carryforward	7,343	7,815
Uncertain tax positions	(101)	2,785
Restructuring	217	1,897
Other	2,834	2,402
	41,494	47,457
Valuation allowance	(6,344)	(6,259)
<b>Total deferred income tax assets, net</b>	<b>\$ 35,150</b>	<b>\$ 41,198</b>
Depreciation	5,709	5,924
Europe pension and other	1,055	1,107
Amortization and other	16,012	14,318
<b>Total deferred income tax liabilities</b>	<b>\$ 22,776</b>	<b>\$ 21,349</b>

The following are the changes in the Company's deferred tax asset valuation allowance for the years ended December 31, 2016, 2015 and 2014:

	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, 2016	\$ 6,259	\$ 294	\$ (187)	\$ (22)	\$ 6,344
Year ended December 31, 2015	\$ 7,345	\$ 86	\$ (802)	\$ (370)	\$ 6,259
Year ended December 31, 2014	\$ 7,666	\$ 5	\$ (105)	\$ (221)	\$ 7,345

The Company's net deferred tax assets and liabilities are classified in the Consolidated Balance Sheets as of December 31, 2016 and 2015 as follows:

	2016	2015
Non-current deferred tax assets	\$ 24,382	\$ 30,107
Non-current deferred tax liabilities	12,008	10,258
<b>Net deferred tax asset</b>	<b>\$ 12,374</b>	<b>\$ 19,849</b>

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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, 2016, 2015 and 2014:

	2016	2015	2014
Income tax provision at the Federal statutory tax rate	\$ 29,403	\$ 24,578	\$ 27,402
Differences in tax rates on foreign earnings and remittances	(2,862)	(5,097)	(3,025)
Foreign dividends	2,939	2,690	3,278
Excess foreign tax credit utilization	(5,493)	(4,141)	(5,011)
Research and development activities credit utilization	(238)	(245)	(226)
Uncertain tax positions	(833)	226	263
Domestic production activities deduction	(875)	(910)	(567)
State income tax provisions, net	357	133	517
Non-deductible entertainment and business meals expense	238	249	278
Miscellaneous items, net	590	302	630
Taxes on income	<u>\$ 23,226</u>	<u>\$ 17,785</u>	<u>\$ 23,539</u>

At December 31, 2016, the Company domestically had a net deferred tax asset of \$3.7 million. In addition, the Company has foreign tax loss carryforwards of \$8.2 million of which \$0.2 million expires in 2018, \$0.2 million expires in 2019, \$0.1 million expires in 2020, \$0.5 million expires in 2021 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.

U.S. income taxes have not been provided on the undistributed earnings of non-U.S. subsidiaries because it is the Company's intention to continue to reinvest these earnings in those subsidiaries to support growth initiatives. U.S. and foreign income taxes that would be payable if such earnings were distributed may be lower than the amount computed at the U.S. statutory rate due to the availability of tax credits. The amount of such undistributed earnings at December 31, 2016 was approximately \$220 million. Any income tax liability, which might result from ultimate remittance of these earnings, is expected to be substantially offset by foreign tax credits. It is currently impractical to estimate any such incremental tax expense.

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 at December 31, 2016. As of December 31, 2015, the Company's cumulative liability for gross unrecognized tax benefits was \$11.0 million. The Company had accrued \$1.9 million for cumulative penalties and \$1.5 million for cumulative interest at December 31, 2015.

The Company continues to recognize interest and penalties associated with uncertain tax positions as a component of tax (benefit) expense on income before equity in net income of associated companies in its Consolidated Statements of Income. The Company recognized (\$0.2) million for penalties and (\$0.7) million for interest (net of expirations and settlements) in its 2016 Consolidated Statement of Income, \$0.2 million for penalties and (\$0.2) million for interest (net of expirations and settlements) in its 2015 Consolidated Statement of Income and less than (\$0.1) million for both penalties and interest, respectively, (net of expirations and settlements) in its 2014 Consolidated Statement of Income.

The Company estimates that during the year ending December 31, 2017, it will reduce its cumulative liability for gross unrecognized tax benefits by approximately \$1.0 to \$1.1 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, 2017.

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 2010, the United Kingdom from 2011, Spain and China from 2012, the United States from 2013, and various domestic state tax jurisdictions from 1993.

In the fourth quarter of 2015, the Dutch tax authorities assessed the Company's subsidiary, Quaker Chemical B.V., for additional income taxes related to the 2011 tax year and Quaker Chemical B.V. filed a protest of such assessment. During the third quarter of 2016, the Company settled with the Dutch tax authorities for matters related to transfer pricing issues for 2011, 2012, 2013, 2014, and 2015, with no change to the income tax returns as filed. In the first quarter of 2016, the French tax authorities gave notice that they were auditing the Company's subsidiary Quaker Chemical S.A. and subsequently, during the second quarter of 2016, gave notice that they closed the audit with no additional tax assessed. As previously reported, the Italian tax authorities have assessed additional tax



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due from the Company's subsidiary, Quaker Italia S.r.l., relating to the tax years 2007, 2008, 2009 and 2010. In the fourth quarter of 2016, the Italian tax authorities assessed Quaker Italia S.r.l. for additional tax due relating to the tax years 2011, 2012, and 2013. As of December 31, 2016, the Company believes it has adequate reserves, where merited, for uncertain tax positions with respect to all of these audits.

A reconciliation of the beginning and ending amounts of unrecognized tax benefits for the years ended December 31, 2016, 2015 and 2014, respectively, is as follows:

	2016	2015	2014
<b>Unrecognized tax benefits at January 1</b>	\$ 11,032	\$ 11,845	\$ 12,596
Decrease in unrecognized tax benefits taken in prior periods	(869)	(416)	(93)
Increase in unrecognized tax benefits taken in current period	1,921	2,512	2,678
Decrease in unrecognized tax benefits due to lapse of statute of limitations	(5,744)	(1,924)	(2,078)
Decrease due to foreign exchange rates	(100)	(985)	(1,258)
<b>Unrecognized tax benefits at December 31</b>	<u>\$ 6,240</u>	<u>\$ 11,032</u>	<u>\$ 11,845</u>

The amount of unrecognized tax benefits above that, if recognized, would impact the Company's tax expense and effective tax rate is \$1.8 million, \$1.1 million and \$1.1 million for the years ended December 31, 2016, 2015 and 2014, respectively.

