UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2022

OR

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

For the transition period from to

Commission file number 1-12154

Waste Management, Inc.

(Exact name of registrant as specified in its charter)

Delaware *(State or other jurisdiction of incorporation or organization)*	**73-1309529** *(I.R.S. Employer Identification No.)*
800 Capitol Street **Suite 3000** **Houston, Texas** *(Address of principal executive offices)*	**77002** *(Zip code)*

Registrant's telephone number, including area code:
(713) 512-6200

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

Title of Each Class	Trading Symbol	Name of Each Exchange on Which Registered
Common Stock, $0.01 par value	WM	New York Stock Exchange

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined by 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 Regulations S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 ☑

The aggregate market value of the voting stock held by non-affiliates of the registrant as of June 30, 2022 was approximately $63.1 billion. The aggregate market value was computed by using the closing price of the common stock as of that date on the New York Stock Exchange ("NYSE"). (For purposes of calculating this amount only, all directors and executive officers of the registrant have been treated as affiliates.)

The number of shares of Common Stock, $0.01 par value, of the registrant outstanding as of January 31, 2023 was 408,152,162 (excluding treasury shares of 222,130,299).

DOCUMENTS INCORPORATED BY REFERENCE

Document	Incorporated as to
Proxy Statement for the 2023 Annual Meeting of Stockholders	Part III

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PART I

Item 1. *Business.*

General

Waste Management, Inc. is a holding company and all operations are conducted by its subsidiaries. When the terms "the Company," "we," "us" or "our" are used in this document, those terms refer to Waste Management, Inc., together with its consolidated subsidiaries and consolidated variable interest entities. When we use the term "WMI," we are referring only to Waste Management, Inc., the parent holding company.

WMI was incorporated in Oklahoma in 1987 under the name "USA Waste Services, Inc." and was reincorporated as a Delaware company in 1995. In a 1998 merger, the Illinois-based waste services company formerly known as Waste Management, Inc. became a wholly-owned subsidiary of WMI and changed its name to Waste Management Holdings, Inc. ("WM Holdings"). At the same time, our parent holding company changed its name from USA Waste Services to Waste Management, Inc. Like WMI, WM Holdings is a holding company and all operations are conducted by subsidiaries.

Our principal executive offices are located at 800 Capitol Street, Suite 3000, Houston, Texas 77002. Our telephone number is (713) 512-6200. Our website address is www.wm.com. Our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K are all available, free of charge, on our website as soon as practicable after we file the reports with the SEC. Our stock is traded on the New York Stock Exchange under the symbol "WM."

We are North America's leading provider of comprehensive environmental solutions, providing services throughout the United States ("U.S.") and Canada. We partner with our residential, commercial, industrial and municipal customers and the communities we serve to manage and reduce waste at each stage from collection to disposal, while recovering valuable resources and creating clean, renewable energy. Our "Solid Waste" business is operated and managed locally by our subsidiaries that focus on distinct geographic areas and provide collection, transfer, disposal, and recycling and resource recovery services. Through our subsidiaries, including our Waste Management Renewable Energy ("WM Renewable Energy") business, we are also a leading developer, operator and owner of landfill gas-to-energy facilities in the U.S. and Canada that produce renewable electricity and renewable natural gas, which is a significant source of fuel for our natural gas fleet. During 2022, our largest customer represented less than 5% of annual revenues. We employed approximately 49,500 people as of December 31, 2022.

We own or operate 259 landfill sites, which is the largest network of landfills throughout the U.S. and Canada. In order to make disposal more practical for larger urban markets, where the distance to landfills is typically farther, we manage 337 transfer stations that consolidate, compact and transport waste efficiently and economically. We also use waste to create energy, recovering the gas produced naturally as waste decomposes in landfills and using the gas in generators to make electricity. We are a leading recycler in the U.S. and Canada, handling materials that include cardboard, paper, glass, plastic and metal. We provide cost-efficient, environmentally sound recycling programs for municipalities, businesses and households across the U.S. and Canada as well as other services that supplement our Solid Waste business.

Our fundamental strategy has not changed; we remain dedicated to providing long-term value to our stockholders by successfully executing our core strategy of focused differentiation and continuous improvement. As North America's leading provider of comprehensive environmental solutions, sustainability and environmental stewardship is embedded in all that we do. We have enabled a people-first, technology-led focus to drive our mission to maximize resource value, while minimizing environmental impact, so that both our economy and our environment are positively impacted. Our strategy leverages and sustains the strongest asset network in the industry to drive best-in-class customer experience and growth. Our strategic planning processes appropriately consider that the future of our business and the industry can be influenced by changes in economic conditions, the competitive landscape, the regulatory environment, asset and resource availability and technology. We believe that focused differentiation, which is driven by capitalizing on our unique and extensive network of assets, will deliver profitable growth and position us to leverage competitive advantages. Simultaneously, we believe the combination of cost control and investing in automation to improve processes and drive operational efficiency will yield an attractive total cost structure and enhanced service quality. While we continue to improve existing diversion technologies, such as through investments in our recycling operations, we are also evaluating and pursuing emerging diversion technologies that may generate additional value.

Our Company's goals are targeted at putting our people first, positioning them to serve and care for our customers, the environment, the communities in which we work and our stockholders. Our brand promise is ALWAYS WORKING FOR A SUSTAINABLE TOMORROW®. We live this promise through our service offerings and sustainable solutions, our investments in innovation, our people, and our commitment to the future. Through our longtime focus on finding sustainable solutions, we continue to evolve beyond being a traditional environmental waste services company. Increasingly, our industry-leading focus on environmental sustainability aligns with demand from our customers who want more of their waste materials recovered. Waste streams are becoming more complex, and our aim is to address current needs, while anticipating the expanding and evolving needs of our customers. We believe we are uniquely equipped to meet the challenges of the changing waste industry and our customers' waste management needs, both today and tomorrow as we work together to envision and create a more sustainable future.

We believe that execution of our strategy will deliver shareholder value and leadership in a dynamic industry and challenging economic environment. In addition, we intend to continue to return value to our stockholders through dividend payments and our common stock repurchase program. In December 2022, we announced that our Board of Directors expects to increase the quarterly dividend from $0.65 to $0.70 per share for dividends declared in 2023, which is a 7.7% increase from the quarterly dividends we declared in 2022. This is an indication of our ability to generate strong and consistent cash flows and marks the 20th consecutive year of dividend increases. All quarterly dividends will be declared at the discretion of our Board of Directors and depend on various factors, including our net earnings, financial condition, cash required for future business plans, growth and acquisitions and other factors the Board of Directors may deem relevant.

Operations

General

Our senior management evaluates, oversees and manages the financial performance of our Solid Waste operations through two operating segments. Our East Tier primarily consists of geographic areas located in the Eastern U.S., the Great Lakes region and substantially all of Canada. Our West Tier primarily includes geographic areas located in the Western U.S., including the upper Midwest region, and British Columbia, Canada. Each of our Solid Waste operating segments provides integrated environmental services, including collection, transfer, recycling, and disposal. The East and West Tiers are presented in this report and constitute our existing Solid Waste business. On October 30, 2020, we acquired Advanced Disposal Services, Inc. ("Advanced Disposal"), the operations of which are presented in this report within our existing Solid Waste tiers. Additional information related to our acquisition of Advanced Disposal and segments is included in Notes 17 and 19 to the Consolidated Financial Statements, respectively. We also provide additional services that are not managed through our Solid Waste business, as described below. These operations are presented in this report as "Other." The services we provide are described below.

Collection. Our commitment to customers begins with a vast waste collection network. Collection involves picking up and transporting waste and recyclable materials from where it was generated to a transfer station, material recovery facility ("MRF") or disposal site. We generally provide collection services under one of two types of arrangements:

- For commercial and industrial collection services, typically we have three-year service agreements. The fees under the agreements are influenced by factors such as collection frequency, type of collection equipment we furnish, type and volume or weight of the waste collected, distance to the disposal facility, labor costs, cost of disposal and general market factors. As part of the service, we provide steel containers to most customers to store their solid waste between pick-up dates. Containers vary in size and type according to the needs of our customers and the restrictions of their communities. Many are designed to be lifted mechanically and either emptied into a truck's compaction hopper or directly into a disposal site. By using these containers, we can service most of our commercial and industrial customers with trucks operated by only one employee.
- For most residential collection services, we have a contract with, or a franchise granted by, a municipality, homeowners' association or some other regional authority that gives us the exclusive right to service all or a

portion of the homes in an area. These contracts or franchises are typically for periods of three to ten years. We also provide services under individual monthly subscriptions directly to households. The fees for residential collection are either paid by the municipality or authority from their tax revenues or service charges, or are paid directly by the residents receiving the service. The Company is generally phasing out traditional manual systems and moving to further automate residential collection services. Benefits of automation include enhanced worker safety, improved service delivery to the customer and an overall reduction in the cost to provide services.

Landfill. Landfills are the main depositories for solid waste in North America. As of December 31, 2022, we owned or operated 254 solid waste landfills and five secure hazardous waste landfills, which represents the largest network of landfills throughout the U.S. and Canada. As of December 31, 2022, we owned or controlled the management of 231 sites with remedial activities, that are in closure or that have received a certification of closure from the applicable regulatory agency. Solid waste landfills are constructed and operated on land with engineering safeguards that limit the possibility of water and air pollution, and are operated under procedures prescribed by regulation. A landfill must meet federal, state or provincial, and local regulations during its design, construction, operation and closure. The operation and closure activities of a solid waste landfill include excavation, construction of liners, continuous spreading and compacting of waste, covering of waste with earth or other acceptable material and constructing final capping of the landfill. These operations are carefully planned to maintain environmentally safe conditions and to maximize the use of the airspace.

All solid waste management companies must have access to a disposal facility, such as a solid waste landfill. The significant capital requirements of developing and operating a landfill serve as a barrier to landfill ownership and, thus, third-party haulers often dispose of waste at our landfills. It is usually preferable for our collection operations to use disposal facilities that we own or operate, a practice we refer to as internalization, rather than using third-party disposal facilities. Internalization generally allows us to realize higher consolidated margins and stronger operating cash flows. The fees charged at disposal facilities, which are referred to as tipping fees, are based on several factors, including our cost to construct, maintain and close the landfill, the distance to an alternative disposal facility, the type and weight or volume of solid waste deposited and competition.

Under environmental laws, the federal government (or states with delegated authority) must issue permits for all hazardous waste landfills. All of our hazardous waste landfills have obtained the required permits, although some can accept only certain types of hazardous waste. These landfills must also comply with specialized operating standards. Only hazardous waste in a stable, solid form, which meets regulatory requirements, can be deposited in our secure disposal cells. In some cases, hazardous waste can be treated before disposal. Generally, these treatments involve the separation or removal of solid materials from liquids and chemical treatments that transform waste into inert materials that are no longer hazardous. Our hazardous waste landfills are sited, constructed and operated in a manner designed to provide long-term containment of waste. We also operate a hazardous waste facility at which we isolate treated hazardous waste in liquid form by injection into deep wells that have been drilled in certain acceptable geologic formations far below the base of fresh water to a point that is safely separated by other substantial geological confining layers.

Transfer. As of December 31, 2022, we owned or operated 337 transfer stations in the U.S. and Canada. We deposit waste at these stations, as do other waste haulers. The solid waste is then consolidated and compacted to reduce the volume and increase the density of the waste and transported by transfer trucks or by rail to disposal sites.

Access to transfer stations is critical to haulers who collect waste in areas not in close proximity to disposal facilities. Fees charged to third parties at transfer stations are usually based on the type and volume or weight of the waste deposited at the transfer station, the distance to the disposal site, market rates for disposal costs and other general market factors.

The utilization of our transfer stations by our own collection operations improves internalization by allowing us to retain fees that we would otherwise pay to third parties for the disposal of the waste we collect. It enables us to manage costs associated with waste disposal because (i) transfer trucks, railcars or rail containers have larger capacities than collection trucks, allowing us to deliver more waste to the disposal facility in each trip; (ii) waste is accumulated and compacted at transfer stations that are strategically located to increase the efficiency of our network of operations and (iii) we can retain the volume by managing the transfer of the waste to one of our own disposal sites.

The transfer stations that we operate but do not own generally are operated through lease agreements under which we lease property from third parties. There are some instances where transfer stations are operated under contract, generally for municipalities. In most cases, we own the permits and will be responsible for any regulatory requirements relating to the operation and closure of the transfer station.

Recycling. Recycling involves the separation of reusable materials from the waste stream for processing and resale or other disposition. We are North America's leading recycler of post-consumer materials. We not only collect materials from households and businesses across the U.S. and Canada, we also sell them to manufacturers to be recycled and sold in the North American market. Demand for recycled materials is generally growing. Several states have recently passed minimum-recycled-content mandates, and many companies are responding to requirements for recycled content from their own customers and to meet sustainability targets. We are helping expand the availability of recycled materials by investing in infrastructure, increasing access to recycling services and educating customers through our Recycle Right® program.

Our recycling operations provide communities and businesses with an alternative to traditional landfill disposal and support our strategic goals to extract more value from the materials we manage. We were the first major solid waste company to focus on residential single-stream recycling, which allows customers to mix clean bottles, cans, paper and cardboard in one bin. Residential single-stream programs have greatly increased recycling volumes. Single-stream recycling is possible through the use of various mechanized screens and optical sorting technologies. In addition to advancing our single stream recycling programs for commercial applications, we continue to invest in recycling technologies and businesses, designed to offer services and solutions to support and grow our current operations, including our recent purchase of a controlling interest in a business intended to accelerate our film and plastic wrap recycling capabilities. We are investing in enhanced MRF technology at new and existing facilities to benefit labor productivity, support increased recycling capacity and allow for dynamic adjustments to respond to evolving end-market demands. In 2022, we opened five new MRFs within the U.S. equipped with advanced recycling technology. We continue to invest in MRF automation in several markets across the U.S. Our recycling operations include the following:

Materials processing — Through our collection operations and third-party customer base, we collect recyclable materials from residential, commercial and industrial customers and direct these materials to one of our MRFs for processing. As of December 31, 2022, we operated 97 MRFs, of which 46 are single stream, where cardboard, paper, glass, metals, plastics, construction and demolition materials and other recycling commodities are recovered for resale or redirected for other purposes.

Recycling commodities — We market and resell recycling commodities globally. We manage the marketing of recycling commodities that are processed in our facilities by maintaining comprehensive service centers that continuously analyze market prices, logistics, market demands and product quality.

Recycling brokerage services — We also provide recycling brokerage services, which involve managing the marketing of recyclable materials for third parties. Our experience in managing recycling commodities for our own operations gives us the expertise needed to effectively manage volumes for third parties. Utilizing the resources and knowledge of our recycling operations' service centers, we can assist customers in marketing and selling their recycling commodities with minimal capital requirements.

The recyclable materials processed in our MRFs are received from various sources, including third parties and our own operations. In recent years, we have been focused on reducing dependency on market prices for recycled commodities by recovering our processing costs first. In our materials processing business, we have been transitioning our customer base over time from the traditional rebate model, where we paid suppliers for the inbound material, to a fee-for-service model that ensures the cost of processing the recyclable materials is covered along with an acceptable margin. With our current fee-for-service model, the pricing for these recyclable materials can either be a charge or "tip fee" when commodity pricing does not cover our cost to process the recyclable materials or a "rebate" when commodity pricing is higher than our processing costs and we are able to share this benefit with the customers generating recyclable materials. In some cases, our pricing is based on fixed contractual rates or on defined minimum per-ton rates. Generally, this pricing also considers the price we receive for sales of processed goods, market conditions and transportation costs. As a result, changes in commodity prices for recycled materials also significantly affect the pricing to our suppliers. Depending on the key terms of the arrangement, these "rebates" are recorded as either operating expenses or a reduction in operating revenues within our Consolidated Statements of Operations. If the key terms result in a charge to the customer, the associated "tip fees" would be recorded as operating revenues within our Consolidated Statements of Operations.

Other. Other services we provide include the following:

- *WM Renewable Energy* — We develop, operate and promote projects for the beneficial use of landfill gas through our WM Renewable Energy business. Landfill gas is produced naturally as waste decomposes in a landfill. The methane component of the landfill gas is a readily available, renewable energy source that can be gathered and used beneficially as an alternative to fossil fuel. The U.S. Environmental Protection Agency ("EPA") endorses landfill gas as a renewable energy resource, in the same category as wind, solar and geothermal resources. As of December 31, 2022, we had 135 landfill gas beneficial use projects producing commercial quantities of methane gas at owned or operated landfills. For 95 of these projects, the processed gas is used to fuel electricity generators. The electricity is then sold to public utilities, municipal utilities or power cooperatives. For 23 of these projects, the gas is used at the landfill or delivered by pipeline to industrial customers as a direct substitute for fossil fuels in industrial processes. For 17 of these projects, the landfill gas is processed to pipeline-quality natural gas and then sold to natural gas suppliers.

  WM Renewable Energy produces renewable natural gas ("RNG") from landfill gas and generates renewable identification numbers ("RINs") under the Renewable Fuel Standard ("RFS") program and other credits under a variety of state programs associated with the use of RNG in our compressed natural gas fleet. The RINs and credits are sold to counterparties who are obligated under the regulatory programs and have a responsibility to procure RINs and credits proportionate to their fossil fuel production and imports. RINs prices generally respond to regulations enacted by the EPA or other regulatory bodies, as well as fluctuations in supply and demand. WM Renewable Energy currently has five owned facilities producing 3.5 million MMBtu of RNG annually and the revenue from these facilities is primarily generated through the sale of natural gas, RINs and related environmental attributes.

  We are also modernizing our landfills and expanding our network of renewable natural gas facilities. Together, these robust solutions will make us a better advisor to our customers while supporting our own sustainability goals.

- *Sustainability and Environmental Solutions ("SES")* — Our SES business offers our customers a variety of services in collaboration with our Areas and strategic accounts programs, including (i) construction and remediation services; (ii) services associated with the disposal of fly ash, which is residue generated from the combustion of coal, and other forms of fuel and (iii) in-plant services, where our employees work full-time inside our customers' facilities to provide full-service waste management solutions and consulting services (this service is managed through our SES business but reflected principally in our collection line of business). Our vertically integrated waste management operations enable us to provide customers with full management of their waste. The breadth of our service offerings, the familiarity we have with waste management practices and our use of technology give us the ability help customers reduce the amount of waste they generate, identify recycling opportunities and determine efficient and environmentally friendly means for waste collection and disposal. Through these services, we aim to help customers increase circularity and accelerate their decarbonization goals.

- *Strategic Business Solutions ("WMSBS")* — Although many waste management services such as collection and disposal are local services, our WMSBS business works with customers whose locations span the U.S. and Canada. Our strategic accounts program provides these customers with streamlined service, enhanced reporting, measurement tools aimed at meeting sustainability objectives and centralized billing and management of accounts.

- *Expanded Service Offerings and Solutions* — We provide expanded service offerings and solutions that are not managed through our Solid Waste business including the collection of project waste, including construction debris and household or yard waste, through our Bagster® business.

  We continue to invest in businesses and technologies that are designed to offer services and solutions ancillary or supplementary to our current operations. While most of these investments are in the form of minority equity stakes, they can also include joint ventures, joint development agreements or majority equity stakes. The solutions and services include (i) waste collection, processing, and recycling; (ii) the development, operation and marketing of waste processing facilities and technologies; (iii) operation of renewable natural gas plants and (iv) the development and operation of organic recycling technologies. Furthermore, we continually scout, evaluate and run proof-of-concepts of innovative technologies within our core operations to improve safety, operational efficiencies and customer solutions.

Competition

We encounter intense competition from governmental, quasi-governmental and private sources in all aspects of our operations. We principally compete with large national waste management companies, counties and municipalities that maintain their own waste collection and disposal operations and regional and local companies of varying sizes and financial resources. The industry also includes companies that specialize in certain discrete areas of waste management, operators of alternative disposal facilities, companies that seek to use parts of the waste stream as feedstock for renewable energy and other by-products, and waste brokers that rely upon haulers in local markets to address customer needs.

Operating costs, disposal costs and collection fees vary widely throughout the geographic areas in which we operate. The prices that we charge are determined locally, and typically vary by volume and weight, type of waste collected, treatment requirements, risk of handling or disposal, frequency of collections, distance to final disposal sites, the availability of airspace within the geographic region, labor costs and amount and type of equipment furnished to the customer. We face intense competition in our Solid Waste business based on pricing and quality of service. We also compete for business based on breadth of service offerings. As companies, individuals and communities look for ways to be more sustainable, we are promoting our comprehensive services that go beyond our core business of collecting and disposing of waste in order to meet their needs.

Seasonal Trends

Our operating revenues tend to be somewhat higher in summer months, primarily due to higher construction and demolition waste volumes. The volumes of industrial and residential waste in certain regions where we operate also tend to increase during the summer months. Our second and third quarter revenues and results of operations typically reflect these seasonal trends.

Service or operational disruptions caused by severe storms, extended periods of inclement weather or climate events can significantly affect the operating results of the geographic areas affected. Extreme weather events may also lead to supply chain disruption and delayed project development, or disruption of our customers' businesses, reducing the amount of waste generated by their operations.

On the other hand, certain destructive weather and climate conditions, such as wildfires in the Western U.S. and hurricanes that most often impact our operations in the Southern and Eastern U.S. during the second half of the year, can increase our revenues in the geographic areas affected as a result of the waste volumes generated by these events. While weather-related and other event-driven special projects can boost revenues through additional work for a limited time, due to significant start-up costs and other factors, such revenue can generate earnings at comparatively lower margins.

Human Capital Resources

Employees

As of December 31, 2022, we had approximately 49,500 full-time employees across the U.S., Canada and India. Approximately 46,300 employees were located within the U.S. and 3,200 employees were located outside of the U.S. Approximately 8,500 employees were employed in administrative and sales positions with the remainder in operations. Approximately 8,600 of our employees are covered by collective bargaining agreements. Additional information about our workforce can be found in our 2022 Sustainability Report at https://sustainability.wm.com. Our 2022 Sustainability Report does not constitute a part of, and is not incorporated by reference into, this report or any other report we file with (or furnish to) the SEC, whether made before or after the date of this Annual Report on Form 10-K.

People First Commitment

Our People First commitment means knowing that the daily contributions of our team members are what enable us to play a vital role in the communities we serve. Our success depends upon effective leadership, the contributions of each employee, and our ability to give them the tools they need to safely execute their roles as well as to develop and excel in their careers. As our industry and workforce evolve, we are focused on our imperatives of keeping our employees safe, improving diversity, equity, and inclusion at all levels of our Company, managing employee turnover, increasing retention, succession planning and development, and supporting employee experience, ongoing cultural integration and knowledge transfer. We regularly focus on these objectives when managing our business.

We strive to be a workplace of choice through competitive pay, comprehensive benefits for long-term financial and personal health and opportunities for growth across our ranks. "We Are WM" is our Employer Value Proposition, grounded in our People First commitment and shared through a framework that enables us to display that we are (i) investing in our teams by providing comprehensive benefits; (ii) committed to the growth of our team by providing state-of-the-art trainings and our new education benefit, Your Tomorrow, as further discussed under *Compensation and Benefits*; (iii) performing essential and meaningful work and (iv) working for a sustainable tomorrow by leaving the world a better place than we found it. Being an employer of choice is critical to our efforts to attract and retain a high-quality workforce, while motivating us to sharpen our focus on our values that help us empower and develop good employees. By promoting from within and offering training and experiential opportunities, we help employees maximize their effectiveness and grow in their careers.

Safety as a Core Value

At the Company, safety is a core value, with no compromise. A large number of our employee population work as drivers, heavy equipment operators and sorters, which are essential jobs that carry inherent risks. For nearly 20 years, we have engaged employees on safety through our Mission to Zero (“M2Z”) program. The “Zero” in M2Z represents zero tolerance for unsafe behaviors. Employees learn safety best practices through new-hire and ongoing training. To build upon lessons learned in training, we conduct structured observations of frontline employees that cover all aspects of our collection and post-collection operations, including driving, loading, unloading, lifting and lowering and arriving prepared for work. In 2022, the Company announced a safety goal focused on reduction of our Total Recordable Incident Rate (“TRIR”) by 3% annually, targeting TRIR of 2.0 annually by 2030. TRIR measures the number of injuries occurring per 100 employees for total hours worked annually. Our TRIR as of December 31, 2022 and 2021 was 3.02 and 3.0, respectively. The Company also remains focused on the prevention of serious injuries.

Inclusion, Equity and Diversity

We embrace and cultivate respect, trust, open communications and diversity of thought and people. We are committed to equality for all, and foster an environment where all team members feel welcomed, valued and seen. We see inclusion, equity and diversity (“IE&D”) as core in everything that we do. Our commitment to IE&D starts at the top with our senior leadership team being comprised of 22% ethnic minorities and 33% women as of December 31, 2022; and with our overall workforce in the U.S. being comprised of approximately 45% ethnic minorities and approximately 20% women as of the same date. We are proud of what we have been able to achieve so far, and we will continue to strive to further embed IE&D within the Company. To solidify this commitment, in 2022 the Company developed two new IE&D goals: (i) increase the overall representation of women in our workforce to at least 25% by 2030 and (ii) increase the representation of racial/ethnic minority employees in our Manager roles and above to 30% by 2030. To enable us to achieve our goals, we have empowered a cross-functional IE&D Council to evaluate and enhance our policies, practices and procedures, recruitment and partnerships to ensure that our IE&D efforts are sustainable and are tied to our business strategy.

Learning and Development

We offer expansive learning and development solutions to meet the development needs of our people and support opportunities for growth and improvement. Our talent management strategy is designed to reach employees at all levels. Given the wide variety of employee roles and skill sets in our Company, our training and development programs are varied but generally fall into the following categories: (i) compliance, including Code of Conduct and cybersecurity training; (ii) safety; (iii) environmental excellence; (iv) professional development and leadership and (v) job-specific.

Compensation and Benefits

The objective of our compensation and benefit programs is to attract, engage, reward and incentivize valuable employees who will support the successful execution of our strategy. We pay the full cost to provide employees with short-term disability benefits, long-term disability benefits, basic life insurance for the employee and their dependents, and employee and family assistance benefits. The costs for medical and dental coverage are shared with employees, with the Company paying for a majority of the premium expense. The Company offers other important benefits such as paid vacation and holidays, legal services, flexible spending accounts, dependent care assistance, adoption assistance, employee discounts and student loan refinancing services. We also recognize the value of learning beyond the workplace. In 2021, we announced a new education benefit, Your Tomorrow. Your Tomorrow was created in partnership with Guild Education to pay 100% of benefits-eligible employees' and dependents' tuition for a broad range of four-year college degree programs, as well as programs such as high-school equivalency and, for employees, other certificate programs and graduate degrees. We also provide plans to help employees save for their future; refer to Note 9 to the Consolidated Financial Statements for additional information on our employee benefit plans.

Financial Assurance and Insurance Obligations

Financial Assurance

Municipal and governmental waste service contracts generally require contracting parties to demonstrate financial responsibility for their obligations under the contract. Financial assurance is also a requirement for (i) obtaining or retaining disposal site or transfer station operating permits; (ii) supporting certain variable-rate tax-exempt debt and (iii) estimated final capping, closure, post-closure and environmental remedial obligations at many of our landfills. We establish financial assurance using surety bonds, letters of credit, insurance policies, trust and escrow agreements and financial guarantees. The type of assurance used is based on several factors, most importantly: the jurisdiction, contractual requirements, market factors and availability of credit capacity.

Surety bonds and insurance policies are supported by (i) a diverse group of third-party surety and insurance companies; (ii) an entity in which we have a noncontrolling financial interest or (iii) a wholly-owned insurance captive, the sole business of which is to issue surety bonds and/or insurance policies on our behalf. Letters of credit generally are supported by our long-term U.S. and Canadian revolving credit facility ("$3.5 billion revolving credit facility") and other credit lines established for that purpose.

Insurance

We carry a broad range of insurance coverages, including health and welfare, general liability, automobile liability, workers' compensation, real and personal property, directors' and officers' liability, pollution legal liability, cyber incident liability and other coverages we believe are customary to the industry. Our exposure to loss for insurance claims is generally limited to the per-incident deductible under the related insurance policy. We use a wholly-owned insurance captive to insure the deductibles for our general liability, automobile liability and workers' compensation claims programs. We do not expect the impact of any known casualty, property, environmental or other contingency to have a material impact on our financial condition, results of operations or cash flows. Our estimated insurance liabilities as of December 31, 2022 are summarized in Note 10 to the Consolidated Financial Statements.

Regulation

Our business is subject to extensive and evolving federal, state or provincial and local environmental, health, safety and transportation laws and regulations. These laws and regulations are administered by the EPA, Environment and Climate Change Canada ("ECCC"), and various other federal, state, provincial and local environmental, zoning, transportation, land use, health and safety agencies in the U.S. and Canada. Many of these agencies regularly examine our operations to monitor compliance with these laws and regulations and have the power to enforce compliance, obtain injunctions or impose civil or criminal penalties in cases of violations.

Because the primary mission of our business is to collect, process and manage solid waste and recyclables in an environmentally sound manner, a significant amount of our capital expenditures are related, either directly or indirectly, to environmental protection measures, including compliance with federal, state, provincial and local rules. There are costs associated with siting, design, permitting, construction, operations, monitoring, site maintenance, corrective actions, financial assurance, and facility closure and post-closure obligations. With acquisition, development or expansion of a waste management or disposal facility, materials recovery facility, compost facility, transfer station, or landfill gas-to-energy facility, we must often spend considerable time, effort and money to obtain or maintain required permits and approvals. There are no assurances that we will be able to obtain or maintain required governmental approvals. Once obtained, permits are subject to renewal, modification, suspension or revocation by the issuing authority. Compliance with current regulations and future requirements could require us to make significant capital and operating expenditures. However, most of these expenditures are made in the normal course of business and do not place us at any competitive disadvantage.

The regulatory environment in which we operate is influenced by changes in leadership at the federal, state, provincial and local levels. For example, divided government likely will impede significant legislative action in the 118th Congress, leading to an expectation that the White House will prioritize regulatory changes to implement parts of its agenda, including taking steps towards reinstating, and in some cases enhancing, policies and regulations rolled back by the previous administration. While increasing regulation may have a negative impact on our operating costs, extensive environmental regulation applicable to our industry is also a barrier to rapid entry that benefits our Company. Moreover, the risk reduction provided by stringent regulation is valuable to our customers and the communities we serve.

Federal Regulation

The primary U.S. federal statutes affecting our business are summarized below:

- The Resource Conservation and Recovery Act of 1976 ("RCRA"), as amended, regulates handling, transporting and disposing of hazardous and non-hazardous waste and delegates authority to states to develop programs to ensure the safe disposal of solid waste. Landfills are regulated under Subtitle D of RCRA, which sets forth minimum federal performance and design criteria for solid waste landfills, and Subtitle C of RCRA, which establishes a federal program to manage hazardous wastes from cradle to grave. These regulations are typically implemented by the states, although states can impose requirements that are more stringent than the federal standards. We incur costs in complying with these standards in the ordinary course of our operations.
- The Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), as amended, which is also known as Superfund, provides for federal authority to respond directly to releases or threatened releases of hazardous substances into the environment that have created actual or potential environmental hazards. CERCLA's primary means for addressing such releases is to impose strict liability for cleanup of disposal sites upon current and former site owners and operators, generators of the hazardous substances at the site and transporters who selected the disposal site and transported substances thereto. Liability under CERCLA is not dependent on the intentional release of hazardous substances; it can be based upon the release or threatened release of hazardous substances, even resulting from lawful, unintentional and attentive action, as the term is defined by CERCLA and other applicable statutes and regulations. The EPA may issue orders requiring responsible parties to perform response actions at sites, or the EPA may seek recovery of funds expended or to be expended in the future at sites. Liability may include contribution for cleanup costs incurred by a defendant in a CERCLA civil action or by an entity that has previously resolved its liability to federal or state regulators in an administrative or judicially-approved settlement. Liability under CERCLA could also

include obligations to a potentially responsible party ("PRP") that voluntarily expends site clean-up costs. Further, liability for damage to publicly-owned natural resources may also be imposed. We are subject to potential liability under CERCLA as an owner or operator of facilities at which hazardous substances have been disposed and as a generator or transporter of hazardous substances disposed of at other locations.

- The Federal Water Pollution Control Act of 1972, as amended, known as the Clean Water Act, regulates the discharge of pollutants into streams, rivers, groundwater, or other surface waters from a variety of sources, including solid and hazardous waste disposal sites. If our operations discharge any pollutants into federally protected surface waters, the Clean Water Act requires us to apply for and obtain discharge permits, conduct sampling and monitoring, and, under certain circumstances, reduce the quantity of pollutants in those discharges. The EPA also requires landfills and other waste-handling facilities to obtain storm water discharge permits, and if a landfill or other facility discharges wastewater through a sewage system to a publicly-owned treatment works, the facility must comply with discharge limits imposed by the treatment works. Further, before the development or expansion of a landfill can alter or affect certain "wetlands," a permit may have to be obtained providing for mitigation or replacement wetlands. The Clean Water Act provides for civil, criminal and administrative penalties for violations of its provisions.

- The Clean Air Act of 1970, as amended, provides for federal, state and local regulation of the emission of air pollutants. Many of our municipal solid waste ("MSW") landfills and landfill gas-to-energy facilities are subject to regulations implemented under the Clean Air Act, including new source performance standards, emission guidelines and national emission standards for hazardous air pollutants. These regulations impose performance standards to minimize air emissions from regulated MSW landfills, subject those landfills to certain operating permit requirements under Title V of the Clean Air Act and, in many instances, require installation of landfill gas collection and control systems to control emissions or to treat and utilize landfill gas on- or off-site. Our vehicle fleet also must adhere to regulations implemented under the Clean Air Act, which authorizes the EPA to mandate controls on air pollution from mobile sources.

- The Occupational Safety and Health Act of 1970, as amended, establishes certain employer responsibilities, including maintenance of a workplace free of recognized hazards likely to cause death or serious injury, compliance with standards promulgated by the Occupational Safety and Health Administration, and various reporting and record keeping obligations as well as disclosure and procedural requirements. Various standards for notices of hazards, safety in excavation and demolition work and the handling of asbestos, may apply to our operations. The Department of Transportation and the Occupational Safety and Health Administration, along with other federal agencies, have jurisdiction over certain aspects of hazardous materials and hazardous waste, including safety, movement and disposal. Various state and local agencies with jurisdiction over disposal of hazardous waste may seek to regulate movement of hazardous materials in areas not otherwise preempted by federal law.

