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

FORM 10-K/A
(Amendment No. 1)

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

For the fiscal year ended December 31, 2023
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)

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

Registrant's telephone number, including area code: (610) 832-4000
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $1 par value	KWR	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 every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S- T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

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 the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant's most recently completed second fiscal quarter. (The aggregate market value is computed by reference to the last reported sale on the New York Stock Exchange on June 30, 2023): $2,689,694,842

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date 17,991,778 shares of Common Stock, $1.00 Par Value, as of February 29, 2024.

Audit Firm ID	Auditor Name	Auditor Location
238	PricewaterhouseCoopers, LLP	Philadelphia, Pennsylvania

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive Proxy Statement relating to the 2024 Annual Meeting of Shareholders are incorporated by reference into Part III.

EXPLANATORY NOTE

Quaker Chemical Corporation ("The Company") is filing this Amendment No. 1 on Form 10-K/A (the "Amended Filing") to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2023, originally filed with the U.S. Securities and Exchange Commission ("SEC") on February 29, 2024 (the "Original Filing"), solely for the purpose of correcting the contractual obligations table contained in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the section "Liquidity and Capital Resources" ("Contractual Obligations Table") included in the Original Filing. The Contractual Obligations Table in the Original Filing contained a clerical error within the figures presented under the "Purchase obligations" caption. The corrected Contractual Obligations Table is as follows:

	Payments due by period						
(dollars in thousand) **Contractual Obligations**	**Total**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029 and Beyond**
Long-term debt (See Note 19 of Notes to Consolidated Financial Statements)	$ 755,046	$ 23,250	$ 36,955	$ 36,914	$ 647,899	$ 10,028	$ —
Interest obligations (See Note 19 of Notes to Consolidated Financial Statements)	155,556	46,855	44,948	42,601	20,977	175	—
Capital lease obligations (See Note 6 of Notes to Consolidated Financial Statements)	1,032	256	29	229	259	15	244
Operating leases (See Note 6 of Notes to Consolidated Financial Statements)	39,694	13,130	9,027	6,840	3,543	1,909	5,245
Purchase obligations	1,286	1,283	1	1	1	—	—
Income taxes payable (See Note 10 and Note 21 of Notes to Consolidated Financial Statements)	8,849	4,023	4,697	129	—	—	—
Pension and other postretirement plan contributions (See Note 20 of Notes to Consolidated Financial Statements)	14,070	14,070	—	—	—	—	—
Other long-term liabilities (See Note 21 of Notes to Consolidated Financial Statements)	7,480	—	—	—	—	—	7,480
Total contractual cash obligations	$ 983,013	$ 102,867	$ 95,657	$ 86,714	$ 672,679	$ 12,127	$ 12,969

In accordance with the rules of the SEC, this Amended Filing sets forth the complete text of Item 7 in Part II, as amended to modify the Contractual Obligations Table. In connection with this Amended Filing and pursuant to the rules of the SEC, we are also including with this Amended Filing new certifications by our principal executive officer and principal financial officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934. Accordingly, Item 15 in Part IV has also been amended to reflect the filing of these new certifications. Because this Amended Filing does not contain or amend any disclosure with respect to Items 307 and 308 of Regulation S-K, paragraphs 4 and 5 of the certifications have been omitted. This Amended Filing does not modify or update any other disclosures set forth in the Original Filing and does not otherwise reflect events occurring after the date of the Original Filing.

Quaker Chemical Corporation

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PART II

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

As used in this Annual Report on Form 10-K (the "Report"), the terms "Quaker Houghton," the "Company," "we," and "our" refer to Quaker Chemical Corporation (doing business as Quaker Houghton), its subsidiaries, and associated companies, unless the context otherwise requires. The "Combination" refers to the Quaker combination with Houghton International, Inc. ("Houghton").

Executive Summary

Quaker Houghton is the global leader in industrial process fluids. With a presence around the world, including operations in over 25 countries, our customers include thousands of the world's most advanced and specialized steel, aluminum, automotive, aerospace, offshore, container, mining, and metalworking companies. Our high-performing, innovative and sustainable solutions are backed by best-in-class technology, deep process knowledge, and customized services. Quaker Houghton is headquartered in Conshohocken, Pennsylvania, located near Philadelphia in the U.S.

Overall, 2023 was a successful year as the Company achieved substantial earnings growth led by its value-based pricing and margin improvement initiatives while navigating through a challenging macroeconomic and geopolitical environment, which included the direct and indirect impacts of the ongoing global conflicts, raw material cost fluctuations, inflationary pressures, supply chain and logistics challenges, and foreign currency volatility. Net sales of $1,953.3 million in 2023 increased 1% compared to $1,943.6 million in 2022, primarily due to increases in selling price and product mix of approximately 7% and favorable impacts from foreign currency translation of approximately 1%, partially offset by a 7% decline in sales volumes. The increase in selling price and product mix was primarily driven by the year-over-year impact of our value-based pricing initiatives. The decline in sales volumes compared to 2022 was primarily attributable to softer end market conditions across all regions, the Company's value-based pricing initiatives and customer order patterns, as well as impacts of the ongoing war in Ukraine in the EMEA segment, the direct and indirect impacts of the United Auto Workers ("UAW") strike in the Americas segment, and the wind-down of the tolling agreement for products previously divested related to the Combination, partially offset by new business wins in all segments.

The Company generated net income of $112.7 million or $6.26 per diluted share in 2023, compared to a net loss of $15.9 million or $0.89 per diluted share in 2022. The Company's reported net income in 2023 primarily reflects a recovery in gross margins compared to prior year and the impacts of certain non-recurring items during 2022. Excluding this and other non-recurring and non-core items, the Company's current year non-GAAP net income and non-GAAP earnings per diluted share were $137.6 million and $7.65, respectively, compared to $105.3 million and $5.87, respectively, in 2022. The Company generated adjusted EBITDA of $320.4 million compared to $257.2 million in 2022, an increase of 25%. The higher year-over-year adjusted EBITDA was primarily a result of an increase in net sales and an increase in gross margins, partially offset by higher selling, general and administrative expenses ("SG&A") as a result of year-over-year inflationary pressures and higher labor-related costs. See the Non-GAAP Measures section of this Item below.

The Company's 2023 operating performance in each of its three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific, reflect similar drivers to that of its consolidated performance as each of the Company's reportable segments net sales benefited from year-over-year increases in selling price and product mix, partially offset by the unfavorable impact of foreign currency translation in the Asia/Pacific segment. All geographic segments had lower sales volumes. Operating earnings increased across all segments due to higher net sales in the EMEA and Americas and an improvement in segment operating margins, driven by favorable pricing and product mix as well as operating improvements. Additional details of each segment's operating performance are further discussed in the Company's reportable segments review, in the Operations section of this Item 7, below.

The Company generated net operating cash flow of $279.0 million in 2023 compared to $41.8 million in 2022. The increase in net operating cash flow year-over-year reflects improved operating performance in 2023 as well as an improvement in net working capital. The key drivers of the Company's operating cash flow and overall liquidity are further discussed in the Company's Liquidity and Capital Resources section of this Item 7, below.

Overall, the Company delivered strong results in 2023 including an increase in net sales, an improvement in gross margins, an increase in operating cash flow. Looking ahead to 2024, while the macroeconomic environment remains uncertain, we believe the business is well positioned to continue to outpace our market growth rates by earning new business by delivering value-added solutions and services to its customers. The Company is committed to its margin improvement initiatives in 2024, while balancing customer relationships and the cost to serve with the value we provide to customers. Additionally, the Company expects to continue to make progress with its enterprise growth strategy, including investing in its long-term growth initiatives, advancing its customer intimate strategy, progressing with its sustainability program and positioning the Company to deliver continued earnings growth in 2024 and beyond.

Critical Accounting Policies and Estimates

Quaker Houghton's discussion and analysis of its financial condition and results of operations are based upon its consolidated financial statements which have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). The preparation of these financial statements requires the Company 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, the Company evaluates its estimates, including those related to customer sales incentives, product returns, credit losses, inventories, property, plant and equipment ("PP&E"), investments, goodwill, intangible assets, income taxes, business combinations, and restructuring. These estimates reflect historical experience as well as our best judgment about current and/or future economic and market conditions and their effects and various other assumptions that are believed to be reasonable based on currently available information, 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 materially from these estimates under different assumptions or conditions.

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

Accounts receivable and inventory exposures: The Company establishes allowances for credit losses for estimated losses resulting from the inability of its customers to make required payments. If the financial condition of the Company's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be required. As part of our terms of trade, we may custom manufacture products for certain large customers and/or may ship products on a consignment basis. Further, a significant portion of our revenue is derived from sales to customers in industries where companies have experienced past financial difficulties. If a significant customer bankruptcy occurs, then we 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 as well as the failure to collect receivables. Reserves for customers filing for bankruptcy protection are established based on a percentage of the amount of receivables outstanding at the bankruptcy filing date. However, initially establishing this reserve and the amount thereof 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. We generally reserve for large and/or financially distressed customers on a specific review basis, while a general reserve is maintained for other customers based on historical experience. The Company's consolidated allowance for credit losses was $13.3 million and $13.5 million as of December 31, 2023 and 2022, respectively. The Company recorded expense to increase its provision for credit losses by $1.3 million, $4.3 million and $0.7 million for the years ended December 31, 2023, 2022 and 2021, respectively. Changing the amount of expense recorded to the Company's provisions by 10% would have increased or decreased the Company's pre-tax earnings by $0.1 million, $0.4 million and $0.1 million for the years ended December 31, 2023, 2022 and 2021, respectively. See Note 12 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Tax exposures, uncertain tax positions and valuation allowances: The Company records expenses and liabilities for taxes based on estimates of amounts that will be determined as deductible or taxable 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, such as taxable income or deductions, which may not be resolved for extended periods of time. The Company also evaluates uncertain tax positions on all income tax positions taken on previously filed tax returns or expected to be taken on a future tax return in accordance with FIN 48, 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 are probable or if they are more likely than not to be sustained upon audit based upon the technical merits of the tax position. For tax positions that are determined to be more likely than not to be sustained upon audit, the 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, the Company does 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 nets its liability for unrecognized tax benefits against deferred tax assets related to net operating losses or other tax credit carryforward on the basis that the uncertain tax position is settled for the presumed amount at the balance sheet date.