**Note 8 – Earnings Per Share**

The following table summarizes earnings per share calculations for the years ended December 31, 2016, 2015 and 2014:

	2016	2015	2014
<b>Basic earnings per common share</b>			
Net income attributable to Quaker Chemical Corporation	\$ 61,403	\$ 51,180	\$ 56,492
Less: income allocated to participating securities	(515)	(443)	(503)
Net income available to common shareholders	\$ 60,888	\$ 50,737	\$ 55,989
Basic weighted average common shares outstanding	13,136,138	13,199,630	13,126,759
<b>Basic earnings per common share</b>	\$ 4.64	\$ 3.84	\$ 4.27
<b>Diluted earnings per common share</b>			
Net income attributable to Quaker Chemical Corporation	\$ 61,403	\$ 51,180	\$ 56,492
Less: income allocated to participating securities	(514)	(443)	(503)
Net income available to common shareholders	\$ 60,889	\$ 50,737	\$ 55,989
Basic weighted average common shares outstanding	13,136,138	13,199,630	13,126,759
Effect of dilutive securities	24,331	15,219	21,309
Diluted weighted average common shares outstanding	13,160,469	13,214,849	13,148,068
<b>Diluted earnings per common share</b>	\$ 4.63	\$ 3.84	\$ 4.26

The following number of stock options are not included in diluted earnings per share since the effect would have been anti-dilutive: 678 in 2016, 6,684 in 2015 and 4,714 in 2014.

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**Note 9 – Accounts Receivable and Allowance for Doubtful Accounts**

At December 31, 2016 and 2015, the Company had gross trade accounts receivable totaling \$202.4 million and \$196.1 million with trade accounts receivable greater than 90 days past due of \$18.0 million and \$15.7 million, respectively. The following are changes in the allowance for doubtful accounts during the years ended December 31, 2016, 2015 and 2014:

	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, 2016	\$ 7,818	\$ 1,375	\$ (1,949)	\$ (24)	\$ 7,220
Year ended December 31, 2015	\$ 6,498	\$ 1,460	\$ (261)	\$ 121	\$ 7,818
Year ended December 31, 2014	\$ 7,133	\$ (264)	\$ (296)	\$ (75)	\$ 6,498

During 2015 and 2014, the Company recorded charges of \$0.3 million, or \$0.02 per diluted share and \$0.8 million or \$0.05 per diluted share, respectively, to its allowance for doubtful accounts and SG&A due to the bankruptcies of certain customers. There were no similar charges during 2016. Included in write-offs charged to allowance during 2016 was \$1.6 million of outstanding receivables related to a prior year customer bankruptcy which the Company previously reserved, but settled during 2016.

Included in exchange rate changes and other adjustments for the years ended December 31, 2016, 2015, and 2014 are allowance for doubtful accounts of less than \$0.1 million, \$0.4 million and \$0.1 million acquired in 2016, 2015 and 2014 business acquisitions, respectively.

**Note 10 – Inventories**

Total inventories as of December 31, 2016 and 2015 were as follows:

	2016	2015
Raw materials and supplies	\$ 37,772	\$ 36,876
Work in process and finished goods	39,310	38,223
Total inventories	\$ 77,082	\$ 75,099

**Note 11 – Property, Plant and Equipment**

Property, plant and equipment as of December 31, 2016 and 2015 were as follows:

	2016	2015
Land	\$ 9,707	\$ 9,388
Building and improvements	80,740	80,110
Machinery and equipment	140,595	136,329
Construction in progress	4,964	5,337
	236,006	231,164
Less accumulated depreciation	(150,272)	(143,545)
	\$ 85,734	\$ 87,619

Gross property, plant and equipment includes \$0.5 million and \$0.5 million of capital leases with \$0.4 million and \$0.3 million of related accumulated depreciation as of December 31, 2016 and 2015, respectively. The Company currently leases certain equipment under capital leases in its North America segment. Future minimum lease payments for these capital leases are less than \$0.1 million in 2017. There are no future minimum lease payments beyond 2017. The amount of remaining minimum lease payments representing interest and the present value of minimum lease payments are also each less than \$0.1 million.

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**Note 12 – Goodwill and Other Intangible Assets**

The Company completes its annual 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 the 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 2016 and no impairment charge was warranted. The estimated fair value of each of the Company's reporting units substantially exceeded its carrying value, with no reporting unit at risk for failing step one of the goodwill impairment test. In addition, the Company has recorded no impairment charges in the past.

Changes in the carrying amount of goodwill for the years ended December 31, 2016 and 2015 were as follows:

	North America	EMEA	Asia/Pacific	South America	Total
Balance as of December 31, 2014	\$ 42,677	\$ 16,050	\$ 16,006	\$ 3,200	\$ 77,933
Goodwill additions	30	4,761	103	—	4,894
Currency translation adjustments	(264)	(1,531)	(865)	(1,056)	(3,716)
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

Gross carrying amounts and accumulated amortization for definite-lived intangible assets as of December 31, 2016 and 2015 were as follows:

	Gross Carrying Amount		Accumulated Amortization	
	2016	2015	2016	2015
Customer lists and rights to sell	\$ 71,454	\$ 67,435	\$ 20,043	\$ 15,806
Trademarks, formulations and product technology	31,436	28,955	11,748	9,620
Other	6,023	5,788	5,151	4,565
Total definite-lived intangible assets	\$ 108,913	\$ 102,178	\$ 36,942	\$ 29,991

The Company recorded \$7.0 million, \$6.8 million and \$4.3 million of amortization expense during the years ended December 31, 2016, 2015 and 2014, respectively. Estimated annual aggregate amortization expense for the subsequent five years is as follows:

For the year ended December 31, 2017	\$ 7,004
For the year ended December 31, 2018	6,770
For the year ended December 31, 2019	6,670
For the year ended December 31, 2020	6,400
For the year ended December 31, 2021	6,029

The Company has two indefinite-lived intangible assets totaling \$1.1 million for trademarks at December 31, 2016 and 2015.

**Note 13 – Investments in Associated Companies**

As of December 31, 2016, the Company held a 50% investment in and had significant influence over Kelko Quaker Chemical, S.A. (Venezuela), Nippon Quaker Chemical, Ltd. (Japan) and Kelko Quaker Chemical S.A. (Panama) and held a 33% investment in and had significant influence over Primex, Ltd. (Barbados).

The carrying amount of the Company's equity investments at December 31, 2016 was \$22.8 million, which includes its investments of \$17.1 million in Primex, Ltd. (Barbados); \$5.2 million in Nippon Quaker Chemical, Ltd. (Japan); \$0.3 million in Kelko Quaker Chemical, S.A. (Panama); and \$0.2 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

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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 I and the SICAD II. Kelco 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 Kelco Venezuela at the CADIVI exchange rate at December 31, 2014. During the second quarter of 2014, the Company recorded a charge of \$0.3 million, or \$0.02 per diluted share, related to the conversion of certain BsF to U.S. dollars on the historical SICAD II exchange.

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 Kelco Venezuela's access to U.S. dollars, the impact on the operations of Kelco Venezuela, and the impact on the Company's equity investment and other related assets, which resulted in revaluing its equity investment in Kelco 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, or \$0.21 per diluted share, recorded 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 Kelco Venezuela's access to U.S. dollars, the impact on the operations of Kelco 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 Kelco Venezuela. As of March 31, 2016, the published rate for the DICOM was approximately 273 BsF per U.S. dollar, which resulted in a currency conversion charge of \$0.1 million, or \$0.01 per diluted share in the first quarter of 2016. As of December 31, 2016, the Company's equity investment in Kelco Venezuela was valued at the DICOM exchange rate of approximately 673 BsF per U.S. dollar.