State, Provincial and Local Regulations

There are also various state or provincial and local regulations that affect our operations. Each state and province in which we operate has its own laws and regulations governing solid waste disposal, water and air pollution, and, in most cases, releases and cleanup of hazardous substances and liabilities for such matters. States and provinces have also adopted regulations governing the design, operation, maintenance and closure of landfills and transfer stations, and laws governing where recyclable materials can be sold. Some counties, municipalities and other local governments have adopted similar laws and regulations. Our facilities and operations are likely to be subject to these types of requirements.

Our landfill operations are affected by the increasing preference for alternatives to landfill disposal. Many state and local governments mandate recycling and waste reduction at the source and prohibit the disposal of certain types of materials at landfills, such as recyclable materials (cardboard, bottles and cans), yard waste, food waste and electronics. The number of state and local governments with recycling and diversion requirements and disposal bans continues to grow, while the logistics and economics of recycling or processing many of these items remain challenging.

Various states have enacted, or are considering enacting, laws that restrict or discourage the disposal within the state of solid waste generated outside the state. While laws that overtly discriminate against out-of-state waste have been found to be unconstitutional, some laws that are less overtly discriminatory have been upheld in court. From time to time, the

U.S. Congress has considered legislation authorizing states to adopt regulations, restrictions, or taxes on the importation of out-of-state or out-of-jurisdiction waste. Additionally, several state and local governments have enacted “flow control” regulations, which attempt to require that all waste generated within the state or local jurisdiction be deposited at specific sites, which has been upheld by the U.S. Supreme Court for waste directed to facilities owned by the local government. The U.S. Congress’ adoption of legislation allowing restrictions on interstate transportation of out-of-state or out-of-jurisdiction waste or certain types of flow control, or courts’ interpretations of interstate waste and flow control legislation, could adversely affect our solid and hazardous waste management services.

Additionally, regulations establishing extended producer responsibility (“EPR”) are being considered or implemented in many places around the world, including in the U.S. and Canada. EPR regulations are designed to place either partial or total responsibility on producers to fund the post-use life cycle of the products they create. Along with the funding responsibility, producers may be required to undertake additional responsibilities, such as taking over management of local recycling programs by taking back their products from end users or managing the collection operations and recycling processing infrastructure. There is no federal law establishing EPR in the U.S. or Canada; however, federal, state, provincial and local governments could take, and in some cases have taken, steps to implement EPR regulations for packaging, including traditional recyclables such as cardboard, bottles and cans. If wide-ranging EPR regulations were adopted, they could significantly impact the waste, recycling and other streams we manage and how we operate our business, including contract terms and pricing.

Many states, provinces and local jurisdictions have enacted “fitness” laws that allow the agencies that have jurisdiction over waste services contracts or permits to deny or revoke these contracts or permits based on the applicant’s or permit holder’s compliance history. Some states, provinces and local jurisdictions go further and consider the compliance history of the parent, subsidiaries or affiliated companies, in addition to the applicant or permit holder. These laws authorize the agencies to make determinations of an applicant’s or permit holder’s fitness to be awarded a contract to operate, and to deny or revoke a contract or permit because of unfitness, unless there is a showing that the applicant or permit holder has been rehabilitated through the adoption of various operating policies and procedures put in place to assure future compliance with applicable laws and regulations. While fitness laws can present potential increased costs and barriers to entry into market areas, these laws have not, and are not expected to have a material adverse impact on our business as a whole.

Recent Developments and Focus Areas in Policy and Regulation

Climate and Sustainability

Jurisdictions are increasingly taking action to reduce greenhouse gas (“GHG”) emissions through a broad range of climate policies. Landfills are one of the focal points for advancing climate-related goals, and we are actively working with policymakers to promote recognition of the significant reductions in GHG emissions that our industry already has achieved and the work being done to further reduce emissions, the challenges associated with quantifying landfill emissions precisely, and the role of our sector in providing an essential, and highly regulated, public service.

We also are closely monitoring the evolving capabilities of ground, aerial, and satellite-based methane detection and monitoring systems, and investing in pilot programs to further explore these innovations for applicability to our operations. We continue to expand our work with various private and government entities employing ground, aerial and satellite-based measurements of our sites. As these technologies are expected to advance rapidly in the coming years, we are actively engaged with the ECCC and EPA on the implications of the changing landscape for the waste industry and potential future regulation.

In light of regulatory and business developments related to concerns about climate change, we have identified strategic business opportunities to provide our public and private sector customers with sustainable solutions to reduce their GHG emissions. As part of our on-going marketing evaluations, we assess customer demand for and opportunities to develop waste services offering verifiable carbon reductions, such as waste reduction, increased recycling, composting, and conversion of landfill gas and discarded materials into electricity and fuel. We use carbon life cycle assessment tools in evaluating potential new services and in establishing the value proposition that makes us attractive as an environmental service provider. We are active in support of public policies that encourage development and use of lower carbon energy and waste services that lower users’ carbon footprints. We understand the importance of broad stakeholder engagement in these endeavors, and actively seek opportunities for public policy discussion on more sustainable materials management practices. In addition, we work with stakeholders at the federal, state, and provincial level in support of legislation that encourages production and use of renewable, low-carbon fuels and electricity.

We continue to assess the physical risks to our Company's operations from the effects of severe weather events and use risk mitigation planning to increase our resiliency in the face of such events. We are investing in infrastructure to withstand more severe storm events, which may afford us a competitive advantage and reinforce our reputation as a reliable service provider through continued service in the aftermath of such events.

Consistent with our Company's long-standing commitment to sustainability and environmental stewardship, we have published our 2022 Sustainability Report, providing details on our environmental, social and governance ("ESG") performance and outlining new 2030 goals. The Sustainability Report conveys the strong linkage between the Company's ESG goals and our growth strategy, inclusive of the planned expansion of the Company's recycling and renewable energy businesses. The information in this report can be found at https://sustainability.wm.com but it does not constitute a part of, and is not incorporated by reference into, this Annual Report on Form 10-K. The Company actively participates in a number of sustainability reporting programs and frameworks.

PFAS

Efforts to safeguard communities from contamination with per- and polyfluoroalkyl substances ("PFAS") have drawn increased attention by the federal government and in the states. PFAS are a large group of chemicals that have been used in industrial and consumer products since the 1940s, including in products as diverse as carpets, paints and stains, water-resistant clothing and fabrics, nonstick cookware, food packaging, and firefighting chemicals. Possible human health effects of exposure to certain PFAS compounds may include low infant birth weights, immune system impacts, or cancer. In 2021, the EPA released its PFAS Strategic Roadmap, providing a high-level overview of activities that the agency intends to take through 2024 to address PFAS contamination. These actions include establishing drinking water standards, expanded authority for PFAS remediation, research and data collection on landfill discharges of PFAS in leachate, new risk assessments and test procedures, and updated guidance on PFAS disposal and destruction options. During 2022, the EPA proposed designation of two PFAS compounds as hazardous substances under CERCLA. We are closely monitoring this proposed rulemaking. In addition, an increasing number of states have enacted new drinking water, surface water and/or groundwater limits for various PFAS, which has led to a patchwork of PFAS standards across the U.S. Compliance with new and proposed state and federal PFAS standards is anticipated to result in additional expense to the Company, but such standards are also anticipated to present potential business opportunities in the area of PFAS management, treatment and disposal.

Recycling; Foreign Import and Export Regulations and Material Restrictions

Enforcement or implementation of foreign and domestic regulations can affect our ability to export recyclables. Attention on waste in the environment has led to new international laws restricting the flow of certain recyclables. As an example, on January 1, 2021, new restrictions on the international trade of most plastics went into effect as part of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. At this time, the U.S. is not a party to the Basel Convention, but most countries to which we export commodities are, which may limit our ability to export certain plastics. However, we do not ship plastics collected on our residential recycling routes and processed at our single stream material recovery facilities to locations outside of North America.

In recent years, new and updated international regulations affecting, and in some cases restricting, the international flow of certain recyclables have led to a reduction in export activity for such recyclables, as well as higher quality requirements, and higher processing costs. COVID-19 placed additional financial stress on recyclers and municipalities, resulting in some recycling programs being paused or eliminated. These changes have led to a number of states and provinces considering and several implementing EPR regulations.

Prices and demand for recyclables fluctuate. While demand for recyclables generally continues to trend upwards, during the second half of 2022, we saw significant declines in commodity prices for recycled material, and we expect significant commodity price headwinds to continue into 2023, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. Recycling revenues attributable to yield increased $19 million and $537 million in 2022 and 2021, respectively, as compared with the prior year periods primarily from higher market prices for recycling commodities in 2021 and the first half of 2022, before the significant downturn in the second half of 2022.

We announced a sustainability growth strategy that includes significant planned investments in our recycling business to increase automation and reduce labor dependency. Such investments are also targeted at addressing increases in quality requirements for commodities. These investments increase our exposure to commodity price fluctuations. We mitigate some of the effects of price fluctuation through the contract terms pursuant to which we sell commodities, such as floor pricing. Additionally, future regulation, tariffs, international trade policies or other initiatives, including regulations addressing climate change or GHG emissions, may impact supply and demand of material, or increase operating costs, which could impact the profitability of our recycling operations.

For the past several years, we have been working with stakeholders to educate the public on the need to recycle properly. We continue to invest time and effort in working closely with customers to improve the quality of materials received at our facilities. We have continued our focus on developing a sustainable recycling business model that meets customers' environmental needs by passing through the increasing cost of processing and higher contamination rates, and these efforts continued to have a positive impact on the operating results for our recycling business in 2022.

With a heightened awareness of the global problems caused by plastic waste in the environment, Canada and an increasing number of cities and states across the U.S. have passed ordinances banning certain types of plastics from sale or use. The most common materials banned include plastic bags and straws, polystyrene plastic, and some types of single use packaging. These bans have increased pressure by manufacturers on our recycling facilities to accept a broader array of materials in curbside recycling and composting programs to alleviate public pressures to ban the sale of those materials. However, with no or limited viable end markets for many of these materials, we and other recyclers are working to educate and remind customers of the need for end market demand and economic viability to support sustainable recycling programs. We are also making investments in end markets to support the collection and processing of some of these materials. With increased focus on responsible management of plastics, our procurement team has taken a proactive approach to ensure environmental sustainability goals are prioritized in managing the products we buy.

Tax Legislation

The Inflation Reduction Act of 2022 ("IRA") was signed into law by President Biden on August 16, 2022 and contains a number of tax-related provisions. The provisions of the IRA related to alternative fuel tax credits secure approximately $55 million of annual pre-tax benefit (to be recorded as a reduction in our operating expense) from tax credits through 2024, which is in line with the benefit we have realized from our alternative fuel tax credits in prior years. Additionally, we will incur an excise tax of 1% for future common stock repurchases, which will be reflected in the cost of purchasing the underlying shares as a component of treasury stock. The IRA contains a number of additional provisions related to tax incentives for investments in renewable energy production, carbon capture, and other climate actions, as well as the overall measurement of corporate income taxes. Given the complexity and uncertainty around the applicability of the legislation to our specific facts and circumstances, we continue to analyze the IRA provisions to identify and quantify potential opportunities and applicable benefits included in the legislation. The current expectation is the minimum corporate tax will not have an impact on the Company. With respect to only the investment tax credit aspect of the IRA, we expect the cumulative benefit to be between $250 million and $350 million, a large portion of which is anticipated to be realized in 2025. Additionally, the production tax credit incentives for investments in renewable energy and the carbon capture provisions of the IRA will likely result in incremental benefit, although at this time the amount of those benefits have not been quantified.

Regulation of Oil and Gas Exploration, Production and Disposal

Our Sustainability and Environmental Services business provides specialized environmental management and disposal services for fluids used and wastes generated by customers engaged in oil and gas exploration and production, and these disposal services include use of underground injection wells. There is heightened federal regulatory focus on emissions of methane that occur during drilling and transportation of natural gas, as well as state attention to protective disposal of drilling residuals. There also remains heightened attention from the public, some states and the EPA to the alleged potential for hydraulic fracturing that occurs during drilling to impact drinking water supplies. Increased regulation of oil and gas exploration and production, including GHG emissions or hydraulic fracturing, could make it more difficult or cost-prohibitive for our customers to continue operations, adversely affecting our business.

Additionally, any new regulations regarding the treatment and disposal of wastes associated with exploration and production operations, including through use of injection wells, could increase our costs to provide oilfield services and reduce our margins and revenue from such services. Conversely, any loosening of regulations regarding how such wastes are handled or disposed of could adversely affect our business, as we believe the size, capital structure, regulatory sophistication and established reliability of our Company provide us with an advantage in providing services that must comply with any complex regulatory regime that may govern providing oilfield waste services.

Investment in Natural Gas Vehicles and Infrastructure

We operate a large fleet of natural gas vehicles, and we plan to continue to invest in these assets for our collection fleet. Natural gas fueling infrastructure is not yet broadly available in the U.S. and Canada; as a result, we have constructed and operate natural gas fueling stations, some of which also serve the public or pre-approved third parties. Concerns have been raised about the potential for emissions from the fueling stations and infrastructure that serve natural gas-fueled vehicles. Additional regulation of, or restrictions on, natural gas fueling infrastructure or reductions in associated tax incentives could increase our operating costs. We are not yet able to evaluate potential operating changes or costs associated with such regulations, but we do not anticipate that such regulations would have a material adverse impact on our business.

There is increasing pressure to reduce the use of fossil fuel in the heavy-duty truck industry, and some cities and states are pursuing requirements for using alternative engine technology, such as electric powered vehicles, rather than natural gas or diesel vehicles. This is resulting in regulatory actions to advance the adoption of zero-emission vehicles and a gradual shift away from tax incentives and grants for natural gas trucks. Although current options for heavy-duty electric vehicles lack sufficient range and proven experience for our operations, we are proactively engaging in pilots of electric powered heavy-duty vehicles and anticipate that we could redirect future planned capital investments in our fleet toward these assets when the vehicles prove economically and operationally viable. Should regulation mandate an accelerated transition to electric powered vehicles, our cost to acquire vehicles needed to service our customers could increase, capital investment required to establish sufficient charging infrastructure could be significant and investments we have made in an industry-leading natural gas fleet and infrastructure could be impaired.

Renewable Energy Production

We have announced a sustainability growth strategy that includes significant planned investments in our renewable energy business. We have invested, and continue to invest, in facilities to capture methane produced from the Company's landfills and convert it into RNG and electricity. RNG produced from our landfills, as well as dairy biogas, constitute a significant source of fuel for our natural gas collection vehicles. Following enactment of the IRA, which included expanded tax credits for the construction of new RNG production and renewable electricity generation facilities, we expect to accelerate our investments in these areas. The Company's investment in renewable energy production also is guided by the EPA's implementation of the RFS program, which promotes the production and use of renewable transportation fuels. Many of our facilities are the EPA-registered producers of transportation fuel making compressed and liquefied RNG from landfill biogas, which qualifies as a cellulosic biofuel under the RFS program. Oil refiners and importers are required through the RFS program to blend specified volumes of various categories of renewable transportation fuels with gasoline or buy credits, referred to as RINs, from renewable fuel producers. Notably, market uncertainty related to the EPA's implementation of the RFS program in recent years has led to volatility in the price of RINs.

The EPA issued a highly anticipated proposed rule in late 2022 establishing biofuel blending volumes under the RFS program for compliance years 2023 through 2025. The proposed rule reflects the outsized role of biogas under the program, delivers on many reforms that benefit the solid waste sector, recognizes the continued growth of the market for RNG in vehicle applications, and incentivizes the generation of electricity from landfill biogas for use in fueling electric vehicles. We will continue to advocate for the current administration to implement policies that reduce the potential for volatility in the RINs market and ensure long-term stability for renewable transportation fuels, as changes in the RFS market or the structure of the RFS program can and has impacted the financial performance of the facilities constructed to capture and treat the gas.

Environmental Justice

Federal, state, and local governments are increasingly adopting requirements for environmental justice reviews as part of certain permitting decisions. These policies generally require permitting agencies to give heightened attention to the potential for projects to disproportionately impact low-income and minority communities. Our Company supports policies seeking to advance high standards of environmental performance and the fair treatment of people of all races, cultures, and incomes, and we continue to proactively engage with local communities. We are actively monitoring recent regulatory developments in this area as additional conditions imposed on permitting decisions could increase the time and cost involved to pursue and maintain necessary permits.

Item 1A. ***Risk Factors.***

In an effort to keep our stockholders and the public informed about our business, we may make "forward-looking statements." Forward-looking statements are often identified by the words, "will," "may," "should," "continue," "anticipate," "believe," "expect," "plan," "forecast," "project," "estimate," "intend" and words of a similar nature and generally include statements regarding:

- future results of operations, including revenues, earnings or cash flows;
- plans and objectives for the future;
- projections, estimates or assumptions relating to our operational or financial performance, including anticipated impacts of the Inflation Reduction Act of 2022;
- projections, estimates or assumptions relating to our capital expenditures; or
- our opinions, views or beliefs about the effects of current or future events, circumstances or performance.

You should view these statements with caution. These statements are not guarantees of future performance, circumstances or events. They are based on facts and circumstances known to us as of the date the statements are made. The following discussion should be read together with the Consolidated Financial Statements and the notes thereto. Outlined below are some of the risks that we believe could affect our business and financial statements for 2023 and beyond and could cause actual results to be materially different from those set forth in forward-looking statements made by the Company. In addition to the following risks, there may be additional risks and uncertainties that adversely affect our business, performance, or financial condition in the future that are not presently known or are not currently believed to be material. We assume no obligation to update any forward-looking statement, whether as a result of future events, circumstances or developments or otherwise.

Strategy and Operational Risks

If we fail to implement our business strategy, our financial performance and our growth could be materially and adversely affected.

Our future financial performance and success are dependent in large part upon our ability to implement our business strategy successfully. Implementation of our strategy will require effective management of our operational, financial and human resources and will place significant demands on those resources. See Item 1. *Business* for more information on our business strategy.

There are risks involved in pursuing our strategy, including the following:

- Our employees, customers or investors may not embrace and support our strategy.
- We may not be able to hire or retain the personnel necessary to manage our strategy effectively.
- A key element of our strategy is yield management through focus on price leadership, which has presented challenges to keep existing business and win new business at reasonable returns. We have also continued our environmental fee, fuel surcharge and regulatory recovery fee to offset costs. The loss of volumes as a result of price increases and our unwillingness to pursue lower margin volumes may negatively affect our cash flows or results of operations. Additionally, we have in the past and may in the future face purported class action lawsuits related to our customer service agreements, prices and fees.
- We may be unsuccessful in implementing our technology-led automation and optimization strategy and other improvements to operational efficiency and such efforts may not yield the intended result.
- We may not be able to maintain cost savings achieved through our automation and optimization efforts, due to inflationary cost pressure or otherwise.
- Strategic decisions with respect to our asset portfolio may result in impairments to our assets. See Item 1A. *Risk Factors — We may record material charges against our earnings due to impairments to our assets.*
- Our ability to make strategic acquisitions depends on our ability to identify desirable acquisition targets, negotiate advantageous transactions despite competition for such opportunities, fund such acquisitions on favorable terms, obtain regulatory approvals and realize the benefits we expect from those transactions.
- Acquisitions, investments and/or new service offerings or lines of business may not increase our earnings in the timeframe anticipated, or at all, due to difficulties operating in new markets or providing new service offerings or lines of business, failure of technologies to perform as expected, failure to operate within budget, integration

issues, or regulatory issues and compliance costs, among others, and we may experience issues successfully integrating acquisitions into our internal controls, operations, and/or accounting systems.

- Integration of acquisitions and/or new services offerings or lines of business could increase our exposure to the risk of inadvertent noncompliance with applicable laws and regulations, and any expansion into markets outside of North America would result in our business being subject to new laws and regulatory regimes, resulting in greater exposure to risk of inadvertent noncompliance and additional compliance costs.
- Liabilities associated with acquisitions, including ones that may exist only because of past operations of an acquired business, may prove to be more difficult or costly to address than anticipated, and businesses or assets we acquire may have undisclosed liabilities, despite our efforts to minimize exposure to such risks through due diligence and other measures.
- Execution of our strategy, including growth through acquisitions and our planned expansion of our recycling and renewable energy businesses, may cause us to incur substantial additional indebtedness, which may divert capital away from our traditional business operations and other financial plans.
- Supply chain disruptions or delays could detrimentally impact the execution timeline for our planned expansion of our recycling and renewable energy businesses.
- We continue to seek to divest underperforming and non-strategic assets if we cannot improve their profitability. We may not be able to successfully negotiate the divestiture of underperforming and non-strategic operations, which could result in asset impairments or the continued operation of low-margin businesses.

In addition to the risks set forth above, implementation of our business strategy could also be affected by other factors beyond our control, such as increased competition, legal developments, government regulation, general economic conditions, including slower growth or recession, increased operating costs or expenses, subcontractor costs and availability and changes in industry trends. We may decide to alter or discontinue certain aspects of our business strategy at any time. If we are not able to implement our business strategy successfully, our long-term growth and profitability may be adversely affected. Even if we are able to implement some or all of the initiatives of our business strategy successfully, our operating results may not improve to the extent we anticipate, or at all.

Our operations must comply with extensive existing regulations, and changes in regulations and/or enforcement of regulations can restrict or alter our operations, increase our operating costs, increase our tax rate, or require us to make additional capital expenditures.

Stringent government regulations at the federal, state, provincial and local level in the U.S. and Canada have a substantial impact on our operations, and compliance with such regulations is costly. Many complex laws, rules, orders and interpretations govern environmental protection, health, safety, land use, zoning, transportation and related matters. Among other things, governmental regulations and enforcement actions restrict our operations at times and may adversely affect our financial condition, results of operations and cash flows by imposing conditions such as:

- limitations on siting and constructing new waste disposal, transfer, recycling or processing facilities or on expanding existing facilities;
- limitations, regulations or levies on collection and disposal prices, rates and volumes;
- limitations, bans, taxes or charges on disposal or transportation of out-of-state waste or certain categories of waste;
- mandates regarding the management of solid waste and other materials, including requirements to recycle, divert or otherwise process certain waste, recycling and other streams; or
- limitations or restrictions on the recycling, processing or transformation of waste, recycling and other streams.

Regulations affecting the siting, design and closure of landfills require us, at times, to undertake investigatory or remedial activities, curtail operations or close landfills temporarily or permanently. We have significant financial obligations relating to final capping, closure, post-closure and environmental remediation at our existing landfills and we establish accruals for these estimated costs. Expenditures could be accelerated or materially exceed our accruals due to earlier than expected closure of landfills; the types of waste collected and manner in which it is transported and disposed of, including actions taken in the past by companies we have acquired or third-party landfill operators; environmental regulatory changes; new information about waste types previously collected, such as PFAS or other emerging contaminates and other reasons.

Additionally, regulations establishing extended producer responsibility (“EPR”) are being considered or implemented in many places around the world, including in the U.S. and Canada. EPR regulations are designed to place either partial or total responsibility on producers to fund the post-use life cycle of the products they create. Along with the funding responsibility, producers may be required to undertake additional responsibilities, such as taking over management of local recycling programs by taking back their products from end users or managing the collection operations and recycling processing infrastructure. There is no federal law establishing EPR in the U.S. or Canada; however, federal, state, provincial and local governments could, and in several cases have, taken steps to implement EPR regulations for packaging, including traditional recyclables such as cardboard, bottles and cans. If wide-ranging EPR regulations were adopted, they could significantly impact the waste and recycling streams we manage and how we operate our business, including contract terms and pricing. A significant reduction in the waste, recycling and other streams we manage could have a material adverse effect on our financial condition, results of operations and cash flows.

Our business is subject to operational and safety risks, including the risk of personal injury to employees and others.

Providing environmental and waste management services, including constructing and operating landfills, transfer stations, material recovery facilities (“MRFs”) and other disposal facilities, and landfill gas-to-energy facilities, involves risks such as truck accidents, equipment defects, malfunctions and failures, and improper use of dangerous equipment. Additionally, we closely monitor and manage landfills to minimize the risk of waste mass instability, releases of hazardous materials, and odors that are sometimes triggered by weather or natural disasters. There are also risks presented by the potential for subsurface heat reactions causing elevated landfill temperatures and increased production of leachate, landfill gas and odors. We also build and operate natural gas fueling stations, some of which also serve the public or third parties. Operation of fueling stations and landfill gas collection and control systems, as well as operation of heavy machinery and management of flammable materials at our MRFs and transfer stations, involves additional risks of fire and explosion. Any of these risks could potentially result in injury or death of employees and others, a need to shut down or reduce operation of facilities, increased operating expense and exposure to liability for pollution and other environmental damage, and property damage or destruction.

While we seek to minimize our exposure to such risks through comprehensive training, compliance and response and recovery programs, as well as vehicle and equipment maintenance programs, if we were to incur substantial liabilities in excess of any applicable insurance, our business, results of operations and financial condition could be adversely affected. Any such incidents could also tarnish our reputation and reduce the value of our brand. Additionally, a major operational failure, even if suffered by a competitor, may bring enhanced scrutiny and regulation of our industry, with a corresponding increase in operating expense.

We may be unable to obtain or maintain required permits or expand existing permitted capacity at our landfills, due to land scarcity, public opposition or otherwise, which can require us to identify disposal alternatives, resulting in decreased revenue and increased costs.

Our ability to meet our financial and operating objectives depends in part on our ability to obtain and maintain the permits necessary to operate landfill sites and transfer stations. Permits to build, operate and expand solid waste management facilities, including landfills and transfer stations, have become more difficult and expensive to obtain and maintain. Permits often take years to obtain as a result of numerous hearings and compliance requirements with regard to zoning, environmental and other regulations. These permits are also often subject to resistance from citizen or other groups and other political pressures. Local communities and citizen groups, adjacent landowners or governmental agencies may oppose the issuance of a permit or approval we may need, allege violations of the permits under which we currently operate or laws or regulations to which we are subjected, or seek to impose liability on us for alleged environmental damage. Such actions could also impact our ability to do business by causing reputational harm. Federal, state and local governments are also increasingly adopting requirements for environmental justice reviews as part of certain permitting decisions. These policies generally require permitting agencies to give heightened attention to the potential for projects to disproportionately impact low-income and minority communities. Responding to permit challenges has, at times, increased our costs and extended the time associated with establishing new facilities and expanding existing facilities. In addition, failure to receive regulatory and zoning approval, as well as land scarcity, particularly in densely populated areas, may prohibit us from establishing new facilities or expanding existing facilities. Diminishing disposal capacity, typically in proximity to major metropolitan areas, sometimes requires us to transport waste by rail or find alternative disposal solutions in affected areas, increasing our operating costs. Our failure to obtain the required permits and necessary capacity expansion to operate our landfills could have a material adverse impact on our financial condition, results of operations and cash flows.

If we are unable to attract, hire or retain key team members and a high-quality workforce, or if our succession planning does not develop an adequate pipeline of future leaders, it could disrupt our business, jeopardize our strategic priorities and result in increased costs, negatively impacting our results of operations.

Our operations require us to attract, hire, develop and retain a high-quality workforce to provide a superior customer experience. This includes key individuals in leadership and specialty roles, as well as a very large number of drivers, technicians and other front-line and back-office team members necessary to provide our environmental services. We experience significant competition to hire and retain individuals for certain front-line positions, such as commercial truck drivers, from within and outside our industry. (Also see Item 1A. *Risk Factors — Market disruption, including labor shortages and supply chain constraints, and macroeconomic pressures, including inflation, have adversely impacted our business and results of operations*.) Additionally, the market for employees that serve on our digital team is highly competitive. As we have accelerated our investments in our technology-led automation and optimization strategy, it is increasingly important that we are able to attract and retain employees with the skills and expertise necessary to implement and manage these projects. We also compete to attract skilled business leaders, and our own key team members are sought after by our competitors and other companies. We make significant investments, and engage in extensive internal succession planning, to provide us with a robust pipeline of future leaders. If we are not able to attract, hire, develop and retain a high-quality workforce with the necessary skills and expertise, as well as key leaders, or if we experience significant employee turnover, it can result in business and strategic disruption, increased costs, and loss of institutional knowledge, which could negatively impact our results of operations.

Our business depends on our reputation and the value of our brand.

We believe we have developed a reputation for high-quality service, reliability and social and environmental responsibility, and we believe our brand symbolizes these attributes. The WM brand name, trademarks and logos and our reputation are powerful sales and marketing tools, and we devote significant resources to promoting and protecting them. Adverse publicity, whether or not justified, relating to activities by our operations, employees or agents, or challenges to our assertions of social and environmental responsibility, could tarnish our reputation and reduce the value of our brand. Damage to our reputation could reduce demand for our services and potentially have an adverse effect on our financial condition, liquidity and results of operations, as well as require additional resources to rebuild our reputation and restore the value of our brand.

We have made significant investments in an extensive natural gas truck fleet, which makes us partially dependent on the availability of natural gas and fueling infrastructure and vulnerable to natural gas prices, and requirements to transition to other vehicle types could impair these investments.

We operate a large fleet of natural gas vehicles, and we plan to continue to invest in these assets for our collection fleet. However, natural gas fueling infrastructure is not yet broadly available in the U.S. and Canada; as a result, we have constructed and operate natural gas fueling stations, some of which also serve the public or pre-approved third parties. It will remain necessary for us to invest capital in fueling infrastructure in order to power our natural gas fleet. Concerns have been raised about the potential for emissions from fueling infrastructure that serve natural gas-fueled vehicles. New regulation of, or restrictions on, natural gas fueling infrastructure or reductions in associated tax incentives could increase our operating costs. Additionally, fluctuations in the price and supply of natural gas could substantially increase our operating expenses; a reduction in the existing cost differential between natural gas and diesel fuel could materially reduce the benefits we anticipate from our investment in natural gas vehicles. Further, our fuel surcharge program is currently indexed to diesel fuel prices, and price fluctuations for natural gas may not effectively be recovered by this program.

There is increasing pressure to reduce the use of fossil fuel in the heavy-duty truck industry, and some cities and states are pursuing requirements for using alternative engine technology, such as electric powered vehicles, rather than natural gas or diesel vehicles. This is resulting in regulatory actions to advance the adoption of zero-emission vehicles and a gradual shift away from tax incentives and grants for natural gas trucks. Although current options for heavy-duty electric vehicles lack sufficient range and proven experience for our operations, we are proactively engaging in pilots of electric powered heavy-duty vehicles and anticipate that we could redirect future planned capital investments in our fleet toward these assets when the vehicles prove economically and operationally viable. Should regulation mandate an accelerated transition to electric powered vehicles, our cost to acquire vehicles needed to service our customers could increase, capital investment required to establish sufficient charging infrastructure could be significant and investments we have made in an industry-leading natural gas fleet and infrastructure could be impaired.

Increases in our labor costs as a result of labor unions organizing, changes in regulations related to labor unions or increases in employee minimum wages, could adversely affect our future results.

Labor unions continually attempt to organize our employees, and these efforts will likely continue in the future. Certain groups of our employees are currently represented by unions, and we have negotiated collective bargaining agreements with these unions. Additional groups of employees may seek union representation in the future, and, if successful, would enhance organized labor's leverage to obtain higher than expected wage and benefits costs and resist the introduction of new technology and other initiatives, which can result in increased operating expenses and lower net income. If we are unable to negotiate acceptable collective bargaining agreements, our operating expenses could increase significantly as a result of work stoppages, including strikes. Additionally, a large portion of our workforce are hourly personnel, and many of these individuals, particularly in our recycling business, are paid at rates related to federal and state minimum wages. Increases in minimum wage rates, or the enactment of new wage-related legislation, may significantly increase our labor costs. Any of these matters could adversely affect our financial condition, results of operations and cash flows.

The seasonal nature of our business, severe weather events resulting from climate change and event driven special projects cause our results to fluctuate, and prior performance may not be indicative of our future results.

Our operating revenues tend to be somewhat higher in summer months, primarily due to the higher construction and demolition waste volumes. The volumes of industrial and residential waste in certain regions where we operate also tend to increase during the summer months. Our second and third quarter revenues and results of operations typically reflect these seasonal trends.

Service or operational disruptions caused by severe storms, extended periods of inclement weather or climate events can significantly affect the operating results of the geographic areas affected. Extreme weather events may also lead to supply chain disruption and delayed project development, or disruption of our customers' businesses, reducing the amount of waste generated by their operations.

On the other hand, certain destructive weather and climate conditions, such as wildfires in the Western U.S. and hurricanes that most often impact our operations in the Southern and Eastern U.S. during the second half of the year, can increase our revenues in the geographic areas affected as a result of the waste volumes generated by these events. While weather-related and other event-driven special projects can boost revenues through additional work for a limited time, due to significant start-up costs and other factors, such revenue can generate earnings at comparatively lower margins.

For these and other reasons, operating results in any period may not be indicative of operating results for any other period. Our stock price may be negatively impacted by interim variations in our results.

We may not be able to achieve our sustainability and other environmental, social and governance ("ESG")-related goals, including reduction of our greenhouse gas ("GHG") emissions, or execute on our sustainability-related growth strategy and initiatives, within planned timelines, and expectations and regulations relating to ESG performance and disclosure can result in increased costs, risk of noncompliance, and related adverse effects.

Consistent with our Company's long-standing commitment to sustainability and environmental stewardship, we have set goals to reduce our GHG emissions and announced other ESG-related goals and initiatives. We have also announced a sustainability growth strategy that includes significant planned investments in our recycling and renewable energy businesses. Our ability to achieve these goals and successfully execute our sustainability growth strategy may be impacted by the numerous risks and uncertainties associated with our business and the environmental services industry, including financial and operating performance, availability of technology and financing, changes in regulation, commodity price fluctuation and general economic conditions. (Also see Item 1A. *Risk Factors — Our revenues, earnings and cash flows will fluctuate based on changes in commodity prices, and commodity prices for recyclable materials are particularly susceptible to volatility based on macroeconomic conditions and regulations that affect our ability to export products* and *— We have announced a sustainability growth strategy that includes significant planned investments in our renewable energy businesses; changes to federal and state renewable fuel policies could affect our financial performance, and such investments may not yield the results anticipated.*)

Some or all of the expected benefits of our sustainability-related investments and initiatives may not occur within the anticipated time periods, or may cost more to achieve than anticipated. An inability to develop, obtain, or scale necessary technology and innovations, and challenges arising from the availability or cost of materials and infrastructure associated with our sustainability investments and initiatives, could impede our ability to execute on our plans and achieve our goals. Actions we take to achieve these goals and implement our sustainability growth strategy and initiatives, including development and implementation of enhanced technology and reporting systems, will require increased capital expenditures and management focus, which may divert investment and management focus away from other aspects of our business operations.