The Company 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 the Company has considered future taxable income and assesses the need for a valuation allowance, in the event Quaker Houghton 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 the Company 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.

Pursuant to the Tax Cuts and Jobs Act ("U.S. Tax Reform"), the Company recorded a $15.5 million transition tax liability for U.S. income taxes on the undistributed earnings of non-U.S. subsidiaries. As of December 31, 2023, $8.5 million in installments have been paid with the remaining $7.0 million to be paid through installments in future years. However, the Company may also be subject to other taxes, such as withholding taxes and dividend distribution taxes, if certain undistributed earnings are ultimately remitted to the U.S. As of December 31, 2023, the Company has a deferred tax liability of $8.2 million, which primarily represents the estimate of the non-U.S. taxes the Company will incur to remit certain previously taxed earnings to the U.S. It is the Company's current intention to reinvest its future undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives outside of the U.S. The amount of such undistributed earnings at December 31, 2023 was approximately $379.2 million. Any tax liability which might result from ultimate remittance of these earnings is expected to be substantially offset by foreign tax credits (subject to certain limitations). It is currently impractical to estimate any such incremental tax expense. See Note 10 of Notes to Consolidated Financial Statements in Item 8 of this Report.

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, the weighted average cost of capital ("WACC"), royalty rates, asset lives and market multiples, among other items. When necessary, the Company consults with external advisors to help determine fair value. For non-observable market values, the Company may determine fair value using acceptable valuation principles, including the excess earnings, relief from royalty, lost profit or cost methods.

The Company amortizes definite-lived intangible assets on a straight-line basis over their useful lives. Goodwill and intangible assets that have indefinite lives are not amortized and are required to be assessed at least annually for impairment. The Company completes its annual goodwill and indefinite-lived intangible asset impairment test during the fourth quarter of each year, or more frequently if triggering events indicate a possible impairment. The Company's consolidated goodwill at December 31, 2023 and 2022 was $512.5 million and $515.0 million, respectively. The Company has four indefinite-lived intangible assets totaling $193.2 million as of December 31, 2023, including $192.1 million of indefinite-lived intangible assets for trademarks and tradename associated with the Combination. Comparatively, the Company had four indefinite-lived intangible assets for trademarks and tradename totaling $189.1 million as of December 31, 2022.

During the fourth quarter of 2022, the Company recorded a non-cash impairment charge of $93.0 million to write down the carrying value of the EMEA reporting unit Goodwill to its estimated fair values. In connection with the Company's reorganization and the associated change in reportable segments and reporting units during the first quarter of 2023, the Company performed the required impairment assessments directly before and immediately after the change in reporting units and concluded that it was not more likely than not that the fair values of any of the Company's previous or new reporting units were less than their respective carrying amounts. Additionally, the Company completed its annual impairment assessment as of October 1, 2023 and concluded no impairment existed.

In completing the annual impairment assessment, the Company used a WACC assumption of approximately 12.0% and holding all other assumptions constant, the WACC would have to increase by approximately 3.0 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired. In addition, holding EBITDA margins and all other assumptions constant, the Company's compound annual revenue growth rate during the entire projection period would need to decline by approximately 4.0 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired. Similarly, holding revenue growth rates and all other assumptions constant, the Company's average EBITDA margins throughout the discreet projection period would need to decline by approximately 7.3 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired.

The Company continually evaluates financial performance, economic conditions and other recent developments in assessing if a triggering event indicates that the carrying values of goodwill, indefinite-lived, or long-lived assets might be impaired. Notwithstanding the results of the Company's impairment assessments during 2023, if the Company is unable to maintain the actions aimed at improving the financial performance of the EMEA reporting unit, or interest rates continue to rise, which leads to an increase in the cost of capital, then these conditions could result in a triggering event for the EMEA reporting unit. This assessment could result in an impairment of the EMEA reporting unit's remaining goodwill, indefinite-lived intangible assets, or long-lived assets. See Note 15 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Pension and 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 U.S. GAAP, 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, which is based on applicable yield curve data, including the use of a split discount rate (spot-rate approach) for the U.S. plans and certain foreign plans, 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.

Recently Issued Accounting Standards

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

Liquidity and Capital Resources

At December 31, 2023, the Company had cash and cash equivalents of $194.5 million. Total cash and cash equivalents was $181.0 million at December 31, 2022. The $13.5 million increase in cash and cash equivalents was the net result of $279.0 million of cash provided by operating activities and approximately $0.7 million of favorable impacts due to the effect of foreign currency translation on cash, largely offset by $238.6 million of cash used in financing activities and $27.6 million of cash used in investing activities.

Net cash flows provided by operating activities were $279.0 million in 2023 compared to $41.8 million in 2022. The increase in net operating cash flow year-over-year reflects higher year-over-year operating performance as well as a cash inflow from working capital, notably reductions in accounts receivable and inventory, in the current year, demonstrating the Company's ongoing focus on cash conversion. Comparatively, during 2022, operating cash flow was negatively impacted by a significant working capital investment due to inflationary impacts on inventory and related pricing impacts on accounts receivable.

Net cash flows used in investing activities were $27.6 million in 2023 compared to $40.2 million in 2022. This $12.6 million decrease in cash outflows used in investing activities is the result of higher current year proceeds from asset dispositions and higher acquisition-related payments in the prior year, partially offset by higher capital expenditures in the current year.

Net cash flows used in financing activities were $238.6 million in 2023 compared to net cash flows provided by financing activities of $24.7 million in 2022. The $263.3 million increase in net cash outflows from financing activities was primarily related to net repayments of borrowings in the current year, primarily under the Company's Credit Facility, described further below, as compared to net borrowings in 2022, which included the impact of new borrowings, net of repayments of old borrowings and debt issuance costs, related to the June 2022 credit facility amendment. In addition, the Company paid $31.7 million of cash dividends to shareholders during 2023, a $1.5 million, or 5.1%, increase compared to the prior year.

During June 2022, the Company, and its wholly owned subsidiary, Quaker Houghton B.V., as borrowers, Bank of America, N.A., as administrative agent, U.S. Dollar swing line lender and letter of credit issuer, Bank of America Europe Designated Active Company, as Euro Swing Line Lender, certain guarantors and other lenders entered into an amendment to its primary credit facility (the "Credit Facility"). The Credit Facility established (A) a new $150.0 million Euro equivalent senior secured term loan (the "Euro Term Loan"), (B) a new $600.0 million senior secured term loan (the "U.S. Term Loan"), and (C) a new $500.0 million senior secured revolving credit facility (the "Revolver"), each maturing in June 2027. The Company has the right to increase the amount of the Credit Facility by an aggregate amount not to exceed the greater of $300.0 million or 100% of Consolidated EBITDA, subject to certain conditions including the agreement to provide financing by any lender providing such increase.

As of December 31, 2023, the Company had Credit Facility borrowings outstanding of $744.5 million. The Company had unused capacity under the Revolver of approximately $465.7 million, which is net of bank letters of credit of approximately $3.4 million, as of December 31, 2023. The Company's other debt obligations are primarily industrial development bonds, bank lines of credit and municipality-related loans, which totaled $11.1 million as of December 31, 2023. Total unused capacity under these arrangements as of December 31, 2023 was approximately $35 million. The Company's total net debt as of December 31, 2023 was $561.1 million, which consists of total borrowings of $755.6 million less cash and cash equivalents of $194.5 million. The Credit Facility contains affirmative and negative covenants, financial covenants and events of default. Financial covenants contained in the Credit Facility include a consolidated interest coverage ratio test and a consolidated net leverage ratio test. As of December 31, 2023, the Company was in compliance with all of the Credit Facility covenants. Refer to the description of the Company's primary Credit Facility in Note 19 of Notes to Consolidated Financial Statements in Item 8 of this Report for more information about the covenants and events of default.

The weighted average variable interest rate incurred on the outstanding borrowings under the Credit Facility during the twelve months ended December 31, 2023 was approximately 6.2%. As of December 31, 2023, the weighted interest rate on the outstanding borrowings under the Credit Facility was approximately 6.3%. As part of the Credit Facility, the Company is required to pay a commitment fee ranging from 0.150% to 0.275% related to unutilized commitments under the Revolver, depending on the Company's consolidated net leverage ratio. The Company had unused capacity under the Revolver of approximately $465.7 million, which is net of bank letters of credit of approximately $3.4 million, as of December 31, 2023.