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

	As of December 31,		
	2016	2015	
Current Assets	\$ 37,998	\$ 36,761	
Noncurrent Assets	1,244	606	
Current Liabilities	26,683	26,039	
Noncurrent Liabilities	1,166	410	

	Year Ended December 31,		
	2016	2015	2014
Net Sales	\$ 41,448	\$ 40,282	\$ 48,834
Gross Margin	13,082	12,887	15,698
Income Before Income Taxes	2,289	(2,843)	3,546
Net Income	1,210	(3,631)	2,263

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

	As of December 31,	
	2016	2015
Total Assets	\$ 116,742	\$ 105,585
Total Liabilities	58,775	54,534

	Year Ended December 31,		
	2016	2015	2014
Revenue	\$ 5,632	\$ 7,058	\$ 10,755
Income Before Income Taxes	5,622	8,407	10,929
Net Income	5,148	6,334	7,352

**Note 14 – Other Assets**

Other assets as of December 31, 2016 and 2015 were as follows:

	2016	2015
Restricted insurance settlement	\$ 21,883	\$ 22,874
Uncertain tax positions	3,892	6,054
Supplemental retirement income program	1,410	1,336
Other	1,567	1,954
Total other assets	\$ 28,752	\$ 32,218

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 \$21.9 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, 2016 and 2015, respectively, offset by \$1.0 million and \$0.8 million of net payments in 2016 and 2015, 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 18 and 22 of Notes to Consolidated Financial Statements.

**Note 15 – Other Current Liabilities**

Other current liabilities as of December 31, 2016 and 2015 were as follows:

	2016	2015
Non-income taxes	\$ 9,278	\$ 6,815
Income taxes payable	2,753	6,534
Selling expenses	2,699	1,848
Freight	2,212	2,354
Professional fees	1,980	1,358
Legal	754	1,165
Acquisition-related liabilities	—	1,384
Other	3,752	4,238
Total other current liabilities	\$ 23,428	\$ 25,696

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**Note 16 – Debt**

Debt as of December 31, 2016 and 2015 includes the following:

	2016	2015
Credit facilities	\$ 47,948	\$ 62,884
Industrial development bonds	15,000	15,000
Municipality-related loans	3,470	4,098
Other debt obligations (including capital leases)	58	119
	<u>66,476</u>	<u>82,101</u>
Short-term debt (including capital leases)	(58)	—
Current portion of long-term debt	(649)	(662)
	<u>\$ 65,769</u>	<u>\$ 81,439</u>

*Credit facilities*

The Company's primary credit facility is a \$300.0 million syndicated multicurrency credit agreement with a group of lenders which matures in June 2018. The maximum amount available under this 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 this credit facility generally bear interest at a base rate or LIBOR rate plus a margin. Access to this credit facility is dependent on meeting certain financial and other covenants, but primarily depends on the Company's consolidated leverage ratio calculation which cannot exceed 3.50 to 1. As of December 31, 2016 and 2015, the Company's consolidated leverage ratio was below 1.0 to 1, respectively, and the Company was also in compliance with all of the other covenants. At December 31, 2016 and 2015, the Company had total credit facility borrowings of approximately \$47.9 million and \$62.9 million, primarily under this credit facility, at weighted average borrowing rates of 1.25% and 1.38%, 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 facilities 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, 2016 and 2015, there was \$1.5 million and \$1.8 million, respectively, outstanding on this loan.

With the 2015 acquisition of Verkol S.A.U. ("Verkol"), the Company assumed 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 2026. The Company recorded 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, 2016 and 2015, there was \$2.0 and \$2.3 million, respectively, outstanding for these loans.

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

2017	\$ 707
2018	53,364
2019	645
2020	641
2021	341

At December 31, 2016 and 2015, the amounts at which the Company's debt is recorded are not materially different from their fair market value.

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**Note 17 – 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, 2016 and 2015:

	Pension Benefits						Other Post-Retirement Benefits	
	2016			2015			2016	2015
	Foreign	Domestic	Total	Foreign	Domestic	Total	Domestic	Domestic
<b>Change in benefit obligation</b>								
Gross benefit obligation at beginning of year	\$ 92,406	\$ 66,862	\$ 159,268	\$ 106,827	\$ 70,667	\$ 177,494	\$ 5,422	\$ 6,045
Service cost	2,378	298	2,676	2,799	250	3,049	10	17
Interest cost	2,314	2,114	4,428	2,476	2,541	5,017	142	195
Employee contributions	71	—	71	80	—	80	—	—
Plan settlements	—	—	—	(328)	—	(328)	—	—
Benefits paid	(1,583)	(4,522)	(6,105)	(1,604)	(4,249)	(5,853)	(443)	(533)
Plan expenses and premiums paid	(155)	(275)	(430)	(57)	(250)	(307)	—	—
Actuarial loss (gain)	14,848	2,777	17,625	(7,799)	(2,097)	(9,896)	(401)	(302)
Translation differences and other	(6,788)	—	(6,788)	(9,988)	—	(9,988)	—	—
Gross benefit obligation at end of year	\$ 103,491	\$ 67,254	\$ 170,745	\$ 92,406	\$ 66,862	\$ 159,268	\$ 4,730	\$ 5,422
<b>Change in plan assets</b>								
Fair value of plan assets at yearbeginning of year	\$ 76,156	\$ 46,701	\$ 122,857	\$ 86,523	\$ 49,689	\$ 136,212	\$ —	\$ —
Actual return (loss) on plan assets	14,472	2,516	16,988	(2,170)	223	(1,947)	—	—
Employer contributions	3,103	4,777	7,880	1,804	1,288	3,092	443	533
Employee contributions	71	—	71	80	—	80	—	—
Plan settlements	—	—	—	(328)	—	(328)	—	—
Benefits paid	(1,583)	(4,522)	(6,105)	(1,604)	(4,249)	(5,853)	(443)	(533)
Plan expenses and premiums paid	(155)	(275)	(430)	(57)	(250)	(307)	—	—
Translation differences	(5,220)	—	(5,220)	(8,092)	—	(8,092)	—	—
Fair value of plan assets at end of year	\$ 86,844	\$ 49,197	\$ 136,041	\$ 76,156	\$ 46,701	\$ 122,857	\$ —	\$ —
Net benefit obligation recognized	\$ (16,647)	\$ (18,057)	\$ (34,704)	\$ (16,250)	\$ (20,161)	\$ (36,411)	\$ (4,730)	\$ (5,422)
Amounts recognized in the balance sheet consist of:								
Current liabilities	\$ (61)	\$ (574)	\$ (635)	\$ (52)	\$ (575)	\$ (627)	\$ (451)	\$ (517)
Non-current liabilities	(16,586)	(17,483)	(34,069)	(16,198)	(19,586)	(35,784)	(4,279)	(4,905)
Net benefit obligation recognized	\$ (16,647)	\$ (18,057)	\$ (34,704)	\$ (16,250)	\$ (20,161)	\$ (36,411)	\$ (4,730)	\$ (5,422)
Amounts not yet reflected in net periodic benefit costs and included in accumulated other comprehensive loss:								
Prior service credit (cost)	\$ 1,687	\$ (122)	\$ 1,565	\$ 1,910	\$ (185)	\$ 1,725	\$ —	\$ —
Accumulated loss	(20,214)	(33,147)	(53,361)	(20,058)	(31,906)	(51,964)	(581)	(983)
Accumulated other comprehensive loss ("AOCI")	(18,527)	(33,269)	(51,796)	(18,148)	(32,091)	(50,239)	(581)	(983)
Cumulative employer contributions in excess of or (below) net periodic benefit cost	1,880	15,212	17,092	1,898	11,930	13,828	(4,149)	(4,439)
Net benefit obligation recognized	\$ (16,647)	\$ (18,057)	\$ (34,704)	\$ (16,250)	\$ (20,161)	\$ (36,411)	\$ (4,730)	\$ (5,422)