There is increasing governmental and social pressure on companies to develop and implement robust ESG policies, practices, and disclosures. The nature, scope and complexity of matters that our Company must assess and report are expanding due to growing mandatory and voluntary reporting on climate-related risks and other topics, such as water usage, waste production, labor, human capital, environmental justice, cybersecurity and privacy, and risk oversight. Our industry faces challenges from these and other rapidly changing laws, regulations, policies and related interpretations, as well as the risk of enforcement actions by governmental and regulatory agencies for noncompliance. Significant expenditures and commitment of time by management, employees and consultants is involved in developing, implementing and overseeing policies, practices, additional disclosures and internal controls related to ESG risk and performance. An inability to implement such policies, practices, and internal controls and maintain compliance with laws and regulations, or a perception among stakeholders that our ESG disclosures and sustainability goals are insufficient or our goals are unattainable, could harm our reputation and competitive position and negatively impact our stock price and business performance.

External Economic and Industry Risks

The COVID-19 global pandemic disrupted social and commercial activity and financial markets throughout North America; a significant resurgence or new variant of the COVID-19 virus, or other similar pandemic conditions, may have a material adverse impact on our business, financial condition, results of operations and cash flows.

The COVID-19 pandemic and related protective measures had a significant adverse impact on many sectors of the economy, including environmental services. The initial business closures and negative impact on general economic conditions resulted in volume declines and reductions in customers' waste service needs, which negatively impacted our results of operations and cash flows. In particular, COVID-19 caused decreases in volumes in higher margin businesses, impacting key financial metrics.

A significant future resurgence in transmission of COVID-19, a significant new virus variant, or other pandemic conditions that result in business closures and social restrictions could adversely impact our volumes and costs. If such conditions were to deepen, resulting in a broad-based economic slow-down, it may have a material adverse impact on our financial condition, results of operations and cash flows and hinder our ability to grow our business and execute our business strategy. Additionally, if a large portion of our employee base were to become ill, it could impact our ability to provide timely and reliable service. Governmental regulation in response to pandemic conditions, including any vaccination requirements, could result in our inability to perform or compete for certain contracts, as well as significant cost, operational disruption, attrition and difficulty securing future labor needs.

Market disruption, including labor shortages and supply chain constraints, and macroeconomic pressures, including inflation, have adversely impacted our business and results of operations.

Macroeconomic pressures, including inflation and rising interest rates, and market disruption resulting in labor market, supply chain and transportation constraints are continuing. Significant global supply chain disruption and the heightened pace of inflation have reduced availability and increased costs for the goods and services we purchase, with a particular impact on our repair and maintenance costs. Supply chain constraints have also caused delayed delivery of fleet, steel containers and other purchases. Aspects of our business rely on third-party transportation providers, and such services have become more limited and expensive. Additionally, we expect continued significant headwinds from commodity prices for recycled material into 2023, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. We are also currently experiencing margin pressures from commodity-driven business impacts, particularly from higher fuel prices. The constrained labor market has resulted in increased costs for wage adjustments, overtime hours and training new hires. If we are not able to overcome limitations on labor availability, it could materially impact our ability to service our customers and our financial results. Geopolitical conflict and the resulting international response, including Russia's invasion of Ukraine, have also exacerbated market disruption, leading to volatility in commodity prices, impacts on the availability and cost of energy, and vendor and supplier disruptions across the global supply chain.

Accelerated and pronounced economic pressures, such as the continuing inflationary cost pressure on labor and the goods and services we rely upon to deliver service to our customers, have had and continue to have a significant impact on our cost structure and capital expenditures. Significant components of our operating expenses vary directly as we experience changes in revenue due to volume and a heightened pace of inflation, and we may not be able to dynamically manage our cost structure in response to such changes. A significant portion of our revenue is tied to a price escalation index with a lookback provision, resulting in a timing lag in our ability to recover increased costs under those contracts during periods of rapid inflation. Separately, for many of our customers we provide services under multi-year contracts that can restrict our ability to increase prices and the timing of such increases. Our overall strategic pricing efforts are focused on recovering as much of the inflationary cost increases we experience in our business as possible by increasing our average unit rate, but such efforts may not be successful for various reasons including the pace of inflation, operating cost inefficiencies, contractual limitations, and market responses. The inability to adequately increase prices to offset increased costs and inflationary pressures, or otherwise mitigate the impact of these macroeconomic conditions and market disruptions on our business, will increase our costs of doing business and reduce our margins.

The extent and duration of the impact of these labor market, supply chain, transportation and commodity-price challenges are subject to numerous external factors beyond our control, including broader macroeconomic conditions; recessionary fears and/or an economic recession; size, location, and qualifications of the labor pool; wage and price structures; adoption of new or revised regulations; future resurgence of COVID-19 or other pandemic conditions and restrictions; geopolitical conflicts and responses; and supply and demand for recycled materials. If such impacts are prolonged and substantial, they could have a material negative effect on our results of operations.

The environmental services industry is highly competitive, and if we cannot successfully compete in the marketplace, our business, financial condition and operating results may be materially adversely affected.

We encounter intense competition from governmental, quasi-governmental and private sources in all aspects of our operations. We principally compete with large national waste management companies, counties and municipalities that maintain their own waste collection and disposal or recycling operations and regional and local companies of varying sizes and financial resources. The industry also includes companies that specialize in certain discrete areas of waste management, operators of alternative disposal facilities, companies that seek to use parts of the waste stream as feedstock for renewable energy and other by-products, and waste brokers that rely upon haulers in local markets to address customer needs. In recent years, the industry has seen some additional consolidation, though the industry remains intensely competitive. Counties and municipalities may have financial competitive advantages because tax revenues are available to them and tax-exempt financing is more readily available to them. Also, such governmental units may attempt to impose flow control or other restrictions that would give them a competitive advantage. In addition, some of our competitors may have lower financial expectations, allowing them to reduce their prices to expand sales volume or to win competitively-bid contracts, including large national accounts and exclusive franchise arrangements with municipalities. When this happens, we may lose customers and be unable to execute our pricing strategy, resulting in a negative impact to our revenue growth from yield on base business.

Our revenues, earnings and cash flows will fluctuate based on changes in commodity prices, and commodity prices for recyclable materials are particularly susceptible to volatility based on macroeconomic conditions and regulations that affect our ability to export products.

Enforcement or implementation of foreign and domestic regulations can affect our ability to export products. In recent years, new and updated international regulations affecting, and in some cases restricting, the international flow of certain recyclables have led to a reduction in export activity for such recyclables, as well as higher quality requirements and higher processing costs. COVID-19 placed additional financial stress on recyclers and municipalities, resulting in some recycling programs being paused or eliminated. These changes have led to a number of states and provinces considering and several implementing EPR regulations.

Prices and demand for recyclables fluctuate. While demand for recyclables generally continues to trend upwards, during the second half of 2022, we saw significant declines in commodity prices for recycled material, and we expect significant commodity price headwinds to continue into 2023, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. Recycling revenues attributable to yield increased $19 million and $537 million in 2022 and 2021, respectively, as compared with the prior year periods primarily from higher market prices for recycling commodities in 2021 and the first half of 2022, before the significant downturn in the second half of 2022.

We have announced a sustainability growth strategy that includes significant planned investments in our recycling business to increase automation and reduce labor dependency. Such investments are also targeted at addressing increases in quality requirements for commodities. These investments increase our exposure to commodity price fluctuations. Additionally, future regulation, tariffs, international trade policies or other initiatives, including regulations addressing climate change or GHG emissions, may impact supply and demand of material, or increase operating costs, which could impact the profitability of our recycling operations. If the Company does not effectively manage changes in demand and commodity prices for recycling materials, or if we do not successfully execute our sustainability growth strategy, our investments in recycling infrastructure and technology may not yield the results anticipated.

Fluctuation in energy prices also affects our business, including recycling of plastics manufactured from petroleum products. We are currently experiencing commodity-price driven impacts from higher fuel costs. We have increased our investment in landfill gas-to-energy facilities and the size of our landfill gas recovery operations. Significant variations in the price of biogas, electricity and other energy-related products that are marketed and sold by our landfill gas recovery operations can result in a corresponding significant impact to our revenue from yield from such operations. Additionally, we provide specialized disposal services for oil and gas exploration and production operations through our energy services business. Demand for these services decreases when drilling activity slows due to depressed oil and gas prices, and our Company and the companies for which we provide these services could face increased regulation and corresponding costs as a result of regulations related to climate change or other environmental concerns. Any of the commodity prices to which we are subject may fluctuate substantially and without notice in the future.

Increasing customer preference for alternatives to landfill disposal and bans on certain types of waste could reduce our landfill volumes and cause our revenues and operating results to decline.

Our customers are increasingly diverting waste to alternatives to landfill disposal, such as recycling and composting, while also working to reduce the amount of waste they generate. In addition, many state and local governments mandate diversion, recycling and waste reduction at the source and prohibit the disposal of certain types of materials at landfills, such as recyclables (cardboard, bottles and cans), yard waste, food waste and electronics. Where organic waste is not banned from disposal in landfills, some large customers such as grocery stores and restaurants are choosing to divert their organic waste from landfills. Reducing landfilled organic waste also reduces the amount of landfill gas produced from our landfills, adversely impacting our landfill gas-to-energy facilities. Zero-waste goals (sending no waste to the landfill) have been set by many of the U.S. and Canada’s largest companies. Although such mandates and initiatives help to protect our environment, these developments reduce the volume of waste going to our landfills, which may affect the prices that we can charge for landfill disposal. Our landfills currently provide our highest income from operations margins. If we are not successful in expanding our service offerings, growing lines of businesses to service waste streams that do not go to landfills, and providing alternative services for customers that wish to reduce waste entirely, then our revenues and operating results may decline. Additionally, despite the development of new service offerings and lines of business, it is possible that our revenues and our income from operations margins could be negatively affected due to disposal alternatives.

With a heightened awareness of the global problems caused by plastic waste in the environment, Canada and an increasing number of cities and states across the U.S. have passed ordinances banning certain types of plastics from sale or use. The most common materials banned include plastic bags and straws, polystyrene plastic and some types of single use packaging. These bans have increased pressure by manufacturers on our recycling facilities to accept a broader array of materials in curbside recycling and composting programs to alleviate public pressures to ban the sale of those materials. However, there are currently no or limited viable end markets for recycling many of these materials, and inclusion of such materials in our recycling stream increases contamination and operating costs that can negatively affect the results of our recycling operations.

General economic conditions, such as a broad-based economic recession, can directly and adversely affect revenues for environmental services and our income from operations margins.

Our business is directly affected by changes in national and general economic factors that are outside of our control, including consumer confidence, inflation, interest rates and access to capital markets. Many in the financial industry have predicted that the North American economy is poised to enter, or has entered, into a period of economic recession. A weak economy generally results in decreased consumer spending and decreases in volumes of waste generated, which negatively impacts the ability to grow through new business or service upgrades, and may result in customer turnover and reduction in customers’ waste service needs. Consumer uncertainty and the loss of consumer confidence may also reduce the number and variety of services requested by customers. Additionally, a weak market for consumer goods can significantly decrease demand by paper mills for recycled corrugated cardboard used in packaging; such as was seen in the second half of 2022, negatively impacting commodity prices and our operating income and cash flows.

A decrease in waste volumes generated results in an increase in competitive pricing pressure; such economic conditions may also interfere with our ability to implement our pricing strategy. Many of our contracts have price adjustment provisions that are tied to an index such as the Consumer Price Index, and our costs may increase more than the increase, if any, in the Consumer Price Index. This is partially due to our relatively high fixed-cost structure; we may not be able to dynamically manage our cost structure in response to shifting volume levels and vendor costs, and our cost structure may not correlate with the Consumer Price Index or the waste industry. An economic recession or other economic weakness is likely to negatively impact our revenues and margins.

Weakness in the economy may expose us to credit risk of governmental entities and municipalities and other major customers, which could negatively impact our financial results.

We provide service to a number of governmental entities, municipalities, and large national accounts. During periods of economic weakness, governmental entities and municipalities can suffer significant financial difficulties, due in part to reduced tax revenue and/or high cost structures. During these periods, such entities, and our non-governmental customers, could be unable to pay amounts owed to us or renew contracts with us at previous or increased rates.

Purchasers of our recycling commodities can be particularly vulnerable to financial difficulties in times of commodity price volatility. The inability of our customers to pay us in a timely manner or to pay increased rates, particularly large national accounts, could negatively affect our operating results.

In addition, the financial difficulties of municipalities could result in a decline in investors' demand for municipal bonds and a correlating increase in interest rates. As of December 31, 2022, we had $725 million of tax-exempt bonds with term interest rate periods that expire within the next 12 months, which is prior to their scheduled maturities. If market dynamics resulted in repricing of our tax-exempt bonds at significantly higher interest rates, we would incur increased interest expenses that may negatively affect our operating results and cash flows.

The Company's effective tax rate and tax liability could materially change as a result of the adoption of new tax legislation and other factors.

Predominantly all of the Company's revenues are generated in the U.S., and changes in U.S. tax laws could materially impact our effective tax rate, financial condition and results of operations. The U.S. Tax Cuts and Jobs Act, enacted on December 22, 2017 (the "Tax Act"), had a significant impact on our effective tax rate, cash tax expenses and net deferred tax liabilities. The Tax Act reduced the U.S. corporate statutory tax rate and eliminated or limited the deduction of several expenses that were previously deductible, among other things. However, future changes in tax laws could reverse the impacts of the Tax Act and if ultimately enacted into law, such an increase could materially impact our tax provision, cash tax liability, effective tax rate and net deferred tax liabilities.

Significant shortages in diesel fuel supply or increases in diesel fuel prices will increase our operating expenses.

The price and supply of diesel fuel can fluctuate significantly based on international, political and economic circumstances, as well as other factors outside our control, such as actions by the Organization of the Petroleum Exporting Countries ("OPEC") and other oil and gas producers, regional production patterns, weather conditions and environmental concerns. We need diesel fuel to run a significant portion of our collection and transfer trucks and our equipment used in our landfill operations. Fuel supply shortages and price increases could substantially increase our operating expenses. We have in place a fuel surcharge program, designed to offset increased fuel expenses; however, we may not be able to pass through all of our increased costs and some customers' contracts prohibit any pass-through of the increased costs. Additionally, lawsuits have challenged our fuel and environmental charges included on our invoices. Regardless of any offsetting surcharge programs, increased operating costs due to higher diesel fuel prices will decrease our income from operations margins.

Technology and Information Security Risks

Developments in technology could trigger a fundamental change in the waste management industry, as waste streams are increasingly viewed as a resource, which may adversely impact volumes at our landfills and our profitability.

Our Company and others have recognized the value of the traditional waste stream as a potential resource. Research and development activities are on-going to provide disposal alternatives that maximize the value of waste, including using waste as a source for renewable energy and other valuable by-products. We and many other companies are investing in these technologies. It is possible that such investments and technological advancements may reduce the cost of waste disposal or the value of landfill gas recovery to a level below our costs and may reduce the demand for landfill space. As a result, our revenues and margins could be adversely affected due to advancements in disposal alternatives.

If we are not able to develop new service offerings and protect intellectual property or if a competitor develops or obtains exclusive rights to a breakthrough technology, our financial results may suffer.

Our existing and proposed service offerings to customers require that we invest in, develop or license, and protect new technologies. Our Company is increasingly focusing on new technologies that automate and innovate our operations, improve the customer experience and provide alternatives to traditional disposal and maximize the resource value of waste. We are continuing our multi-year commitment to strategic investments in technology that prioritize reduction of labor dependency for certain high-turnover jobs, further digitalize our customer self-service and implement technologies to further enhance the safety, reliability and efficiency of our collection operations. Research, development and implementation of enhanced technology often requires significant spending that may divert capital investment away from our traditional business operations. We may experience difficulties or delays in the research, development, production and/or marketing of new products and services or implementation of technologies in which we have invested or acquired, which may negatively impact our operating results and prevent us from recouping or realizing a return on these investments and acquisitions. Further, protecting our intellectual property rights and combating unlicensed copying and use of intellectual property is difficult, and inability to obtain or protect new technologies could impact our services to customers and development of new revenue sources. If a competitor develops or obtains exclusive rights to a "breakthrough technology" that provides a revolutionary change in traditional waste management, or if we have inferior intellectual property to our competitors, our financial results may suffer.

We are increasingly dependent on technology in our operations and if our technology fails, our business could be adversely affected.

We may experience problems with the operation of our current information technology systems or the technology systems of third parties on which we rely, as well as the development and deployment of new information technology systems, that could adversely affect, or even temporarily disrupt, all or a portion of our operations until resolved. Inabilities and delays in implementing new systems can also affect our ability to realize projected cost savings or other benefits. Significant system failures could impede our ability to timely collect and report financial results in accordance with applicable laws and regulations. In 2022, we implemented a new general ledger accounting system, complementary finance enterprise resource planning system and a human capital management system. These systems increase our utilization of, and dependance on, third-party "cloud" computing services in connection with our business operations. Employee work-from-home arrangements prompted by the COVID-19 pandemic increased various technology risks, including potential exposure to cyber incidents, loss of data, fraud, internal control challenges and other disruptions as a consequence of more employees accessing Company systems and information remotely in the course of their ordinary work.

Significant cybersecurity incidents negatively impact our business and our relationships with customers, vendors and employees and expose us to increased liability.

Substantially all aspects of our business operations rely on digital technology. We use computers, mobile devices, social networking and other online platforms to connect with our employees, customers, and vendors. These uses give rise to cybersecurity risks, including security breach, espionage, system disruption, theft and inadvertent, unauthorized access and/or release of information. Our business necessitates the storage and transmission of numerous classes of sensitive and/or confidential information and intellectual property, including customers' personal information, private and sensitive personal information about employees, and financial and strategic information about the Company and its business partners. In addition to our own safeguarding efforts, we also rely on a Payment Card Industry compliant third party to protect our customers' credit card information.

We are regularly the target of attempted cyber intrusions, and we anticipate continuing to be subject to such attempts as cyber intrusions become increasingly sophisticated and more difficult to predict and protect against. Geopolitical conflict, including Russia's invasion of Ukraine, has also increased the risk of cyber incidents. As such, we commit substantial resources to continuously monitor and further develop our networks and infrastructure to prevent, detect, and address the risk of unauthorized access, misuse, computer viruses and other events. Our security programs and measures do not prevent all intrusions. Cyber intrusions require a significant amount of time and effort to assess and remedy, and our incident response efforts may not be effective in all cases. Although we believe that the probability of occurrence of a significant cybersecurity incident is less than likely, if such an incident were to occur, the impact on the Company could be substantial. The Company experienced a cyber intrusion in the first quarter of 2021 that was promptly detected, and the third-party software vulnerability was quickly remediated. There was no impact to the Company's operations, services or financial statements. A subsidiary of WMI provided notice to potentially affected individuals, U.S. state and federal regulators, and Canadian regulators. As a result of the cyber intrusion, regulatory investigations may result in costs, fines, penalties, or other obligations. A subsidiary of WMI was named as a defendant in a class action lawsuit related to this incident. Such case was dismissed in 2022, but an appeal by the plaintiffs is currently pending. The Company intends to vigorously defend itself against any such proceedings and does not expect that the outcome of any proceedings related to the 2021 incident will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows; however, assessing and responding to this intrusion required a significant amount of time and management attention. While the magnitude of future cyber intrusions that result in a theft, destruction, loss, misappropriation, or release of sensitive and/or confidential information or intellectual property, or material interference with our information technology systems or the technology systems of third parties on which we rely cannot be predicted, such incidents could result in material business disruption, direct financial loss, negative publicity, brand damage, alleged violation of privacy laws, loss of customers, potential regulatory enforcement or private litigation liability and competitive disadvantage. We maintain insurance for cyber incidents; however, due to policy terms, limits and exclusions, such insurance may not apply in all cases, and it may not be adequate to cover all liabilities incurred.

As the Company pursues its strategy to grow through acquisitions and to pursue new initiatives that improve our operations and cost structure, the Company is also expanding and improving its information technologies, resulting in a larger technological presence, utilization of "cloud" computing services, and corresponding exposure to cybersecurity risk. Certain new technologies, such as use of autonomous vehicles, remote-controlled equipment, virtual reality, automation and artificial intelligence, present new and significant cybersecurity safety risks that must be analyzed and addressed before implementation. If we fail to assess and identify cybersecurity risks associated with acquisitions and new initiatives, we may become increasingly vulnerable to such risks.

Increased state, federal and international laws and regulations related to cybersecurity protections and disclosures may require additional resources for compliance, and any inability, or perceived inability, to adequately address new requirements could subject us to regulatory enforcement, private litigation, and public criticism, disrupt our operations, cause us to lose customers, result in additional costs and legal liability, damage our reputation, and otherwise harm our business.

Increasing regulatory focus on privacy and data protection issues and expanding laws could negatively impact our business, subject us to criticism and expose us to increased liability.

The legislative and regulatory framework for privacy and data protection issues worldwide is rapidly evolving and is likely to remain uncertain for the foreseeable future. We collect certain personally identifiable information and other sensitive information in connection with providing services to our customers. We are subject to a variety of laws and regulations, and may become subject to additional pending laws and regulations, that govern the collection and use of such information obtained from individuals and businesses. These laws and regulations are inconsistent across jurisdictions and are subject to evolving interpretations. Government officials, regulators, privacy advocates and class action attorneys are increasingly scrutinizing how companies collect, process, use, store, share, transmit and destroy personal data. We must continually monitor the development and adoption of, and commit substantial time and resources to comply with, new and emerging laws and regulations. These laws and regulations provide disclosure obligations for businesses that collect personal information, individual rights relating to personal information, collection and storage requirements, automated decision-making transparency, and potential liability expansion. Any inability, or perceived inability, to adequately address privacy and data protection concerns, even if unfounded, or comply with applicable laws, regulations, policies, industry standards, contractual obligations, or other legal obligations, including at newly acquired companies, could subject us to regulatory enforcement, private litigation, public criticism, business disruption, loss of customers, additional costs and legal liability, reputational damage, and other harm.

Legal, Regulatory and Compliance Risks

Our operations are subject to environmental, health and safety laws and regulations, as well as contractual obligations that may result in significant liabilities.

There is risk of incurring significant environmental liabilities in the use, treatment, storage, transfer and disposal of waste materials. Under applicable environmental laws and regulations, we could be liable if it is alleged that our operations cause environmental damage to our properties or to the property of other landowners, particularly as a result of the contamination of air, drinking water or soil. Under current law, we could also be held liable for damage caused by conditions that existed before we acquired the assets or operations involved and for conditions resulting from waste types or compounds previously considered non-hazardous but later determined to present possible threat to public health or the environment. The risks of successor liability and emerging contaminants are of particular concern as we execute our growth strategy, partially through acquisitions, because we may be unsuccessful in identifying and assessing potential liabilities during our due diligence investigations. Further, the counterparties in such transactions may be unable to perform their indemnification obligations owed to us. Any substantial liability for environmental damage could have a material adverse effect on our financial condition, results of operations and cash flows.

In the ordinary course of our business, we have in the past, we are currently, and we may in the future, become involved in legal and administrative proceedings relating to land use and environmental laws and regulations. These include proceedings in which governmental entities, private groups or individuals seek to impose liability on us for alleged environmental damage or violation of statutes or desire to revoke or deny permits required for our operations. We generally seek to work with the authorities or other persons involved in these proceedings to resolve any issues raised. If we are not successful, the adverse outcome of one or more of these proceedings could result in, among other things, material increases in our costs or liabilities as well as material charges for asset impairments.

Further, we often enter into agreements with landowners imposing obligations on us to meet certain regulatory or contractual conditions upon site closure or upon termination of the agreements. Compliance with these agreements inherently involves subjective determinations and may result in disputes, including litigation. Costs to remediate or restore the condition of closed sites may be significant.

We have announced a sustainability growth strategy that includes significant planned investments in our renewable energy businesses; changes to federal and state renewable fuel policies could affect our financial performance, and such investments may not yield the results anticipated.

The primary drivers of renewable fuel development at our landfills are tax policies, such as the recently expanded federal tax credits for renewable natural gas ("RNG") production and renewable electricity generation, and federal and state incentive programs, such as the federal Renewable Fuel Standard ("RFS") program and the California Low Carbon Fuel Standard. At the federal level, oil refiners and importers are required through the RFS program to blend specified volumes of renewable transportation fuels with gasoline or buy credits, referred to as renewable identification numbers ("RINs"), from renewable fuel producers. The Company has invested, and continues to invest, in facilities that capture and convert landfill gas into RNG, and also works with facilities that capture and convert dairy digester gas into RNG, so that we can participate in the program, and the Company has stated its intention to grow its asset base to notably increase its RNG production by 2026. RINs prices generally respond to regulations enacted by the EPA, as well as fluctuations in supply and demand. The value of the RINs associated with RNG is set through a market established by the program.

Prior to 2022, the EPA has promulgated rules on an annual basis establishing refiners' obligations to purchase RNG and other cellulosic biofuels under the RFS program; however, the EPA issued a highly anticipated proposed rule in late 2022 setting forth the direction of the RFS program for compliance years 2023 through 2025. Although this proposal delivers on many reforms that benefit the solid waste sector, the EPA's programmatic shift towards multi-year standards could lead to market uncertainty and volatility in the price of RINs. We continue to advocate for the current administration to implement policies that ensure long-term stability for renewable transportation fuels and expand opportunities for the biogas sector to participate in the RFS program. Changes in the RFS market, the structure of the RFS program or RINs prices and demand can and has impacted the financial performance of the facilities constructed to capture and treat the gas. Such changes could impact or alter our projected future investments, and such investments may not yield the results anticipated.

The impact of climate change, and the adoption of climate change legislation or regulations restricting emissions of GHGs, could increase our costs to operate.

We continue to assess the physical risks, such as sea-level rise, catastrophic storms and other extreme weather conditions and long-term shifts in climate patterns, and transition risks, such as regulatory, market, policy, and technology changes, to our operations from the effects of climate change. These risks are expected to be unpredictable and widespread.

Although we have made investments to mitigate risk associated with severe storm events, damage to our facilities or disruption of service caused by more frequent or more severe storms associated with climate extremes could negatively impact operating results. We have also identified risk to our assets and our employees associated with drought or water scarcity, flooding, extreme heat and rain events, and fire conditions associated with climate change. For example, wildfires influenced by climate change can damage landfill infrastructure such as gas collection systems, flooding in low-lying areas enhanced by sea level rise can result in greater maintenance expenses at our facilities and service disruption, and more frequent or extreme rain events can erode the protective vegetative caps on our landfills and generate increased volumes of leachate to manage. Those areas of the country most prone to these occurrences have protocols in place, or are developing protocols to address these conditions, including employee safety, driver training, and equipment and facility protection protocols. We have incurred and will incur costs to develop and implement these protocols, and these protocols may not be effective in offsetting these risks. Additionally, the actions of others in response to climate change effects, such as the rolling power blackouts implemented in California in 2019 due to wildfire risks, can result in service disruptions and increase our costs to operate.

Our landfill operations emit methane, identified as a GHG. There are a number of legislative and regulatory efforts at the state, provincial, regional and federal levels to cap and/or curtail the emission of GHGs to ameliorate the effect of climate change, and otherwise to promote adaptation to climate change, support the transition to a low-carbon economy, and require disclosure of climate-related matters. We continue to monitor these efforts and the potential impacts to our operations. Additionally, existing technology presents challenges to our ability to quantify landfill emissions precisely. Should comprehensive federal climate change legislation be enacted, we expect it could impose operational and compliance costs that might not be offset by the revenue increases associated with our lower-carbon service options, the materiality of which we cannot predict. Climate change laws and regulations could also result in increased operational costs or disruption to the business of our customers, potentially impacting our operations and financial condition. We could also experience damage to our reputation and brand, including as a result of a failure or perceived failure to respond responsibly and effectively to changes in legal and regulatory measures adopted to address climate change.

We could be subject to significant fines and penalties, and our reputation could be adversely affected, if our businesses, or third parties with whom we have a relationship, were to fail to comply with U.S. or foreign laws or regulations.

Some of our projects and new business may be conducted in countries where corruption has historically been prevalent. It is our policy to comply with all applicable anti-bribery laws, such as the U.S. Foreign Corrupt Practices Act, and with applicable local laws of the foreign countries in which we operate, and we monitor our local partners' compliance with such laws as well. Our reputation may be adversely affected if we were reported to be associated with corrupt practices or if we or our local partners failed to comply with such laws. Additionally, violations of such laws could subject us to significant fines and penalties.

Currently pending or future litigation or governmental proceedings could result in material adverse consequences, including judgments or settlements.

As a large company with operations across the U.S. and Canada, we are subject to various proceedings, lawsuits, disputes and claims arising in the ordinary course of our business, including governmental proceedings. Actions that have been filed against us, and that may be filed against us in the future, include personal injury, property damage, commercial, customer, and employment-related claims, including purported state and national class action lawsuits related to:

- alleged environmental contamination, including releases of hazardous materials and odors;
- sales and marketing practices, customer service agreements, prices and fees; and
- federal and state wage and hour and other laws.

The timing of the final resolutions to these types of matters is often uncertain. Additionally, the possible outcomes or resolutions to these matters could include adverse judgments or settlements, either of which could require substantial payments, adversely affecting our liquidity.

Financial Risks

Our capital requirements and our business strategy could increase our expenses, cause us to change our growth and development plans, or result in an inability to maintain our desired credit profile.

If economic conditions or other risks and uncertainties cause a significant reduction in our cash flows from operations, we may reduce or suspend capital expenditures, growth and acquisition activity, implementation of our business strategy, dividend declarations or share repurchases. We may choose to incur indebtedness to pay for these activities, although our access to capital markets is not assured and we may not be able to incur indebtedness at a cost that is consistent with current borrowing rates. We also may need to incur indebtedness to refinance scheduled debt maturities, and it is possible that the cost of financing could increase significantly, thereby increasing our expenses and decreasing our net income. Macroeconomic pressures, including inflation and rising interest rates, and market disruption are continuing. The U.S. government's decisions regarding its debt ceiling and the possibility that the U.S. could default on its debt obligations may cause further interest rate increases, disrupt access to capital markets and deepen recessionary conditions. Further, our ability to execute our financial strategy and our ability to incur indebtedness is somewhat dependent upon our ability to maintain investment grade credit ratings on our senior debt. The credit rating process is contingent upon our credit profile and several other factors, many of which are beyond our control, including methodologies established and interpreted by third-party rating agencies. If we were unable to maintain our investment grade credit ratings in the future, our interest expense would increase and our ability to obtain financing on favorable terms could be adversely affected.

Additionally, we have $3.5 billion of debt as of December 31, 2022 that is exposed to changes in market interest rates within the next 12 months because of the impact of our commercial paper borrowings, our $1.0 billion, two-year, U.S. term credit agreement ("Term Loan") and tax-exempt bonds. If interest rates increase, our interest expense would also increase, lowering our net income and decreasing our cash flow.

We may use our $3.5 billion long-term U.S. and Canadian revolving credit facility ("$3.5 billion revolving credit facility") to meet our cash needs, to the extent available, until maturity in May 2027. As of December 31, 2022, we had no outstanding borrowings under this facility. We had $166 million of letters of credit issued and $1.7 billion of outstanding borrowings (net of related discount on issuance) under our commercial paper program, both supported by this facility, leaving unused and available credit capacity of $1.6 billion as of December 31, 2022. In the event of a default under our $3.5 billion revolving credit facility, or our Term Loan, we could be required to immediately repay all outstanding borrowings and make cash deposits as collateral for all obligations the facility supports, which we may not be able to do. Additionally, any such default could cause a default under many of our other credit agreements and debt instruments. Without waivers from lenders party to those agreements, any such default would have a material adverse effect on our ability to continue to operate.

We have substantial financial assurance and insurance requirements and increases in the costs of obtaining adequate financial assurance, or the inadequacy of our insurance coverages, could negatively impact our liquidity and increase our liabilities.

The amount of insurance we are required to maintain for environmental liability is governed by statutory requirements. We also carry a broad range of other insurance coverages that are customary for a company our size. To the extent our obligations for claims are more than we estimated, our insurance coverage is inadequate to cover our obligations, or our insurers are unable to meet their obligations, the requirement that we pay such obligations could have a material adverse effect on our financial results.

In addition, to fulfill our financial assurance obligations with respect to variable-rate tax-exempt debt, and final capping, closure, post-closure and environmental remediation obligations, we generally obtain letters of credit or surety bonds, rely on insurance, including captive insurance, fund trust and escrow accounts or rely upon WMI financial guarantees. Our financial position, which can be negatively affected by asset impairments, our credit profile and general economic factors, may increase the cost of our current financial assurance instruments, and changes in regulations may impose stricter requirements on the types of financial assurance that will be accepted. In the event we are unable to obtain sufficient surety bonding, letters of credit or third-party insurance coverage at reasonable cost, or one or more states cease to view captive insurance as adequate coverage, we would need to rely on other forms of financial assurance. It is possible that we could be required to deposit cash to collateralize certain obligations, which could negatively impact our liquidity.

We may record material charges against our earnings due to impairments to our assets.

In accordance with U.S. Generally Accepted Accounting Principles ("GAAP"), we capitalize certain expenditures and advances relating to disposal site and other facility development, expansion projects, acquisitions, software development costs and other projects. Events that have in the past and may in the future lead to an impairment include, but are not limited to, shutting down a facility or operation, abandoning a development project, project cost overruns or the denial of an expansion permit. Additionally, declining waste volumes and development of, and customer preference for, alternatives to traditional waste disposal could warrant asset impairments. If we determine an asset or expansion project is impaired, we will charge against earnings any unamortized capitalized expenditures and advances relating to such asset or project reduced by any portion of the capitalized costs that we estimate will be recoverable, through sale or otherwise. We also carry a significant amount of goodwill on our Consolidated Balance Sheets, which is required to be assessed for impairment annually, and more frequently in the case of certain triggering events. We have in the past and may in the future be required to incur charges against earnings if such impairment tests indicate that the fair value of a reporting unit is below its carrying amount. Any such charges could have a material adverse effect on our results of operations.