In order to manage the Company's exposure to variable interest rate risk associated with the Credit Facility, such as SOFR, in the first quarter of 2023, the Company entered into $300.0 million notional amounts of three-year interest rate swaps to convert a portion of the Company's variable rate borrowings into an average fixed rate obligation of 3.64% plus an applicable margin as provided in the Credit Facility based on the Company's consolidated net leverage ratio. As of December 31, 2023, the aggregate interest rate on the swaps, including the fixed base rate plus the applicable margin, was 5.3%. See Note 24 of Notes to Consolidated Financial Statements in Item 8 of this Report.

In connection with executing the original credit facility in 2019 ("Original Credit Facility") and the amended Credit Facility during the second quarter of 2022, the Company capitalized certain third-party and creditor debt issuance costs. Costs attributed to the Euro Term Loan and U.S. Term Loan were recorded as a direct reduction of Long-term debt on the Consolidated Balance Sheet. These capitalized costs, as well as the previously capitalized costs that were not written off will collectively be amortized into Interest expense over the five year term of the Credit Facility. As of December 31, 2023, the Company had $1.5 million of debt issuance costs recorded as a reduction of Long-term debt on the Consolidated Balance Sheet and $3.3 million of debt issuance costs recorded within Other assets on the Consolidated Balance Sheet. Comparatively, as of December 31, 2022, the Company had $2.0 million of debt issuance costs recorded as an offset of Long-term debt on the Consolidated Balance Sheet and $4.3 million of debt issuance costs recorded within Other assets on the Consolidated Balance Sheet.

The Company uses foreign exchange forward contracts to economically hedge the impact of the variability in exchange rates on certain assets and/or liabilities denominated in certain foreign currencies. During the year ended December 31, 2023, the Company entered into and settled forward contracts resulting in cash proceeds of $2.1 million. See Note 24 of Notes to Consolidated Financial Statements in Item 8 of this Report.

The Company had no Combination, integration and other acquisition-related expenses during 2023, except for $0.5 million in other income related to changes for an indemnification asset related to the Combination. Comparatively, in 2022, the Company incurred $11.0 million of total Combination, integration and other acquisition-related expenses, which includes $2.4 million of other expense related to an indemnification asset partially offset by a $0.2 million gain on the sale of certain held-for-sale real property assets.

The Company incurred $4.7 million of strategic planning expenses for the year ended December 31, 2023 as compared to $14.4 million for the year ended December 31, 2022. The Company expects to incur minimal additional operating costs and associated cash flows related to strategic planning expenses through the beginning of 2024.

Quaker Houghton's management approved, and the Company initiated, a global restructuring plan (the "QH Program") in 2019 as part of its planned cost synergies associated with the Combination. The QH Program included restructuring and associated severance costs to reduce total headcount by approximately 400 people globally and plans for the closure of certain manufacturing and non-manufacturing facilities. The Company had substantially completed all of the initiatives under the QH Program in 2022 with an immaterial amount of remaining severance paid in 2023.

In the fourth quarter of 2022, the Company's management initiated a global cost and optimization program to improve its cost structure and drive a more profitable and productive organization. The exact timing to complete all actions and final costs associated will depend on a number of factors and are subject to change. The Company expects additional headcount reductions and restructuring costs may be incurred in the future. The Company expects to generate full annualized run-rate cost savings from the global cost and optimization program of approximately $20 million by the end of 2024. The Company expects total cash costs of this program to be approximately 1 to 1.5 times annualized savings. The Company recognized $7.6 million, $3.2 million and $1.4 million of restructuring and related charges for the years ended December 31, 2023, 2022 and 2021, respectively, as a result of these programs. The Company made cash payments related to the settlement of restructuring liabilities for these programs of $9.8 million and $1.5 million during the years ended December 31, 2023 and 2022, respectively. The Company has remaining restructuring accruals, as of December 31, 2023, for this program of $3.4 million, which the Company expects to settle over the next twelve months. See Note 7 of Notes to Consolidated Financial Statements in Item 8 of this Report.

As of December 31, 2023, the Company's gross liability for uncertain tax positions, including interest and penalties, was $19.7 million. The Company cannot determine a reliable estimate of the timing of cash flows by period related to its uncertain tax position liability. However, should the entire liability be paid, the amount of the payment may be reduced by up to $5.6 million as a result of offsetting benefits in other tax jurisdictions. During 2021, the Company recorded $13.1 million of non-income tax credits for certain of its Brazilian subsidiaries. The Company utilized these credits to offset certain Brazilian federal tax payments during 2022. See Note 25 of Notes to Consolidated Financial Statements in Item 8 of this Report.

During 2021, two of the Company's locations suffered property damage as a result of flooding and electrical fire, respectively. The Company maintains property insurance for all of its locations globally. The Company, its insurance adjuster, and insurance carrier actively managed the remediation and restoration activities associated with each of these events and have settled on both claims. In total, the Company received payments from its insurers of $7.2 million, after an aggregate deductible of $2.0 million. The Company and its insurance carrier continue to review the impact of the electrical fire on the production facility's operations as it relates to a potential business interruption insurance claim; however, as of the date of this Report, the Company cannot reasonably estimate any probable amount of business interruption insurance claim recoverable. Therefore, the Company has not recorded a gain contingency for a possible business interruption insurance claim as of December 31, 2023. See Note 25 of Notes to Consolidated Financial Statements in Item 8 of this Report.

The Company believes that its existing cash, anticipated cash flows from operations and available additional liquidity will be sufficient to support its operating requirements and fund its business objectives for at least the next twelve months and beyond, including but not limited to, payments of dividends to shareholders, payments for restructuring activities including further strategic and optimization initiatives, pension plan contributions, capital expenditures, other business opportunities (including potential acquisitions), implementing actions to achieve the Company's sustainability goals and other potential contingencies. The Company also believes it has sufficient additional liquidity to support its operating requirements and to fund its business obligations for the period beyond the next twelve months, including the aforementioned items which are expected to recur annually, as well as future principal and interest payments on the Company's Credit Facility, tax obligations and other long-term liabilities. The Company's liquidity is affected by many factors, some based on normal operations of our business and others related to the impact of the pandemic and other events on our business and on global economic conditions as well as industry uncertainties, which we cannot predict. We also cannot predict economic conditions and industry downturns or the timing, strength or duration of recoveries. We may seek, as we believe appropriate, additional debt or equity financing which would provide capital for corporate purposes, working capital funding, additional liquidity needs or to fund future growth opportunities, including possible acquisitions and investments. The timing and amount of potential capital requirements cannot be determined at this time and will depend on a number of factors, including the actual and projected demand for our products, specialty chemical industry conditions, competitive factors, and the condition of financial markets, among others.

On February 28, 2024, the Board approved a new share repurchase program ("2024 Share Repurchase Program"), authorizing the Company to repurchase up to an aggregate of $150 million of the Company's outstanding common stock. The 2024 Share Repurchase Program is effective immediately and has no expiration date. In connection with the 2024 Share Repurchase Program, the Company's previous share repurchase program ("2015 Share Repurchase Program"), which was approved by the Board in 2015 and had no expiration date, was terminated. See further information in Note 22 of Notes to Consolidated Financial Statements in Item 8 of this Report.

The following table summarizes the Company's contractual obligations as of December 31, 2023, and the effect such obligations are expected to have on its liquidity and cash flows in future periods. Pension and postretirement plan contributions beyond 2023 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 consists primarily of deferred compensation agreements and environmental reserves, also cannot be readily determined due to their uncertainty. Interest obligations on the Company's long-term debt and capital leases assume the current debt levels will be outstanding for the entire respective period and apply the interest rates in effect as of December 31, 2023.

(dollars in thousand)	**Payments due by period**						
Contractual Obligations	**Total**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029 and Beyond**
Long-term debt (See Note 19 of Notes to Consolidated Financial Statements)	$ 755,046	$ 23,250	$ 36,955	$ 36,914	$ 647,899	$ 10,028	$ –
Interest obligations (See Note 19 of Notes to Consolidated Financial Statements)	155,556	46,855	44,948	42,601	20,977	175	–
Capital lease obligations (See Note 6 of Notes to Consolidated Financial Statements)	1,032	256	29	229	259	15	24
Operating leases (See Note 6 of Notes to Consolidated Financial Statements)	39,694	13,130	9,027	6,840	3,543	1,909	5,24
Purchase obligations	1,286	1,283	1	1	1	—	–
Income taxes payable (See Note 10 and Note 21 of Notes to Consolidated Financial Statements)	8,849	4,023	4,697	129	—	—	–
Pension and other postretirement plan contributions (See Note 20 of Notes to Consolidated Financial Statements)	14,070	14,070	—	—	—	—	–
Other long-term liabilities (See Note 21 of Notes to Consolidated Financial Statements)	7,480	—	—	—	—	—	7,48
Total contractual cash obligations	$ 983,013	$ 102,867	$ 95,657	$ 86,714	$ 672,679	$ 12,127	$ 12,96

Non-GAAP Measures

The information in this Form 10-K filing includes non-GAAP (unaudited) financial information that includes EBITDA, adjusted EBITDA, adjusted EBITDA margin, non-GAAP operating income, non-GAAP operating margin, non-GAAP net income and non-GAAP earnings per diluted share. 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 indicative of future operating performance of the Company, and facilitate a comparison among fiscal periods, as the non-GAAP financial measures exclude items that are not indicative of future operating performance or 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. In addition, our definitions of EBITDA, adjusted EBITDA, adjusted EBITDA margin, non-GAAP operating income, non-GAAP operating margin, non-GAAP net income and non-GAAP earnings per share as discussed and reconciled below to the more comparable GAAP measures, may not be comparable to similarly named measures reported by other companies.