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The accumulated benefit obligation for all defined benefit pension plans was \$167.1 million (\$66.7 million Domestic and approximately \$100.4 million Foreign) and \$157.5 million (\$66.9 million Domestic and \$90.6 million Foreign) at December 31, 2016 and 2015, respectively.

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

	2016			2015		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Projected benefit obligation	\$ 103,491	\$ 67,254	\$ 170,745	\$ 92,406	\$ 66,862	\$ 159,268
Accumulated benefit obligation	100,463	66,676	167,139	90,624	66,862	157,486
Fair value of plan assets	86,844	49,197	136,041	76,156	46,701	122,857

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

	2016			2015		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Projected benefit obligation	\$ 103,491	\$ 67,254	\$ 170,745	\$ 92,406	\$ 66,862	\$ 159,268
Fair value of plan assets	86,844	49,197	136,041	76,156	46,701	122,857

**Components of net periodic benefit costs – pension plans:**

	2016			2015		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Service cost	\$ 2,378	\$ 298	\$ 2,676	\$ 2,799	\$ 250	\$ 3,049
Interest cost	2,314	2,114	4,428	2,476	2,541	5,017
Expected return on plan assets	(2,026)	(3,316)	(5,342)	(2,092)	(3,453)	(5,545)
Settlement loss	—	—	—	170	—	170
Actuarial loss amortization	839	2,336	3,175	1,136	2,353	3,489
Prior service (credit) cost amortization	(164)	63	(101)	(164)	63	(101)
Net periodic benefit cost	\$ 3,341	\$ 1,495	\$ 4,836	\$ 4,325	\$ 1,754	\$ 6,079

	2014		
	Foreign	Domestic	Total
Service cost	\$ 2,626	\$ 250	\$ 2,876
Interest cost	3,210	2,823	6,033
Expected return on plan assets	(2,543)	(3,817)	(6,360)
Actuarial loss amortization	1,307	1,757	3,064
Prior service cost amortization	736	63	799
Net periodic benefit cost	\$ 5,336	\$ 1,076	\$ 6,412



**QUAKER CHEMICAL CORPORATION**  
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**Other changes recognized in other comprehensive income:**

	2016			2015		
	Foreign	Domestic	Total	Foreign	Domestic	Total
Net loss (gain) arising during the period	\$ 2,401	\$ 3,576	\$ 5,977	\$ (3,537)	\$ 1,134	\$ (2,403)
Recognition of amortization in net periodic benefit cost						
Prior service credit (cost)	164	(63)	101	164	(63)	101
Actuarial loss	(839)	(2,336)	(3,175)	(1,306)	(2,353)	(3,659)
Effect of exchange rates on amounts included in AOCI	(1,347)	—	(1,347)	(2,353)	—	(2,353)
Total recognized in other comprehensive loss (income)	379	1,177	1,556	(7,032)	(1,282)	(8,314)
Total recognized in net periodic benefit cost and other comprehensive loss (income)	\$ 3,720	\$ 2,672	\$ 6,392	\$ (2,707)	\$ 472	\$ (2,235)

	2014		
	Foreign	Domestic	Total
Net loss arising during period	\$ 4,973	\$ 7,290	\$ 12,263
Effect of plan amendment	242	—	242
Recognition of amortization in net periodic benefit cost			
Prior service cost	(736)	(63)	(799)
Actuarial loss	(1,307)	(1,757)	(3,064)
Effect of exchange rates on amounts included in AOCI	(3,076)	—	(3,076)
Total recognized in other comprehensive loss	96	5,470	5,566
Total recognized in net periodic benefit cost and other comprehensive loss	\$ 5,432	\$ 6,546	\$ 11,978

**Components of net periodic benefit costs – other postretirement plan:**

	2016	2015	2014
Service cost	\$ 10	\$ 17	\$ 19
Interest cost	142	195	232
Actuarial loss amortization	—	83	65
Net periodic benefit costs	\$ 152	\$ 295	\$ 316

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

	2016	2015	2014
Net (gain) loss arising during period	\$ (401)	\$ (302)	\$ 688
Amortization of actuarial loss in net periodic benefit costs	—	(83)	(65)
Total recognized in other comprehensive (income) loss	(401)	(385)	623
Total recognized in net periodic benefit cost and other comprehensive (income) loss	\$ (249)	\$ (90)	\$ 939

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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	\$ 808	\$ 2,658	\$ 3,466	\$ 22
Prior service (credit) cost	(155)	63	(92)	—
	<u>\$ 653</u>	<u>\$ 2,721</u>	<u>\$ 3,374</u>	<u>\$ 22</u>

Weighted-average assumptions used to determine benefit obligations at December 31, 2016 and 2015:

	Pension Benefits		Other Postretirement Benefits	
	2016	2015	2016	2015
<b>U.S. Plans:</b>				
Discount rate	3.88 %	4.07 %	3.73 %	3.88 %
Rate of compensation increase	3.63 %	3.63 %	N/A	N/A
<b>Foreign Plans:</b>				
Discount rate	2.17 %	2.95 %	N/A	N/A
Rate of compensation increase	2.48 %	2.41 %	N/A	N/A

Weighted-average assumptions used to determine net periodic benefit costs for the years ended December 31, 2016 and 2015:

	Pension Benefits		Other Postretirement Benefits	
	2016	2015	2016	2015
<b>U.S. Plans:</b>				
Discount rate	4.07 %	3.72 %	3.88 %	3.45 %
Expected long-term return on plan assets	7.20 %	7.30 %	N/A	N/A
Rate of compensation increase	3.63 %	3.63 %	N/A	N/A
<b>Foreign Plans:</b>				
Discount rate	2.95 %	2.51 %	N/A	N/A
Expected long-term return on plan assets	2.65 %	2.55 %	N/A	N/A
Rate of compensation increase	2.41 %	3.05 %	N/A	N/A

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 year ended December 31, 2016 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 during 2016.