We could face significant liabilities for withdrawal from Multiemployer Pension Plans.

We are a participating employer in a number of trustee-managed multiemployer defined benefit pension plans ("Multiemployer Pension Plans") for employees who are covered by collective bargaining agreements. In the event of our withdrawal from a Multiemployer Pension Plan, we may incur expenses associated with our obligations for unfunded vested benefits at the time of the withdrawal. Depending on various factors, including potential legislative changes, future withdrawals could have a material adverse effect on results of operations or cash flows for a particular reporting period, and our on-going costs of participation in Multiemployer Pension Plans may increase. See Notes 9 and 10 to the Consolidated Financial Statements for more information related to our participation in Multiemployer Pension Plans.

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

None.

Item 2. ***Properties.***

Our principal executive offices are in Houston, Texas where we lease approximately 285,000 square feet under a lease expiring in 2035. We also have administrative offices in Arizona, Connecticut, Illinois and India. We own or lease real property in most locations where we have operations or administrative functions. We have operations (i) in all 50 states except Montana; (ii) in the District of Columbia and (iii) throughout Canada.

Our principal property and equipment consist of land (primarily landfills and other disposal facilities, transfer stations and bases for collection operations), buildings, vehicles and equipment. We believe that our operating properties, vehicles and equipment are adequately maintained and sufficient for our current operations. However, we expect to continue to make investments in additional property and equipment for expansion, for the replacement of aging assets and investment in assets that support our strategy of continuous improvement through efficiency and innovation. In addition, we continue to make progress on our planned investments to expand our renewable energy and recycling businesses. As of December 31, 2022 and 2021, we owned and operated five and four renewable natural gas facilities, respectively. For more information, see Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations* included within this report.

The following table summarizes our various operations as of December 31:

	2022	2021
Landfills owned or operated	259	260
Transfer stations	337	340
Material recovery facilities	97	96

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

Information regarding our legal proceedings can be found under the *Environmental Matters* and *Litigation* sections of Note 10 to the Consolidated Financial Statements included within this report.

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

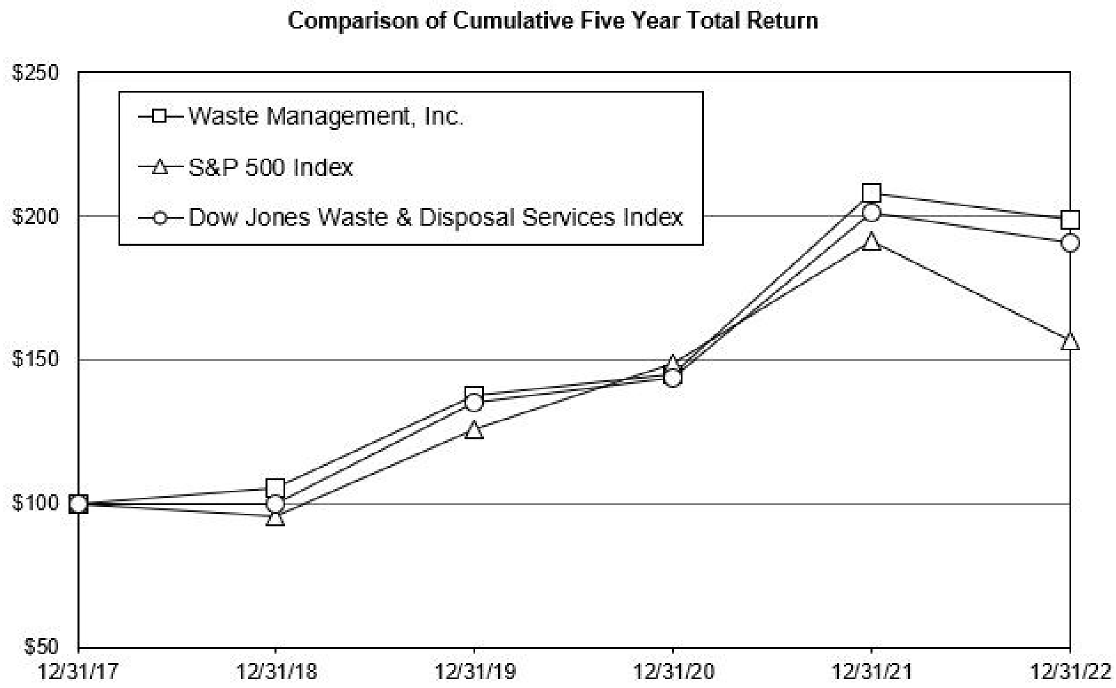
Information concerning mine safety and other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K is included in Exhibit 95 to this annual report.

PART II

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

Our common stock is traded on the New York Stock Exchange ("NYSE") under the symbol "WM." The number of holders of record of our common stock on January 31, 2023 was 7,847.

The graph below shows the relative investment performance of Waste Management, Inc. common stock, the S&P 500 Index and the Dow Jones Waste & Disposal Services Index for the last five years, assuming reinvestment of dividends at date of payment into the common stock. The graph is presented pursuant to SEC rules and is not meant to be an indication of our future performance.



	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22
Waste Management, Inc.	$ 100	$ 105	$ 137	$ 145	$ 208	$ 199
S&P 500 Index	$ 100	$ 96	$ 126	$ 149	$ 192	$ 157
Dow Jones Waste & Disposal Services Index	$ 100	$ 100	$ 135	$ 144	$ 201	$ 191

The Company repurchases shares of its common stock as part of capital allocation programs authorized by our Board of Directors. During 2022, we repurchased an aggregate of $1.5 billion of our common stock under accelerated share repurchase ("ASR") agreements and open market transactions, which equated to 9.4 million shares with a weighted average price per share of $160.32, inclusive of per-share commissions. In addition, in December 2021, we executed an ASR agreement that completed in January 2022, at which time we received 0.4 million shares. See Note 13 to the Consolidated Financial Statements for additional information. We announced in December 2022 that the Board of Directors has authorized up to $1.5 billion in future share repurchases. This new authorization replaces our prior $1.5 billion authorization that was fully utilized in 2022.

The following table summarizes common stock repurchases made during the fourth quarter of 2022 (shares in millions):

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Maximum Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
October 1 — 31	0.1	$ 159.79 (a)	0.1	$ 417 million
November 1 — 30	2.1	$ 161.19 (b)	2.1	$ 84 million
December 1 — 31	0.5	$ 161.19 (b)	0.5	$ 1.5 billion
Total	2.7	$ 161.13	2.7	

(a) In October 2022, we repurchased 125,167 shares of our common stock in open market transactions in compliance with Rule 10b5-1 and Rule 10b-18 of the Exchange Act for $20 million, inclusive of per-share commissions, at a weighted average price of $159.79.

(b) In November 2022, we delivered $417 million cash and received 2.1 million shares pursuant to an Accelerated Share Repurchase ("ASR") agreement executed in late October 2022. In December 2022, we completed the ASR agreement and received 0.5 million additional shares based on a final weighted average price of $161.19. The "Average Price Paid per Share" in the table represents the final weighted average price per share paid for the ASR agreement.

Any future share repurchases will be made at the discretion of management and will depend on various factors including our net earnings, financial condition and cash required for future business plans, growth and acquisitions.

Item 6. *[Reserved]*

None.

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

This section includes a discussion of our results of operations for the three years ended December 31, 2022. This discussion may contain forward-looking statements that anticipate results based on management's plans that are subject to uncertainty. We discuss in more detail various factors that could cause actual results to differ materially from expectations in Item 1A. *Risk Factors*. The following discussion should be read considering those disclosures and together with the Consolidated Financial Statements and the notes thereto.

Overview

We are North America's leading provider of comprehensive environmental solutions, providing services throughout the United States ("U.S.") and Canada. We partner with our residential, commercial, industrial and municipal customers and the communities we serve to manage and reduce waste at each stage from collection to disposal, while recovering valuable resources and creating clean, renewable energy. We own or operate the largest network of landfills throughout the U.S. and Canada. In order to make disposal more practical for larger urban markets, where the distance to landfills is typically farther, we manage transfer stations that consolidate, compact and transport waste efficiently and economically.

Through our subsidiaries, including our Waste Management Renewable Energy ("WM Renewable Energy") business, we are also a leading developer, operator and owner of landfill gas-to-energy facilities in the U.S. and Canada that produce renewable electricity and renewable natural gas, which is a significant source of fuel for our natural gas fleet. Additionally, we are a leading recycler in the U.S. and Canada, handling materials that include paper, cardboard, glass, plastic and metal. Our "Solid Waste" business is operated and managed locally by our subsidiaries that focus on distinct geographic areas and provide collection, transfer, disposal, and recycling and resource recovery services.

Our senior management evaluates, oversees and manages the financial performance of our Solid Waste operations through two operating segments. Our East Tier primarily consists of geographic areas located in the Eastern U.S., the Great Lakes region and substantially all of Canada. Our West Tier primarily includes geographic areas located in the Western U.S., including the upper Midwest region, and British Columbia, Canada. Each of our Solid Waste operating segments provides integrated environmental services, including collection, transfer, recycling, and disposal.

Our Solid Waste operating revenues are primarily generated from fees charged for our collection, transfer, disposal, and recycling and resource recovery services, and from sales of commodities by our recycling and landfill gas-to-energy operations. Revenues from our collection operations are influenced by factors such as collection frequency, type of collection equipment furnished, type and volume or weight of the waste collected, distance to the disposal facility or material recovery facility and our disposal costs. Revenues from our landfill operations consist of tipping fees, which are generally based on the type and weight or volume of waste being disposed of at our disposal facilities. Fees charged at transfer stations are generally based on the weight or volume of waste deposited, considering our cost of loading, transporting and disposing of the solid waste at a disposal site. Recycling revenues generally consist of tipping fees and the sale of recycling commodities to third parties. The fees we charge for our services generally include our environmental, fuel surcharge and regulatory recovery fees which are intended to pass through to customers direct and indirect costs incurred. We also provide additional services that are not managed through our Solid Waste business, described under *Results of Operations* below.

Business Environment

The waste industry is a comparatively mature and stable industry. However, customers increasingly expect more of their waste materials to be recovered and those waste streams are becoming more complex. In addition, many state and local governments mandate diversion, recycling and waste reduction at the source and prohibit the disposal of certain types of waste at landfills. We monitor these developments to adapt our service offerings. As companies, individuals and communities look for ways to be more sustainable, we promote our comprehensive services that go beyond our core business of collecting and disposing of waste in order to meet their needs. This includes expanding traditional recycling services, increasing organics collection and processing, and expanding our renewable energy projects to meet the evolving needs of our diverse customer base. As North America's leading provider of comprehensive environmental solutions, we are taking big, bold steps to catalyze positive change – change that will impact our Company as well as the communities we serve. Consistent with our Company's long-standing commitment to sustainability and environmental stewardship, we published our 2022 Sustainability Report providing details on our Environmental, Social and Governance ("ESG") performance and outlining new 2030 goals. The Sustainability Report conveys the strong linkage between the Company's ESG goals and our growth strategy, inclusive of the planned expansion of the Company's recycling and renewable energy businesses. The information in this report can be found at https://sustainability.wm.com but it does not constitute a part of, and is not incorporated by reference into, this Annual Report on Form 10 K. For further discussion see Item1. *Business – Regulation – Recent Developments and Focus Areas in Policy and Regulation*.

We encounter intense competition from governmental, quasi-governmental and private service providers based on pricing, and to a much lesser extent, the nature of service offerings, particularly in the residential line of business. Our industry is directly affected by changes in general economic factors, including increases and decreases in consumer spending, business expansions and construction activity. These factors generally correlate to volumes of waste generated and impact our revenue. Negative economic conditions and other macroeconomic trends can and have caused customers to reduce their service needs. Such negative economic conditions, in addition to competitor actions, can impact our strategy to negotiate, renew, or expand service contracts and grow our business. We also encounter competition for acquisitions and growth opportunities. General economic factors and the market for consumer goods, in addition to regulatory developments, can also significantly impact commodity prices for the recyclable materials we sell. Significant components of our operating expenses vary directly as we experience changes in revenue due to volume and a heightened pace of inflation. Volume changes can fluctuate significantly by line of business and volume changes in higher margin businesses, such as what we saw with COVID-19, can impact key financial metrics. We must dynamically manage our cost structure in response to volume changes and cost inflation.

We believe the Company’s industry-leading asset network and strategic focus on investing in our people and our digital platform will give the Company the necessary tools to address the evolving challenges impacting the Company and our industry. In line with our commitment to continuous improvement and a differentiated customer experience, we remain focused on our automation and optimization investments to enhance our operational efficiency and change the way we interact with our customers. Enhancements made through these initiatives are intended to seamlessly and digitally connect all the Company’s functions required to service our customers in order to provide the best experience and service. In late 2021, we began to execute on the next phase of this technology enablement strategy to automate and optimize certain elements of our service delivery model. This next phase will prioritize reduced labor dependency on certain high-turnover jobs, particularly in customer experience, recycling and residential collection. We continue to make these investments to further digitalize our customer self-service and implement technologies to further enhance the safety, reliability and efficiency of our collection operations. Additionally, in 2022, we implemented a new general ledger accounting system, complementary finance enterprise resource planning system and a human capital management system, which will drive operational and service excellence by empowering our people through a modern, simplified and connected employee experience.

Macroeconomic pressures, including inflation and rising interest rates, and market disruption, resulting in labor market, supply chain and transportation constraints are continuing. Significant global supply chain disruption and the heightened pace of inflation have reduced availability and increased costs for the goods and services we purchase, with a particular impact on our repair and maintenance costs. Supply chain constraints have also caused delayed delivery of fleet, steel containers and other purchases. Aspects of our business rely on third-party transportation providers, and such services have become more limited and expensive.

While demand for recyclables generally continues to trend upwards, during the second half of 2022, we saw significant declines in commodity prices for recycled materials, and we expect continued significant headwinds from commodity prices for recycled material into 2023, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. We are also currently experiencing margin pressures from other commodity-driven business impacts, particularly from higher fuel prices. The constrained labor market has resulted in increased costs for wage adjustments, overtime hours and training new hires. Geopolitical conflict and the resulting international response, including Russia’s invasion of Ukraine, have also exacerbated market disruption, leading to volatility in commodity prices, impacts on the availability and cost of energy, and vendor and supplier disruptions across the global supply chain. The extent and duration of the impact of these labor market, supply chain, transportation and recycling challenges are subject to numerous external factors beyond our control, including broader macroeconomic conditions; recessionary fears and/or an economic recession; size, location, and qualifications of the labor pool; wage and price structures; adoption of new or revised regulations; future resurgence of COVID-19 or other pandemic conditions and restrictions; geopolitical conflicts and responses and supply and demand for recycled materials. As we experience inflationary cost pressures, we focus on our strategic pricing efforts, as well as operating efficiencies and cost controls, to maintain and grow our earnings and cash flow. With these macroeconomic pressures, we remain focused on putting our people first to ensure that they are well positioned to execute our daily operations diligently and safely. We are encouraged by our results in 2022 and remain focused on delivering outstanding customer service, managing our variable costs with changing volumes and investing in technology that will enhance our customers’ experience and reduce our cost to serve.

Acquisition of Advanced Disposal Services, Inc. (“Advanced Disposal”)

On October 30, 2020, we completed our acquisition of all outstanding shares of Advanced Disposal for $30.30 per share in cash, pursuant to an Agreement and Plan of Merger dated April 14, 2019, as amended on June 24, 2020. Total enterprise value of the acquisition was $4.6 billion when including approximately $1.8 billion of Advanced Disposal’s net debt. This acquisition grew our footprint and allows us to provide differentiated, sustainable waste management and recycling services to approximately three million new commercial, industrial and residential customers primarily located in the Eastern half of the U.S. In connection with our acquisition of Advanced Disposal, we and Advanced Disposal entered into an agreement that provided for GFL Environmental to acquire a combination of assets from us and Advanced Disposal to address divestitures required by the U.S. Department of Justice. Immediately following the acquisition, the divestiture transactions were consummated and the Company subsequently received cash proceeds from the sale of $856 million.

For the year ended December 31, 2022 and 2021, we incurred integration related costs of $10 million and $51 million, respectively, and for the year ended December 31, 2020, we incurred acquisition and integration related costs of $156 million, which were primarily classified as "Selling, general and administrative expenses". The post-closing operating results of Advanced Disposal have been included in our consolidated financial statements, within our existing reportable segments. Post-closing through December 31, 2020, Advanced Disposal recognized $205 million, $142 million and $60 million of revenue, operating expenses and selling, general and administrative expenses, respectively, which are included in our Consolidated Statement of Operations.

For more information related to our acquisitions, see Notes 11 and 17 to the Consolidated Financial Statements and the *Summary of Cash Flow Activity* section below.

COVID-19 Impact

The impacts of COVID-19 on the global economy increased rapidly during the second quarter of 2020, affecting our business in most geographies and across a variety of our customer types. Over the past two years, our volumes have recovered, largely exceeding volumes from the pre-pandemic levels in 2019. While we continue to be optimistic about North America's overall economic recovery from the impacts of the COVID-19 pandemic. A significant future resurgence in transmission of COVID-19, a significant new virus variant, or other pandemic conditions that result in business closures and social restrictions could adversely impact our volumes and costs in the future.

Current Year Financial Results

During 2022, we continued to advance our strategic priorities—enhancing employee engagement, improving our operations through the use of technology and automation, and investing in growth through our recycling and renewable energy businesses. This strategic focus, combined with strong operational execution resulted in increased revenue, income from operations and income from operations margin driven primarily by both yield and volume growth in our collection and disposal business. We were able to achieve these results despite high inflationary cost pressures. We remain diligent in offering a competitively profitable service that meets the needs of our customers and are focused on driving operating efficiencies and reducing discretionary spend. We continue to invest in our people through market wage adjustments, investments in our digital platform and training for our team members. Despite the significant downturn in commodity prices for recyclable materials in the second half of the year, we remain committed to our investment in recycling automation, which reduces costs and increases throughput, positioning us to overcome commodity price headwinds and deliver a differentiated service. We also continue to make investments in automation and optimization to enhance our operational efficiency and improve labor productivity for all lines of business. During 2022, the Company allocated $2,587 million of available cash to capital expenditures. We also allocated $2,577 million of available cash to our shareholders during 2022 through dividends and common stock repurchases.

Key elements of our 2022 financial results include:

- Revenues of $19,698 million for 2022 compared with $17,931 million in 2021, an increase of $1,767 million, or 9.9%. The increase is primarily attributable to (i) higher yield in our collection and disposal lines of business; (ii) increases from our fuel surcharge program and (iii) higher volume in our collection and disposal lines of business;
- Operating expenses of $12,294 million in 2022, or 62.4% of revenues, compared with $11,111 million, or 62.0% of revenues, in 2021. The $1,183 million increase is primarily attributable to (i) inflationary cost pressures, particularly for maintenance and repairs and subcontractor costs; (ii) commodity-driven business impacts from higher fuel prices and recycling and (iii) labor cost increases from frontline employee wage adjustments;
- Selling, general and administrative expenses of $1,938 million in 2022, or 9.8% of revenues, compared with $1,864 million, or 10.4% of revenues, in 2021. The $74 million increase is primarily attributable to (i) higher costs associated with our strategic investments in our digital platform and sustainability initiatives; (ii) increased labor costs primarily from higher annual incentive compensation costs and merit increases; (iii) increased

business travel and entertainment expense and (iv) an increase in provision for bad debts; partially offset by (i) lower long-term incentive compensation costs; (ii) market adjustments for deferred compensation plans related to investment performance and (iii) lower litigation costs;

- Income from operations of $3,365 million, or 17.1% of revenues, in 2022 compared with $2,965 million, or 16.5% of revenues, in 2021. The increase in the current year was primarily driven by revenue growth in our collection and disposal lines of business driven by both yield and volume, partially offset by (i) inflationary cost pressures; (ii) labor cost increases from frontline employee wage adjustments; (iii) non-cash asset impairments; and (iv) reduced profitability in our recycling business;
- Net income attributable to Waste Management, Inc. was $2,238 million, or $5.39 per diluted share, compared with $1,816 million, or $4.29 per diluted share, in 2021. The increase in income from operations, as discussed above, in addition to a net loss on early extinguishment of debt of $220 million in 2021 that did not repeat in 2022, drove an increase in net income;
- Net cash provided by operating activities was $4,536 million in 2022, compared with $4,338 million in 2021. The increase in net cash provided by operating activities was driven by (i) an increase in earnings and (ii) lower interest payments during 2022. These results were partially offset by higher income tax payments in 2022 primarily as a result of higher pre-tax earnings and a deposit of approximately $103 million that was made to the Internal Revenue Service ("IRS") related to a disputed tax matter. The Company expects to seek a refund of the entire amount deposited with the IRS and litigate any denial of the claim for refund. See Note 8 to the Consolidated Financial Statements for further discussion; and
- Free cash flow was $1,976 million in 2022, compared with $2,530 million in 2021. The decrease in free cash flow is primarily attributable to (i) an increase in capital spending, primarily driven by our intentional investment in sustainability growth projects as well as timing differences in our fixed asset purchases to support our ongoing operations and (ii) higher income tax payments in 2022. This decrease was partially offset by increased earnings in 2022. Free cash flow is a non-GAAP measure of liquidity. Refer to *Free Cash Flow* below for our definition of free cash flow, additional information about our use of this measure, and a reconciliation to net cash provided by operating activities, which is the most comparable GAAP measure.

Results of Operations

Operating Revenues

Our Solid Waste operating revenues are primarily generated from fees charged for our collection, transfer, disposal, and recycling and resource recovery services, and from sales of commodities by our recycling and landfill gas-to-energy operations. We also provide additional services that are not managed through our Solid Waste business, including both our Strategic Business Solutions ("WMSBS") and Sustainability and Environmental Services ("SES") businesses, which include landfill gas-to-energy services, environmental solutions services and recycling brokerage services. We also offer certain other expanded service offerings and solutions. The mix of operating revenues from our major lines of business for the year ended December 31 are as follows (in millions):

	2022	2021	2020
Commercial	$ 5,450	$ 4,760	$ 4,102
Industrial	3,681	3,210	2,770
Residential	3,339	3,172	2,716
Other collection	699	533	465
Total collection	13,169	11,675	10,053
Landfill	4,600	4,153	3,667
Transfer	2,143	2,072	1,855
Recycling	1,701	1,681	1,127
Other (a)	2,405	2,112	1,776
Intercompany (b)	(4,320)	(3,762)	(3,260)
Total	$ 19,698	$ 17,931	$ 15,218

(a) The “Other” line of business includes (i) certain services provided by our WMSBS business; (ii) certain services within our sustainability business including our landfill gas to energy operations managed by our WM Renewable Energy business and (iii) certain other expanded service offerings and solutions and reflects the results of non-operating entities that provide financial assurance and self-insurance support for our Solid Waste business, net of intercompany activity. Revenue attributable to collection, landfill, transfer and recycling services provided by our “Other” businesses has been reflected as a component of the relevant line of business for purposes of presentation in this table.

(b) Intercompany revenues between lines of business are eliminated in the Consolidated Financial Statements included within this report.

The following table provides details associated with the period-to-period change in revenues and average yield for the year ended December 31 (dollars in millions):

	2022 vs. 2021				2021 vs. 2020			
	Amount	As a % of Related Business(a)	Amount	As a % of Total Company(b)	Amount	As a % of Related Business(a)	Amount	As a % of Total Company(b)
Collection and disposal	$ 1,025	6.7 %			$ 468	3.5 %		
Recycling (c)	19	1.2			537	51.5		
Fuel surcharges and other	474	51.7			240	36.9		
Total average yield (d)			$ 1,518	8.5 %			$ 1,245	8.2 %
Volume			233	1.3			435	2.8
Internal revenue growth			1,751	9.8			1,680	11.0
Acquisitions			62	0.4			1,032	6.8
Divestitures			(15)	(0.1)			(49)	(0.3)
Foreign currency translation			(31)	(0.2)			50	0.3
Total			$ 1,767	9.9 %			$ 2,713	17.8 %

(a) Calculated by dividing the increase or decrease for the current year by the prior year’s related business revenue adjusted to exclude the impacts of divestitures for the current year.

(b) Calculated by dividing the increase or decrease for the current year by the prior year’s total Company revenue adjusted to exclude the impacts of divestitures for the current year.

(c) Includes combined impact of commodity price variability and changes in fees.

(d) The amounts reported herein represent the changes in our revenue attributable to average yield for the total Company.

The following provides further details about our period-to-period change in revenues:

Average Yield

Collection and Disposal Average Yield — This measure reflects the effect on our revenue from the pricing activities of our collection, transfer and landfill operations, exclusive of volume changes. Revenue growth from collection and disposal average yield includes not only base rate changes and environmental and service fee fluctuations, but also (i) certain average price changes related to the overall mix of services, which are due to the types of services provided; (ii) changes in average price from new and lost business and (iii) price decreases to retain customers.

The details of our revenue growth from collection and disposal average yield for the year ended December 31 are as follows (dollars in millions):

	2022 vs. 2021		2021 vs. 2020	
	Amount	**As a % of Related Business**	**Amount**	**As a % of Related Business**
Commercial	$ 406	9.2 %	$ 152	3.9 %
Industrial	307	10.2	126	4.8
Residential	185	6.1	119	4.5
Total collection	898	8.2	397	4.2
Landfill	79	3.1	42	1.8
Transfer	48	4.5	29	2.9
Total collection and disposal	$ 1,025	6.7 %	$ 468	3.5 %

Our overall strategic pricing efforts are focused on recovering our higher cost to service our customers that we experience in our business by increasing our average unit rate. We experienced strong average yield growth in our collection line of business of 8.2% in 2022, up from 4.2% in 2021, illustrating our focus on our pricing efforts in this inflationary environment. We are driving improvements in our residential line of business, aligning the price charged for services we provide to our customers with the costs to provide the services, resulting in increased average yield in 2022 of 6.1%, up from 4.5% in 2021. We are also continuing to see growth in our disposal business with our municipal solid waste business experiencing average yield of 6.2% in 2022, up from 3.2% in 2021.

Recycling — Recycling revenues attributable to yield increased $19 million and $537 million in 2022 and 2021, respectively, as compared with the prior year periods, primarily from higher market prices for recycling commodities in 2021 and the first half of 2022, before the significant downturn in the second half of 2022.

Demand for recycled materials strengthened through 2021 and into early 2022, primarily driven by the growth in e-commerce, businesses re-opening, and manufacturers committing to use more recycled content in their packaging. In 2022, we experienced all-time high recycling commodity pricing in the first half of the year to be followed by historically low pricing through the second half of the year, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. We expect significant commodity price headwinds to continue into 2023. Average market prices for recycling commodities at the Company's facilities were approximately 10% lower and 115% higher in 2022 and 2021, respectively, when compared with the prior year periods. Revenue decline from lower commodity pricing was offset by higher pricing in our recycling brokerage business as well as our continued focus on a fee-based pricing model that ensures fees paid by customers cover the cost of processing materials and the impact on our cost structure of managing contamination in the recycling stream.

Fuel Surcharges and Other — These fees, which include (i) our fuel surcharge program, (ii) yield from our WM Renewable Energy business and (iii) other mandated fees, increased $474 million and $240 million in 2022 and 2021, respectively, as compared to the prior year periods. Fuel surcharge revenues are based on and fluctuate in response to changes in the national average prices for diesel fuel, and also vary with changes in our volume-based revenue activity. Market prices for diesel fuel were over 50% and 30% higher in 2022 and 2021, as compared to the prior year periods. Revenue from yield growth in our WM Renewable Energy business increased $48 million and $85 million in 2022 and 2021, respectively, as compared to the prior year period, primarily driven by increases in the value for electricity and renewable natural gas credits. The mandated fees are primarily related to fees and taxes assessed by various state, county and municipal government agencies at our landfills and transfer stations. These amounts have not significantly impacted the change in revenue for the periods presented.

Volume

Our revenues from volume (excluding volumes from acquisitions and divestitures) increased $233 million, or 1.3%, and $435 million, or 2.8%, in 2022 and 2021, respectively, as compared with the prior year periods. Our collection and disposal business volumes grew 1.8% and 3.0% in 2022 and 2021, respectively.

Our 2022 volume growth has moderated when compared to the accelerated volume recovery from COVID-related impacts experienced in 2021. Special waste volumes at our landfills have been the most significant driver of volume growth, primarily due to an increase in event-driven projects. In addition, our WMSBS business volumes grew as a result of our continued focus on a differentiated service model for national accounts customers. Our volumes have been impacted by our intentional efforts to reduce unprofitable residential and industrial collection volumes.

We experienced higher volume growth in 2021 relative to the sharp decline experienced in April 2020 as a result of COVID-related impacts. The pace of recovery in our volumes accelerated in the second quarter of 2021 and continued in the second half of 2021 with minimal impact from periodic resurgences in transmission of COVID-19 virus variants as communities and businesses have remained open. The portions of our business that had the most pronounced decreases in volume due to the pandemic were our industrial and commercial collection businesses and our landfill volumes.

Acquisitions and Divestitures

Acquisitions and divestitures resulted in a net increase in revenues of $47 million, or 0.3%, and $983 million, or 6.5%, in 2022 and 2021, respectively, as compared with the prior year periods, with the increase in 2021 primarily due to our acquisition of Advanced Disposal.

Operating Expenses

Our operating expenses are comprised of (i) labor and related benefits costs (excluding labor costs associated with maintenance and repairs discussed below), which include salaries and wages, bonuses, related payroll taxes, insurance and benefits costs and the costs associated with contract labor; (ii) transfer and disposal costs, which include tipping fees paid to third-party disposal facilities and transfer stations; (iii) maintenance and repairs costs relating to equipment, vehicles and facilities and related labor costs; (iv) subcontractor costs, which include the costs of independent haulers who transport waste collected by us to disposal facilities and are affected by variables such as volumes, distance and fuel prices; (v) costs of goods sold, which includes the cost to purchase recycling materials for our recycling line of business, including certain rebates paid to suppliers; (vi) fuel costs, net of tax credits for alternative fuel, which represent the costs of fuel to operate our truck fleet and landfill operating equipment; (vii) disposal and franchise fees and taxes, which include landfill taxes, municipal franchise fees, host community fees, contingent landfill lease payments and royalties; (viii) landfill operating costs, which include interest accretion on landfill liabilities, interest accretion on and discount rate adjustments to environmental remediation liabilities and recovery assets, leachate and methane collection and treatment, landfill remediation costs and other landfill site costs; (ix) risk management costs, which include general liability, automobile liability and workers' compensation claims programs costs and (x) other operating costs, which include gains and losses on sale of assets, telecommunications, equipment and facility lease expenses, property taxes, utilities and supplies. Variations in volumes year-over-year, as discussed above in *Operating Revenues*, in addition to cost inflation, affect the comparability of the components of our operating expenses.

The following table summarizes the major components of our operating expenses for the year ended December 31 (dollars in millions and as a percentage of revenues):

	2022		2021		2020	
Labor and related benefits	$ 3,452	17.5 %	$ 3,223	18.0 %	$ 2,746	18.1 %
Transfer and disposal costs	1,215	6.2	1,161	6.5	1,135	7.5
Maintenance and repairs	1,835	9.3	1,596	8.9	1,331	8.7
Subcontractor costs	2,006	10.2	1,766	9.9	1,523	10.0
Cost of goods sold	973	4.9	936	5.2	553	3.6
Fuel	592	3.0	393	2.2	265	1.7
Disposal and franchise fees and taxes	720	3.7	698	3.9	606	4.0
Landfill operating costs	421	2.1	412	2.3	394	2.6
Risk management	348	1.8	344	1.9	269	1.8
Other	732	3.7	582	3.2	519	3.4
	$ 12,294	62.4 %	$ 11,111	62.0 %	$ 9,341	61.4 %

Our operating expenses in 2022 increased, as compared with 2021, primarily due to (i) inflationary cost pressures, particularly for maintenance and repairs and subcontractor costs; (ii) commodity-driven business impacts from higher fuel prices and recycling and (iii) labor cost pressure from frontline employee wage adjustments. We also continue to focus on operating efficiency and efforts to control costs.

Our operating expenses in 2021 increased, as compared with 2020, primarily due to (i) increased volumes from the acquisition of Advanced Disposal; (ii) commodity-driven business impacts, particularly from recycling brokerage rebates and higher fuel prices; (iii) volume recovery from earlier pandemic-driven lows; (iv) labor cost pressure from frontline employee wage adjustments, increased turnover driving up training costs and higher overtime due to driver shortages and volume growth and (v) inflationary cost pressures, primarily in the second half of 2021. These impacts were partially offset by our continued focus on operating efficiency and efforts to control costs as volumes grow.

Significant items affecting the comparison of operating expenses between reported periods include:

Labor and Related Benefits — The increase in labor and related benefits costs in 2022, as compared with 2021,was largely driven by (i) proactive market wage adjustments to hire and retain talent; (ii) annual merit and annual incentive compensation cost increases and (iii) increases in health and welfare costs attributable to our intentional investment in delivering a leading benefits program for our employees and increases in medical care activity. The increase in labor and related benefits costs in 2021, as compared with 2020, was largely driven by (i) increased labor and related benefits costs related to our acquisition of Advanced Disposal; (ii) merit and proactive market wage adjustments to hire and retain talent; (iii) volume increases, particularly in our commercial and industrial collection businesses, which when combined with driver shortages and turnover in certain markets, increased overtime and training hours; (iv) higher annual incentive compensation and (v) increases in health and welfare costs attributable to medical care activity generally returning to pre-pandemic levels.

Transfer and Disposal Costs — The increase in transfer and disposal costs in 2022, as compared with 2021, was largely driven by inflationary cost increases, which includes increased disposal fees at third-party sites and higher fuel from our third-party haulers offset, in part, by decreases in residential collection and transfer volume. The increase in transfer and disposal costs in 2021, as compared with 2020, was largely driven by increased volume, which includes the volumes from our acquisition of Advanced Disposal and inflationary cost increases from our third-party haulers.