The Company presents EBITDA which is calculated as net income attributable to the Company before depreciation and amortization, interest expense, net, and taxes on income before equity in net income of associated companies. The Company also presents adjusted EBITDA which is calculated as EBITDA plus or minus certain items that are not indicative of future operating performance or not considered core to the Company's operations. In addition, the Company presents non-GAAP operating income which is calculated as operating income plus or minus certain items that are not indicative of future operating performance or not considered core to the Company's operations. Adjusted EBITDA margin and non-GAAP operating margin are calculated as the percentage of adjusted EBITDA and non-GAAP operating income to consolidated net sales, respectively. The Company believes these non-GAAP measures provide transparent and useful information and are widely used by analysts, investors, and competitors in our industry as well as by management in assessing the operating performance of the Company on a consistent basis.

Additionally, the Company presents non-GAAP net income and non-GAAP earnings per diluted share as additional performance measures. Non-GAAP net income is calculated as adjusted EBITDA, defined above, less depreciation and amortization, interest expense, net, and taxes on income before equity in net income of associated companies, in each case adjusted, as applicable, for any depreciation, amortization, interest or tax impacts resulting from the non-core items identified in the reconciliation of net income attributable to the Company to adjusted EBITDA. Non-GAAP earnings per diluted share is calculated as non-GAAP net income per diluted share as accounted for under the "two-class share method." The Company believes that non-GAAP net income and non-GAAP earnings per diluted share provide transparent and useful information and are widely used by analysts, investors, and competitors in our industry as well as by management in assessing the operating performance of the Company on a consistent basis.

Certain of the prior period non-GAAP financial measures presented in the following tables have been adjusted to conform with current period presentation. The following tables reconcile the Company's non-GAAP financial measures (unaudited) to their most directly comparable GAAP financial measures (dollars in thousands, unless otherwise noted, except per share amounts):

Non-GAAP Operating Income and Margin Reconciliations	**For the years ended December 31,**		
	2023	**2022**	**2021**
Operating income	$ 214,495	$ 52,304	$ 150,466
Combination, integration and other acquisition-related (credits) expenses (a)	—	8,812	25,412
Restructuring and related charges, net (b)	7,588	3,163	1,433
Strategic planning expenses (c)	4,704	14,446	—
Russia-Ukraine conflict related expenses (j)	—	2,487	—
Facility remediation (recovery) costs, net (d)	—	—	1,509
Impairment charges (e)	—	93,000	—
Other charges (i)	987	3,679	3,805
Non-GAAP operating income	$ 227,774	$ 177,891	$ 182,625
Non-GAAP operating margin (%) (o)	11.7 %	9.2 %	10.4

EBITDA, Adjusted EBITDA, Adjusted EBITDA Margin and Non-GAAP Net Income Reconciliations	For the years ended December 31,		
	2023	2022	2021
Net income (loss) attributable to Quaker Chemical Corporation	$ 112,748	$ (15,931)	$ 121,369
Depreciation and amortization (a)(m)	83,020	81,514	87,728
Interest expense, net	50,699	32,579	22,326
Taxes on income (loss) before equity in net income of associated companies	55,585	24,925	34,939
EBITDA	302,052	123,087	266,362
Equity (income) loss in a captive insurance company (f)	(2,090)	1,427	(4,993)
Combination, integration and other acquisition-related (credits) expenses (a)	(475)	10,990	18,718
Restructuring and related charges, net (b)	7,588	3,163	1,433
Strategic planning expenses (c)	4,704	14,446	—
Facility remediation (recovery) costs, net (d)	(2,141)	(1,804)	2,066
Impairment charges (e)	—	93,000	—
Currency conversion impacts of hyper-inflationary economies (g)	7,849	1,617	564
Brazilian non-income tax credits (h)	—	—	(13,087)
Russia-Ukraine conflict related expenses (j)	—	2,487	—
Loss on extinguishment of debt (k)	—	6,763	—
Other charges (i)	2,892	1,974	3,046
Adjusted EBITDA	$ 320,379	$ 257,150	$ 274,109
Adjusted EBITDA margin (%) (o)	16.4 %	13.2 %	15.6
Adjusted EBITDA	$ 320,379	$ 257,150	$ 274,109
Less: Depreciation and amortization - adjusted (a)	83,020	81,514	87,002
Less: Interest expense, net	50,699	32,579	22,326
Less: Taxes on income (loss) before equity in net income of associated companies - adjusted (l)(n)	49,017	37,737	41,976
Non-GAAP net income	$ 137,643	$ 105,320	$ 122,805

Non-GAAP Earnings per Diluted Share Reconciliations	**For the years ending December 31,**		
	2023	**2022**	**2021**
GAAP earnings (loss) per diluted share attributable to Quaker Chemical Corporation common shareholders	$ 6.26	$ (0.89)	$ 6.7
Equity (income) loss in a captive insurance company per diluted share (f)	(0.12)	0.08	(0.2
Combination, integration and other acquisition-related (credits) expenses per diluted share (a)	(0.03)	0.49	0.8
Restructuring and related charges, net per diluted share (b)	0.32	0.13	0.0
Strategic planning expenses per diluted share (c)	0.21	0.63	–
Facility remediation (recovery) costs, net per diluted share (d)	(0.09)	(0.08)	0.0
Impairment charges per diluted share (e)	—	5.19	–
Currency conversion impacts of hyper-inflationary economies per diluted share (g)	0.44	0.09	0.0
Brazilian non-income tax credits per diluted share (h)	—	—	(0.4
Russia-Ukraine conflict related expenses per diluted share (j)	—	0.12	–
Loss on extinguishment of debt per diluted share (k)	—	0.29	–
Other charges per diluted share (i)	0.12	0.08	0.1
Impact of certain discrete tax items per diluted share (l)	0.54	(0.26)	(0.3
Non-GAAP earnings per diluted share (p)	$ 7.65	$ 5.87	$ 6.8

(a) Combination, integration and other acquisition-related (credits) expenses include certain legal, financial, and other advisory and consultant costs incurred in connection with the Combination integration activities including internal control readiness and remediation. These amounts also include expense associated with the Company's other recent acquisitions, including certain legal, financial, and other advisory and consultant costs incurred in connection with due diligence as well as costs associated with selling inventory from acquired businesses which was adjusted to fair value as part of purchase accounting. These costs are not indicative of the future operating performance of the Company. Approximately $0.2 million and $0.6 million for the years ended December 31, 2022 and 2021, respectively, of these pre-tax costs were considered non-deductible for the purpose of determining the Company's effective tax rate, and, therefore, taxes on income before equity in net income of associated companies - adjusted reflects the impact of these items. During 2021, the Company recorded $0.7 million of accelerated depreciation related to certain of the Company's facilities, which is included in the caption "Combination, integration and other acquisition-related (credits) expenses" in the reconciliation of operating income to non-GAAP operating income and included in the caption "Depreciation and amortization" in the reconciliation of net income attributable to the Company to EBITDA, but excluded from the caption "Depreciation and amortization – adjusted" in the reconciliation of adjusted EBITDA to non-GAAP net income attributable to the Company. During 2023, 2022 and 2021, the Company recorded $0.5 million of other income, $2.4 million of other expense and $0.6 million of other income, respectively, related to an indemnification asset. During 2021, the Company recorded $0.8 million related to the sale of inventory from acquired businesses which was adjusted to fair value. During 2022 and 2021, the Company recorded a gain of $0.2 million and $5.4 million, respectively, on the sale of certain held-for-sale real property assets related to the Combination. Each of these items are included in the caption "Combination, integration and other acquisition-related (credits) expenses" in the reconciliation of GAAP earnings per diluted share attributable to Quaker Chemical Corporation common shareholders to Non-GAAP earnings per diluted share as well as the reconciliation of Net Income attributable to Quaker Chemical Corporation to Adjusted EBITDA and Non-GAAP net income. See Notes 2, 9 and 10 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.

(b) Restructuring and related charges, net represent the costs incurred by the Company associated with the Company's restructuring programs. These costs are not indicative of the future operating performance of the Company. During 2023, 2022 and 2021, the Company recorded restructuring and related charges of $7.6 million, $3.2 million and $1.4 million, respectively. See Note 7 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.

(c) Strategic planning expenses include certain consultant and advisory expenses for the Company's long-term strategic planning, as well as process optimization and the next phase of the Company's long-term integration to further optimize its footprint, processes and other functions. These costs are not indicative of the future operating performance of the Company.