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.

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**Assumed health care cost trend rates at December 31, 2016 and 2015:**

	2016	2015
Health care cost trend rate for next year	6.70 %	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	\$ 12	\$ (10)
Effect on postretirement benefit obligations	352	(308)

**Plan Assets and Fair Value**

The Company's pension plan target asset allocation and the weighted-average asset allocations at December 31, 2016 and 2015 by asset category were as follows:

<i>Asset Category</i>	Target	2016	2015
<b>U.S. Plans</b>			
Equity securities	61%	60%	65%
Debt securities	32%	39%	34%
Other	7%	1%	1%
Total	100%	100%	100%
<b>Foreign Plans</b>			
Equity securities and other	25%	24%	26%
Debt securities	75%	76%	74%
Total	100%	100%	100%

As of December 31, 2016 and 2015, "Other" consisted principally of cash and cash equivalents (approximately 1% to 2% 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 NAV, which is generally based on the underlying asset values of the pooled investments held in the trusts. In accordance with the accounting standard update adopted by the Company during 2016, these assets are no longer included in the fair value hierarchy.

As of December 31, 2016, the U.S. pension plan commingled funds included approximately 61 percent of investments in equity securities and 39 percent of investments in fixed income securities. As of December 31, 2016, foreign pension plan commingled funds included approximately 30 percent of investments in diversified equity securities, 60 percent of investments in fixed income securities, and 10 percent of other non-related investments, primarily real estate.

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*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. In accordance with the accounting standard update adopted by the Company during 2016, these assets are no longer included in the fair value hierarchy.

*Registered Investment Companies*

Investments in shares of registered investment companies in the U.S. pension plan as of December 31, 2015 which represent the net asset values of shares held by the Plan and were valued based on quoted market prices on an exchange in an active market and classified as Level 1 investments.

*Fixed Income Corporate Securities*

Investments in corporate fixed income securities in the U.S. pension plan as of December 31, 2015 were valued using third party pricing services which were based on a combination of quoted market prices on an exchange in an active market as well as proprietary pricing models and inputs using observable market data and were classified as Level 2 investments.

*Fixed Income U.S. and Foreign Government Securities*

Investments in U.S. and foreign government fixed income securities in the U.S. pension plan as of December 31, 2015 were valued using third party pricing services which are based on a combination of quoted market prices on an exchange in an active market as well as proprietary pricing models and inputs using observable market data and were classified as Level 2 investments.

*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.

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As of December 31, 2016 and 2015, the U.S. and foreign plans' investments measured at fair value on a recurring basis were as follows:

	Total Fair Value	Fair Value Measurements at December 31, 2016 Using Fair Value Hierarchy		
		Level 1	Level 2	Level 3
<b>U.S. Pension Assets</b>				
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			
<b>Foreign Pension Assets</b>				
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
Sub-total of foreign pension assets in fair value hierarchy	\$ 85,010	\$ 130	\$ 10,061	\$ 74,819
Commingled funds measured at NAV	1,834			
Total foreign pension 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			

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	Total Fair Value	Fair Value Measurements at December 31, 2015 Using Fair Value Hierarchy		
		Level 1	Level 2	Level 3
<b>U.S. Pension Assets</b>				
Cash and cash equivalents	\$ 753	\$ 753	\$ —	\$ —
Large capitalization common stock	13,346	13,346	—	—
Large capitalization registered investment companies	6,363	6,363	—	—
Small capitalization common stock	773	773	—	—
Small capitalization registered investment companies	2,333	2,333	—	—
International developed and emerging markets registered investment companies	5,166	5,166	—	—
International developed and emerging markets common stock	2,519	2,519	—	—
Fixed income corporate securities	9,601	—	9,601	—
Fixed income registered investment companies	4,147	4,147	—	—
Fixed income U.S. and foreign government securities	308	—	308	—
Subtotal U.S. pension plan assets in fair value hierarchy	\$ 45,309	\$ 35,400	\$ 9,909	\$ —
Pooled separate accounts measured at NAV	1,392			
Total U.S. pension plan assets	\$ 46,701			
<b>Foreign Pension Assets</b>				
Cash and cash equivalents	\$ 7	\$ 7	\$ —	\$ —
Insurance contract	62,409	—	—	62,409
Diversified equity securities - registered investment companies	7,180	—	7,180	—
Fixed income - foreign registered investment companies	2,290	—	2,290	—
Real estate - registered investment companies	2,388	—	—	2,388
Subtotal foreign pension assets in fair value hierarchy	\$ 74,274	\$ 7	\$ 9,470	\$ 64,797
Commingled funds measured at NAV	1,882			
Total foreign pension plan assets	\$ 76,156			
Total pension assets in fair value hierarchy	\$ 119,583	\$ 35,407	\$ 19,379	\$ 64,797
Total pension assets measured at NAV	3,274			
Total pension assets	\$ 122,857			

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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. During 2016, the Company adopted the guidance in the accounting standard update issued in May, 2015 which removed the requirement to categorize within the fair value hierarchy all such investments. Adoption of this guidance was done on a retrospective basis, which required reclassifications to the fair value tables for the year ended December 31, 2015. 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, 2016 and 2015 were as follows:

	Insurance		Real Estate		Total
	Contract		Fund		
Balance at December 31, 2014	\$	72,417	\$	478	\$ 72,895
Purchases		953		1,937	2,890
Settlements		(1,239)		—	(1,239)
Unrealized (losses) gains		(2,402)		60	(2,342)
Currency translation adjustment		(7,320)		(87)	(7,407)
Balance at 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 at December 31, 2016	\$	72,778	\$	2,041	\$ 74,819

U.S. pension assets include Company common stock in the amounts of \$1.3 million (3% of total U.S. plan assets) and \$0.8 million (2% of total U.S. plan assets) at December 31, 2016 and 2015, respectively.

During 2013, it was discovered that the Company's subsidiary in the U.K. did not appropriately amend a trust for a legacy change in its pension scheme as it related to a past retirement age equalization law. Given the lack of an official deed to the pension trust, the effective date of the change to the subsidiary's pension scheme differed from the Company's historical beliefs, but the extent of the potential exposure was not estimable. In the first quarter of 2014, the Company recorded costs of \$0.9 million, or \$0.05 per diluted share, related to prior service cost and interest cost, to appropriately reflect the past plan amendment related to the retirement age equalization law.

**Cash Flows**

**Contributions**

The Company expects to make minimum cash contributions of \$7.8 million to its pension plans (\$4.6 million Domestic and \$3.2 million Foreign) and \$0.5 million to its other postretirement benefit plan in 2017.

**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 Benefits
	Foreign	Domestic	Total	
2017	\$ 1,780	\$ 4,929	\$ 6,709	\$ 451
2018	1,946	4,642	6,588	444
2019	2,094	4,605	6,699	432
2020	2,311	4,354	6,665	407
2021	2,922	4,346	7,268	385
2022 to 2026	16,581	23,445	40,026	1,611

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 \$0.9 million, \$0.9 million and \$0.8 million in 2016, 2015 and 2014, respectively, representing the annual accrued benefits under this plan.