Maintenance and Repairs — The increase in maintenance and repairs costs in 2022, as compared with 2021,was largely driven by (i) inflationary cost increases for parts, supplies and third-party services; (ii) additional fleet maintenance driven by supply chain constraints, which have delayed deliveries of new trucks; (iii) labor cost increases for our technicians, including higher overtime; (iv) increased building maintenance costs including improvements to facilities and (v) an increase in container repairs driven by delays in delivery of steel containers due to supply chain constraints. The increase in maintenance and repairs costs in 2021, as compared with 2020, was largely driven by (i) our acquisition of Advanced Disposal, including intentional investments to bring the acquired fleet to our standards; (ii) inflationary cost increases for parts, supplies and third-party services; (iii) additional fleet maintenance driven by commercial and industrial collection volume increases; (iv) labor cost increases for our technicians, including higher overtime from labor shortages; (v) an increase in container repairs driven by volume increases and delays in normal course capital expenditures for steel containers due to both steel costs and supply chain constraints and (vi) increased building maintenance costs including improvements to facilities.

Subcontractor Costs — The increase in subcontractor costs in 2022, as compared with 2021,was largely driven by (i) inflationary cost increases, particularly for fuel and labor costs from third-party haulers and (ii) an increase in volumes in our WMSBS business, which relies more extensively on subcontracted hauling than our collection and disposal business. The increase in subcontractor costs in 2021, as compared with 2020, was largely driven by (i) inflationary cost increases from third-party haulers and higher volumes; (ii) an increase in volumes in our WMSBS business and (iii) the acquisition of Advanced Disposal.

Cost of Goods Sold — The increase in cost of goods sold in 2022, as compared with 2021, was primarily driven by all-time high recycling commodity pricing in the first half of the year offset, in part, by the historically low pricing through the second half of the year. The increase in cost of goods sold in 2021, as compared with 2020, was primarily driven by increases in market prices for recycling commodities of approximately 115% and to a lesser extent, higher recycling volumes.

Fuel — The increase in fuel costs in 2022, as compared with 2021, was primarily due to increases in market diesel and natural gas fuel prices as compared to the prior year. The increase in fuel costs in 2021, as compared with 2020, was primarily due to (i) increases in market diesel and natural gas fuel prices; (ii) the acquisition of Advanced Disposal and (iii) volume increases in our commercial and industrial collection businesses.

Disposal and Franchise Fees and Taxes — The increase in disposal and franchise fees and taxes in 2022, as compared with 2021, was primarily driven by higher franchise fees, driven by an increase in landfill volumes, paid to certain municipalities where we operate and overall rate increases in our fees and taxes paid on our disposal volumes. The increase in disposal and franchise fees and taxes in 2021, as compared with 2020, was primarily driven by (i) landfill volume increases; (ii) disposal rate increases at certain landfills and (iii) additional costs attributable to our acquisition of Advanced Disposal.

Landfill Operating Costs — Our landfill operating costs increased in 2022, as compared with 2021, primarily due to increases in methane and leachate management costs and other site maintenance costs, in part due to inflation. The increase in landfill operating costs in 2021, as compared with 2020, was primarily due to volume increases, including from our acquisition of Advanced Disposal and increased testing and monitoring costs. These increases were partially offset by (i) lower leachate management costs, primarily due to the cessation of certain transportation costs in our East Tier segment and (ii) changes in the measurement of our environmental remediation obligations and recovery assets. The increases in both 2022 and 2021 were offset, in part, by changes in the measurement of our environmental remediation obligations and recovery assets in each year. Our measurement of these balances includes application of a risk-free discount rate, which is based on the rate for U.S. Treasury bonds. The discount rate increased, which resulted in a reduction in the net liability balance and a credit to expense, in both 2021 and 2022 with more significant impact in 2022. Conversely, in 2020, there was a decrease in the discount rate, which resulted in an increase in the net liability balance and a charge to expense.

Risk Management — Risk management costs increased slightly in 2022, as compared with 2021, primarily due to inflation in premiums. The increase in risk management costs in 2021, as compared with 2020, was primarily due to our acquisition of Advanced Disposal and overall economic recovery from COVID-driven impacts, increasing business activity and claim volumes and related costs.

Other — Other operating cost increases in 2022, as compared with 2021, were primarily due to (i) inflationary cost pressures; (ii) higher equipment rental costs attributable, in part, to supply chain constraints slowing normal course fleet and equipment orders; (iii) higher utility costs at our facilities and (iv) an increase in business travel in 2022. Additionally, a favorable litigation settlement in 2021 impacted the comparison. Other operating cost increases in 2021, as compared with 2020, were due to our acquisition of Advanced Disposal and increased equipment rental costs attributable, in part, to increased volumes and supply chain constraints slowing normal course fleet and equipment orders. Additionally, during the second half of 2021, additional volumes and inflationary cost pressures drove an increase in various costs. Partially offsetting these was a favorable litigation settlement in 2021. Additionally, net gains on sales of certain assets during each year impacted the comparability of the reported periods

Selling, General and Administrative Expenses

Our selling, general and administrative expenses consist of (i) labor and related benefits costs, which include salaries, bonuses, related insurance and benefits, contract labor, payroll taxes and equity-based compensation; (ii) professional fees, which include fees for consulting, legal, audit and tax services; (iii) provision for bad debts, which includes allowances for uncollectible customer accounts and collection fees and (iv) other selling, general and administrative expenses, which include, among other costs, facility-related expenses, voice and data telecommunication, advertising, bank charges, computer costs, travel and entertainment, rentals, postage and printing. In addition, the financial impacts of litigation reserves generally are included in our "Other" selling, general and administrative expenses.

The following table summarizes the major components of our selling, general and administrative expenses for the year ended December 31 (dollars in millions and as a percentage of revenues):

	2022		2021		2020	
Labor and related benefits	$ 1,195	6.1 %	$ 1,215	6.8 %	$ 1,057	6.9 %
Professional fees	268	1.4	228	1.3	256	1.7
Provision for bad debts	50	0.2	37	0.2	54	0.4
Other	425	2.1	384	2.1	361	2.4
	$ 1,938	9.8 %	$ 1,864	10.4 %	$ 1,728	11.4 %

Selling, general and administrative expenses in 2022, as compared with 2021, increased primarily due to (i) strategic investments in our digital platform, including those that support our ongoing sustainability initiatives; (ii) higher annual incentive compensation costs and merit increases for our employees; (iii) increased business travel and entertainment expense and (iv) an increase in provision for bad debts, partially offset by (i) lower long-term incentive compensation costs; (ii) market adjustments for deferred compensation plans related to investment performance and (iii) lower litigation costs.

Selling, general and administrative expenses in 2021, as compared with 2020, increased primarily due to (i) higher incentive compensation costs; (ii) strategic investments in our digital platform and (iii) increased labor, support and integration costs following our acquisition of Advanced Disposal. Partially offsetting these increases are lower consulting, advisory and legal fees following the completion of our acquisition of Advanced Disposal in 2020 and improvements in our provision for bad debts as collections returned to pre-pandemic levels.

Although our costs increased in 2022 and 2021, the significant revenue increases positioned us to reduce our overall selling, general and administrative expenses as a percentage of revenues when compared with each of the prior year periods.

Significant items affecting the comparison of our selling, general and administrative expenses between reported periods include:

Labor and Related Benefits — The decrease in labor and related benefits costs in 2022, as compared with 2021, was primarily due to (i) lower long-term incentive compensation costs; (ii) reductions in contract labor and (iii) market adjustments for deferred compensation plans related to investment performance, partially offset by higher annual incentive compensation and annual merit increases for our employees. The increase in labor and related benefits costs in 2021, as compared with 2020, was primarily due to (i) higher incentive compensation costs; (ii) additional headcount, including from our acquisition of Advanced Disposal; (iii) annual merit increases for our employees; (iv) costs associated with our strategic investments in our digital platform and (v) increases in health and welfare costs attributable to medical care activities generally returning to pre-pandemic levels from the lower level experienced during 2020.

Professional Fees — The increase in professional fees in 2022, as compared with 2021, was primarily driven by strategic investments in our digital platform, including those that support our ongoing sustainability initiatives, partially offset by lower acquisition and integration costs. Professional fees decreased in 2021, as compared with 2020, primarily due to lower consulting, advisory and legal fees following the completion of our acquisition of Advanced Disposal in 2020, partially offset by increased strategic investments in our digital platform and integration costs related to our acquisition of Advanced Disposal.

Provision for Bad Debts — The increase in provision for bad debts in 2022, as compared with 2021, is primarily related to (i) increased revenue; (ii) increased collection risk with certain customers and (iii) favorable adjustments to our reserves taken in 2021 as a result of improvement in customer account collections. The decrease in provision for bad debts in 2021, as compared with 2020, was primarily due to an overall improvement in customer account collections and decreased collection risk with certain customers.

Other — The increase in other expenses in 2022, as compared with 2021, was primarily driven by costs associated with technology infrastructure to support our strategic investments in our digital platform and an increase in business travel and entertainment expense, partially offset by lower litigation costs. The increase in other expenses in 2021, as compared with 2020, was primarily driven by costs associated with our acquisition of Advanced Disposal and increased technology infrastructure costs to support our strategic investments in our digital platform.

Depreciation, Depletion and Amortization Expenses

The following table summarizes the components of our depreciation, depletion and amortization expenses for the year ended December 31 (dollars in millions and as a percentage of revenues):

	2022		2021		2020	
Depreciation of tangible property and equipment	$ 1,155	5.9 %	$ 1,125	6.2 %	$ 996	6.6 %
Depletion of landfill airspace	754	3.8	731	4.1	568	3.7
Amortization of intangible assets	129	0.6	143	0.8	107	0.7
	$ 2,038	10.3 %	$ 1,999	11.1 %	$ 1,671	11.0 %

The increase in depreciation of tangible property and equipment in 2022, as compared with 2021, was primarily driven by investments in capital assets, including containers to service our customers and strategic investments in our digital platform. The increase in depletion of landfill airspace in 2022, as compared with 2021, was primarily driven by changes in depletion rates from revisions in landfill cost estimates and increased volumes at our landfills, partially offset by a prior year charge due to management's decision to close a landfill in our West Tier segment earlier than expected, resulting in the acceleration of the timing of capping, closure, and post-closure activities. The decrease in amortization of intangible assets in 2022, as compared with 2021, was primarily driven by the amortization of acquired intangible assets from the acquisition of Advanced Disposal.

The increase in depreciation of tangible property and equipment in 2021, as compared with 2020, was related to our acquisition of Advanced Disposal and investments in capital assets, including our fleet, heavy equipment at our landfills and containers to service our customers. The increase in depletion of landfill airspace in 2021, as compared with 2020, was driven by (i) changes in depletion rates driven by revisions in landfill estimates, including a $15 million charge due to management's decision to close a landfill in our West Tier segment earlier than expected; (ii) our acquisition of Advanced Disposal and (iii) landfill volume increases associated with the economic recovery from COVID-driven impacts. Additionally, 2020 benefited from a decrease in the inflation rate used to estimate capping, closure, and post-closure asset retirement obligations. The increase in amortization of intangible assets in 2021, as compared with 2020, was primarily driven by the amortization of acquired intangible assets related to the acquisition of Advanced Disposal.

Restructuring

During the year ended December 31, 2021, we recognized $8 million of restructuring charges primarily related to our acquisition of Advanced Disposal. During the year ended December 31, 2020, we recognized $9 million of restructuring charges primarily related to modifying our field sales and customer services structures to better support our strategic investments in our digital platform.

(Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net

The following table summarizes the major components of (gain) loss from divestitures, asset impairments and unusual items, net for the year ended December 31 (in millions):

	2022	2021	2020
Gain from divestitures, net	$ (5)	$ (44)	$ (33)
Asset impairments	50	8	68
Other	17	20	—
	$ 62	$ (16)	$ 35

For the year ended December 31, 2022, we recognized $62 million of net charges consisting of (i) $50 million of asset impairment charges primarily related to management's decision to close two landfills within our East Tier segment and (ii) a $17 million charge pertaining to reserves for loss contingencies in our Corporate and Other segment to adjust an indirect wholly-owned subsidiary's estimated potential share of the liability for a proposed environmental remediation plan at a closed site, as discussed in Note 10 to the Consolidated Financial Statements. These losses were partially offset by a $5 million gain from the divestiture of a solid waste business in our West Tier segment.

For the year ended December 31, 2021, we recognized net gains of $16 million primarily consisting of (i) a $35 million pre-tax gain from the recognition of cumulative translation adjustments on the divestiture of certain non-strategic Canadian operations in our East Tier segment and (ii) an $8 million gain from divestitures of certain ancillary operations in our Other segment. These gains were partially offset by (i) a $20 million charge pertaining to reserves for loss contingencies in our Corporate and Other segment and (ii) $8 million of asset impairment charges primarily related to our WM Renewable Energy business within our Other segment.

For the year ended December 31, 2020, we recognized $35 million of net charges primarily related to (i) a $33 million net gain associated with net asset divestitures executed to address requirements of the U.S. Department of Justice in connection with our acquisition of Advanced Disposal, primarily within our West Tier segment; (ii) $41 million of non-cash impairment charges primarily related to two landfills and an oil field waste injection facility in our West Tier segment; (iii) a $20 million non-cash impairment charge in our East Tier segment due to management's decision to close a landfill once its constructed airspace is filled and abandon any remaining permitted airspace and (iv) $7 million of net charges primarily related to non-cash impairments of certain assets within our WM Renewable Energy business in our Other segment.

See Note 2 to the Consolidated Financial Statements for additional information related to the accounting policy and analysis involved in identifying and calculating impairments.

Income from Operations

The following table summarizes income from operations for the year ended December 31 (dollars in millions):

	2022	Period-to-Period Change		2021	Period-to-Period Change		2020
Solid Waste:							
East Tier	$ 2,249	$ 212	10.4 %	$ 2,037	$ 365	21.8 %	$ 1,672
West Tier	2,346	243	11.6	2,103	303	16.8	1,800
Solid Waste	4,595	455	11.0	4,140	668	19.2	3,472
Other (a)	26	(8)	*	34	76	*	(42)
Corporate and Other (b)	(1,256)	(47)	3.9	(1,209)	(213)	21.4	(996)
Total	$ 3,365	$ 400	13.5 %	$ 2,965	$ 531	21.8 %	$ 2,434
Percentage of revenues	17.1 %			16.5 %			16.0 %

* Percentage change does not provide a meaningful comparison.

(a) "Other" includes (i) elements of our WMSBS business that are not included in the operations of our reportable segments; (ii) elements of our sustainability business that includes landfill gas-to-energy operations managed by our WM Renewable Energy business, our SES business and recycling brokerage services and not included in the operations of our reportable segments; (iii) certain other expanded service offerings and solutions and (iv) the results of non-operating entities that provide financial assurance and self-insurance support for our Solid Waste business, net of intercompany activity.

(b) "Corporate and Other" operating results reflect certain costs incurred for various support services that are not allocated to our reportable segments. These support services include, among other things, treasury, legal, digital, tax, insurance, centralized service center processes, other administrative functions and the maintenance of our closed landfills. Income from operations for "Corporate and Other" also includes costs associated with our long-term incentive program.

Solid Waste — The most significant items affecting the results of operations of our Solid Waste business during the three years ended December 31, 2022 are summarized below:

- Income from operations in our Solid Waste business increased in 2022, as compared with 2021, primarily due to revenue growth in our collection and disposal businesses driven by both yield and volume. This increase was partially offset by (i) inflationary cost pressures; (ii) labor cost increases from frontline employee wage adjustments; (iii) divestitures, asset impairments and unusual items discussed above in *(Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net*; that impacted our East Tier results and (iv) reduced profitability in our recycling business from the decline in recycling commodity prices and lower volumes.
- Income from operations in our Solid Waste business increased in 2021, as compared with 2020, primarily due to (i) revenue growth in our collection and disposal businesses driven by both yield and volume, as well as the acquisition of Advanced Disposal; (ii) improved profitability in our recycling business from higher market prices for recycling commodities and improved costs at facilities where we have made investments in enhanced technology and equipment and (iii) changes from divestitures, asset impairments and unusual items discussed above in *(Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net* that impacted both Tiers' results. These increases were partially offset by (i) labor cost pressure from frontline employee wage adjustments, increased turnover driving up training costs and higher overtime due to driver shortages and volume growth; (ii) increased landfill depletion from higher volumes and revisions in landfill estimates, including the anticipated timing of capping, closure and post-closure activities at certain landfills and adjustments in 2020 to the inflation rate used to estimate capping, closure, and post-closure asset retirement obligations that benefitted costs in 2020 and (iii) inflationary cost pressures. During 2021, the positive earnings contributions from Advanced Disposal were offset by elevated depreciation, depletion and amortization of acquired assets.

Other — The decrease in income from operations in 2022, as compared with 2021, was due to the recognition of acquisition and integration-related costs, as well as, a prior year gain from divestitures of certain ancillary operations in our Other segment, discussed above in *(Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net*, partially offset by improved profitability in our SES and WMSBS businesses. The increase in income from operations for 2021, as compared to 2020, was primarily driven by increased market values for renewable energy credits generated by our WM Renewable Energy business.

Corporate and Other — The most significant items affecting the results of operations for Corporate and Other during the three years ended December 31, 2022 are summarized below:

- These costs increased in 2022, as compared with 2021, primarily due to strategic investments in our digital platform and sustainability initiatives, partially offset by lower acquisition and integration related costs.
- These costs increased in 2021, as compared with 2020, due to (i) higher incentive compensation costs; (ii) increased labor, support and integration costs following our acquisition of Advanced Disposal; (iii) strategic investments in our digital platform; (iv) increased health and welfare costs attributable to medical care activity generally returning to pre-pandemic levels from the lower levels experienced during 2020 and (v) charges pertaining to reserves for certain loss contingencies during 2021. These increases were partially offset by lower consulting, advisory and legal fees following the completion of our acquisition of Advanced Disposal in the fourth quarter of 2020 and changes in the measurement of our environmental remediation obligations and recovery assets in both 2020 and 2021.

Interest Expense, Net

Our interest expense, net was $378 million, $365 million and $425 million in 2022, 2021 and 2020, respectively. The increase in interest expense, net for 2022 was primarily related to borrowings incurred under our $1.0 billion two-year, U.S. term credit agreement (“Term Loan”) and increases in interest rates on our floating-rate debt, including commercial paper and variable-rate tax-exempt bonds. Partially offsetting these increases were benefits from higher capitalized interest and increases in interest income as a result of higher cash and cash equivalent balances.

The decrease in interest expense, net for 2021 was primarily due to certain refinancing activities, as discussed further below, including (i) the redemption of $3.0 billion of senior notes in July 2020 and the issuance of $2.5 billion of senior notes in November 2020 at lower rates and (ii) the retirement of $1.3 billion of certain high-coupon senior notes and concurrent issuance of $950 million of lower coupon senior notes in May 2021. The decreases were partially offset by decreases in interest income as a result of lower cash and cash equivalents balances in 2021. See Note 6 to the Consolidated Financial Statements for more information related to our debt balances.

Loss on Early Extinguishment of Debt, Net

In May 2021, WMI issued $950 million of senior notes. Concurrently, we used the net proceeds from the newly issued senior notes of $942 million and available cash on hand to retire $1.3 billion of certain high-coupon senior notes. The loss on early extinguishment of debt for 2021 includes $220 million of charges related to this tender offer, including cash paid of $211 million related to premiums and other third-party costs, and $9 million primarily related to unamortized discounts and debt issuance costs. See Note 6 to the Consolidated Financial Statements for more information related to these transactions.

In July 2020, we recognized a $52 million loss on early extinguishment of debt in our Consolidated Statement of Operations related to the mandatory redemption of $3.0 billion of senior notes with a special mandatory redemption feature (the “SMR Notes”). The loss includes $30 million of premiums paid and $22 million of unamortized discounts and debt issuance costs. Pursuant to the terms of the SMR Notes, we were required to redeem all of such outstanding notes paying debt holders 101% of the aggregate principal amounts of such notes, plus accrued but unpaid interest, as a result of the Advanced Disposal acquisition not being completed by July 14, 2020. Accordingly, the redemption was completed on

July 20, 2020 using available cash on hand and, to a lesser extent, commercial paper borrowings. The cash paid included the $3.0 billion principal amount of debt redeemed, $30 million of related premiums and $8 million of accrued interest.

During the fourth quarter of 2020, we repaid the outstanding borrowings under a 364-day revolving credit facility and contemporaneously terminated the facility, at which time we recognized a $2 million loss on early extinguishment of debt in our Consolidated Statement of Operations related to unamortized debt issuance costs. Additionally, at the time of acquisition, Advanced Disposal had outstanding $425 million of 5.625% senior notes due November 2024. In November 2020, we redeemed the notes pursuant to an optional redemption feature upon which we recognized a $1 million gain on early extinguishment of debt in our Consolidated Statement of Operations due to the difference in carrying value and redemption price.

Equity in Net Losses of Unconsolidated Entities

We recognized equity in net losses of unconsolidated entities of $67 million, $36 million and $68 million in 2022, 2021 and 2020, respectively. The losses for each period were primarily related to our noncontrolling interests in entities established to invest in and manage low-income housing properties. We generate tax benefits, including tax credits, from the losses incurred from these investments, which are discussed further in Notes 8 and 18 to the Consolidated Financial Statements. We also held a residual financial interest in an entity that owned a refined coal facility that qualified for federal tax credits. In 2020, the entity sold the majority of its assets resulting in a $7 million non-cash impairment charge at that time.

Income Tax Expense

We recorded income tax expense of $678 million, $532 million and $397 million in 2022, 2021 and 2020, respectively, resulting in effective income tax rates of 23.2%, 22.6% and 20.9% for the years ended December 31, 2022, 2021 and 2020, respectively. The comparability of our income tax expense for the reported periods has been primarily affected by the following:

- *Investments Qualifying for Federal Tax Credits* — Our low-income housing properties investments reduced our income tax expense by $99 million, $74 million and $87 million, primarily due to tax credits realized from these investments for the years ended December 31, 2022, 2021 and 2020, respectively. See Note 18 to the Consolidated Financial Statements for additional information related to these unconsolidated variable interest entities;
- *Equity-Based Compensation* — During 2022, 2021 and 2020, we recognized a reduction in our income tax expense of $17 million, $18 million and $27 million, respectively, for excess tax benefits related to the vesting or exercise of equity-based compensation awards;
- *State Net Operating Losses and Credits* — During 2022, 2021 and 2020, we recognized state net operating losses and credits resulting in a reduction in our income tax expense of $8 million, $15 million and $12 million, respectively;
- *Tax Audit Settlements* — We file income tax returns in the U.S. and Canada, as well as other state and local jurisdictions. We are currently under audit by various taxing authorities and our audits are in various stages of completion. During the reported periods, we settled various tax audits, which resulted in a reduction in our income tax expense of $6 million, $13 million and $10 million for the years ended December 31, 2022, 2021 and 2020, respectively;
- *Adjustments to Accruals and Related Deferred Taxes* — Adjustments to our accruals and related deferred taxes primarily due to the filing of our income tax returns, analysis of our deferred tax balances and uncertain tax positions, and changes in state and foreign laws resulted in an increase in our income tax expense of $1 million and $17 million for the years ended December 31, 2022 and 2021, respectively, and a reduction in our income tax expense of $3 million for the year ended December 31, 2020;
- *Tax Implications of Divestitures* – During 2021, we recognized a pre-tax gain from the recognition of cumulative translation adjustments on the divestiture of certain non-strategic Canadian operations. This gain was not taxable, which benefited our effective income tax rate for the year ended December 31, 2021;

- *Non-Deductible Transaction Costs* — During 2020, we recognized the detrimental tax impact of $27 million of non-deductible transaction costs related to our acquisition of Advanced Disposal. The tax rules require the capitalization of certain facilitative costs on the acquisition of stock of a company resulting in the applicable costs not being deductible for tax purposes; and
- *Tax Legislation* — The Inflation Reduction Act of 2022 ("IRA") was signed into law by President Biden on August 16, 2022 and contains a number of tax-related provisions. The provisions of the IRA related to alternative fuel tax credits secure approximately $55 million of annual pre-tax benefit (to be recorded as a reduction in our operating expense) from tax credits through 2024, which is in line with the benefit we have realized from our alternative fuel tax credits in prior years. Additionally, we will incur an excise tax of 1% for future common stock repurchases, which will be reflected in the cost of purchasing the underlying shares as a component of treasury stock. The IRA contains a number of additional provisions related to tax incentives for investments in renewable energy production, carbon capture, and other climate actions, as well as the overall measurement of corporate income taxes. Given the complexity and uncertainty around the applicability of the legislation to our specific facts and circumstances, we continue to analyze the IRA provisions to identify and quantify potential opportunities and applicable benefits included in the legislation. The current expectation is the minimum corporate tax will not have an impact on the Company. With respect to only the investment tax credit aspect of the IRA, we expect the cumulative benefit to be between $250 million and $350 million, a large portion of which is anticipated to be realized in 2025. Additionally, the production tax credit incentives for investments in renewable energy and the carbon capture provisions of the IRA will likely result in incremental benefit, although at this time the amount of those benefits have not been quantified.

See Note 8 to the Consolidated Financial Statements for more information related to income taxes.

Landfill and Environmental Remediation Discussion and Analysis

We owned or operated 254 solid waste landfills and five secure hazardous waste landfills as of December 31, 2022 and 255 solid waste landfills and five secure hazardous waste landfills as of December 31, 2021. For these landfills, the following table reflects changes in capacity, as measured in tons of waste, for the year ended December 31 and remaining airspace, measured in cubic yards of waste, as of December 31 (in millions):

	2022			2021		
	Remaining Permitted Capacity	Expansion Capacity	Total Capacity	Remaining Permitted Capacity	Expansion Capacity	Total Capacity
Balance as of beginning of year (in tons)	4,889	174	5,063	4,891	191	5,082
Acquisitions, divestitures, newly permitted landfills and closures	163	—	163	(4)	—	(4)
Changes in expansions pursued (a)	—	62	62	—	105	105
Expansion permits granted (b)	57	(57)	—	126	(126)	—
Depletable tons received	(125)	—	(125)	(124)	—	(124)
Changes in engineering estimates and other (c) (d)	181	11	192	—	4	4
Balance as of end of year (in tons) (e)	5,165	190	5,355	4,889	174	5,063
Balance as of end of year (in cubic yards) (e)	5,079	180	5,259	4,808	163	4,971

(a) Amounts reflected here relate to the combined impacts of (i) new expansions pursued; (ii) increases or decreases in the airspace being pursued for ongoing expansion efforts; (iii) adjustments for differences between the airspace being pursued and airspace granted and (iv) decreases due to decisions to no longer pursue expansion permits, if any.

(b) We received expansion permits at 12 of our landfills during 2022 and seven of our landfills during 2021, demonstrating our continued success in working with municipalities and regulatory agencies to expand the disposal airspace of our existing landfills.

(c) Changes in engineering estimates can result in changes to the estimated available remaining airspace of a landfill or changes in the utilization of such landfill airspace, affecting the number of tons that can be placed in the future. Estimates of the amount of waste that can be placed in the future are reviewed annually by our engineers and are based on a number of factors, including standard engineering techniques and site-specific factors such as current and projected mix of waste type; initial and projected waste density; estimated number of years of life remaining; depth of underlying waste; anticipated access to moisture through precipitation or recirculation of landfill leachate and operating practices. We continually focus on improving the utilization of airspace through efforts that may include recirculating landfill leachate where allowed by permit; optimizing the placement of daily cover materials and increasing initial compaction through improved landfill equipment, operations and training.

(d) In 2022, a change in accounting estimate resulted in an increase of 190 million tons across certain landfills.

(e) See Note 2 to the Consolidated Financial Statements for discussion of converting remaining cubic yards of airspace to tons of capacity.

The depletable tons received at our landfills for the year ended December 31 are shown below (tons in thousands):

	2022			2021		
	# of Sites	Depletable Tons	Tons per Day	# of Sites	Depletable Tons	Tons per Day
Solid waste landfills (a)	254 (b)	123,462	452	255	123,163	451
Hazardous waste landfills	5	652	2	5	586	2
	259	124,114	454	260	123,749	453
Solid waste landfills closed, divested or lease or other contractual agreement expired during related year	4	633		9	114	
		124,747			123,863 (c)	

(a) As of December 31, 2022 and 2021, we had 15 landfills and 14 landfills, respectively, which were not accepting waste.

(b) In 2022, we (i) executed one new contractual agreement; (ii) reopened one previously closed landfill; (iii) developed one new landfill; (iv) closed three landfills and (v) closed one landfill operated under contractual agreement.

(c) December 31, 2021 tons have been restated for comparability purposes by removing 1.6 million tons received at the landfill that were not depleted as they were used for beneficial purposes and generally were redirected from the permitted airspace to other areas of the landfill.

As of December 31, 2022, we owned or controlled the management of 231 sites with remedial activities, are in closure or have received a certification of closure or post-closure from the applicable regulatory agency.

Based on remaining permitted airspace as of December 31, 2022 and projected annual disposal volume, the weighted average remaining landfill life for all of our owned or operated landfills is approximately 39 years. Many of our landfills have the potential for expanded airspace beyond what is currently permitted. We monitor the availability of permitted airspace at each of our landfills and evaluate whether to pursue an expansion at a given landfill based on estimated future disposal volume, disposal prices, construction and operating costs, remaining airspace and likelihood of obtaining an expansion permit. We are seeking expansion permits at 16 of our landfills that meet the expansion criteria outlined in the *Critical Accounting Estimates and Assumptions — Landfills* section below. Although no assurances can be made that all future expansions will be permitted or permitted as designed, the weighted average remaining landfill life for all owned or operated landfills is approximately 40 years when considering remaining permitted airspace, expansion airspace and projected annual disposal volume.

The number of landfills owned or operated as of December 31, 2022, segregated by their estimated operating lives based on remaining permitted and expansion airspace and projected annual disposal volume, was as follows:

	# of Landfills
0 to 5 years	28
6 to 10 years	23
11 to 20 years	53
21 to 40 years	62
41+ years	93
Total	259 (a)

(a) Of the 259 landfills, 218 are owned, 29 are operated under lease agreements and 12 are operated under other contractual agreements. For the landfills not owned, we are usually responsible for final capping, closure and post-closure obligations.

Landfill Assets — We capitalize various costs that we incur to prepare a landfill to accept waste. These costs generally include expenditures for land (including the landfill footprint and required landfill buffer property), permitting, excavation, liner material and installation, landfill leachate collection systems, landfill gas collection systems, environmental monitoring equipment for groundwater and landfill gas, directly related engineering, capitalized interest, and on-site road construction and other capital infrastructure costs. The cost basis of our landfill assets also includes estimates of future costs associated with landfill final capping, closure and post-closure activities, which are discussed further below.

The changes to the cost basis of our landfill assets and accumulated landfill airspace depletion for the year ended December 31, 2022 are reflected in the table below (in millions):

	Cost Basis of Landfill Assets	Accumulated Landfill Airspace Depletion	Net Book Value of Landfill Assets
December 31, 2021	$ 17,734	$ (10,390)	$ 7,344
Capital additions	791	—	791
Asset retirement obligations incurred and capitalized	114	—	114
Depletion of landfill airspace	—	(754)	(754)
Foreign currency translation	(81)	36	(45)
Asset retirements and other adjustments	(32)	212	180
December 31, 2022	$ 18,526	$ (10,896)	$ 7,630

As of December 31, 2022, we estimate that we will spend approximately $731 million in 2023, and approximately $1.6 billion in 2024 and 2025 combined, for the construction and development of our landfill assets. The specific timing of landfill capital spending is dependent on future events and spending estimates are subject to change due to fluctuations in landfill waste volumes, changes in environmental requirements and other factors impacting landfill operations.

Landfill and Environmental Remediation Liabilities — As we accept waste at our landfills, we incur significant asset retirement obligations, which include liabilities associated with landfill final capping, closure and post-closure activities. These liabilities are accounted for in accordance with authoritative guidance on accounting for asset retirement obligations and are discussed in Note 2 to the Consolidated Financial Statements. We also have liabilities for the remediation of properties that have incurred environmental damage, which generally was caused by operations or for damage caused by conditions that existed before we acquired operations or a site. We recognize environmental remediation liabilities when we determine that the liability is probable and the estimated cost for the likely remedy can be reasonably estimated.

The changes to landfill and environmental remediation liabilities for the year ended December 31, 2022 are reflected in the table below (in millions):

	Landfill	Environmental Remediation
December 31, 2021	$ 2,326	$ 213
Obligations incurred and capitalized	114	—
Obligations settled	(121)	(28)
Interest accretion	108	4
Revisions in estimates and interest rate assumptions (a)	243	15
Acquisitions, divestitures and other adjustments	(6)	—
December 31, 2022	$ 2,664	$ 204

(a) In 2021, the increase in our landfill liabilities for revisions in estimates and interest rate assumptions was $33 million. The increase in our landfill liabilities in 2022 is primarily due to inflationary cost pressures that are expected to impact costs over the remaining landfill lives.

Landfill Operating Costs — The following table summarizes our landfill operating costs for the year ended December 31 (in millions):

	2022	2021	2020
Interest accretion on landfill liabilities	$ 108	$ 108	$ 103
Interest accretion on and discount rate adjustments to environmental remediation liabilities and recovery assets	(10)	(2)	9
Leachate and methane collection and treatment	193	183	189
Landfill remediation costs	12	6	1
Other landfill site costs	118	117	92
Total landfill operating costs	$ 421	$ 412	$ 394

Depletion of Landfill Airspace — Depletion of landfill airspace, which is included as a component of depreciation, depletion and amortization expenses, includes the following:

- the depletion of landfill capital costs, including (i) costs that have been incurred and capitalized and (ii) estimated future costs for landfill development and construction required to develop our landfills to their remaining permitted and expansion airspace; and
- the depletion of asset retirement costs arising from landfill final capping, closure and post-closure obligations, including (i) costs that have been incurred and capitalized and (ii) projected asset retirement costs.

Depletion expense is recorded on a units-of-consumption basis, applying cost as a rate per ton. The rate per ton is calculated by dividing each component of the depletable basis of a landfill (net of accumulated depletion) by the number of tons needed to fill the corresponding asset's remaining permitted and expansion airspace. Landfill capital costs and closure and post-closure asset retirement costs are generally incurred to support the operation of the landfill over its entire operating life and are, therefore, depleted on a per-ton basis using a landfill's total permitted and expansion airspace. Final capping asset retirement costs are related to a specific final capping event and are, therefore, depleted on a per-ton basis using each discrete final capping event's estimated permitted and expansion airspace. Accordingly, each landfill has multiple per-ton depletion rates.