(d) Facility remediation (recovery) costs, net, presents the gross costs associated with remediation, cleaning and subsequent restoration costs associated with the property damage to certain of the Company's facilities, net of insurance recoveries received. These charges are non-recurring and are not indicative of the future operating performance of the Company. See Note 25 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(e) Impairment charges represents the non-cash charges taken to write down the value of goodwill and indefinite-lived intangible assets. These charges are not indicative of the future operating performance of the Company. See Note 15 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(f) Equity income (loss) in a captive insurance company represents the after-tax income attributable to the Company's interest in Primex, Ltd. ("Primex"), a captive insurance company. The Company holds a 32% investment in and has significant influence over Primex, and therefore accounts for this investment under the equity method of accounting. The income attributable to Primex is not indicative of the future operating performance of the Company and is not considered core to the Company's operations. See Note 16 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(g) Currency conversion impacts of hyper-inflationary economies represents the foreign currency remeasurement impacts associated with the Company's affiliates whose local economies are designated as hyper-inflationary under U.S. GAAP. During the years ended December 31, 2023, 2022 and 2021, the Company incurred non-deductible, pre-tax charges related to the Company's Argentina and Türkiye affiliates. The charges incurred related to the immediate recognition of foreign currency remeasurement in the Consolidated Statements of Income associated with these entities are not indicative of the future operating performance of the Company See Note 1 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(h) Brazilian non-income tax credits represent indirect tax credits related to certain of the Company's Brazilian subsidiaries prevailing in a legal claim as well as the Brazil Supreme Court ruling on these non -income tax matters. The non-income tax credit is non-recurring and not indicative of the future operating performance of the Company. See Note 25 of Note to Consolidated Financial Statements, which appears in Item 8 of this Report.

(i) Other charges include executive transition costs, pension and postretirement benefit costs (income), non-service components and charges incurred by an inactive subsidiary of the Company as a result of the termination of restrictions on insurance settlement reserves. These expenses are not indicative of the future operating performance of the Company. See Notes 1, 12 and 20 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.

(j) Russia-Ukraine conflict related expenses represent the direct costs associated with the Company's exit of operations in Russia during 2022, primarily employee separation benefits, as well as costs associated with establishing specific reserves or changes to existing reserves for trade accounts receivable within the Company's EMEA reportable segment due to the economic instability associated with certain customer accounts receivables which have been directly impacted by the current economic conflict between Russia and Ukraine or the Company's decision to end operations in Russia. These expenses are not indicative of the future operating performance of the Company. See Note 12 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(k) In connection with executing the Credit Facility, the Company recorded a loss on extinguishment of debt of approximately $6.8 million which includes the write-off of certain previously unamortized deferred financing costs as well as a portion of the third-party and creditor debt issuance costs incurred to execute the Credit Facility. These expenses are not indicative of the future operating performance of the Company. See Note 19 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(l) The impacts of certain discrete tax items include certain impacts of tax law changes, valuation allowance adjustments, uncertain tax positions and prior year true-ups, and the impact on certain intercompany asset transfers. For 2023 the impacts also include $6.7 million of withholding taxes for the repatriation of non-U.S. earnings. The Company does not believe these items are core or indicative of future performance and has adjusted them as a Non-GAAP measure. See Note 10 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.

(m) Depreciation and amortization includes $1.0 million for both of the years ended December 31, 2023 and 2022, respectively, and $1.2 million for the year ended December 31, 2021, of amortization expense recorded within equity in net income of associated companies in the Company's Consolidated Statements of Operations, which is attributable to the amortization of the fair value step up for the Company's 50% interest Korea Houghton Corporation as a result of required purchase accounting.

(n) Taxes on income before equity in net income of associated companies – adjusted presents the impact of any current and deferred income tax expense (benefit), as applicable, of the reconciling items presented in the reconciliation of net income attributable to Quaker Chemical Corporation to adjusted EBITDA and was determined utilizing the applicable rates in the taxing jurisdictions in which these adjustments occurred, subject to deductibility.

(o) The Company calculates adjusted EBITDA margin and non-GAAP operating margin as the percentage of adjusted EBITDA and non-GAAP operating income to consolidated net sales.

(p) The Company calculates non-GAAP earnings per diluted share as non-GAAP net income attributable to the Company per weighted average diluted shares outstanding using the "two-class share method" to calculate such in each given period.

Off-Balance Sheet Arrangements

The Company had approximately $5 million of bank letters of credit and guarantees as of December 31, 2023. The bank letters of credit and guarantees are not significant to the Company's liquidity or capital resources. See Note 19 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Operations

Consolidated Operations Review – Comparison of 2023 with 2022

Net sales were a record $1,953.3 million in 2023 compared to $1,943.6 million in 2022. The increase in net sales of approximately $9.7 million or 1% year-over-year was primarily due to an increase in selling price and product mix of 7% and approximately 1% favorable impact of foreign currency translations, partially offset by a decline in sales volumes of approximately 7%. The increase in selling price and product mix was primarily driven by year-over-year impact of our value-based pricing initiatives. The decline in sales volumes was primarily attributable to softer end market conditions across all regions, including the direct and indirect impacts of the UAW strike, the Company's value-based pricing initiatives and customer order patterns, as well as the impacts of the ongoing war in Ukraine in the EMEA segment, and the wind-down of the tolling agreement for products previously divested related to the Combination, partially offset by new business wins in all segments, as mentioned above.

COGS were $1,247.7 million in 2023 compared to $1,330.9 million in 2022. The decrease in COGS of 6% reflects lower spend on the decline in current year sales volumes, which more than offset higher costs due to inflationary pressures in the Company's global raw material, manufacturing and supply chain and logistics costs compared to the prior year.

Gross profit in 2023 of $705.6 million increased $93.0 million or approximately 15% from 2022. The Company's reported gross margin in 2023 was 36.1% compared to 31.5% in 2022. The Company's current year improvement in gross margin was primarily driven by the year-over-year impact of our value-based pricing and margin improvement initiatives.

SG&A in 2023 increased $28.2 million compared to 2022 driven by higher labor-related costs including year-over-year inflationary increases and higher levels of incentive compensation on improved Company performance, partially offset by lower SG&A due to foreign currency translation compared to the prior year.

During 2022, the Company incurred $8.8 million of Combination, integration and other acquisition-related expenses. See the Non-GAAP Measures section of this Item, above. There were no similar costs incurred during 2023.

The Company incurred Restructuring and related charges of $7.6 million and $3.2 million during 2023 and 2022, respectively, related to the Company's previous and current restructuring programs. See the Non-GAAP Measures section of this Item, above.

In 2022, the Company recorded a $93.0 million non-cash impairment charge to write down the value of goodwill associated with the Company's EMEA reportable segment. This non-cash impairment charge was the result of the Company's trigger based fourth quarter of 2022 impairment assessment. There were no similar impairment charges in 2023. See the Critical Accounting Policies and Estimates section as well as the Non-GAAP Measures section, of this Item, above.

Operating income in 2023 was $214.5 million compared to $52.3 million in 2022. Excluding the non-cash impairment charge, as well as other non-core items that are not indicative of future operating performance, the Company's current year non-GAAP operating income was $227.8 million compared to $177.9 million in the prior year. The increase in non-GAAP operating income was primarily due to higher gross profit partially offset by higher SG&A, as described above.

The Company had Other expense of $10.7 million in 2023 compared to $12.6 million in 2022. The 2023 and 2022 results include $2.1 million and $1.8 million, respectively of facility remediation recoveries, while prior year's Other expense also includes $6.8 million of loss on extinguishment of debt related to the Company's refinancing the Original Credit Facility and $2.4 million of expense related to an indemnification asset. Also, there were higher foreign currency transaction losses in 2023 compared to 2022.

Interest expense, net, increased $18.1 million compared to 2022, primarily driven by increases in the average borrowings outstanding coupled with an increase in interest rates year-over-year as the weighted average interest rate incurred on borrowings under the Company's primary credit facility was approximately 6.2% during 2023 compared to approximately 3.0% during 2022.

The Company's effective tax rates for 2023 and 2022 were an expense of 36.3% and 350.2%, respectively. The Company's current year effective tax rate was primarily impacted by changes to the valuation allowance for and the usage of certain foreign tax credits, withholding taxes and deferred taxes on unremitted earnings, and the impact of the mix of pre-tax earnings. The Company's 2022 effective tax rate was driven by the non-cash impairment charge, the impact of pre-tax earnings and the mix of such earnings, foreign tax inclusions and withholding taxes, partially offset by a reduction in reserves for uncertain tax positions and changes in the valuation allowance for foreign tax credits. Excluding the impact of all non-core items in each year, described in the Non-GAAP Measures section of this Item, above, the Company estimates that the 2023 and 2022 effective tax rates would have been approximately 28% and 27%, respectively. The higher estimated current year effective tax rate was primarily driven by pre-tax earnings and the mix of such earnings. In 2023, the Company recognized $6.7 million of withholding taxes for the repatriation of non-U.S. earnings that the Company does not believe is core or indicative of future performance and has adjusted these withholding taxes as a Non-GAAP measure. The Company may experience continued volatility in its effective tax rates due to several factors, including the timing of tax audits and the expiration of applicable statutes of limitations as they relate to uncertain tax positions, the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, and the timing and amount of certain share-based compensation-related tax benefits, among other factors. In addition, the foreign tax credit valuation allowance, or absence thereof, is based on a number of variables, including forecasted earnings, which may vary.

Equity in net income of associated companies increased $13.4 million in 2023 compared to 2022, primarily due to higher current year income from the Company's interest in a captive insurance company (see the Non-GAAP Measures section of this Item, above) due to higher market performance on equity investments and from the Company's 50% interest in a joint venture in Korea due to overall market improvement.

Net income attributable to noncontrolling interest was approximately $0.1 million for both 2023 and 2022.