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**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 has 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. Total Company contributions were \$2.7 million, \$2.6 million and \$2.5 million for 2016, 2015 and 2014, respectively.

**Note 18 – Other Non-Current Liabilities**

Other non-current liabilities as of December 31, 2016 and 2015 were as follows:

	2016	2015
Restricted insurance settlement	\$ 21,883	\$ 22,874
Uncertain tax positions (includes interest and penalties)	7,933	13,332
Deferred and other long-term compensation	5,550	5,866
Other	520	512
<b>Total other non-current liabilities</b>	<b>\$ 35,886</b>	<b>\$ 42,584</b>

See also Notes 14 and 22 of Notes to Consolidated Financial Statements.

**Note 19 – 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. The Company currently intends to repurchase shares to at least offset the dilutive impact of shares issued each year as part of its employee benefit and share based compensation plans, and could repurchase more if the Company considers the share price to be at a level that offers an advantageous return for its shareholders. The 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. 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.

The Company has 30,000,000 shares of common stock authorized with a par value of \$1, and 13,277,832 and 13,288,113 shares issued as of December 31, 2016 and 2015, respectively. The change in shares issued and outstanding during 2016 was primarily related to 83,879 shares repurchased in connection with the 2015 Share Repurchase Program offset by 55,982 shares issued for equity-based compensation plans, 6,130 shares issued for the ESPP and 11,486 shares issued for the exercise of stock options and other employee and director-related share activity.

Holders of record of the Company's common stock for a period of less than 36 consecutive calendar months or less are entitled to one vote per share of common stock. Holders of record of the Company's common stock for a period greater than 36 consecutive calendar months are entitled to 10 votes per share of common stock.

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, 2016, no preferred stock had been issued.



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The following table shows the reclassifications from and resulting balances of AOCI for the years ended December 31, 2016, 2015 and 2014:

	Currency Translation Adjustments	Defined Benefit Pension Plans	Unrealized Gain (Loss) in Available-for- Sale Securities	Total
<b>Balance at December 31, 2013</b>	\$ 1,152	\$ (37,433)	\$ 1,581	\$ (34,700)
Other comprehensive (loss) income before reclassifications	(15,464)	(9,232)	2,057	(22,639)
Amounts reclassified from AOCI	—	3,043	(2,245)	798
Related tax amounts	—	2,071	64	2,135
<b>Balance at December 31, 2014</b>	(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)
<b>Balance at December 31, 2015</b>	(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)
<b>Balance at December 31, 2016</b>	<u>\$ (52,255)</u>	<u>\$ (36,168)</u>	<u>\$ 1,016</u>	<u>\$ (87,407)</u>

Approximately 30% and 70% 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, 2016, 2015 and 2014 were recorded in cost of goods sold and SG&A, respectively. See Note 17 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 20 – Business Acquisitions**

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 15.9 million CAD, or approximately \$11.9 million, which includes an immaterial post-closing adjustment to be received by the Company in the first quarter of 2017. Lubricor's technology provides the Company with additional offerings in synthetic coolants, hydroforming, and stamping products, and, also, it brings the Company its strong customer relationships, particularly in the North America automotive market. The Company allocated approximately \$6.1 million of the purchase price to intangible assets, comprised of trademarks and formulations, to be amortized over 15 years; a non-compete agreement, to be amortized over 5 years; and customer relationships, to be amortized over 15 years. In addition, the Company recorded approximately \$3.2 million of goodwill, related to expected value not allocated to other acquired assets, none of which will be tax deductible.

In May 2016, the Company acquired a business that is associated with dust control products for the mining industry for its North America reportable operating segment for \$1.9 million. The acquisition provides a strategic opportunity to expand Quaker's technology and product portfolio offering in the mining industry. The Company allocated \$1.7 million of the purchase price to intangible assets, comprised of trademarks and formulations, to be amortized over 15 years; a non-compete agreement, to be amortized over 5 years; and customer relationships, to be amortized over 15 years. In addition, the Company recorded \$0.1 million of goodwill, related to expected value not allocated to other acquired assets, all of which will be tax deductible.

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As of December 31, 2016, the allocation of the purchase price for the 2016 acquisitions have not been finalized and the one-year measurement period for each acquisition has not ended. Adjustments may be necessary as a result of the Company's assessment of additional information related to the fair value of assets acquired and liabilities assumed. The following table presents the current allocation of the purchase price of the assets acquired and liabilities assumed in all of the Company's acquisitions in 2016:

<b>2016 Acquisitions</b>	
Current assets (includes cash acquired)	\$ 3,443
Property, plant and equipment	2,574
<b>Intangibles</b>	
Customer lists and rights to sell	5,041
Trademarks, formulations and product technology	2,543
Other intangibles	127
Goodwill	3,311
<b>Total assets purchased</b>	<b>17,039</b>
Current liabilities	(1,198)
<b>Other long-term liabilities</b>	<b>(2,019)</b>
Total liabilities assumed	(3,217)
<b>Gross cash paid for acquisition</b>	<b>\$ 13,822</b>
Less: cash acquired	105
<b>Net cash paid for acquisition</b>	<b>\$ 13,717</b>

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.

During the first six months of 2016, the Company identified and recorded certain adjustments to the allocation of the purchase price for the Verkol acquisition. These adjustments were the result of the Company assessing additional information related to assets acquired during the one-year measurement period following the acquisition. As of June 30, 2016, the allocation of the purchase price for the Verkol acquisition was finalized. The following table presents the final allocation of the purchase price of the assets acquired and liabilities assumed for the Verkol acquisition:

<b>Verkol Acquisition</b>	
Current assets (includes cash acquired)	\$ 31,151
Property, plant and equipment	7,941
<b>Intangibles</b>	
Customer lists and rights to sell	6,146
Trademarks, formulations and product technology	5,378
Other intangibles	219
Goodwill	5,051
<b>Other long-term assets</b>	<b>158</b>
<b>Total assets purchased</b>	<b>56,044</b>
Current liabilities	(6,720)
Long-term debt	(2,400)
<b>Other long-term liabilities</b>	<b>(5,531)</b>
Total liabilities assumed	(14,651)
<b>Gross cash paid for acquisition</b>	<b>\$ 41,393</b>
Less: cash acquired	15,423
<b>Net cash paid for acquisition</b>	<b>\$ 25,970</b>

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**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
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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.

In August 2014, the Company acquired ECLI Products, LLC ("ECLI"), a specialty grease manufacturer for its North American reportable operating segment for approximately \$53.1 million, including certain post-closing adjustments.