The following table presents our landfill airspace depletion expense on a per-ton basis for the year ended December 31:

	2022	2021	2020
Depletion of landfill airspace (in millions)	$ 754	$ 731	$ 568
Tons received, net of redirected waste (in millions)	125	124	112
Average landfill airspace depletion expense per ton	$ 6.05	$ 5.90	$ 5.07

Different per-ton depletion rates are applied at each of our 259 landfills, and per-ton depletion rates vary significantly from one landfill to another due to (i) inconsistencies that often exist in construction costs and provincial, state and local regulatory requirements for landfill development and landfill final capping, closure and post-closure activities and (ii) differences in the cost basis of landfills that we develop versus those that we acquire. Accordingly, our landfill airspace depletion expense measured on a per-ton basis can fluctuate due to changes in the mix of volumes we receive across the Company each year.

Liquidity and Capital Resources

The Company consistently generates annual cash flow from operations that meets and exceeds our working capital needs, allows for payment of our dividends, investment in the business through capital expenditures and tuck-in acquisitions, and funding of strategic sustainability growth investments. We continually monitor our actual and forecasted cash flows, our liquidity and our capital resources, enabling us to plan for our present needs and fund unbudgeted business requirements that may arise during the year. The Company believes that its investment grade credit ratings, large value of unencumbered assets and modest leverage enable it to obtain adequate financing to meet its ongoing capital, operating, strategic and other liquidity requirements.

Summary of Contractual Obligations

The following table summarizes our significant contractual obligations as of December 31, 2022 (other than recorded obligations related to liabilities associated with environmental remediation costs and non-cancelable operating lease obligations, which are discussed further in Notes 3 and 7 to the Consolidated Financial Statements, respectively) and the anticipated effect of these obligations on our liquidity in future years (in millions):

	2023	2024	2025	2026	2027	Thereafter	Total
Recorded Obligations:							
Final capping, closure and post-closure liabilities (a)	$ 137	$ 219	$ 212	$ 181	$ 147	$ 3,162	$ 4,058
Debt payments (b)	2,423	1,290	1,324	673	1,163	8,275	15,148
Unrecorded Obligations:							
Interest on debt (c)	451	384	349	326	297	2,691	4,498
Estimated unconditional purchase obligations (d)	192	158	114	101	34	369	968
Anticipated liquidity impact as of December 31, 2022	$ 3,203	$ 2,051	$ 1,999	$ 1,281	$ 1,641	$ 14,497	$ 24,672

(a) Includes liabilities for final capping, closure and post-closure costs recorded in our Consolidated Balance Sheet as of December 31, 2022, without the impact of discounting and inflation. Our recorded liabilities for final capping, closure and post-closure costs will increase as we continue to place additional tons within the permitted airspace at our landfills.

(b) These amounts represent the scheduled principal payments based on their contractual maturities related to our long-term debt and financing leases, excluding interest. Refer to Note 6 to the Consolidated Financial Statements for additional information regarding our debt obligations.

(c) Interest on our fixed-rate debt was calculated based on contractual rates and interest on our variable-rate debt was calculated based on interest rates as of December 31, 2022. As of December 31, 2022, we had $89 million of accrued interest related to our debt obligations.

(d) Our unrecorded obligations represent purchase commitments from which we expect to realize an economic benefit in future periods. We have also made certain guarantees that we do not expect to materially affect our current or future financial position, results of operations or liquidity. See Note 10 to the Consolidated Financial Statements for discussion of the nature and terms of our unconditional purchase obligations and guarantees.

Summary of Cash and Cash Equivalents, Restricted Funds and Debt Obligations

The following is a summary of our cash and cash equivalents, restricted funds and debt balances as of December 31 (in millions):

	2022	2021
Cash and cash equivalents	$ 351	$ 118
Restricted funds:		
Insurance reserves	$ 313	$ 305
Final capping, closure, post-closure and environmental remediation funds	113	118
Other	5	5
Total restricted funds (a)	$ 431	$ 428
Debt:		
Current portion	$ 414	$ 708
Long-term portion	14,570	12,697
Total debt	$ 14,984	$ 13,405

(a) As of December 31, 2022 and 2021, $83 million and $80 million, respectively, of these account balances was included in other current assets in our Consolidated Balance Sheets.

Debt — We use long-term borrowings in addition to the cash we generate from operations as part of our overall financial strategy to support and grow our business. We primarily use senior notes and tax-exempt bonds to borrow on a long-term basis, but we also use other instruments and facilities, when appropriate. The components of our borrowings as of December 31, 2022 are described in Note 6 to the Consolidated Financial Statements.

As of December 31, 2022, we had approximately $3.1 billion of debt maturing within the next 12 months, including (i) $1.7 billion of short-term borrowings under our commercial paper program (net of related discount on issuance); (ii) $725 million of tax-exempt bonds with term interest rate periods that expire within the next 12 months, which is prior to their scheduled maturities; (iii) $500 million of 2.4% senior notes that mature in May 2023 and (iv) $192 million of other debt with scheduled maturities within the next 12 months, including $65 million of tax-exempt bonds. As of December 31, 2022, we have classified $2.7 billion of debt maturing in the next 12 months as long term because we have the intent and ability to refinance these borrowings on a long-term basis as supported by the forecasted available capacity under our $3.5 billion long-term U.S. and Canadian revolving credit facility (“$3.5 billion revolving credit facility”). The remaining $414 million of debt maturing in the next 12 months is classified as current obligations.

In May 2022, WMI issued $1.0 billion of 4.15% senior notes due April 15, 2032, the net proceeds of which were $992 million. We used the net proceeds to redeem our $500 million of 2.9% senior notes due September 2022 in advance of their scheduled maturity, to repay a portion of outstanding borrowings under our commercial paper program and for general corporate purposes.

In May 2022, we entered into a Term Loan to be used for general corporate purposes and as of December 31, 2022, we had $1.0 billion of outstanding borrowings. WM Holdings guarantees all of the obligations under the Term Loan.

See Note 6 to the Consolidated Financial Statements for more information related to the debt transactions.

We have credit lines in place to support our liquidity and financial assurance needs. The following table summarizes our outstanding letters of credit, categorized by type of facility as of December 31 (in millions):

	2022	2021
Revolving credit facility (a)	$ 166	$ 167
Other letter of credit lines (b)	800	764
	$ 966	$ 931

(a) As of December 31, 2022, we had an unused and available credit capacity of $1.6 billion.

(b) As of December 31, 2022, these other letter of credit lines are uncommitted with terms extending through April 2024.

Amendment and Extension of Revolving Credit Facility

In May 2022, we amended and restated our $3.5 billion U.S. and Canadian revolving credit facility extending the term through May 2027. The agreement includes a $1.0 billion accordion feature that may be used to increase total capacity in future periods, and we have the option to request up to two one-year extensions. Waste Management of Canada Corporation and WM Quebec Inc., each an indirect wholly-owned subsidiary of WMI, are borrowers under the $3.5 billion revolving credit facility, and the agreement permits borrowing in Canadian dollars up to the U.S. dollar equivalent of $375 million, with such borrowings to be repaid in Canadian dollars. WM Holdings, a wholly-owned subsidiary of WMI, guarantees all the obligations under the $3.5 billion revolving credit facility. Refer to Note 6 to the Consolidated Financial Statements for additional information.

Guarantor Financial Information

WM Holdings has fully and unconditionally guaranteed all of WMI’s senior indebtedness. WMI has fully and unconditionally guaranteed all of WM Holdings’ senior indebtedness. None of WMI’s other subsidiaries have guaranteed any of WMI’s or WM Holdings’ debt. In lieu of providing separate financial statements for the subsidiary issuer and guarantor (WMI and WM Holdings), we have presented the accompanying supplemental summarized combined balance sheet and income statement information for WMI and WM Holdings on a combined basis after elimination of intercompany transactions between WMI and WM Holdings and amounts related to investments in any subsidiary that is a non-guarantor (in millions):

	December 31, 2022
Balance Sheet Information:	
Current assets	$ 193
Noncurrent assets	14
Current liabilities	325
Noncurrent liabilities:	
Advances due to affiliates	19,740
Other noncurrent liabilities	12,618

	Year Ended December 31, 2022
Income Statement Information:	
Revenue	$ —
Operating income	—
Net loss	184

Summary of Cash Flow Activity

The following is a summary of our cash flows for the year ended December 31 (in millions):

	2022	2021	2020
Net cash provided by operating activities	$ 4,536	$ 4,338	$ 3,403
Net cash used in investing activities	$ (3,063)	$ (1,894)	$ (4,847)
Net cash used in financing activities	$ (1,216)	$ (2,900)	$ (1,559)

Net Cash Provided by Operating Activities — Our operating cash flows for 2022, as compared with 2021, increased by $198 million. The increase was largely driven by increased earnings in our collection and disposal and WM Renewable Energy businesses. We also experienced lower interest payments due to timing and refinancing activities in 2021 that reduced our overall interest rate. Partially offsetting our increase in cash from operating activities were higher income tax payments as a result of higher earnings in 2022 and a deposit of approximately $103 million that was made to the IRS related to a disputed tax matter. The Company expects to seek a refund of the entire amount deposited with the IRS and litigate any denial of the claim for refund. See Note 8 to the Consolidated Financial Statements for further details.

Our operating cash flows for 2021, as compared with 2020, increased by $935 million largely as a result of (i) an increase in earnings primarily attributable to our collection, disposal and recycling lines of business; (ii) our acquisition of Advanced Disposal; (iii) lower interest payments in 2021 primarily due to certain refinancing activities and the retirement of high-coupon debt during 2020 reducing our overall interest rates; (iv) lower income taxes paid in 2021 and (v) favorable changes in our working capital, net of effects of acquisitions and divestitures. Our working capital was favorably impacted by process improvements that contributed to a significant improvement in our days-to-collect metrics. These favorable impacts were partially offset by the timing of cash tax benefits received in 2020 associated with federal alternative fuel tax credits.

Net Cash Used in Investing Activities — The most significant items affecting the comparison of our investing cash flows for the periods presented are summarized below:

- *Acquisitions* — Our spending on acquisitions was $377 million, $76 million and $4,088 million in 2022, 2021 and 2020, respectively, of which $377 million, $75 million and $4,085 million, respectively, are considered cash used in investing activities. The remaining spend is financing or operating activities related to the timing of contingent consideration paid. Substantially all of these acquisitions are related to our Solid Waste business.

  Our acquisition spending in 2022 was primarily attributable to the purchase of a controlling interest in a business intended to accelerate our film and plastic wrap recycling capabilities. Our acquisition spending in 2020 was primarily attributable to Advanced Disposal. See Note 17 to the Consolidated Financial Statements for additional information. We continue to focus on accretive acquisitions and growth opportunities that will enhance and expand our existing service offerings.

- *Capital Expenditures* — We used $2,587 million, $1,904 million and $1,632 million for capital expenditures in 2022, 2021 and 2020, respectively. The increase in 2022 is primarily driven by our intentional investment in growth capital spending on recycling and renewable energy projects, as well as timing differences in our fixed asset purchases to support our ongoing operations. The increase in 2021 is due in part to intentional steps the Company took to accelerate growth capital spending on recycling and renewable energy projects. Additionally, in 2020 we took proactive steps to reduce the amount of capital spending required due to the decrease in volumes as a result of COVID-19.

  The Company continues to maintain a disciplined focus on capital management to prioritize investments for expansion, the replacement of aging assets and assets that support our strategy of continuous improvement through efficiency and innovation. In addition, we continue to make progress on our planned investments to expand our renewable energy and recycling businesses. We expect to spend between $2.0 billion and $2.1 billion on capital expenditures to support our normal course business in 2023. Additionally, we expect to spend approximately $1.1 billion on capital expenditures for recycling and renewable energy growth projects in 2023.

- *Proceeds from Divestitures* — Proceeds from divestitures of businesses and other assets, net of cash divested, were $27 million, $96 million and $885 million in 2022, 2021 and 2020, respectively. In 2021, our proceeds are primarily the result of the sale of certain non-strategic Canadian operations. In 2020, our proceeds included

$856 million related to the sale of assets required to be sold by the U.S. Department of Justice in connection with our acquisition of Advanced Disposal. The remaining amounts in 2022, 2021 and 2020 generally related to the sale of fixed assets.

- *Other, Net* — Our spending within other, net was $126 million, $11 million, and $15 million in 2022, 2021 and 2020, respectively. During 2022, 2021 and 2020, we used $23 million, $32 million and $14 million, respectively, of cash from restricted cash and cash equivalents to invest in available-for-sale securities. In 2022, we used $67 million to fund secured convertible promissory notes associated with an acquisition and $28 million to make an initial cash payment associated with a low-income housing investment. Our 2021 cash spend was partially offset by proceeds received from the sale of an equity method investment.

Net Cash Used in Financing Activities — The most significant items affecting the comparison of our financing cash flows for the periods presented are summarized below:

- *Debt Borrowings (Repayments)* — The following summarizes our cash borrowings and repayments of debt for the year ended December 31 (in millions):

	2022	2021	2020
Borrowings:			
Revolving credit facility	$ —	$ —	$ 50
Commercial paper program (a)	6,596	6,831	3,630
364-day revolving credit facility (b)	—	—	3,000
Term loan	1,000	—	—
Senior notes	992	942	2,479
Tax-exempt bonds	100	175	261
	$ 8,688	$ 7,948	$ 9,420
Repayments:			
Revolving credit facility	$ —	$ —	$ (50)
Commercial paper program (a)	(6,664)	(6,872)	(1,822)
364-day revolving credit facility (b)	—	—	(3,000)
Senior notes	(500)	(1,289)	(4,000)
Advanced Disposal senior notes (c)	—	—	(437)
Tax-exempt bonds	(71)	(127)	(212)
Other debt	(93)	(116)	(108)
	$ (7,328)	$ (8,404)	$ (9,629)
Net cash borrowings (repayments)	$ 1,360	$ (456)	$ (209)

(a) Commercial paper borrowings incurred in 2022 and 2021 were primarily to support acquisitions and general corporate purposes. Commercial paper borrowings incurred in 2020 were used for the redemption of the SMR Notes and to partially fund our acquisition of Advanced Disposal.

(b) In November 2020, we terminated our 364-day revolving facility contemporaneously with repayment of all outstanding borrowings with proceeds from our November 2020 senior notes issuance.

(c) Advanced Disposal had certain outstanding senior notes which were redeemed in 2020 pursuant to an optional redemption feature as further discussed in Note 17 to the Consolidated Financial Statements.

Refer to Note 6 to the Consolidated Financial Statements for additional information related to our debt borrowings and repayments.

- *Premiums and Other Paid on Early Extinguishment of Debt* — During 2021, we paid premiums and other third-party costs of $211 million to retire certain high-coupon notes as discussed further in Note 6 to the Consolidated Financial Statements. During 2020, we paid premiums of $30 million to redeem $3.0 billion of senior notes that contained a special mandatory redemption feature tied to the timing of the Advanced Disposal acquisition closing. See *Loss on Early Extinguishment of Debt, Net* for further discussion.

- *Common Stock Repurchase Program* — For the periods presented, all share repurchases have been made in accordance with financial plans approved by our Board of Directors. We allocated \$1,500 million, \$1,350 million and \$402 million of available cash to common stock repurchases during 2022, 2021, and 2020, respectively. See Note 13 to the Consolidated Financial Statements for additional information.

  We announced in December 2022 that the Board of Directors has authorized up to \$1.5 billion in future share repurchases. Any future share repurchases will be made at the discretion of management and will depend on factors similar to those considered by the Board of Directors in making dividend declarations and listed below, as well as market conditions.

- *Cash Dividends* — For the periods presented, all dividends have been declared by our Board of Directors. Cash dividends declared and paid were \$1,077 million in 2022, or \$2.60 per common share, \$970 million in 2021, or \$2.30 per common share, and \$927 million in 2020, or \$2.18 per common share.

  In December 2022, we announced that our Board of Directors expects to increase the quarterly dividend from \$0.65 to \$0.70 per share for dividends declared in 2023. However, all future dividend declarations are at the discretion of the Board of Directors and depend on various factors, including our net earnings, financial condition, cash required for future business plans, growth and acquisitions and other factors the Board of Directors may deem relevant.

- *Exercise of Common Stock Options* — The exercise of common stock options generated financing cash inflows of \$44 million, \$66 million and \$63 million from the exercise of 675,000, 962,000 and 1,039,000 of employee stock options during 2022, 2021 and 2020, respectively.

Free Cash Flow

We are presenting free cash flow, which is a non-GAAP measure of liquidity, in our disclosures because we use this measure in the evaluation and management of our business. We define free cash flow as net cash provided by operating activities, less capital expenditures, plus proceeds from divestitures of businesses and other assets, net of cash divested. We believe it is indicative of our ability to pay our quarterly dividends, repurchase common stock, fund acquisitions and other investments and, in the absence of refinancings, to repay our debt obligations. Free cash flow is not intended to replace net cash provided by operating activities, which is the most comparable GAAP measure. We believe free cash flow gives investors useful insight into how we view our liquidity, but the use of free cash flow as a liquidity measure has material limitations because it excludes certain expenditures that are required or that we have committed to, such as declared dividend payments and debt service requirements.

Our calculation of free cash flow and reconciliation to net cash provided by operating activities is shown in the table below for the year ended December 31 (in millions), and may not be calculated the same as similarly-titled measures presented by other companies:

	2022	2021	2020
Net cash provided by operating activities	\$ 4,536	\$ 4,338	\$ 3,403
Capital expenditures to support the business	(2,026)	(1,665)	(1,606)
Capital expenditures - sustainability growth investments (a)	(561)	(239)	(26)
Total Capital expenditures	(2,587)	(1,904)	(1,632)
Proceeds from divestitures of businesses and other assets, net of cash divested	27	96	885
Free cash flow	\$ 1,976	\$ 2,530	\$ 2,656

(a) These growth investments are intended to further our sustainability leadership position by increasing recycling volumes and growing renewable natural gas generation. We expect they will deliver circular solutions for our customers and drive environmental value to the communities we serve.

Critical Accounting Estimates and Assumptions

In preparing our financial statements, we make numerous estimates and assumptions that affect the accounting for and recognition and disclosure of assets, liabilities, equity, revenues and expenses. We must make these estimates and assumptions because certain information that we use is dependent on future events, cannot be calculated with precision from available data or simply cannot be calculated. In some cases, these estimates are difficult to determine, and we must exercise significant judgment. In preparing our financial statements, the most difficult, subjective and complex estimates and the assumptions that present the greatest amount of uncertainty relate to our accounting for landfills, environmental remediation liabilities, long-lived asset impairments, intangible asset impairments and the fair value of assets and liabilities acquired in business combinations. Each of these items is discussed in additional detail below and in Note 2 to the Consolidated Financial Statements. Actual results could differ materially from the estimates and assumptions that we use in the preparation of our financial statements.

Landfills

Accounting for landfills requires that significant estimates and assumptions be made regarding (i) the cost to construct and develop each landfill asset; (ii) the estimated fair value of final capping, closure and post-closure asset retirement obligations, which must consider both the expected cost and timing of these activities and (iii) the determination of each landfill's remaining permitted and expansion airspace.

Landfill Costs — We estimate the total cost to develop each of our landfill sites to its remaining permitted and expansion airspace. This estimate includes such costs as landfill liner material and installation, excavation for airspace, landfill leachate collection systems, landfill gas collection systems, environmental monitoring equipment for groundwater and landfill gas, directly related engineering, capitalized interest, on-site road construction and other capital infrastructure costs. Additionally, landfill development includes all land purchases for the landfill footprint and landfill buffer property. The projection of these landfill costs is dependent, in part, on future events. The remaining depletable basis of each landfill includes costs to develop a site to its remaining permitted and expansion airspace and includes amounts previously expended and capitalized, net of accumulated airspace depletion, and projections of future purchase and development costs.

Final Capping Costs — We estimate the cost for each final capping event based on the area to be capped and the capping materials and activities required. The estimates also consider when these costs are anticipated to be paid and factor in inflation and discount rates. Our engineering personnel allocate landfill final capping costs to specific final capping events and the capping costs are depleted as waste is disposed of at the landfill. We review these costs annually, or more often if significant facts change. Changes in estimates, such as timing or cost of construction, for final capping events immediately impact the required liability and the corresponding asset. When the change in estimate relates to a fully consumed landfill, the adjustment to the asset must be depleted immediately through expense. When the change in estimate relates to a final capping event at a landfill with remaining airspace, the adjustment to the asset is recognized in income prospectively as a component of landfill airspace depletion.

Closure and Post-Closure Costs — We base our estimates for closure and post-closure costs on our interpretations of permit and regulatory requirements for closure and post-closure monitoring and maintenance. The estimates for landfill closure and post-closure costs also consider when the costs are anticipated to be paid and factor in inflation and discount rates. The possibility of changing legal and regulatory requirements and the forward-looking nature of these types of costs make any estimation or assumption less certain. Changes in estimates for closure and post-closure events immediately impact the required liability and the corresponding asset. When the change in estimate relates to a fully consumed landfill, the adjustment to the asset must be depleted immediately through expense. When the change in estimate relates to a landfill with remaining airspace, the adjustment to the asset is recognized in income prospectively as a component of landfill airspace depletion.

Remaining Permitted Airspace — Our engineers, in consultation with third-party engineering consultants and surveyors, are responsible for determining remaining permitted airspace at our landfills. The remaining permitted airspace is determined by an annual survey, which is used to compare the existing landfill topography to the expected final landfill topography.

Expansion Airspace — We also include currently unpermitted expansion airspace in our estimate of remaining permitted and expansion airspace in certain circumstances. First, for unpermitted airspace to be initially included in our estimate of remaining permitted and expansion airspace, we must believe that obtaining the expansion permit is likely.

Second, we must generally expect the initial expansion permit application to be submitted within one year and the final expansion permit to be received within five years, in addition to meeting the following criteria:

- Personnel are actively working on the expansion of an existing landfill, including efforts to obtain land use and local, state or provincial approvals;
- We have a legal right to use or obtain land to be included in the expansion plan;
- There are no significant known technical, legal, community, business, or political restrictions or similar issues that could negatively affect the success of such expansion; and
- Financial analysis has been completed based on conceptual design, and the results demonstrate that the expansion meets Company criteria for investment.

These criteria are evaluated by our field-based engineers, accountants, managers and others to identify potential obstacles to obtaining the permits. Once the unpermitted airspace is included, our policy provides that airspace may continue to be included in remaining permitted and expansion airspace even if certain of these criteria are no longer met as long as we continue to believe we will ultimately obtain the permit, based on the facts and circumstances of a specific landfill. In these circumstances, continued inclusion must be approved through a landfill-specific review process that includes approval by our Chief Financial Officer on a quarterly basis.

When we include the expansion airspace in our calculations of remaining permitted and expansion airspace, we also include the projected costs for development, as well as the projected asset retirement costs related to final capping, closure and post-closure of the expansion in the depletable basis of the landfill.

Once the remaining permitted and expansion airspace is determined in cubic yards, an airspace utilization factor (“AUF”) is established to calculate the remaining permitted and expansion capacity in tons. The AUF is established using the measured density obtained from previous annual surveys and is then adjusted to account for future settlement. The amount of settlement that is forecasted will consider several site-specific factors including current and projected mix of waste type, initial and projected waste density, estimated number of years of life remaining, depth of underlying waste, anticipated access to moisture through precipitation or recirculation of landfill leachate and operating practices. In addition, the initial selection of the AUF is subject to a subsequent multi-level review by our engineering group and the AUF used is reviewed on a periodic basis and revised as necessary. Our historical experience generally indicates that the impact of settlement at a landfill is greater later in the life of the landfill when the waste placed at the landfill approaches its highest point under the permit requirements.

After determining the costs and remaining permitted and expansion capacity at each of our landfills, we determine the per ton rates that will be expensed as waste is received and deposited at the landfill by dividing the costs by the corresponding number of tons. We calculate per ton depletion rates for each landfill for assets associated with each final capping event, for assets related to closure and post-closure activities and for all other costs capitalized or to be capitalized in the future. These rates per ton are updated annually, or more often, as significant facts change.

It is possible that actual results, including the amount of costs incurred, the timing of final capping, closure and post-closure activities, our airspace utilization or the success of our expansion efforts could ultimately turn out to be significantly different from our estimates and assumptions. To the extent that such estimates, or related assumptions, prove to be significantly different than actual results, lower earnings may be experienced due to higher depletion rates or higher expenses; or higher earnings may result if the opposite occurs. Most significantly, if it is determined that expansion capacity should no longer be considered in calculating the recoverability of a landfill asset, we may be required to recognize an asset impairment or incur significantly higher depletion expense. If at any time management makes the decision to abandon the expansion effort, the capitalized costs related to the expansion effort are expensed immediately.

Environmental Remediation Liabilities

A significant portion of our operating costs and capital expenditures could be characterized as costs of environmental protection. The nature of our operations, particularly with respect to the construction, operation and maintenance of our landfills subjects us to an array of laws and regulations relating to the protection of the environment. Under current laws and regulations, we may have liabilities for environmental damage caused by our operations, or for damage caused by conditions that existed before we acquired a site. In addition to remediation activity required by state or local authorities, such liabilities include potentially responsible party ("PRP") investigations. The costs associated with these liabilities can include settlements, certain legal and consultant fees, as well as incremental internal and external costs directly associated with site investigation and clean up.

Where it is probable that a liability has been incurred, we estimate costs required to remediate sites based on site-specific facts and circumstances. We routinely review and evaluate sites that require remediation and determine our estimated cost for the likely remedy based on a number of estimates and assumptions. Next, we review the same type of information with respect to other named and unnamed PRPs. Estimates of the costs for the likely remedy are then either developed using our internal resources or by third-party environmental engineers or other service providers. Internally developed estimates are based on:

- Management's judgment and experience in remediating our own and unrelated parties' sites;
- Information available from regulatory agencies as to costs of remediation;
- The number, financial resources and relative degree of responsibility of other PRPs who may be liable for remediation of a specific site; and
- The typical allocation of costs among PRPs, unless the actual allocation has been determined.

Fair Value of Nonfinancial Assets and Liabilities

Significant estimates are made in determining the fair value of long-lived tangible and intangible assets (i.e., property and equipment, intangible assets and goodwill) during the impairment evaluation process. In addition, the majority of assets acquired and liabilities assumed in a business combination are required to be recognized at fair value under the relevant accounting guidance.

Fair value is computed using several factors, including projected future operating results, economic projections, anticipated future cash flows, comparable marketplace data and the cost of capital. There are inherent uncertainties related to these factors and to our judgment in applying them in our analysis. However, we believe our methodology for estimating the fair value of our reporting units is reasonable.

Property and Equipment, Including Landfills and Definite-Lived Intangible Assets — We monitor the carrying value of our long-lived assets for potential impairment on an ongoing basis and test the recoverability of such assets generally using significant unobservable ("Level 3") inputs whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. These events or changes in circumstances, including management decisions pertaining to such assets, are referred to as impairment indicators. If an impairment indicator occurs, we perform a test of recoverability by comparing the carrying value of the asset or asset group to its undiscounted expected future cash flows. If cash flows cannot be separately and independently identified for a single asset, we will determine whether an impairment has occurred for the group of assets for which we can identify the projected cash flows. If the carrying values are in excess of undiscounted expected future cash flows, we measure any impairment by comparing the fair value of the asset or asset group to its carrying value and the difference is recorded in the period that the impairment indicator occurs. Fair value is generally determined by considering (i) internally developed discounted projected cash flow analysis of the asset or asset group; (ii) actual third-party valuations and/or (iii) information available regarding the current market for similar assets. Estimating future cash flows requires significant judgment and projections may vary from the cash flows eventually realized, which could impact our ability to accurately assess whether an asset has been impaired.

The assessment of impairment indicators and the recoverability of our capitalized costs associated with landfills and related expansion projects require significant judgment due to the unique nature of the waste industry, the highly regulated permitting process and the sensitive estimates involved. During the review of a landfill expansion application, a regulator may initially deny the expansion application although the expansion permit is ultimately granted. In addition, management may periodically divert waste from one landfill to another to conserve remaining permitted landfill airspace, or a landfill may be required to cease accepting waste, prior to receipt of the expansion permit. However, such events occur in the ordinary course of business in the waste industry and do not necessarily result in impairment of our landfill assets because, after consideration of all facts, such events may not affect our belief that we will ultimately obtain the expansion permit. As a result, our tests of recoverability, which generally make use of a probability-weighted cash flow estimation approach, may indicate that no impairment loss should be recorded.

Indefinite-Lived Intangible Assets, Including Goodwill — At least annually using a measurement date of October 1, and more frequently if warranted, we assess the indefinite-lived intangible assets including the goodwill of our reporting units for impairment using Level 3 inputs.

We first perform a qualitative assessment to determine if it was more likely than not that the fair value of a reporting unit is less than its carrying value. If the assessment indicates a possible impairment, we complete a quantitative review, comparing the estimated fair value of a reporting unit to its carrying amount, including goodwill. An impairment charge is recognized if the asset's estimated fair value was less than its carrying amount. Fair value is typically estimated using an income approach using Level 3 inputs. However, when appropriate, we may also use a market approach. The income approach is based on the long-term projected future cash flows of the reporting units. We discount the estimated cash flows to present value using a weighted average cost of capital that considers factors such as market assumptions, the timing of the cash flows and the risks inherent in those cash flows. We believe that this approach is appropriate because it provides a fair value estimate based upon the reporting units' expected long-term performance considering the economic and market conditions that generally affect our business. The market approach estimates fair value by measuring the aggregate market value of publicly-traded companies with similar characteristics to our business as a multiple of their reported earnings. We then apply that multiple to the reporting units' earnings to estimate their fair values. We believe that this approach may also be appropriate in certain circumstances because it provides a fair value estimate using valuation inputs from entities with operations and economic characteristics comparable to our reporting units.

Acquisitions — In accordance with the purchase method of accounting, the purchase price paid for an acquisition is allocated to the assets and liabilities acquired based upon their estimated fair values as of the acquisition date, with the excess of the purchase price over the net assets acquired recorded as goodwill. When we are in the process of valuing all of the assets and liabilities acquired in an acquisition, there can be subsequent adjustments to our estimates of fair value and resulting preliminary purchase price allocation. Generally, the valuation of our acquired asset and liabilities rely on complex estimates and assumptions.

Acquisition-date fair value estimates are revised as necessary if, and when, additional information regarding these contingencies becomes available to further define and quantify assets acquired and liabilities assumed. Subsequent to finalization of purchase accounting, these revisions are accounted for as adjustments to income from operations. All acquisition-related transaction costs are expensed as incurred. See Note 17 to the Consolidated Financial Statements for additional information related to our acquisitions, including our 2020 acquisition of Advanced Disposal.

See Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — (Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net*.

Inflation

Macroeconomic pressures, including inflation and market disruption resulting in labor, supply chain and transportation constraints are continuing. Significant global supply chain disruption and the heightened pace of inflation has reduced availability and increased costs for the goods and services we purchase, with a particular impact on our repair and maintenance costs. Supply chain constraints have also caused delayed delivery of fleet, steel containers and other purchases. Aspects of our business rely on third-party transportation providers, and such services have become more limited and expensive. Our overall strategic pricing efforts are focused on recovering as much of the inflationary cost increases we experience in our business as possible by increasing our average unit rate, but such efforts may not be successful for various reasons including the pace of inflation, operating cost inefficiencies, contractual limitations, and market responses. Throughout 2022, many of these contract lookback provisions began to capture the inflationary cost increases experienced since the second half of 2021 in the price escalation calculation; however, such timing lag persists and will continue to restrict our ability to address proactively future rapid cost increases for those contracts. Refer to Item 1A. *Risk Factors* for further discussion.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

In the normal course of business, we are exposed to market risks, including changes in interest rates, certain commodity prices and Canadian currency rates. From time to time, we use derivatives to manage some portion of these risks. The Company had no derivatives outstanding as of December 31, 2022.

Interest Rate Exposure — Our exposure to market risk for changes in interest rates relates primarily to our financing activities. As of December 31, 2022, we had $15.1 billion of long-term debt, excluding the impacts of accounting for debt issuance costs, discounts and fair value adjustments attributable to terminated interest rate derivatives. We have $3.5 billion of debt that is exposed to changes in market interest rates within the next 12 months comprised primarily of (i) $1.7 billion of short-term borrowings under our commercial paper program; (ii) $1.0 billion of long-term borrowings under our $1.0 billion, two-year, U.S. term credit agreement and (iii) $725 million of tax-exempt bonds with term interest rate periods that expire within the next 12 months. We currently estimate that a 100-basis point increase in the interest rates of our outstanding variable-rate debt obligations would increase our 2023 interest expense by $28 million.

Our remaining outstanding debt obligations have fixed interest rates through either the scheduled maturity of the debt or, for certain of our fixed-rate tax-exempt bonds, through the end of a term interest rate period that exceeds 12 months. The fair value of our fixed-rate debt obligations can increase or decrease significantly if market interest rates change.

We performed a sensitivity analysis to determine how market rate changes might affect the fair value of our market risk-sensitive debt instruments. This analysis is inherently limited because it reflects a singular, hypothetical set of assumptions. Actual market movements may vary significantly from our assumptions. An instantaneous, 100-basis point increase in interest rates across all maturities attributable to these instruments would have decreased the fair value of our debt by approximately $700 million as of December 31, 2022.

We are also exposed to interest rate market risk from our cash and cash equivalent balances, as well as assets held in restricted trust fund accounts. These assets are generally invested in high-quality, liquid instruments including money market funds that invest in U.S. government obligations with original maturities of three months or less. We believe that our exposure to changes in fair value of these assets due to interest rate fluctuations is insignificant as the fair value generally approximates our cost basis. We also invest a portion of our restricted trust fund account balances in available-for-sale securities, including U.S. Treasury securities, U.S. agency securities, municipal securities, mortgage- and asset-backed securities, which generally mature over the next nine years, as well as equity securities.