Foreign exchange negatively impacted the Company's yearly results by approximately 1% driven by the impact from foreign currency translation on earnings as well as higher foreign exchange transaction losses in the current year as compared to the prior year.

Consolidated Operations Review – Comparison of 2022 with 2021

Net sales were a record $1,943.6 million in 2022 compared to $1,761.2 million in 2021. The increase in net sales of approximately $182.4 million or 10% year-over-year was primarily due to an increase in selling price and product mix of approximately 22% and additional net sales from acquisitions of 1%, partially offset by a decline in sales volumes of approximately 7% and the unfavorable impact from foreign currency translation of approximately 6%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material and other input costs that began during 2021 and continued throughout 2022. The decline in sales volumes was primarily attributable to softer end market demand, particularly in the EMEA and Asia/Pacific segments, the wind-down of the tolling agreement for products previously divested related to the Combination and the impact of the ongoing war in Ukraine, partially offset by net new business wins, including the impact of the Company's ongoing value-based pricing initiatives. The impact from foreign currency translation is primarily the result of the year-over-year strengthening of the U.S. Dollar compared to major world currencies including the Euro and the Chinese renminbi.

COGS were $1,330.9 million in 2022 compared to $1,166.5 million in 2021. The increase in COGS of 14% was driven by the continued increases in the Company's global raw material, manufacturing and supply chain and logistics costs compared to the prior year.

Gross profit in 2022 of $612.7 million increased $18.0 million or approximately 3% from 2021. The Company's reported gross margin in 2022 was 31.5% compared to 33.8% in 2021. The Company's current year gross margin reflects a significant increase in raw material and other input costs and the impacts of constraints on the global supply chain, partially offset by the Company's ongoing value-based pricing initiatives.

SG&A in 2022 increased $36.6 million compared to 2021 due primarily to the impact of sales increases on direct selling costs, higher operating costs due to inflationary pressures, costs associated with strategic planning initiatives (see the Non-GAAP Measures section of this Item, above), and additional SG&A from recent acquisitions, partially offset by lower SG&A due to foreign currency translation compared to the prior year. In addition, SG&A was lower in the prior year period as a result of continued temporary cost saving measures the Company implemented in response to the onset of COVID-19.

During 2022 and 2021, the Company incurred $8.8 million and $23.9 million, respectively, of Combination, integration and other acquisition-related expenses. See the Non-GAAP Measures section of this Item, above.

The Company incurred restructuring expenses of $3.2 million and $1.4 million during 2022 and 2021, respectively, related to the Company's restructuring programs. See the Non-GAAP Measures section of this Item, above.

In 2022, the Company recorded a $93.0 million non-cash impairment charge to write down the value of goodwill associated with the Company's EMEA reportable segment. This non-cash impairment charge is the result of the Company's trigger based fourth quarter of 2022 impairment assessment. There were no similar impairment charges in 2021. See the Critical Accounting Policies and Estimates section as well as the Non-GAAP Measures section, of this Item, above.

Operating income in 2022 was $52.3 million compared to $150.5 million in 2021. Excluding the non-cash impairment charge, as well as other non-core items that are not indicative of future operating performance, the Company's current year non-GAAP operating income was $177.9 million compared to $182.6 million in the prior year. The decline in non-GAAP operating income was primarily due to higher SG&A, as described above.

Other expense in 2022 includes $6.8 million of loss on extinguishment of debt related to the Company's refinancing the Original Credit Facility, partially offset by $1.8 million of facility remediation insurance recoveries and $2.4 million of income related to an indemnification asset. Other income in 2021 includes $13.1 million of non-income tax credits recorded by the Company's Brazilian subsidiaries as well as a $4.8 million gain on the sale of certain held-for-sale real property assets. See the Non-GAAP Measures section of this Item, above. In addition, foreign exchange losses, net, were higher in 2022 as compared to 2021.

Interest expense, net, increased $10.3 million compared to 2021, primarily driven by increases in the average borrowings outstanding coupled with an increase in interest rates year-over-year as the weighted average interest rate incurred on borrowings under the Company's primary credit facility was approximately 3.0% during 2022 compared to approximately 1.6% during 2021. This was partially offset by lower amortization of debt issuance costs in 2022 as compared to 2021 due to the June 2022 credit facility amendment and write off of certain previously capitalized debt issuance costs.

The Company's effective tax rates for 2022 and 2021 were an expense of 350.2% and an expense of 23.8%, respectively. The Company's current year effective tax rate was largely driven by the non-cash impairment charge described above and to a lesser extent a decline in profits, earnings mix, foreign tax inclusions and withholding taxes, partially offset by a reduction in reserves for uncertain tax positions and changes in the valuation allowance for foreign tax credits. The Company's 2021 effective tax rate was driven by a higher level of pre-tax earnings and mix of earnings, as well as deferred taxes on unremitted earnings. In addition, the rate was impacted by certain one-time charges and benefits related to an intercompany intangible asset transfer and related royalty income recognition offset by changes in the valuation allowance for foreign tax credits. Excluding the impact of all non-core items in each year, described in the Non-GAAP Measures section of this Item, above, the Company estimates that the 2022 and 2021 effective tax rates would have been approximately 27% and 26%, respectively. The higher estimated current year tax rate was primarily driven by a lower level of pre-tax earnings and the impact of changes in mix of earnings. The Company may experience continued volatility in its effective tax rates due to several factors, including the timing of tax audits and the expiration of applicable statutes of limitations as they relate to uncertain tax positions, the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, the treatment of certain acquisition-related costs and the timing and amount of certain share-based compensation-related tax benefits, among other factors. In addition, the foreign tax credit valuation allowance, or absence thereof, is based on a number of variables, including forecasted earnings, which may vary.

Equity in net income of associated companies decreased $7.4 million in 2022 compared to 2021, primarily due to lower current year income from the Company's interest in a captive insurance company (see the Non-GAAP Measures section of this Item, above) due to lower market performance on equity investments and from the Company's 50% interest in a joint venture in Korea due to overall market challenges.

Net income attributable to noncontrolling interest was less than $0.1 million for both 2022 and 2021.

Foreign exchange negatively impacted the Company's yearly results by approximately 8% driven by the negative impact from foreign currency translation on earnings as well as higher foreign exchange transaction losses in the current year as compared to the prior year.

Reportable Segments Review - Comparison of 2023 with 2022

The Company's reportable segments reflect the structure of the Company's internal organization, the method by which the Company's resources are allocated and the manner by which the chief operating decision maker of the Company assesses its performance. During the first quarter of 2023, the Company reorganized its executive management team to align with its new business structure. The Company's new structure includes three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific.

The three segments are comprised of the assets and operations in each respective region, including assets and operations formerly included in the Global Specialty Businesses segment. Prior to the Company's reorganization, the Company's historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses. Prior period information has been recast to reflect the Company's new reportable segments. However, the Company did not recast the carrying amount of goodwill for the years ended December 31, 2022 and 2021. See Notes 1, 4, 5, and 15 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Segment operating earnings for the Company's reportable segments are comprised of net sales less COGS and SG&A directly related to the respective segment's sales of products and services. Operating expenses not directly attributable to the net sales of each respective segment, such as certain corporate and administrative costs, Combination, integration and other acquisition-related expenses and Restructuring and related charges, are not included in segment operating earnings. Other items not specifically identified with the Company's reportable segments include interest expense, net, and other income (expense), net.

Americas

Americas represented approximately 50% of the Company's consolidated net sales in 2023. The segment's net sales were $977.1 million, an increase of $30.6 million or 3% compared to 2022. The increase in net sales was due to higher selling price and product mix of 8% and favorable foreign currency impacts of 1%, partially offset by a decrease in sales volumes of approximately 6%. The decline in sales volumes was primarily driven by softer market conditions, customer order patterns, the direct and indirect impacts of the UAW strike, and the Company's value-based pricing initiatives, partially offset by new business wins. The increase in selling price and product mix was primarily driven by value-based price increases implemented to offset the significant increases in raw material, manufacturing and other input costs. The favorable foreign exchange impact was primarily due to the weakening of the U.S. dollar against the Mexican peso. This segment's operating earnings were $266.0 million, an increase of $42.4 million or 19% compared to 2022 primarily driven by an increase in net sales and an improvement in segment operating margins driven by the Company's ongoing margin improvement initiatives.

EMEA

EMEA represented approximately 29% of the Company's consolidated net sales in 2023. The segment's net sales were $571.3 million, an increase of $8.8 million or 2% compared to 2022. The increase in net sales was a result of a 9% increase in selling price and a favorable impact from foreign currency translation of 2%, which was partially offset by a decrease in sales volumes of approximately 9%. The increase in selling price and product mix was primarily driven by value-based price increases implemented to offset the significant increases in raw material, manufacturing and other input costs. The favorable foreign currency translation impact was primarily due to the weakening of the U.S. dollar against the Euro. The decrease in sales volumes was primarily driven by softer market conditions, the Company's value-based pricing initiatives, customer order patterns and the impacts of the wind-down of the tolling agreement for products previously divested related to the Combination as well as the ongoing war in Ukraine, partially offset by new business wins. This segment's operating earnings were $104.8 million, an increase of $28.4 million or 37% compared to 2022. The increase in segment operating earnings was primarily driven by an increase in net sales and an improvement in segment operating margins driven by the Company's ongoing margin improvement initiatives.