During 2015, the Company identified and recorded certain adjustments to the allocations of the purchase price for certain 2014 acquisitions. These adjustments were the result of the Company assessing additional information related to assets acquired and liabilities assumed during the one-year measurement period following each acquisition. As of December 31, 2015, the allocations of the purchase price for all of the Company's 2014 acquisitions were 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 2014:

<u>2014 Acquisitions</u>	
Current assets (includes cash acquired)	\$ 12,413
Property, plant and equipment	4,158
Intangibles	
Customer lists and rights to sell	30,924
Trademarks, formulations and product technology	12,606
Other intangibles	1,127
Goodwill	21,546
Other long-term assets	198
Total assets purchased	<u>82,972</u>
Current liabilities	(4,562)
Long-term liabilities	(4,374)
Total liabilities assumed	<u>(8,936)</u>
Gross cash paid for acquisition	\$ 74,036
Less: cash acquired	1,037
Net cash paid for acquisition	<u>\$ 72,999</u>

Additionally, in June 2014, the Company acquired the remaining 49% ownership interest in its Australian affiliate, Quaker Chemical (Australasia) Pty. Limited ("QCA") for 8.0 million AUD, or approximately \$7.6 million, from its joint venture partner, Nuplex Industries. QCA 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 \$6.5 million of excess purchase price over the carrying value of the noncontrolling interest in Capital in excess of par value.

In December 2010, the Company acquired Summit Lubricants, Inc., which manufactures and distributes specialty greases and lubricants, for approximately \$29.8 million, including certain post-closing adjustments finalized in 2011. Liabilities assumed included an earnout to be paid to the former shareholders if certain earnings targets were met by the end of 2013, which was settled and paid during the second quarter of 2014 with a payment to the former shareholder of approximately \$4.7 million.

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.

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
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**Note 21 – Fair Value Measures**

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

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

Assets	Fair Value Measurements at December 31, 2015			
	Total Fair Value	Using Fair Value Hierarchy		
		Level 1	Level 2	Level 3
Company-owned life insurance	\$ 1,366	\$ —	\$ 1,366	\$ —
Total	<u>\$ 1,366</u>	<u>\$ —</u>	<u>\$ 1,366</u>	<u>\$ —</u>

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, 2016 or 2015, respectively, so related disclosures have not been included.

**Note 22 – 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, 2016, 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, 2016, 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 and \$0.3 million was accrued at December 31, 2016 and 2015, 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 \$2.2 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

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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, 2016, 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.

As initially disclosed in 2010, one of the Company's subsidiaries may have paid certain value-added-taxes ("VAT") incorrectly and, in certain cases, may not have collected sufficient VAT from certain customers. The VAT rules and regulations at issue are complex, vary among the jurisdictions and can be contradictory, in particular as to how they relate to the subsidiary's products and to sales between jurisdictions. Since its inception, the subsidiary had been consistent in its VAT collection and remittance practices and had never been contacted by any tax authority relative to VAT. The subsidiary later determined that for certain products, a portion of the VAT was incorrectly paid and that the total VAT due exceeded the amount originally collected and remitted by the subsidiary. In response, the subsidiary modified its VAT invoicing and payment procedures to eliminate or mitigate future exposure.

In 2010, three jurisdictions contacted the subsidiary and, in 2013, an additional jurisdiction issued an assessment against the subsidiary for certain tax years. As of December 31, 2016, the Company had no remaining accrual for this or any other related tax assessment, as the subsidiary had previously participated in an amnesty program or had entered into a settlement arrangement with each jurisdiction. Also, the Company believes there are no potentially impacted jurisdictions remaining due to the expiration of the applicable statutes of limitation on past assessments as of December 31, 2016.

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 2031. Rent expense for the years ended December 31, 2016, 2015 and 2014 was \$5.6 million, \$5.9 million, and \$5.8 million, respectively.

The Company's minimum rental commitments under non-cancelable operating leases at December 31, 2016 for future years were approximately:

2017	\$	5,279
2018		2,967
2019		2,613
2020		2,225
2021		1,962
2022 and beyond		9,758

**QUAKER CHEMICAL CORPORATION**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued**  
(Dollars in thousands, except share and per share amounts, unless otherwise stated)

**Note 23 – Quarterly Results (unaudited)**

	<u>First</u> <u>Quarter (1)</u>	<u>Second</u> <u>Quarter (2)</u>	<u>Third</u> <u>Quarter (3)</u>	<u>Fourth</u> <u>Quarter (4)</u>
<b>2016</b>				
Net sales	\$ 178,077	\$ 186,915	\$ 190,428	\$ 191,245
Gross profit	67,875	71,235	70,779	69,704
Operating income	19,234	22,093	21,339	20,385
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	\$ 0.98	\$ 1.13	\$ 1.21	\$ 1.31
Net income attributable to Quaker Chemical Corporation				
Common Shareholders - Diluted	\$ 0.98	\$ 1.13	\$ 1.21	\$ 1.31
<b>2015</b>				
Net sales	\$ 181,330	\$ 183,726	\$ 189,224	\$ 183,275
Gross profit	66,328	70,617	71,329	68,766
Operating income	17,864	21,445	18,728	13,223
Net income attributable to Quaker Chemical Corporation	10,378	15,038	14,371	11,393
Net income attributable to Quaker Chemical Corporation				
Common Shareholders - Basic	\$ 0.78	\$ 1.13	\$ 1.08	\$ 0.86
Net income attributable to Quaker Chemical Corporation				
Common Shareholders - Diluted	\$ 0.78	\$ 1.13	\$ 1.08	\$ 0.86

- (1) Net income attributable to Quaker Chemical Corporation for both the first quarter of 2016 and 2015 includes earnings from the Company's equity interest in a captive insurance company of approximately \$0.01 and \$0.06 per diluted share, respectively. Net income attributable to Quaker Chemical Corporation for both the first quarter of 2016 and 2015 includes a currency conversion charge of approximately \$0.01 and \$0.21 per diluted share, respectively, related to the Company's 50% owned equity affiliate in Venezuela. Net income attributable to Quaker Chemical Corporation for the first quarter of 2015 includes costs related to streamlining certain operations in the Company's South America segment of approximately \$0.01 per diluted share.
- (2) Net income attributable to Quaker Chemical Corporation for both the second quarter of 2016 and 2015 includes earnings (losses) from the Company's equity interest in a captive insurance company of approximately \$0.02 and (\$0.01) per diluted share, respectively. Net income attributable to Quaker Chemical Corporation for the second quarter of 2015 includes a charge due to a certain U.S. customer bankruptcy of approximately \$0.01 per diluted share.
- (3) Net income attributable to Quaker Chemical Corporation for both the third quarter of 2016 and 2015 includes earnings from the Company's equity interest in a captive insurance company of approximately \$0.04 and \$0.04 per diluted share, respectively. Net income attributable to Quaker Chemical Corporation for both the third quarter of 2016 and 2015 includes charges of approximately \$0.08 and \$0.15 per diluted share, respectively, related to certain uncommon transaction-related costs incurred in connection with the execution of, and diligence on, acquisition candidates.
- (4) Net income attributable to Quaker Chemical Corporation for both the fourth quarter of 2016 and 2015 includes earnings from the Company's equity interest in a captive insurance company of approximately \$0.06 and \$0.07 per diluted share, respectively. Net income attributable to Quaker Chemical Corporation for both the fourth quarter of 2016 and 2015 includes (credits) charges of approximately (\$0.02) and \$0.36 per diluted share, respectively, related to a global restructuring plan. Net income attributable to Quaker Chemical Corporation for the fourth quarter of 2016 includes charges of approximately \$0.03 per diluted share related to certain uncommon transaction-related costs incurred in connection with the execution of, and diligence on, acquisition candidates. Net income attributable to Quaker Chemical Corporation for the fourth quarter of 2015 includes approximately \$0.01 per diluted share due to a U.S. customer bankruptcy.