Commodity Price Exposure — In the normal course of our business, we are subject to operating agreements that expose us to market risks arising from changes in the prices for commodities such as diesel fuel, electricity (and related renewable energy credits) and recycled materials, including old corrugated cardboard and plastics. We work to manage these risks through operational strategies that focus on capturing our costs in the prices we charge our customers for the services provided. Accordingly, as the market prices for these commodities increase or decrease, our revenues, operating costs and margins may also increase or decrease. Recycling revenues attributable to yield increased $19 million and $537 million in 2022 and 2021, respectively, as compared with the prior year periods, primarily from higher market prices for recycling commodities in 2021 and the first half of 2022, before the significant downturn in the second half of 2022.

Demand for recycled materials strengthened through 2021 and into early 2022, primarily driven by the growth in e-commerce, businesses re-opening, and manufacturers committing to use more recycled content in their packaging. In 2022, we experienced all-time high recycling commodity pricing in the first half of the year to be followed by historically low pricing through the second half of the year, resulting from the slowdown in the global economy, which reduced retail demand and the corresponding need for cardboard packaging to ship retail goods. We expect significant commodity price headwinds to continue into 2023. Average market prices for recycling commodities at the Company’s facilities were approximately 10% lower and 115% higher in 2022 and 2021, respectively, when compared with the prior year periods. Revenue decline from lower commodity pricing was offset by higher pricing in our recycling brokerage business as well as our continued focus on a fee-based pricing model that ensures fees paid by customers cover the cost of processing materials and the impact on our cost structure of managing contamination in the recycling stream. Variability in commodity prices can also impact the margins of our business as certain components of our revenue are structured as a pass through of costs, including recycling brokerage and fuel surcharges.

The primary drivers of renewable fuel development at our landfills are tax policies, such as the recently expanded federal tax credits for renewable natural gas ("RNG") production and renewable electricity generation, and federal and state incentive programs, such as the federal Renewable Fuel Standard ("RFS") program and the California Low Carbon Fuel Standard. At the federal level, oil refiners and importers are required through the RFS program to blend specified volumes of renewable transportation fuels with gasoline or buy credits, referred to as renewable identification numbers ("RINs"), from renewable fuel producers. The Company has invested, and continues to invest, in facilities that capture and convert landfill gas into RNG, and also works with facilities that capture and convert dairy digester gas into RNG, so that we can participate in the program, and the Company has stated its intention to grow its asset base to notably increase its RNG production by 2026. RINs prices generally respond to regulations enacted by the EPA, as well as fluctuations in supply and demand. The value of the RINs associated with RNG is set through a market established by the program.

Prior to 2022, the EPA has promulgated rules on an annual basis establishing refiners' obligations to purchase RNG and other cellulosic biofuels under the RFS program; however, the EPA issued a highly anticipated proposed rule in late 2022 setting forth the direction of the RFS program for compliance years 2023 through 2025. Although this proposal delivers on many reforms that benefit the solid waste sector, the EPA's programmatic shift towards multi-year standards could lead to market uncertainty and volatility in the price of RINs. We continue to advocate for the current administration to implement policies that ensure long term stability for renewable transportation fuels and expand opportunities for the biogas sector to participate in the RFS program. Changes in the RFS market, the structure of the RFS program or RINs prices and demand can and has impacted the financial performance of the facilities constructed to capture and treat the gas. Such changes could impact or alter our projected future investments, and such investments may not yield the results anticipated.

Currency Rate Exposure — We have operations in Canada as well as certain support functions in India. Where significant, we have quantified and described the impact of foreign currency translation on components of income, including operating revenue and operating expenses. However, the impact of foreign currency has not materially affected our results of operations.

Item 8. ***Financial Statements and Supplementary Data.***

INDEX TO

CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Waste Management, Inc.

Opinion on Internal Control over Financial Reporting

We have audited Waste Management, Inc.'s internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Waste Management, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the 2022 consolidated financial statements of the Company, and our report dated February 7, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ ERNST & YOUNG LLP

Houston, Texas
February 7, 2023

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Waste Management, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Waste Management, Inc. (the Company) as of December 31, 2022 and 2021, the related consolidated statements of operations, comprehensive income, cash flows, and changes in equity for each of the three years in the period ended December 31, 2022, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated February 7, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Landfill Depletion

Description of the Matter	At December 31, 2022, the Company's landfill assets, net of accumulated depletion, totaled $7.6 billion and the associated depletion expense for 2022 was $754 million. As discussed in Note 2 of the financial statements, the Company updates the estimates used to calculate individual landfill depletion rates at least annually, or more often if significant facts change. Landfill depletion rates are used in the computation of landfill depletion expense. Auditing landfill depletion rates and related depletion expense is complex due to the highly judgmental nature of assumptions used in estimating the rates. Significant assumptions used in the calculation of the rates include: estimated future development costs associated with the construction and retirement of the landfill, estimated remaining permitted and expansion airspace, airspace utilization factors, and projected timing of retirement activities.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design, and tested the operating effectiveness of the Company's controls over determining landfill depletion rates and calculating depletion expense. Our audit procedures included, among others, testing controls over: the Company's process for evaluating and updating the significant assumptions used in the development of the landfill depletion rates, management's review of those significant assumptions, and the mathematical accuracy of the calculation and recording of depletion expense. To test the landfill asset depletion rates, our audit procedures included, among others, assessing methodologies used by the Company and testing the significant assumptions discussed above, inclusive of the underlying data used by the Company in its development of these assumptions. We compared the significant assumptions used by management to historical trends and, when available, to comparable size landfills accepting a similar type of waste. Regarding expansion airspace, we evaluated the Company's criteria for inclusion in remaining airspace. In addition, we considered the professional qualifications and objectivity of management's internal engineers responsible for developing the assumptions. We involved EY's engineering specialists to assist with the evaluation of the Company's landfill future development cost and airspace assumptions. We also tested the completeness and accuracy of the historical data utilized in the development of the landfill depletion rates.

Landfill – Final Capping, Closure and Post-Closure Costs

Description of the Matter	At December 31, 2022, the carrying value of the Company's landfill asset retirement obligations related to final capping, closure and post-closure costs totaled $2.7 billion. As discussed in Note 2 of the financial statements, the Company updates the estimates used to measure the asset retirement obligations annually, or more often if significant facts change. Auditing the landfill asset retirement obligation is complex due to the highly judgmental nature of the assumptions used in the measurement process. These assumptions include: estimated future costs associated with the capping, closure and post closure activities at each specific landfill; airspace consumed to date in relation to total estimated permitted and expansion airspace; and the projected timing of retirement activities.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design, and tested the operating effectiveness of the Company's controls over the calculation of landfill asset retirement obligations. Our audit procedures included, among others, testing the Company's controls over the landfill asset retirement obligation estimation process and management's review of the significant assumptions used in the estimation of the liability, including the amount and timing of retirement costs. To test the landfill asset retirement obligation valuation, we performed audit procedures that included, among others, assessing methodologies used by the Company, testing the completeness of activities included in the estimate (e.g., gas monitoring and extraction), and testing the significant assumptions discussed above, inclusive of the underlying data used by the Company in its development of these assumptions. We compared the significant assumptions used by management to historical trends and, when available, to comparable size landfills accepting the same type of waste. In addition, we considered the professional qualifications and objectivity of management's internal engineers responsible for developing the assumptions. We involved EY engineering specialists to assist us with these procedures. Specifically, we utilized the EY engineering specialists to evaluate the reasons for significant changes in assumptions from the historical trend, and to determine whether the change from the historical trend was appropriate and identified timely. We also tested the completeness and accuracy of the historical data utilized in preparing the estimate.

/s/ ERNST & YOUNG LLP

We have served as the Company's auditor since 2002.

Houston, Texas
February 7, 2023

WASTE MANAGEMENT, INC.

CONSOLIDATED BALANCE SHEETS
(In Millions, Except Share and Par Value Amounts)

	December 31, 2022	December 31, 2021
ASSETS		
Current assets:		
Cash and cash equivalents	$ 351	$ 118
Accounts receivable, net of allowance for doubtful accounts of $26 and $25, respectively	2,461	2,278
Other receivables, net of allowance for doubtful accounts of $7 and $8, respectively	291	268
Parts and supplies	164	135
Other assets	284	270
Total current assets	3,551	3,069
Property and equipment, net of accumulated depreciation and depletion of $21,627 and $20,537, respectively	15,719	14,419
Goodwill	9,323	9,028
Other intangible assets, net	827	898
Restricted funds	348	348
Investments in unconsolidated entities	578	432
Other assets	1,021	903
Total assets	$ 31,367	$ 29,097
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	$ 1,766	$ 1,375
Accrued liabilities	1,625	1,428
Deferred revenues	589	571
Current portion of long-term debt	414	708
Total current liabilities	4,394	4,082
Long-term debt, less current portion	14,570	12,697
Deferred income taxes	1,733	1,694
Landfill and environmental remediation liabilities	2,700	2,373
Other liabilities	1,106	1,125
Total liabilities	24,503	21,971
Commitments and contingencies (Note 10)		
Equity:		
Waste Management, Inc. stockholders' equity:		
Common stock, $0.01 par value; 1,500,000,000 shares authorized; 630,282,461 shares issued	6	6
Additional paid-in capital	5,314	5,169
Retained earnings	13,167	12,004
Accumulated other comprehensive income (loss)	(69)	17
Treasury stock at cost, 222,396,166 and 214,158,636 shares, respectively	(11,569)	(10,072)
Total Waste Management, Inc. stockholders' equity	6,849	7,124
Noncontrolling interests	15	2
Total equity	6,864	7,126
Total liabilities and equity	$ 31,367	$ 29,097

See Notes to Consolidated Financial Statements.

WASTE MANAGEMENT, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS
(In Millions, Except per Share Amounts)

	Year Ended December 31, 2022	2021	2020
Operating revenues	$ 19,698	$ 17,931	$ 15,218
Costs and expenses:			
Operating	12,294	11,111	9,341
Selling, general and administrative	1,938	1,864	1,728
Depreciation, depletion and amortization	2,038	1,999	1,671
Restructuring	1	8	9
(Gain) loss from divestitures, asset impairments and unusual items, net	62	(16)	35
	16,333	14,966	12,784
Income from operations	3,365	2,965	2,434
Other income (expense):			
Interest expense, net	(378)	(365)	(425)
Loss on early extinguishment of debt, net	—	(220)	(53)
Equity in net losses of unconsolidated entities	(67)	(36)	(68)
Other, net	(2)	5	5
	(447)	(616)	(541)
Income before income taxes	2,918	2,349	1,893
Income tax expense	678	532	397
Consolidated net income	2,240	1,817	1,496
Less: Net income (loss) attributable to noncontrolling interests	2	1	—
Net income attributable to Waste Management, Inc.	$ 2,238	$ 1,816	$ 1,496
Basic earnings per common share	$ 5.42	$ 4.32	$ 3.54
Diluted earnings per common share	$ 5.39	$ 4.29	$ 3.52

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In Millions)

	Year Ended December 31, 2022	2021	2020
Consolidated net income	$ 2,240	$ 1,817	$ 1,496
Other comprehensive income (loss), net of tax:			
Derivative instruments, net	3	9	15
Available-for-sale securities, net	(24)	(6)	11
Foreign currency translation adjustments	(65)	(28)	20
Post-retirement benefit obligations, net	—	3	1
Other comprehensive income (loss), net of tax	(86)	(22)	47
Comprehensive income	2,154	1,795	1,543
Less: Comprehensive income (loss) attributable to noncontrolling interests	2	1	—
Comprehensive income attributable to Waste Management, Inc.	$ 2,152	$ 1,794	$ 1,543

See Notes to Consolidated Financial Statements.

WASTE MANAGEMENT, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In Millions)

	Year Ended December 31,		
	2022	2021	2020
Cash flows from operating activities:			
Consolidated net income	$ 2,240	$ 1,817	$ 1,496
Adjustments to reconcile consolidated net income to net cash provided by operating activities:			
Depreciation, depletion and amortization	2,038	1,999	1,671
Deferred income tax expense (benefit)	49	(77)	165
Interest accretion on landfill and environmental remediation liabilities	112	111	103
Provision for bad debts	50	37	54
Equity-based compensation expense	84	108	94
Net gain on disposal of assets	(21)	(25)	(9)
(Gain) loss from divestitures, asset impairments and other, net	62	(16)	43
Equity in net losses of unconsolidated entities, net of dividends	67	38	60
Loss on early extinguishment of debt, net	—	220	53
Change in operating assets and liabilities, net of effects of acquisitions and divestitures:			
Receivables	(329)	28	(179)
Other current assets	(35)	(39)	10
Other assets	42	34	53
Accounts payable and accrued liabilities	393	206	(37)
Deferred revenues and other liabilities	(216)	(103)	(174)
Net cash provided by operating activities	4,536	4,338	3,403
Cash flows from investing activities:			
Acquisitions of businesses, net of cash acquired	(377)	(75)	(4,085)
Capital expenditures	(2,587)	(1,904)	(1,632)
Proceeds from divestitures of businesses and other assets, net of cash divested	27	96	885
Other, net	(126)	(11)	(15)
Net cash used in investing activities	(3,063)	(1,894)	(4,847)
Cash flows from financing activities:			
New borrowings	8,688	7,948	9,420
Debt repayments	(7,328)	(8,404)	(9,629)
Premiums and other paid on early extinguishment of debt	—	(211)	(30)
Common stock repurchase program	(1,500)	(1,350)	(402)
Cash dividends	(1,077)	(970)	(927)
Exercise of common stock options	44	66	63
Tax payments associated with equity-based compensation transactions	(39)	(28)	(34)
Other, net	(4)	49	(20)
Net cash used in financing activities	(1,216)	(2,900)	(1,559)
Effect of exchange rate changes on cash, cash equivalents and restricted cash and cash equivalents	(6)	2	4
Increase (decrease) in cash, cash equivalents and restricted cash and cash equivalents	251	(454)	(2,999)
Cash, cash equivalents and restricted cash and cash equivalents at beginning of period	194	648	3,647
Cash, cash equivalents and restricted cash and cash equivalents at end of period	$ 445	$ 194	$ 648
Reconciliation of cash, cash equivalents and restricted cash and cash equivalents at end of period:			
Cash and cash equivalents	$ 351	$ 118	$ 553
Restricted cash and cash equivalents included in other current assets	25	7	28
Restricted cash and cash equivalents included in restricted funds	69	69	67
Cash, cash equivalents and restricted cash and cash equivalents at end of period	$ 445	$ 194	$ 648

See Notes to Consolidated Financial Statements.

WASTE MANAGEMENT, INC.

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY
(In Millions, Except Shares in Thousands)

		Waste Management, Inc. Stockholders' Equity							
		Common Stock		Additional Paid-In	Retained	Accumulated Other Comprehensive	Treasury Stock		Noncontrolling
	Total	Shares	Amounts	Capital	Earnings	Income (Loss)	Shares	Amounts	Interests
Balance, December 31, 2019	$ 7,070	630,282	$ 6	$ 5,049	$ 10,592	$ (8)	(205,956)	$ (8,571)	$ 2
Adoption of new accounting standards	(2)	—	—	—	(2)	—	—	—	—
Consolidated net income	1,496	—	—	—	1,496	—	—	—	—
Other comprehensive income (loss), net of tax	47	—	—	—	—	47	—	—	—
Cash dividends declared of $2.18 per common share	(927)	—	—	—	(927)	—	—	—	—
Equity-based compensation transactions, net	172	—	—	80	1	—	2,158	91	—
Common stock repurchase program	(402)	—	—	—	—	—	(3,687)	(402)	—
Other, net	—	—	—	—	(1)	—	4	1	—
Balance, December 31, 2020	$ 7,454	630,282	$ 6	$ 5,129	$ 11,159	$ 39	(207,481)	$ (8,881)	$ 2
Consolidated net income	1,817	—	—	—	1,816	—	—	—	1
Other comprehensive income (loss), net of tax	(22)	—	—	—	—	(22)	—	—	—
Cash dividends declared of $2.30 per common share	(970)	—	—	—	(970)	—	—	—	—
Equity-based compensation transactions, net	198	—	—	110	(1)	—	2,049	89	—
Common stock repurchase program	(1,350)	—	—	(70)	—	—	(8,731)	(1,280)	—
Other, net	(1)	—	—	—	—	—	4	—	(1)
Balance, December 31, 2021	$ 7,126	630,282	$ 6	$ 5,169	$ 12,004	$ 17	(214,159)	$ (10,072)	$ 2
Consolidated net income	2,240	—	—	—	2,238	—	—	—	2
Other comprehensive income (loss), net of tax	(86)	—	—	—	—	(86)	—	—	—
Cash dividends declared of $2.60 per common share	(1,077)	—	—	—	(1,077)	—	—	—	—
Equity-based compensation transactions, net	150	—	—	75	2	—	1,555	73	—
Common stock repurchase program	(1,500)	—	—	70	—	—	(9,796)	(1,570)	—
Acquisitions and other, net	11	—	—	—	—	—	4	—	11
Balance, December 31, 2022	$ 6,864	630,282	$ 6	$ 5,314	$ 13,167	$ (69)	(222,396)	$ (11,569)	$ 15

See Notes to Consolidated Financial Statements.

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
Years Ended December 31, 2022, 2021 and 2020

1. Basis of Presentation

The financial statements presented in this report represent the consolidation of Waste Management, Inc., a Delaware corporation; its wholly-owned and majority-owned subsidiaries; and certain variable interest entities for which Waste Management, Inc. or its subsidiaries are the primary beneficiaries as described in Note 18. Waste Management, Inc. is a holding company and all operations are conducted by its subsidiaries. When the terms "the Company," "we," "us" or "our" are used in this document, those terms refer to Waste Management, Inc., together with its consolidated subsidiaries and consolidated variable interest entities. When we use the term "WMI," we are referring only to Waste Management, Inc., the parent holding company.

We are North America's leading provider of comprehensive environmental solutions, providing services throughout the United States ("U.S.") and Canada. We partner with our residential, commercial, industrial and municipal customers and the communities we serve to manage and reduce waste at each stage from collection to disposal, while recovering valuable resources and creating clean, renewable energy. Our "Solid Waste" business is operated and managed locally by our subsidiaries that focus on distinct geographic areas and provide collection, transfer, disposal, and recycling and resource recovery services. Through our subsidiaries, including our Waste Management Renewable Energy ("WM Renewable Energy") business, we are also a leading developer, operator and owner of landfill gas-to-energy facilities in the U.S and Canada that produce renewable electricity and renewable natural gas, which is a significant source of fuel for our natural gas fleet.

Our senior management evaluates, oversees and manages the financial performance of our Solid Waste operations through two operating segments. Our East Tier primarily consists of geographic areas located in the Eastern U.S., the Great Lakes region and substantially all of Canada. Our West Tier primarily includes geographic areas located in the Western U.S., including the upper Midwest region, and British Columbia, Canada. Each of our Solid Waste operating segments provides integrated environmental services, including collection, transfer, recycling, and disposal. The East and West Tiers are presented in this report and constitute our existing Solid Waste business. On October 30, 2020, we acquired Advanced Disposal Services, Inc. ("Advanced Disposal"), the operations of which are presented in this report within our existing Solid Waste tiers. We also provide additional services that are not managed through our Solid Waste business, which are presented in this report as "Other." Additional information related to our acquisition of Advanced Disposal and segments is included in Notes 17 and 19, respectively.

Reclassifications

When necessary, reclassifications have been made to our prior period financial information to conform to the current year presentation and are not material to our consolidated financial statements.

2. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying Consolidated Financial Statements include the accounts of WMI, its wholly-owned and majority-owned subsidiaries and certain variable interest entities for which we have determined that we are the primary beneficiary. All material intercompany balances and transactions have been eliminated. Investments in unconsolidated entities are accounted for under the appropriate method of accounting.

Estimates and Assumptions

In preparing our financial statements, we make numerous estimates and assumptions that affect the accounting for and recognition and disclosure of assets, liabilities, equity, revenues and expenses. We must make these estimates and assumptions because certain information that we use is dependent on future events, cannot be calculated with precision from available data or simply cannot be calculated. In some cases, these estimates are difficult to determine, and we must exercise significant judgment. In preparing our financial statements, the most difficult, subjective and complex estimates and the assumptions that present the greatest amount of uncertainty relate to our accounting for landfills, environmental remediation liabilities, long-lived asset impairments, intangible asset impairments and the fair value of assets and liabilities acquired in business combinations. Each of these items is discussed in additional detail below. Actual results could differ materially from the estimates and assumptions that we use in the preparation of our financial statements.

Cash and Cash Equivalents

Cash in excess of current operating requirements is invested in short-term interest-bearing instruments with maturities of three months or less at the date of purchase and is stated at cost, which approximates market value.

Concentrations of Credit Risk

Financial instruments that potentially subject us to concentrations of credit risk consist primarily of cash and cash equivalents, investments held within restricted funds, and accounts receivable. We make efforts to control our exposure to credit risk associated with these instruments by (i) placing our assets and other financial interests with a diverse group of credit-worthy financial institutions; (ii) holding high-quality financial instruments while limiting investments in any one instrument and (iii) maintaining strict policies over credit extension that include credit evaluations, credit limits and monitoring procedures, although generally we do not have collateral requirements for credit extensions. We also control our exposure associated with trade receivables by discontinuing service, to the extent allowable, to non-paying customers. However, our overall credit risk associated with trade receivables is limited due to the large number and diversity of customers we serve. As of December 31, 2022 and 2021, no single customer represented greater than 5% of total accounts receivable.

Accounts and Other Receivables

Our receivables, which are recorded when billed, when services are performed or when cash is advanced, are claims against third parties that will generally be settled in cash. The carrying value of our receivables, net of the allowance for doubtful accounts, represents the estimated net realizable value. We estimate our allowance for doubtful accounts based on historical collection trends; type of customer, such as municipal or commercial; the age of outstanding receivables and existing as well as expected economic conditions. If events or changes in circumstances indicate that specific receivable balances may be impaired, further consideration is given to the collectability of those balances and the allowance is adjusted accordingly. Past-due receivable balances are written off when our internal collection efforts have been unsuccessful. Also, we recognize interest income on long-term interest-bearing notes receivable as the interest accrues under the terms of the notes. We no longer accrue interest once the notes are deemed uncollectible.

The following table reflects the activity in our allowance for doubtful accounts of trade receivables for the year ended December 31 (in millions):

	2022	2021
Balance as of January 1	$ 25	$ 33
Additions charged to expense	55	35
Accounts written-off, net of recoveries	(49)	(36)
Acquisitions, divestitures and other, net	(5)	(7)
Balance as of December 31	$ 26	$ 25

To determine the allowance for doubtful accounts for trade receivables, we rely upon, among other factors, historical loss trends, the age of outstanding receivables, and existing as well as expected economic conditions. We determined that all of our trade receivables share similar risk characteristics. We monitor our credit exposure on an ongoing basis and assess whether assets in the pool continue to display similar risk characteristics. Based on aging analysis as of both December 31, 2022 and 2021, approximately 90% of our trade receivables were outstanding less than 60 days.

To determine the allowance for doubtful accounts for other receivables, as well as loans and other instruments, we rely primarily on credit ratings and associated default rates based on the maturity of the instrument. Other receivables, as of December 31, 2022 and 2021, include receivables related to income tax payments in excess of our current income tax obligations of $150 million and $166 million, respectively. Other receivables as of December 31, 2022 and 2021 also include a receivable of $19 million and $14 million, respectively, related to alternative fuel tax credits. Based on an aging analysis as of December 31, 2022 and 2021, approximately 55% and 60%, respectively, of our other receivables were due within 12 months or less.

Parts and Supplies

Parts and supplies consist primarily of spare parts, fuel, tires, lubricants and processed recycling materials. Our parts and supplies are stated at the lower of cost (using the average cost method) or market.

Landfill Accounting

Cost Basis of Landfill Assets — We capitalize various costs that we incur to make a landfill ready to accept waste. These costs generally include expenditures for land (including the landfill footprint and required landfill buffer property); permitting; excavation; liner material and installation; landfill leachate collection systems; landfill gas collection systems; environmental monitoring equipment for groundwater and landfill gas; and directly related engineering, capitalized interest, on-site road construction and other capital infrastructure costs. The cost basis of our landfill assets also includes asset retirement costs, which represent estimates of future costs associated with landfill final capping, closure and post-closure activities. These costs are discussed below.

Final Capping, Closure and Post-Closure Costs — Following is a description of our asset retirement activities and our related accounting:

- *Final Capping* — Generally involves the installation of flexible membrane liners and geosynthetic clay liners, drainage and compacted soil layers and topsoil over areas of a landfill where total airspace has been consumed. Final capping asset retirement obligations are recorded on a units-of-consumption basis as airspace is consumed related to the specific final capping event with a corresponding increase in the landfill asset. Each final capping event is accounted for as a discrete obligation and recorded as an asset and a liability based on estimates of the discounted cash flows associated with each final capping event.
- *Closure* — Includes the construction of the final portion of methane gas collection systems (when required), demobilization and routine maintenance costs. These are costs incurred after the site ceases to accept waste, but

before the landfill is certified as closed by the applicable state regulatory agency. These costs are recorded as an asset retirement obligation as airspace is consumed over the life of the landfill with a corresponding increase in the landfill asset. Closure obligations are recorded over the life of the landfill based on estimates of the discounted cash flows associated with performing closure activities.

- *Post-Closure* — Involves the maintenance and monitoring of a landfill site that has been certified closed by the applicable regulatory agency. Generally, we are required to maintain and monitor landfill sites for a 30-year period. These maintenance and monitoring costs are recorded as an asset retirement obligation as airspace is consumed over the life of the landfill with a corresponding increase in the landfill asset. Post-closure obligations are recorded over the life of the landfill based on estimates of the discounted cash flows associated with performing post-closure activities.

We develop our estimates of these obligations using input from our operations personnel, engineers and accountants. Our estimates are based on our interpretation of current requirements and proposed regulatory changes and are intended to approximate fair value. Absent quoted market prices, the estimate of fair value is based on the best available information, including the results of present value techniques. In many cases, we contract with third parties to fulfill our obligations for final capping, closure and post-closure. We use historical experience, professional engineering judgment and quoted or actual prices paid for similar work to determine the fair value of these obligations. We are required to recognize these obligations at market prices whether we plan to contract with third parties or perform the work ourselves. In those instances where we perform the work with internal resources, the incremental profit margin realized is recognized as a component of operating income when the work is completed.

Once we have determined final capping, closure and post-closure costs, we inflate those costs to the expected time of payment and discount those expected future costs back to present value. As of December 31, 2022, 2021 and 2020, we inflated these costs in current dollars to the expected time of payment using an inflation rate of 2.50%, 2.25% and 2.25%, respectively. We discounted these costs to present value using the credit-adjusted, risk-free rate effective at the time an obligation is incurred, consistent with the expected cash flow approach. Any changes in expectations that result in an upward revision to the estimated cash flows are treated as a new liability and discounted at the current rate while downward revisions are discounted at the historical weighted average rate of the recorded obligation. As a result, the credit-adjusted, risk-free discount rate used to calculate the present value of an obligation is specific to each individual asset retirement obligation. The weighted average rate applicable to our long-term asset retirement obligations as of December 31, 2022 was approximately 4.8%.

We record the estimated fair value of final capping, closure and post-closure liabilities for our landfills based on the airspace consumed through the current period. The fair value of final capping obligations is developed based on our estimates of the airspace consumed to date for each final capping event and the expected timing of each final capping event. The fair value of closure and post-closure obligations is developed based on our estimates of the airspace consumed to date for the entire landfill and the expected timing of each closure and post-closure activity. Because these obligations are measured at estimated fair value using present value techniques, changes in the estimated cost or timing of future final capping, closure and post-closure activities could result in a material change in these liabilities, related assets and results of operations. We assess the appropriateness of the estimates used to develop our recorded balances annually, or more often if significant facts change.

Sustained changes in inflation rates or the estimated costs, timing or extent of future final capping, closure and post-closure activities typically result in both (i) a current adjustment to the recorded liability and landfill asset and (ii) a change in liability and asset amounts to be recorded prospectively over either the remaining permitted and expansion airspace (as defined below) of the related discrete final capping event or the remaining permitted and expansion airspace of the landfill, as appropriate. Any changes related to the capitalized and future cost of the landfill assets are then recognized in accordance with our landfill depletion policy (previously landfill amortization policy), which would generally result in depletion expense being recognized prospectively over the remaining permitted and expansion airspace of the final capping event or the remaining permitted and expansion airspace of the landfill, as appropriate. Changes in such estimates associated with a fully consumed landfill result in an adjustment to the recorded liability and landfill assets with an immediate corresponding adjustment to landfill airspace depletion expense.

Interest accretion on final capping, closure and post-closure liabilities is recorded using the effective interest method and is recorded as landfill operating costs, which is included in operating expenses within our Consolidated Statements of Operations.

Depletion of Landfill Assets — The depletable basis of a landfill includes (i) amounts previously expended and capitalized; (ii) capitalized landfill final capping, closure and post-closure costs; (iii) projections of future purchase and development costs required to develop the landfill site to its remaining permitted and expansion airspace (as defined below) and (iv) projected asset retirement costs related to landfill final capping, closure and post-closure activities.

Depletion is recorded on a units-of-consumption basis, applying expense as a rate per ton. The rate per ton is calculated by dividing each component of the depletable basis of a landfill by the number of tons needed to fill the corresponding asset's airspace. For landfills that we do not own, but operate through lease or other contractual agreements, the rate per ton is calculated based on expected airspace to be utilized over the lesser of the contractual term of the underlying agreement or the life of the landfill.

We apply the following guidelines in determining a landfill's remaining permitted and expansion airspace:

- *Remaining Permitted Airspace* — Our engineers, in consultation with third-party engineering consultants and surveyors, are responsible for determining remaining permitted airspace at our landfills. The remaining permitted airspace is determined by an annual survey, which is used to compare the existing landfill topography to the expected final landfill topography.
- *Expansion Airspace* — We also include currently unpermitted expansion airspace in our estimate of remaining permitted and expansion airspace in certain circumstances. First, for unpermitted airspace to be initially included in our estimate of remaining permitted and expansion airspace, we must believe that obtaining the expansion permit is likely. Second, we must generally expect the initial expansion permit application to be submitted within one year and the final expansion permit to be received within five years, in addition to meeting the following criteria:
  - Personnel are actively working on the expansion of an existing landfill, including efforts to obtain land use and local, state or provincial approvals;
  - We have a legal right to use or obtain land to be included in the expansion plan;
  - There are no significant known technical, legal, community, business, or political restrictions or similar issues that could negatively affect the success of such expansion; and
  - Financial analysis has been completed based on conceptual design, and the results demonstrate that the expansion meets Company criteria for investment.

These criteria are evaluated by our field-based engineers, accountants, managers and others to identify potential obstacles to obtaining the permits. Once the unpermitted airspace is included, our policy provides that airspace may continue to be included in remaining permitted and expansion airspace even if certain of these criteria are no longer met as long as we continue to believe we will ultimately obtain the permit, based on the facts and circumstances of a specific landfill. In these circumstances, continued inclusion must be approved through a landfill-specific review process that includes approval by our Chief Financial Officer on a quarterly basis. Of the 16 landfill sites with expansions included as of December 31, 2022, two landfills required the Chief Financial Officer to approve the inclusion of the unpermitted airspace because the permit application process did not meet the one- or five-year requirements.

When we include the expansion airspace in our calculations of remaining permitted and expansion airspace, we also include the projected costs for development, as well as the projected asset retirement costs related to final capping, closure and post-closure of the expansion in the depletable basis of the landfill.

Once the remaining permitted and expansion airspace is determined in cubic yards, an airspace utilization factor (“AUF”) is established to calculate the remaining permitted and expansion capacity in tons. The AUF is established using the measured density obtained from previous annual surveys and is then adjusted to account for future settlement. The amount of settlement that is forecasted will consider several site-specific factors including current and projected mix of waste type, initial and projected waste density, estimated number of years of life remaining, depth of underlying waste, anticipated access to moisture through precipitation or recirculation of landfill leachate and operating practices. In addition, the initial selection of the AUF is subject to a subsequent multi-level review by our engineering group and the AUF used is reviewed on a periodic basis and revised as necessary. Our historical experience generally indicates that the impact of settlement at a landfill is greater later in the life of the landfill when the waste placed at the landfill approaches its highest point under the permit requirements.

After determining the costs and remaining permitted and expansion capacity at each of our landfills, we determine the per ton rates that will be expensed as waste is received and deposited at the landfill by dividing the costs by the corresponding number of tons. We calculate per ton depletion rates for each landfill for assets associated with each final capping event, for assets related to closure and post-closure activities and for all other costs capitalized or to be capitalized in the future. These rates per ton are updated annually, or more often, as significant facts change.

It is possible that actual results, including the amount of costs incurred, the timing of final capping, closure and post-closure activities, our airspace utilization or the success of our expansion efforts could ultimately turn out to be significantly different from our estimates and assumptions. To the extent that such estimates, or related assumptions, prove to be significantly different than actual results, lower earnings may be experienced due to higher depletion rates or higher expenses; or higher earnings may result if the opposite occurs. Most significantly, if it is determined that expansion capacity should no longer be considered in calculating the recoverability of a landfill asset, we may be required to recognize an asset impairment or incur significantly higher depletion expense. If at any time management makes the decision to abandon the expansion effort, the capitalized costs related to the expansion effort are expensed immediately.

Environmental Remediation Liabilities

A significant portion of our operating costs and capital expenditures could be characterized as costs of environmental protection. The nature of our operations, particularly with respect to the construction, operation and maintenance of our landfills, subjects us to an array of laws and regulations relating to the protection of the environment. Under current laws and regulations, we may have liabilities for environmental damage caused by our operations, or for damage caused by conditions that existed before we acquired a site. In addition to remediation activity required by state or local authorities, such liabilities include potentially responsible party (“PRP”) investigations. The costs associated with these liabilities can include settlements, certain legal and consultant fees, as well as incremental internal and external costs directly associated with site investigation and clean up.

Where it is probable that a liability has been incurred, we estimate costs required to remediate sites based on site-specific facts and circumstances. We routinely review and evaluate sites that require remediation and determine our estimated cost for the likely remedy based on a number of estimates and assumptions. Next, we review the same type of information with respect to other named and unnamed PRPs. Estimates of the costs for the likely remedy are then either developed using our internal resources or by third-party environmental engineers or other service providers. Internally developed estimates are based on:

- Management’s judgment and experience in remediating our own and unrelated parties’ sites;
- Information available from regulatory agencies as to costs of remediation;

- The number, financial resources and relative degree of responsibility of other PRPs who may be liable for remediation of a specific site; and
- The typical allocation of costs among PRPs, unless the actual allocation has been determined.