Asia/Pacific

Asia/Pacific represented approximately 21% of the Company's consolidated net sales in 2023. The segment's net sales were $404.9 million, a decrease of 7% or approximately $29.7 million compared to 2022. The decrease in net sales was a result of lower sales volumes of 7% and an unfavorable impact from foreign currency translation of 4%, partially offset by a 4% increase in selling price and product mix. The decrease in sales volumes was primarily driven by softer end market conditions and the impacts of the Company's value-based pricing initiatives, partially offset by new business wins. The increase in selling price and product mix was primarily driven by value-based price increases implemented to offset the significant increases in raw material, manufacturing and other input costs. The unfavorable foreign exchange impact was primarily due to the strengthening of the U.S. dollar against the Chinese renminbi. This segment's operating earnings were $118.5 million, an increase of $12.6 million or 12% compared to 2022 as a result of higher gross margins reflecting the Company's value-based pricing initiatives and the Company's ongoing margin improvement initiatives.

Reportable Segments Review – Comparison of 2022 with 2021

Americas

Americas represented approximately 49% of the Company's consolidated net sales in 2022. The segment's net sales were $946.5 million, an increase of $184.3 million or 24% compared to 2021. The increase in net sales was due to higher selling price and product mix of 28% and additional net sales from acquisition of 1%, partially offset by a decrease in organic sales volumes of approximately 5%. The increase in selling price and product mix is primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The current year decline in organic sales volumes was primarily driven by softer end market conditions, primarily in the automotive industry, due to the semiconductor supply constraints and to a lesser extent the primary metals markets, the wind-down of the tolling agreement for products previously divested related to the Combination, the Company's ongoing value-based pricing initiatives, partially offset by net new business wins. This segment's operating earnings were $223.6 million, an increase of $47.4 million or 27% compared to 2021 primarily driven by higher margins as the Company's ongoing value-based pricing initiatives offset the ongoing inflationary pressures on the business.

EMEA

EMEA represented approximately 29% of the Company's consolidated net sales in 2022. The segment's net sales were $562.5 million, a decrease of $1.6 million or less than 1% compared to 2021. The decrease in net sales was a result of a 20% increase in selling price and product mix and additional net sales from acquisition of 2% which was more than offset by an unfavorable impact of foreign currency translation of 15% and a decrease in sales volumes of 7%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The decrease in sales volumes was primarily driven by current geopolitical and macroeconomic pressures including the direct and indirect impacts of the ongoing war in Ukraine and the impact of the economic and other sanctions by other nations on Russia in response to the war, as well as the wind-down of the tolling agreement for products previously divested related to the Combination and softer economic conditions in the region. The significant and unfavorable foreign currency translation impact was primarily due to the strengthening of the U.S. dollar against the euro. This segment's operating earnings were $76.4 million, a decrease of $34.6 million or 31% compared to 2021. The decrease in segment operating earnings was primarily a result of lower net sales, lower gross margins, and inflationary pressures on other costs, including SG&A.

Asia/Pacific

Asia/Pacific represented approximately 22% of the Company's consolidated net sales in 2022. The segment's net sales were $434.6 million, a decrease of less than 1% or approximately $0.3 million compared to 2021. The decrease in net sales was a result of a 15% increase in selling price and product mix offset by lower sales volumes of 10% and an unfavorable impact from foreign currency translation of 5%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The decline in sales volumes was primarily driven by softer market conditions, primarily in China, in part as a result of the government imposed COVID-19 quarantine and related production disruptions implemented at the end of March 2022 and continued throughout 2022, partially offset by net new business wins. The unfavorable foreign exchange impact was primarily due to the strengthening of the U.S. dollar against the Chinese renminbi. This segment's operating earnings were $105.8 million, a decrease of $3.4 million or 3% compared to 2021 as a result of lower net sales, lower gross margins, and inflationary pressures on other costs, including SG&A.

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. This includes certain soil and groundwater contamination the Company identified in 1992 at AC Products, Inc. ("ACP"), a wholly owned subsidiary. In voluntary coordination with the Santa Ana California Regional Water Quality Board, ACP has been remediating the contamination. In 2007, ACP agreed to operate two groundwater treatment systems, so as to hydraulically contain groundwater contamination emanating from ACP's site until such time as the concentrations of contaminants are below the current Federal maximum contaminant level for four consecutive quarterly sampling events. In 2014, ACP ceased operation at one of its two groundwater treatment systems, as it had met the above condition for closure. In 2020, the Santa Ana Regional Water Quality Control Board asked that ACP conduct some additional indoor and outdoor soil vapor testing on and near the ACP site to confirm that ACP continues to meet the applicable local standards and ACP has begun the testing program. Such testing began in 2020 and continued into 2021. As of December 31, 2023, 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, 2023, the Company believes that the range of potential-known liabilities associated with the balance of the 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 determined by groundwater modeling. Costs of operation include the operation and maintenance of the extraction well, groundwater monitoring, program management, and soil vapor testing.

The Company is also party to environmental matters related to certain domestic and foreign properties. These environmental matters primarily require the Company to perform long-term monitoring as well as operating and maintenance at each of the applicable sites. During the year ended December 31, 2023, there have been no significant changes to the facts or circumstances of these matters, aside from ongoing monitoring and maintenance activities and routine payments associated with each of these sites. The Company continually evaluates its obligations related to such matters, and based on historical costs incurred and projected costs to be incurred over the next 26 years, has estimated the present value range of costs for all of these environmental matters, on a discounted basis, to be between approximately $5.0 million and $6.0 million as of December 31, 2023, for which $5.1 million is accrued within other accrued liabilities and other non-current liabilities on the Company's Consolidated Balance Sheet as of December 31, 2023. Comparatively, as of December 31, 2022, the Company had $5.3 million accrued with respect to these matters. These accrued amounts are inclusive of the Brazilian environmental matter discussed below.

The Company's Sao Paulo, Brazil site was required under Brazilian environmental, health and safety regulations to perform an environmental assessment as part of a permit renewal process. Initial investigations identified soil and ground water contamination in select areas of the site. The site has conducted a multi-year soil and groundwater investigation and corresponding risk assessments based on the result of the investigations. In 2017, the site had to submit a new 5-year permit renewal request and was asked to complete additional investigations to further delineate the site based on review of the technical data by the local regulatory agency, Companhia Ambiental do Estado de São Paulo ("CETESB"). Based on review of the updated investigation data, CETESB issued a Technical Opinion regarding the investigation and remedial actions taken to date. The site developed an action plan and submitted it to CETESB in 2018 based on CETESB requirements. The site intervention plan primarily requires the site, amongst other actions, to conduct periodic monitoring for methane in soil vapors, source zone delineation, groundwater plume delineation, bedrock aquifer assessment, update the human health risk assessment, develop a current site conceptual model and conduct a remedial feasibility study and provide a revised intervention plan. In 2020, the site submitted a report on the activities completed including the revised site conceptual model and results of the remedial feasibility study and recommended remedial strategy for the site.

The Company believes that it has made adequate accruals for costs associated with other environmental matters of which it is aware. Approximately $0.2 million and $0.3 million were accrued as of December 31, 2023 and 2022, respectively, to provide for such anticipated future environmental assessments and remediation costs.

Notwithstanding the foregoing, the Company cannot be certain that future liabilities in the form of remediation expenses and damages will not exceed amounts reserved. See Note 25 of Notes to Consolidated Financial Statements in Item 8 of this Report.

General

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

PART IV

Item 15. ***Exhibits and Financial Statement Schedules.***

(a) Exhibits

(b) No financial statements or schedules are filed with this report on Form 10-K/A.

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):

2.1	—	Share Purchase Agreement, dated April 4, 2017, by and among Quaker Chemical Corporation, a Pennsylvania corporation, Gulf Houghton Lubricants, Ltd., an exempted company incorporated under the laws of the Cayman Islands, Global Houghton Ltd., an exempted company incorporated under the laws of the Cayman Islands, and certain members of the management of Global Houghton Ltd. and Gulf Houghton Lubricants, Ltd., as agent for the Sellers. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K, filed on April 5, 2017.***
3.1	—	Amended and Restated Articles of Incorporation (as amended through July 24, 2019). Incorporated by reference to Exhibit 3.1 as filed by the Registrant with its quarterly report on Form 10-Q on August 1, 2019.
3.2	—	Amended and Restated By-laws (effective December 19, 2022). Incorporated by reference to Exhibit 3.1 as filed by Registrant within its current report on Form 8-K on December 20, 2022.
4.1	—	Registration Rights, dated August 1, 2019, issued to certain members of the management of Global Houghton Ltd. and Gulf Houghton Lubricants, Ltd. by Quaker Chemical Corporation. Incorporated by reference to Exhibit 4.5 as filed by Registrant on Form S-3 on August 29, 2019.
4.2	—	Description of Quaker Houghton common stock. Incorporated by reference to Exhibit 4.2 as filed by the Registrant with Form 10-K for the year ended 2019.
10.1	—	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(k) as filed by the Registrant with Form 10-Q for the quarter ended September 30, 2007.
10.2	—	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.
10.3	—	Memorandum of Employment by and between Registrant and Joseph Berquist dated April 1, 2010. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2010.†
10.4	—	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.†
10.5	—	Employment Agreement by and between Registrant and Joseph Berquist dated August 18 2021, effective on September 9, 2021. Incorporated by reference to Exhibit 10.3 as filed by the registrant with Form 10-Q for the quarter ended September 30, 2021.†
10.6	—	Employment Agreement by and between Registrant and Andrew Tometich dated September 2, 2021, effective on October 11, 2021. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended September 30, 2021.†
10.7	—	Change in Control Agreement by and between Registrant and Andrew Tometich dated September 2, 2021, effective on October 11, 2021. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended on September 30, 2021.†
10.8	—	Form of Change of Control Agreement by and between the Registrant and certain executive officers (including Robert Traub, Jeewat Bijlani, and David Slinkman). Incorporated by reference to Exhibit 10.4 as filed by the Registrant with Form 10-Q, filed on November 12, 2019.†
10.9	—	Memorandum of Employment by and between the Registrant and Shane Hostetter dated and effective April 19, 2021. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended on March 31, 2021.†
10.10	—	Form of Change of Control Agreement by and between the Registrant and Shane Hostetter dated and effective April 19, 2021. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter that ended on March 31, 2021.†