**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, 2016. 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, 2016, the Company’s internal control over financial reporting is effective based on those criteria.

Management has excluded Lubricor, Inc. and its affiliated entities from our assessment of internal control over financial reporting as of December 31, 2016, because these entities were acquired by the Company in a purchase business combination in November 2016. These entities are wholly owned subsidiaries, whose total assets and total revenues represent approximately 2% and less than 1%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2016.

The effectiveness of the Company’s internal control over financial reporting as of December 31, 2016 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, 2016 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, 2016.

**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 2017 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, 2016 (the “2017 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 2017 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 2017 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 2017 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 2017 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 2017 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, 2016. Each number of securities reflected in the table is a reference to shares of Quaker common stock.

Plan Category	Equity Compensation Plan Information		
	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	117,220	\$ 75.34	967,932 (1)
Equity compensation plans not approved			
by security holders	—	—	—
<b>Total</b>	<b>117,220</b>	<b>\$ 75.34</b>	<b>967,932 (1)</b>

- (1) As of December 31, 2016, 304,900 of these shares were available for issuance as restricted stock awards under the Company’s 2001 Global Annual Incentive Plan, 594,090 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 68,942 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 2017 Proxy Statement beginning with and including the caption “Certain Relationships and Related Transactions” to, but not including, the caption “Proposal 4—Ratification of Appointment of Independent Registered Public Accounting Firm,” (ii) the information in the 2017 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 2017 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 2017 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, 2017.

## 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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Financial Statements:	
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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) — 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(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(fffi) 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. Jeffrey Benoiel 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. Jeffrey Benoiel 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 — Employment Agreement 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 — Stock Purchase Agreement by and among Registrant, Summit Lubricants Inc., Ronald Krol, Brian Caputi, Dale M. Perry and Anthony Musilli, dated December 31, 2010. Incorporated by reference to Exhibit 10.54 as filed by the Registrant with Form 10-K for the year ended 2010.
- 10.22 — 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. \*
- 10.23 — Change in Control Agreement by and between Registrant and Dieter Laininger dated May 31, 2011, effective June 15, 2011. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2011. \*
- 10.24 — Global Annual Incentive Plan (as amended and restated effective May 11, 2011). Incorporated by reference to Appendix B to the Registrant's definitive proxy statement filed on March 31, 2011. \*
- 10.25 — 2011 Long-Term Performance Incentive Plan. Incorporated by reference to Appendix C to the Registrant's definitive proxy statement filed on March 31, 2011. \*

10.26 —	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. *
10.27 —	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. *
10.28 —	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. *
10.29 —	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.
10.30 —	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. *
10.31 —	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. *
10.32 —	Memorandum of Employment by and between Registrant and Mary Dean Hall, dated and effective November 30, 2015. *
10.33 —	Change in control agreement by and between Registrant and Mary Dean Hall, dated and effective November 30, 2015. *
10.34 —	Retirement Savings Plan, as amended and restated effective January 1, 2016. *
10.35 —	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. *
10.36 —	2016 Long-Term Performance Incentive Plan. Incorporated by reference to Appendix C to the Registrant's definitive proxy statement filed on March 28, 2016. *
10.37 —	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 as filed by Registrant with Form 8-K filed on May 6, 2016. *
10.38 —	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 as filed by Registrant with Form 8-K filed on May 6, 2016. *
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.

(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 President**

Date: February 28, 2017

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.

<u>Signatures</u>	<u>Capacity</u>	<u>Date</u>
_____ /s/ MICHAEL F. BARRY Michael F. Barry <b>Chairman of the Board, Chief Executive Officer and President</b>	Principal Executive Officer and Director	February 28, 2017
_____ /s/ MARY DEAN HALL Mary Dean Hall <b>Vice President, Chief Financial Officer and Treasurer</b>	Principal Financial Officer	February 28, 2017
_____ /s/ SHANE W. HOSTETTER Shane W. Hostetter Global Controller	Principal Accounting Officer	February 28, 2017
_____ /s/ DONALD R. CALDWELL Donald R. Caldwell	Director	February 28, 2017
_____ /s/ ROBERT E. CHAPPELL Robert E. Chappell	Director	February 28, 2017
_____ /s/ WILLIAM R. COOK William R. Cook	Director	February 28, 2017
_____ /s/ MARK A. DOUGLAS Mark A. Douglas	Director	February 28, 2017
_____ /s/ JEFFRY D. FRISBY Jeffry D. Frisby	Director	February 28, 2017
_____ /s/ WILLIAM H. OSBORNE William H. Osborne	Director	February 28, 2017
_____ /s/ ROBERT H. ROCK Robert H. Rock	Director	February 28, 2017
_____ /s/ FAY WEST Fay West	Director	February 28, 2017

## 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%
*G.W. Smith and Sons, Inc.	Ohio, U.S.A.	100%
*Tecniquimia Mexicana S.A. de C.V.	Mexico	100%
*Unitek Servicios De Asesoría 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	55%
*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%

SUBSIDIARIES AND AFFILIATES OF THE REGISTRANT, *continued*

Name	Jurisdiction of Incorporation	Percentage of Voting Securities Owned Directly or Indirectly by Quaker
+*B&A Banner Holdings, Inc.	Canada	100%
*Lubricor Investments, Inc.	Canada	100%
+*Lubricor Holdings, Inc	Canada	100%
*Lubricor, Inc Mexico	Mexico	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.



**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 Form S-8 (Registration Nos. 333-48130, 033-54158, 333-58676, 333-115713, 333-136648, 333-159513, 333-174145, 333-208188, 333-188594 and 333-211238) of Quaker Chemical Corporation of our report dated February 28, 2017 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, PA  
February 28, 2017

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**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, 2017

/s/ MICHAEL F. BARRY

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**Michael F. Barry**  
**Chief Executive Officer**

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**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, 2017

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/s/ MARY DEAN HALL

**Mary Dean Hall**  
**Chief Financial Officer**

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**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, 2016 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, 2017

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/s/ MICHAEL F. BARRY

**Michael F. Barry**

**Chief Executive Officer of Quaker Chemical Corporation**

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**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, 2016 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, 2017

/s/ MARY DEAN HALL

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**Mary Dean Hall**

**Chief Financial Officer of Quaker Chemical Corporation**

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