10.11	—	Memorandum of Employment by and between the Registrant and Melissa Leneis dated May 24, 2022 and effective July 5, 2022. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2022.†
10.12	—	Form of Change of Control Agreement by and between the Registrant and certain executive officers (including Melissa Leneis). Incorporated by reference to Exhibit 10.3 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2022.†
10.13	—	Memorandum of Employment by and between the Registrant and Dhruwa Rai dated June 23, 2022 and effective July 6, 2022. Incorporated by reference to Exhibit 10.4 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2022.†
10.14	—	Memorandum of Employment by and between the Registrant and Jeffrey Kutz dated November 30, 2023 and effective January 2, 2024 (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024). †
10.15	—	Employment Agreement by and between the Registrant and Anna Ransley dated July 31, 2023, effective July 31,2023. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2023.†
10.16	—	Form of Change of Control Agreement by and between the Registrant and certain executive officers (including Anna Ransley). Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended June 30, 2023.†
10.17	—	Employment Agreement by and between the Registrant and Jeffrey Fleck dated January 23, 2023, effective February 27, 2023. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2023.†
10.18	—	Form of Change of Control Agreement by and between the Registrant and certain executive officers (including Jeffrey Fleck). Incorporated by reference to Exhibit 10.2 as filed by the Registrant with Form 10-Q for the quarter ended March 31, 2023.†
10.19	—	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.†
10.20	—	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.†
10.21	—	Quaker Chemical Corporation 2023 Director Stock Ownership Plan. Incorporated by reference to Appendix A to the Registrant's definitive proxy statement filed on March 31, 2023.†
10.22	—	Retirement Savings Plan, as amended and restated effective January 22, 2021, approved November 1, 2021.†
10.23	—	Quaker Houghton Annual Incentive Plan (as amended and restated effective November 17, 2021).†
10.24	—	2016 Long-Term Performance Incentive Plan. Incorporated by reference to Appendix C to the Registrant's definitive proxy statement filed on March 28, 2016.†
10.25	—	Form of Restricted Stock Award Agreement for executive officers and other employees under Registrant's 2016 Long- Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.3 as filed by Registrant with Form 8-K filed on May 6, 2016.†
10.26	—	Form of Restricted Stock Unit Agreement for executive officers and other employees under Registrant's 2016 Long- Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.4 as filed by Registrant with Form 8-K filed on May 6, 2016.†
10.27	—	Form of Stock Option Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.30 as filed by the Registrant with Form 10-K for the year ended 2019.†
10.28	—	Chief Executive Officer Transition Agreement dated April 22, 2021, effective December 31, 2021. Incorporated by reference to Exhibit 10.4 as filed by the Registrant with Form 10-Q for the quarter ended on March 31, 2021.†
10.29	—	Form of Restricted Stock Award Agreement for non-employee directors under Registrant's 2016 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 on June 30, 2021.†

10.30	—	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 10.2 as filed by the Registrant with Form 10- Q for the quarter ended on June 30, 2021. †
10.31	—	Form of Incentive Stock Option Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.3 as filed by the Registrant with Form 10-Q for the quarter ended on June 30, 2021.†
10.32	—	Form of Non-Qualified Stock Option Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.4 as filed by the Registrant with Form 10-Q for the quarter ended on June 30, 2021.†
10.33	—	Form of Restricted Stock Unit Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.5 as filed by the Registrant with Form 10-Q for the quarter ended on June 30, 2021.†
10.34	—	Form of Performance Stock Unit Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.6 as filed by the Registrant with Form 10-Q for the quarter ended on June 30, 2021.†
10.35	—	Form of Performance Stock Unit Award Agreement for executive officers and other employees under Registrant's 2016 Long-Term Performance Incentive Plan. Incorporated by reference to Exhibit 10.3 as filed by the Registrant with Form 10-Q for the quarter ended on March 31, 2023.†
10.36	—	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.
10.37	—	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.
10.38	—	Senior Secured Credit Facilities Commitment Letter, dated April 4, 2017, by and among Quaker Chemical Corporation, Bank of America, N.A., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Deutsche Bank AG New York Branch and Deutsche Bank Securities Inc. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K, filed on April 7, 2017.
10.39	—	Credit Agreement, dated as of August 1, 2019, among Quaker Chemical Corporation and certain of its subsidiaries, Banks of America, N.A. and each of the lenders from time to time party thereto. Incorporated by reference to Exhibit 10.3 as filed by Registrant with Form 8-K filed on August 2, 2019.***
10.40	—	Amendment No. 1, dated as of March 17, 2020, to the Credit Agreement, dated as of August 1, 2019. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K filed on March 17, 2020.
10.41	—	Amendment No. 2, dated as of December 10, 2021, to the Credit Agreement, dated as of August 1, 2019.
10.42	—	Amendment No. 3, dated as of June 17, 2022, to the Credit Agreement, dated as of August 1, 2019, as amended. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with Form 8-K filed on June 21, 2022.
10.43	—	Shareholder Agreement, dated August 1, 2019, among Quaker Chemical Corporation, Gulf Hungary Holding Korlátolt Felelősségű Társaság, Gulf Oil International, Ltd. and GOCL Corporation Limited. Inc. Incorporated by reference to Exhibit 10.1 as filed by Registrant with Form 8-K filed on August 2, 2019.
10.44	—	Escrow Agreement, dated August 1, 2019, among Quaker Chemical Corporation, Gulf Houghton Lubricants, Ltd. and Citibank N.A. Incorporated by reference to Exhibit 4.4 as filed by Registrant on Form S-3 on August 29, 2019.***
10.45	—	Amendment No 1, effective March 1, 2020, to the Quaker Houghton Retirement Savings Plan. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with its quarterly report on Form 10-Q on May 11, 2020.†
10.46	—	Amendment No 2, effective February 10, 2020, to the Quaker Houghton Retirement Savings Plan. Incorporated by reference to Exhibit 10.1 as filed by the Registrant with its quarterly report on Form 10-Q on August 5, 2020.†
10.47	—	Amendment No 3, effective April 17, 2020, to the Quaker Houghton Retirement Savings Plan. Incorporated by reference to Exhibit 10.2 as filed by the Registrant with its quarterly report on Form 10-Q on August 5, 2020.†
21.0	—	Subsidiaries and Affiliates of the Registrant (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024).
23.0	—	Consent of Independent Registered Public Accounting Firm (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024).

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 Andrew E. Tometich pursuant to 18 U.S.C. Section 1350 (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024).
32.2	—	Certification of Shane W. Hostetter pursuant to 18 U.S.C. Section 1350 (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024).
97.0	—	Quaker Houghton Compensation Recoupment Policy (previously filed with the Annual Report on Form 10-K filed with the SEC on February 29, 2024).
101.INS	—	Inline XBRL Instance Document*
101.SCH	—	Inline XBRL Taxonomy Extension Schema Document*
101.LAB	—	Inline XBRL Taxonomy Label Linkbase Document*
101.PRE	—	Inline XBRL Taxonomy Presentation Linkbase Document*
104.0	—	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101.INS)*

*	Filed herewith.
***	Certain exhibits and schedules have been omitted, and the Company agrees to furnish supplementally to the Securities and Exchange commission a copy of any omitted exhibits and schedules upon request.
†	Management contract or compensatory plan

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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/ ANDREW E. TOMETICH

Andrew E. Tometich
Director, Chief Executive Officer and President

Date: March 14, 2024

EXHIBIT 31.1

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

I, Andrew E. Tometich, certify that:

1. I have reviewed this Amendment No. 1 to the Annual Report on Form 10-K of Quaker Chemical Corporation;

2. Based on my knowledge, this Amendment No. 1 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 Amendment No. 1; and

3. Based on my knowledge, the financial statements, and other financial information included in this Amendment No. 1 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 Amendment No. 1.

Date: March 14, 2024

/s/ ANDREW E. TOMETICH

Andrew E. Tometich

Chief Executive Officer

EXHIBIT 31.2

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

I, Shane W. Hostetter, certify that:

1. I have reviewed this Amendment No. 1 to the Annual Report on Form 10-K of Quaker Chemical Corporation;

2. Based on my knowledge, this Amendment No. 1 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 Amendment No. 1; and

3. Based on my knowledge, the financial statements, and other financial information included in this Amendment No. 1 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 Amendment No. 1.

Date: March 14, 2024

/s/ Shane W. Hostetter

Shane W. Hostetter
Chief Financial Officer