Estimating our degree of responsibility for remediation is inherently difficult. We recognize and accrue for an estimated remediation liability when we determine that such liability is both probable and reasonably estimable. Determining the method and ultimate cost of remediation requires that a number of assumptions be made. There can sometimes be a range of reasonable estimates of the costs associated with the likely site remediation alternatives identified in the environmental impact investigation. In these cases, we use the amount within the range that is our best estimate. If no amount within a range appears to be a better estimate than any other, we use the amount that is the low end of such range. If we used the high ends of such ranges, our aggregate potential liability would be approximately $135 million higher than the $204 million recorded in the Consolidated Balance Sheet as of December 31, 2022. Our ultimate responsibility may differ materially from current estimates. It is possible that technological, regulatory or enforcement developments, the results of environmental studies, the inability to identify other PRPs, the inability of other PRPs to contribute to the settlements of such liabilities, or other factors could require us to record additional liabilities. Our ongoing review of our remediation liabilities, in light of relevant internal and external facts and circumstances, could result in revisions to our accruals that could cause upward or downward adjustments to our balance sheet and income from operations. These adjustments could be material in any given period.

Where we believe that both the amount of a particular environmental remediation liability and the timing of the payments are fixed or reliably determinable, we inflate the cost in current dollars until the expected time of payment and discount the cost to present value using a risk-free discount rate, which is based on the rate for U.S. Treasury bonds with a term approximating the weighted average period until settlement of the underlying obligation. We determine the risk-free discount rate and the inflation rate on an annual basis unless interim changes would materially impact our results of operations. For remedial liabilities that have been discounted, we include interest accretion, based on the effective interest method, in operating expenses in our Consolidated Statements of Operations. As of December 31, 2022, 2021 and 2020, we inflated the costs by 2.50%, 2.25% and 2.25%, respectively, and discounted the costs by 3.75%, 1.50% and 1.00%, respectively. Our discount rate has increased since 2020 as a result of the overall increase in the 10-year Treasury rates. The following table summarizes the impacts of revisions in the risk-free discount rate applied to our environmental remediation liabilities and recovery assets for the year ended December 31 (in millions) and the risk-free discount rate applied as of December 31:

	2022	2021	2020
Increase (decrease) in operating expenses	$ (14)	$ (4)	$ 8
Risk-free discount rate applied to environmental remediation liabilities and recovery assets	3.75 %	1.50 %	1.00 %

The portion of our recorded environmental remediation liabilities that were not subject to inflation or discounting, as the amounts and timing of payments are not fixed or reliably determinable, was $31 million as of December 31, 2022 and 2021. Had we not inflated and discounted any portion of our environmental remediation liability, the amount recorded would have increased by $10 million and decreased by $6 million as of December 31, 2022 and 2021, respectively.

Property and Equipment (exclusive of landfills, discussed above)

We record property and equipment at cost. Expenditures for major additions and improvements are capitalized and maintenance activities are expensed as incurred. We depreciate property and equipment over the estimated useful life of the asset using the straight-line method. We generally assume no salvage value for our depreciable property and equipment. When property and equipment are retired, sold or otherwise disposed of, the cost and accumulated depreciation are removed from our accounts and any resulting gain or loss is included in results of operations as an offset or increase to operating expense for the period.

The estimated useful lives for significant property and equipment categories are as follows (in years):

	Useful Lives
Vehicles — excluding rail haul cars	3 to 10
Vehicles — rail haul cars	10 to 30
Machinery and equipment — including containers	3 to 30
Buildings and improvements	5 to 40
Furniture, fixtures and office equipment	3 to 10

Leases

We lease property and equipment in the ordinary course of our business. Our operating lease activities primarily consist of leases for real estate, landfills and operating equipment. Our financing lease activities primarily consist of leases for operating equipment, railcars and landfill assets. Our leases have varying terms. Some may include renewal or purchase options, escalation clauses, restrictions, penalties or other obligations that we consider in determining minimum lease payments. The leases are classified as either operating leases or financing leases, as appropriate.

Operating Leases (excluding landfill leases discussed below) — The majority of our leases are operating leases. This classification generally can be attributed to either (i) relatively low fixed minimum lease payments as a result of real property lease obligations that vary based on the volume of waste we receive or process or (ii) minimum lease terms that are much shorter than the assets' economic useful lives. Management expects that in the normal course of business our operating leases will be renewed, replaced by other leases or replaced with fixed asset expenditures.

Financing Leases (excluding landfill leases discussed below) — Assets under financing leases are capitalized using interest rates determined at the commencement of each lease and are depreciated over either the useful life of the asset or the lease term, as appropriate, on a straight-line basis. The present value of the related lease payments is recorded as a debt obligation.

Landfill Leases — From an operating perspective, landfills that we lease are similar to landfills we own because generally we will operate the landfill for the life of the operating permit. The most significant portion of our rental obligations for landfill leases is contingent upon operating factors such as disposal volume and often there are no contractual minimum rental obligations. Contingent rental obligations are expensed as incurred. For landfill financing leases that provide for minimum contractual rental obligations, we record the present value of the minimum obligation as part of the landfill asset, which is depleted on a units-of-consumption basis over the shorter of the lease term or the life of the landfill.

For operating and financing leases, including landfill leases, our rent expense for each of the last three years and future minimum lease payments are disclosed in Note 7.

Acquisitions

We generally recognize assets acquired and liabilities assumed in business combinations, including contingent assets and liabilities, based on fair value estimates as of the date of acquisition.

Contingent Consideration — In certain acquisitions, we agree to pay additional amounts to sellers contingent upon achievement by the acquired businesses of certain negotiated goals, such as targeted revenue levels, targeted disposal volumes or the issuance of permits for expanded landfill airspace. We have recognized liabilities for these contingent obligations based on their estimated fair value as of the date of acquisition with any differences between the acquisition-date fair value, subsequent remeasurements and the ultimate settlement of the obligations being recognized as an adjustment to income from operations.

Acquired Assets and Assumed Liabilities — Assets and liabilities arising from contingencies such as pre-acquisition environmental matters and litigation are recognized at their acquisition-date fair value when their respective fair values can be determined. If the fair values of such contingencies cannot be readily determined, they are recognized as of the acquisition date if the contingencies are probable and an amount can be reasonably estimated.

Acquisition-date fair value estimates are revised as necessary if, and when, additional information regarding these contingencies becomes available to further define and quantify assets acquired and liabilities assumed. Subsequent to finalization of purchase accounting, these revisions are accounted for as adjustments to income from operations. All acquisition-related transaction costs are expensed as incurred. See Note 17 for additional information related to our acquisitions, including our 2020 acquisition of Advanced Disposal.

Goodwill and Other Intangible Assets

Goodwill is the excess of our purchase cost over the fair value of the net assets of acquired businesses. We do not amortize goodwill, but as discussed in the *Long-Lived Asset Impairments* section below, we assess our goodwill for impairment at least annually.

Other intangible assets consist primarily of customer and supplier relationships, covenants not-to-compete, licenses, permits (other than landfill permits, which are combined with landfill tangible assets and depleted per our landfill depletion policy), and other contracts. Other intangible assets are recorded at fair value on the acquisition date and are generally amortized using either a 150% declining balance approach or a straight-line basis as we determine appropriate. Customer and supplier relationships are typically amortized over terms of 10 to 15 years. Covenants not-to-compete are amortized over the term of the non-compete covenant, which is generally five years. Licenses, permits and other contracts are amortized over the definitive terms of the related agreements. If the underlying agreement does not contain definitive terms and the useful life is determined to be indefinite, the asset is not amortized.

Long-Lived Asset Impairments

We assess our long-lived assets for impairment as required under the applicable accounting standards. If necessary, impairments are recorded in (gain) loss from divestitures, asset impairments and unusual items, net in our Consolidated Statement of Operations.

Property and Equipment, Including Landfills and Definite-Lived Intangible Assets — We monitor the carrying value of our long-lived assets for potential impairment on an ongoing basis and test the recoverability of such assets generally using significant unobservable (“Level 3”) inputs whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. These events or changes in circumstances, including management decisions pertaining to such assets, are referred to as impairment indicators. If an impairment indicator occurs, we perform a test of recoverability by comparing the carrying value of the asset or asset group to its undiscounted expected future cash flows. If cash flows cannot be separately and independently identified for a single asset, we will determine whether an impairment has occurred for the group of assets for which we can identify the projected cash flows. If the carrying values are in excess of undiscounted expected future cash flows, we measure any impairment by comparing the fair value of the asset or asset group to its carrying value and the difference is recorded in the period that the impairment indicator occurs. Fair value is generally determined by considering (i) internally developed discounted projected cash flow analysis of the asset or asset group; (ii) actual third-party valuations and/or (iii) information available regarding the current market for similar assets. Estimating future cash flows requires significant judgment and projections may vary from the cash flows eventually realized, which could impact our ability to accurately assess whether an asset has been impaired.

The assessment of impairment indicators and the recoverability of our capitalized costs associated with landfills and related expansion projects require significant judgment due to the unique nature of the waste industry, the highly regulated permitting process and the sensitive estimates involved. During the review of a landfill expansion application, a regulator may initially deny the expansion application although the expansion permit is ultimately granted. In addition, management may periodically divert waste from one landfill to another to conserve remaining permitted landfill airspace, or a landfill may be required to cease accepting waste, prior to receipt of the expansion permit. However, such events occur in the ordinary course of business in the waste industry and do not necessarily result in impairment of our landfill assets because, after consideration of all facts, such events may not affect our belief that we will ultimately obtain the expansion permit. As a result, our tests of recoverability, which generally make use of a probability-weighted cash flow estimation approach, may indicate that no impairment loss should be recorded.

Indefinite-Lived Intangible Assets, Including Goodwill — At least annually using a measurement date of October 1, and more frequently if warranted, we assess our indefinite-lived intangible assets, including the goodwill of our reporting units, for impairment.

We first perform a qualitative assessment to determine if it is more likely than not that the fair value of a reporting unit is less than its carrying value. If the assessment indicates a possible impairment, we complete a quantitative review, comparing the estimated fair value of a reporting unit to its carrying amount, including goodwill. An impairment charge is recognized if the asset's estimated fair value is less than its carrying amount. Fair value is typically estimated using an income approach using Level 3 inputs. However, when appropriate, we may also use a market approach. The income approach is based on the long-term projected future cash flows of the reporting units. We discount the estimated cash flows to present value using a weighted average cost of capital that considers factors such as market assumptions, the timing of the cash flows and the risks inherent in those cash flows. We believe that this approach is appropriate because it provides a fair value estimate based upon the reporting units' expected long-term performance considering the economic and market conditions that generally affect our business. The market approach estimates fair value by measuring the aggregate market value of publicly-traded companies with similar characteristics to our business as a multiple of their reported earnings. We then apply that multiple to the reporting units' earnings to estimate their fair values. We believe that this approach may also be appropriate in certain circumstances because it provides a fair value estimate using valuation inputs from entities with operations and economic characteristics comparable to our reporting units.

Fair value is computed using several factors, including projected future operating results, economic projections, anticipated future cash flows, comparable marketplace data and the cost of capital. There are inherent uncertainties related to these factors and to our judgment in applying them in our analysis. However, we believe our methodology for estimating the fair value of our reporting units is reasonable.

Refer to Note 11 for information related to impairments recognized during the reported periods.

Insured and Self-Insured Claims

We have retained a significant portion of the risks related to our health and welfare, general liability, automobile liability and workers' compensation claims programs. For our self-insured portions, the exposure for unpaid claims and associated expenses, including incurred but not reported losses, is based on an actuarial valuation or internal estimates. The gross estimated liability associated with settling unpaid claims is included in accrued liabilities in our Consolidated Balance Sheets if expected to be settled within one year; otherwise, it is included in other long-term liabilities. Estimated insurance recoveries related to recorded liabilities are reflected as other current receivables or other long-term assets in our Consolidated Balance Sheets when we believe that the receipt of such amounts is probable.

We use a wholly-owned insurance captive to insure the deductibles for our general liability, automobile liability and workers' compensation claims programs. We continue to maintain conventional insurance policies with third-party insurers. WMI pays an annual premium to the insurance captive on behalf of WMI and its insured subsidiaries, typically in the first quarter of the year, for estimated losses based on an external actuarial analysis. These premiums are held in a restricted funds account to be used solely for paying insurance claims, resulting in a transfer of risk from our Company to the insurance captive, and are allocated between current and long-term assets depending on estimated timing of the use of funds.

Restricted Funds

Our restricted funds accounts primarily consist of funds deposited for purposes of funding insurance claims and settling landfill final capping, closure, post-closure and environmental remediation obligations. These funds are generally allocated between cash, money market funds, equity securities and available-for-sale debt securities depending on the estimated timing and purpose of the use of funds. We use a wholly-owned insurance captive to insure the deductibles for certain claims programs and the premiums paid are directly deposited into a restricted funds account to be used solely for paying insurance claims. At several of our landfills, we provide financial assurance by depositing cash into restricted trust funds for purposes of settling final capping, closure, post-closure and environmental remediation obligations. Balances maintained in these restricted funds accounts will fluctuate based on (i) changes in statutory requirements; (ii) future deposits made to comply with contractual arrangements; (iii) the ongoing use of funds; (iv) acquisitions or divestitures and (v) changes in the fair value of the financial instruments held in the restricted funds accounts.

See Notes 16 and 18 for additional discussion related to restricted funds accounts for final capping, closure, post-closure or environmental remediation obligations.

Investments in Unconsolidated Entities

Investments in unconsolidated entities over which the Company has significant influence are accounted for under the equity method of accounting. Equity investments in which the Company does not have the ability to exert significant influence over the investees' operating and financing activities are measured using a quantitative approach as these investments do not have readily determinable fair values. The quantitative approach, or measurement alternative, is equal to its cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. The fair value of our redeemable preferred stock has been measured based on third-party investors' recent or pending transactions in these securities, which are considered the best evidence of fair value. The following table summarizes our investments in unconsolidated entities as of December 31 (in millions):

	2022	2021
Equity method investments	$ 460	$ 335
Investments without readily determinable fair values	62	48
Redeemable preferred stock	56	49
Investments in unconsolidated entities	$ 578	$ 432

We monitor and assess the carrying value of our investments throughout the year for potential impairment and write them down to their fair value when other-than-temporary declines exist. Fair value is generally based on (i) other third-party investors' recent or pending transactions in the securities; (ii) other information available regarding the current market for similar assets; (iii) a market or income approach, as deemed appropriate and/or (iv) a quantitative approach, or measurement alternative, as noted above. Impairments of our investments are recorded in equity in net losses of unconsolidated entities or other, net in our Consolidated Statements of Operations in accordance with appropriate accounting guidance.

Refer to Note 11 for information related to impairments and other adjustments recognized during the reported periods.

Foreign Currency

We have operations in Canada, as well as certain support functions in India. Local currencies generally are considered the functional currencies of our operations and investments outside the U.S. The assets and liabilities of our foreign operations are translated to U.S. dollars using the exchange rate as of the balance sheet date. Revenues and expenses are translated to U.S. dollars using the average exchange rate during the period. The resulting translation difference is reflected as a component of other comprehensive income (loss). Foreign currency translation adjustments have been impacted by decreases in the U.S. dollar/Canadian dollar exchange rate from 1.2734 at December 31, 2020, to 1.2639 at December 31, 2021 and to 1.3554 at December 31, 2022. Refer to Note 12 for information regarding the impacts of foreign currency on our comprehensive income and results of operations.

Revenue Recognition

Our Solid Waste operating revenues are primarily generated from fees charged for our collection, transfer, disposal, and recycling and resource recovery services, and from sales of commodities by our recycling and landfill gas-to-energy operations. Revenues from our collection operations are influenced by factors such as collection frequency, type of collection equipment furnished, type and volume or weight of the waste collected, distance to the disposal facility or material recovery facility and our disposal costs. Revenues from our landfill operations consist of tipping fees, which are generally based on the type and weight or volume of waste being disposed of at our disposal facilities. Fees charged at transfer stations are generally based on the weight or volume of waste deposited, taking into account our cost of loading, transporting and disposing of the solid waste at a disposal site. Recycling revenues generally consist of tipping fees and the sale of recycling commodities to third parties. The fees we charge for our services generally include our environmental, fuel surcharge and regulatory recovery fees, which are intended to pass through to customers direct and indirect costs incurred. We also provide additional services that are not managed through our Solid Waste business, including our Strategic Business Solutions (“WMSBS”) and sustainability businesses, which include landfill gas-to-energy services, Sustainability and Environmental Solutions (“SES”) business and recycling brokerage services. We also offer certain other expanded service offerings and solutions.

We generally recognize revenue as services are performed or products are delivered. For example, revenue typically is recognized as waste is collected, tons are received at our landfills or transfer stations, or recycling commodities are collected or delivered as product. We bill for certain services prior to performance. Such services include, among others, certain commercial and residential contracts and equipment rentals. These advanced billings are included in deferred revenues and recognized as revenue in the period service is provided.

See Note 19 for additional information related to revenue by reportable segment and major lines of business.

Deferred Revenues

We record deferred revenues when cash payments are received or due in advance of our performance and classify them as current since they are earned within a year and there are no significant financing components. Substantially all our deferred revenues during the reported periods are realized as revenues within one to three months, when the related services are performed.

Contract Acquisition Costs

Our incremental direct costs of obtaining a contract, which consist primarily of sales incentives, are generally deferred and amortized to selling, general and administrative expense over the estimated life of the relevant customer relationship, ranging from five to 13 years. Contract acquisition costs that are paid to the customer are deferred and amortized as a reduction in revenue over the contract life. Our contract acquisition costs are classified as current or noncurrent based on the timing of when we expect to recognize amortization and are included in other assets in our Consolidated Balance Sheets.

As of December 31, 2022 and 2021, we had $192 million and $175 million of deferred contract costs, respectively, of which $137 million and $126 million, respectively, were related to deferred sales incentives. During each of the years ended December 31, 2022, 2021 and 2020, we amortized $24 million, $23 million and $23 million, respectively, of sales incentives to selling, general and administrative expense.

Long-Term Contracts

Approximately 20% of our total revenue is derived from contracts with a remaining term greater than one year. The consideration for these contracts is primarily variable in nature. The variable elements of these contracts primarily include the number of homes and businesses served and annual rate changes based on consumer price index, fuel prices or other operating costs. Such contracts are generally within our collection, recycling and other lines of business and have a weighted average remaining contract life of approximately four years. We do not disclose the value of unsatisfied performance obligations for these contracts as our right to consideration corresponds directly to the value provided to the customer for services completed to date and all future variable consideration is allocated to wholly unsatisfied performance obligations.

Capitalized Interest

We capitalize interest on certain projects under development, including landfill expansion projects, certain assets under construction, including operating landfills and landfill gas-to-energy projects and internal-use software. During 2022, 2021 and 2020, total interest costs were $425 million, $388 million and $473 million, respectively, of which $29 million, $13 million and $16 million was capitalized in 2022, 2021 and 2020, respectively.

Income Taxes

The Company is primarily subject to income tax in the U.S. and Canada. Current tax obligations associated with our income tax expense are reflected in the accompanying Consolidated Balance Sheets as a component of accrued liabilities and our deferred tax obligations are reflected in deferred income taxes.

Deferred income taxes are based on the difference between the financial reporting and tax basis of assets and liabilities. Deferred income tax expense represents the change during the reporting period in the deferred tax assets and liabilities, net of the effect of acquisitions and dispositions. Deferred tax assets include tax loss and credit carry-forwards and are reduced by a valuation allowance if, based on available evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized. We establish reserves for uncertain tax positions when, despite our belief that our tax return positions are supportable, we believe that certain positions may be challenged and potentially disallowed. When facts and circumstances change, we adjust these reserves through our income tax expense.

Should interest and penalties be assessed by taxing authorities on any underpayment of income tax, such amounts would be accrued and classified as a component of our income tax expense in our Consolidated Statements of Operations.

See Note 8 for discussion of our income taxes.

Contingent Liabilities

We estimate the amount of potential exposure we may have with respect to claims, assessments and litigation in accordance with authoritative guidance on accounting for contingencies. We are party to pending or threatened legal proceedings covering a wide range of matters in various jurisdictions. It is difficult to predict the outcome of litigation, as it is subject to many uncertainties. Additionally, it is not always possible for management to make a meaningful estimate of the potential loss or range of loss associated with such contingencies. See Note 10 for discussion of our commitments and contingencies.

Internal-Use Software

We include capitalized costs associated with developing or obtaining internal-use software within long-term other assets, and these costs are amortized over the term of the relevant subscription period including any renewal options that are reasonably certain of being exercised. These costs include direct external costs of materials and services used in developing or obtaining the software and internal costs for employees directly associated with the software development project. As of December 31, 2022 and 2021, total costs capitalized for our internal-use software were $45 million and $48 million, respectively, net of accumulated amortization of $27 million and $11 million, respectively. During each of the years ended December 31, 2022, 2021 and 2020, we amortized $16 million, $10 million and $1 million, respectively, to selling, general and administrative expense.

Supplemental Cash Flow Information

The following table shows supplemental cash flow information for the year ended December 31 (in millions):

	2022	2021	2020
Interest, net of capitalized interest	$ 348	$ 387	$ 461
Income taxes (a)	736	370	422

(a) The increase in income taxes paid in 2022 is primarily due to the increase in pre-tax book income during 2022 and a deposit of approximately $103 million made to the Internal Revenue Service ("IRS") in the fourth quarter of 2022 related to a disputed tax matter for which we expect to seek a refund. See Note 8 for further discussion.

During 2022, we had $225 million of non-cash financing activities primarily from our federal low-income housing investment and new financing leases. Additionally, we had approximately $135 million of non-cash investing activities related to non-cash consideration transferred as part of our acquisitions in 2022. See Note 17 for further discussion of our 2022 acquisitions. During 2021, we had $30 million of non-cash financing activities from new financing leases. During 2020, we had $50 million of non-cash financing activities primarily related to new financing leases, a portion of which were attributed to our acquisition of Advanced Disposal. Non-cash investing and financing activities are generally excluded from the Consolidated Statements of Cash Flows.

3. Landfill and Environmental Remediation Liabilities

Liabilities for landfill and environmental remediation costs as of December 31 are presented in the table below (in millions):

	2022			2021		
	Landfill	Environmental Remediation	Total	Landfill	Environmental Remediation	Total
Current (in accrued liabilities)	$ 137	$ 31	$ 168	$ 137	$ 29	$ 166
Long-term	2,527	173	2,700	2,189	184	2,373
	$ 2,664	$ 204	$ 2,868	$ 2,326	$ 213	$ 2,539

The changes to landfill and environmental remediation liabilities for the year ended December 31, 2022 are reflected in the table below (in millions):

	Landfill	Environmental Remediation
December 31, 2021	$ 2,326	$ 213
Obligations incurred and capitalized	114	—
Obligations settled	(121)	(28)
Interest accretion	108	4
Revisions in estimates and interest rate assumptions (a)	243	15
Acquisitions, divestitures and other adjustments	(6)	—
December 31, 2022	$ 2,664	$ 204

(a) In 2021, the increase in our landfill liabilities for revisions in estimates and interest rate assumptions was $33 million. The increase in our landfill liabilities in 2022 is primarily due to inflationary cost pressures that are expected to impact costs over the remaining landfill lives.

Our recorded liabilities as of December 31, 2022 include the impacts of inflating certain of these costs based on our expectations of the timing of cash settlement and of discounting certain of these costs to present value. Anticipated payments of currently identified environmental remediation liabilities, as measured in current dollars, are $31 million in 2023, $43 million in 2024, $29 million in 2025, $19 million in 2026, $16 million in 2027 and $76 million thereafter.

4. Property and Equipment

Property and equipment as of December 31 consisted of the following (in millions):

	2022	2021
Land	$ 752	$ 732
Landfills	18,526	17,734
Vehicles	6,173	5,893
Machinery and equipment	4,401	3,571
Containers	3,021	2,807
Buildings and improvements	3,809	3,542
Furniture, fixtures and office equipment	664	677
	37,346	34,956
Less: Accumulated depreciation of tangible property and equipment	(10,731)	(10,147)
Less: Accumulated depletion of landfill airspace	(10,896)	(10,390)
Property and equipment, net	$ 15,719	$ 14,419

See Note 11 for information regarding asset impairments.

Depreciation and depletion expense, including for assets recorded as financing leases, consisted of the following for the year ended December 31 (in millions):

	2022	2021	2020
Depreciation of tangible property and equipment	$ 1,155	$ 1,125	$ 996
Depletion of landfill airspace	754	731	568
Depreciation and depletion expense	$ 1,909	$ 1,856	$ 1,564

See Note 5 for information regarding amortization of our intangible assets.

5. Goodwill and Other Intangible Assets

Goodwill was $9,323 million and $9,028 million as of December 31, 2022 and 2021, respectively. The $295 million increase in goodwill during 2022 is primarily related to acquisitions. As discussed in Note 2, we perform our annual impairment test of goodwill balances for our reporting units using a measurement date of October 1. We will also perform interim tests if an impairment indicator exists. See Notes 17 and 19 for additional information related to goodwill.

Our other intangible assets consisted of the following as of December 31 (in millions):

	Customer and Supplier Relationships	Covenants Not-to-Compete	Licenses, Permits and Other	Total
2022				
Intangible assets	$ 1,288	$ 51	$ 141	$ 1,480
Less: Accumulated amortization	(543)	(23)	(87)	(653)
	$ 745	$ 28	$ 54	$ 827
2021				
Intangible assets	$ 1,355	$ 43	$ 142	$ 1,540
Less: Accumulated amortization	(538)	(26)	(78)	(642)
	$ 817	$ 17	$ 64	$ 898

Amortization expense for other intangible assets was $129 million, $143 million and $107 million for 2022, 2021 and 2020, respectively. The decrease in amortization expense in 2022 was primarily due to decreasing amortization under the 150% declining balance approach for intangible assets from the acquisition of Advanced Disposal. Amortization expense for other intangible assets for 2021 increased, as compared with 2020, due to the amortization of acquired intangible assets related to our acquisition of Advanced Disposal. Additional information related to other intangible assets acquired through business combinations is included in Note 17. As of December 31, 2022 and 2021, we had $19 million of licenses, permits and other intangible assets that are not subject to amortization because they do not have stated expirations or have routine, administrative renewal processes. As of December 31, 2022, we expect annual amortization expense related to other intangible assets to be $120 million in 2023, $110 million in 2024, $101 million in 2025, $80 million in 2026 and $75 million in 2027.

6. Debt

The following table summarizes the major components of debt as of each balance sheet date (in millions) and provides the maturities and interest rate ranges of each major category as of December 31:

	2022	2021
Commercial paper program (weighted average interest rate of 4.9% as of December 31, 2022 and 0.4% as of December 31, 2021)	$ 1,730	$ 1,778
Senior notes, maturing through 2050, interest rates ranging from 0.75% to 7.75% (weighted average interest rate of 3.2% as of December 31, 2022 and 3.1% as of December 31, 2021)	8,626	8,126
Term Loan maturing May 2024, interest rate of 5.1% as of December 31, 2022	1,000	—
Canadian senior notes, C$500 million maturing September 2026, interest rate of 2.6%	369	395
Tax-exempt bonds, maturing through 2048, fixed and variable interest rates ranging from 0.4% to 4.4% (weighted average interest rate of 2.7% as of December 31, 2022 and 1.4% as of December 31, 2021)	2,648	2,619
Financing leases and other, maturing through 2071, weighted average interest rate of 4.7% as of December 31, 2022 and 4.5% as of December 31, 2021) (a)	699	567
Debt issuance costs, discounts and other	(88)	(80)
	14,984	13,405
Current portion of long-term debt	414	708
Long-term debt, less current portion	$ 14,570	$ 12,697

(a) Excluding our landfill financing leases, the maturities of our financing leases and other debt obligations extend through 2059.

Debt Classification

As of December 31, 2022, we had approximately $3.1 billion of debt maturing within the next 12 months, including (i) $1.7 billion of short-term borrowings under our commercial paper program (net of related discount on issuance); (ii) $725 million of tax-exempt bonds with term interest rate periods that expire within the next 12 months, which is prior to their scheduled maturities; (iii) $500 million of 2.4% senior notes that mature in May 2023 and (iv) $192 million of other debt with scheduled maturities within the next 12 months, including $65 million of tax-exempt bonds. As of December 31, 2022, we have classified $2.7 billion of debt maturing in the next 12 months as long-term because we have the intent and ability to refinance these borrowings on a long-term basis as supported by the forecasted available capacity under our $3.5 billion long-term U.S. and Canadian revolving credit facility (“$3.5 billion revolving credit facility”), as discussed below. The remaining $414 million of debt maturing in the next 12 months is classified as current obligations.

Access to and Utilization of Credit Facilities, Commercial Paper Program and Term Loan

$3.5 Billion Revolving Credit Facility — In May 2022, we amended and restated our $3.5 billion U.S. and Canadian revolving credit facility extending the term through May 2027. The agreement includes a $1.0 billion accordion feature that may be used to increase total capacity in future periods, and we have the option to request up to two one-year extensions. Waste Management of Canada Corporation and WM Quebec Inc., each an indirect wholly-owned subsidiary of WMI, are borrowers under the $3.5 billion revolving credit facility, and the agreement permits borrowing in Canadian dollars up to the U.S. dollar equivalent of $375 million, with such borrowings to be repaid in Canadian dollars. WM Holdings, a wholly-owned subsidiary of WMI, guarantees all the obligations under the $3.5 billion revolving credit facility.

The $3.5 billion revolving credit facility provides us with credit capacity to be used for cash borrowings, to support letters of credit or to support our commercial paper program. The interest rates we pay on outstanding U.S. or Canadian loans are based on a secured overnight financing rate administered by the Federal Reserve Bank of New York (“SOFR”) or the Canadian Dollar Offered Rate (“CDOR”), respectively, plus a spread depending on WMI’s senior public debt rating assigned by Moody’s Investors Service, Inc. and Standard and Poor’s Global Ratings. The spread above SOFR or CDOR can range from 0.585% to 1.025% per annum, plus a credit adjustment spread of 0.10% per annum on SOFR-based rates (the “SOFR Credit Adjustment Spread”) to account for the transition from the use of LIBOR to SOFR in such rate calculations. We also pay certain other fees set forth in the $3.5 billion revolving credit facility agreement, including a facility fee based on the aggregate commitment, regardless of usage. As of December 31, 2022, we had no outstanding borrowings under this facility. We had $166 million of letters of credit issued and $1.7 billion of outstanding borrowings (net of related discount on issuance) under our commercial paper program, both supported by the facility, leaving unused and available credit capacity of $1.6 billion as of December 31, 2022.

Commercial Paper Program — We have a commercial paper program that enables us to borrow funds for up to 397 days at competitive interest rates. The rates we pay for outstanding borrowings are based on the term of the notes. The commercial paper program is fully supported by our $3.5 billion revolving credit facility. As of December 31, 2022, we had $1.7 billion of outstanding borrowings (net of related discount on issuance) under our commercial paper program.

$1.0 Billion, Two-Year, Term Credit Agreement — In May 2022, we entered into a $1.0 billion, two-year, U.S. term credit agreement (“Term Loan”) maturing May 2024 to be used for general corporate purposes. The interest rate we pay on our outstanding balance is generally based on SOFR, plus a spread depending on WMI’s senior public debt rating assigned by Moody’s Investors Service, Inc. and Standard and Poor’s Global Ratings. The spread above SOFR can range from 0.50% to 0.90% per annum, plus the SOFR Credit Adjustment Spread. As of December 31, 2022, we had $1.0 billion of outstanding borrowings under our Term Loan. WM Holdings also guarantees all of the obligations under the Term Loan.

Other Letter of Credit Lines — As of December 31, 2022, we had utilized $800 million of other uncommitted letter of credit lines with terms extending through April 2024.

Debt Borrowings and Repayments

Commercial Paper Program — During the year ended December 31, 2022 we made cash repayments of $6.7 billion, which were partially offset by $6.6 billion of cash borrowings (net of related discount on issuance).

Term Loan — In May 2022, we borrowed $1.0 billion under our Term Loan for general corporate purposes.

Senior Notes — In May 2022, WMI issued $1.0 billion of 4.15% senior notes due April 15, 2032, the net proceeds of which were $992 million. We used the net proceeds to redeem our $500 million of 2.9% senior notes due September 2022 in advance of their scheduled maturity, to repay a portion of outstanding borrowings under our commercial paper program and for general corporate purposes.

Tax-Exempt Bonds — We issued $100 million of tax-exempt bonds in 2022. The proceeds from the issuance of these bonds were deposited directly into a restricted trust fund and may only be used for the specific purpose for which the money was raised, which is generally to finance expenditures for solid waste disposal facility, material recovery facility and renewable natural gas facility construction and development. In 2022, we also repaid $71 million of our tax-exempt bonds with available cash at their scheduled maturities.

Financing Leases and Other — The increase in our financing leases and other debt obligations in 2022 is primarily related to a note payable associated with our federal low-income housing investment discussed in Note 8, which increased our debt obligations by $183 million. The increase in our debt obligations was partially offset by $93 million of cash repayments of debt at maturity.

Scheduled Debt Payments

Principal payments of our debt for the next five years and thereafter, based on scheduled maturities are as follows: $2,423 million in 2023, $1,290 million in 2024, $1,324 million in 2025, $673 million in 2026, $1,163 million in 2027 and $8,275 million thereafter. Our recorded debt and financing lease obligations include non-cash adjustments associated with debt issuance costs, discounts and fair value adjustments attributable to terminated interest rate derivatives, which have been excluded from these amounts because they will not result in cash payments. As discussed above, we have the intent and ability to refinance certain 2023 scheduled maturities on a long-term basis, including our $500 million of 2.4% senior notes that mature in May 2023. See Note 7 below for further discussion of our financing lease arrangements.

Secured Debt

Our debt balances are generally unsecured, except for financing lease obligations and the notes payable associated with our investments in low-income housing properties. See Notes 8 and 18 for additional information related to these investments.

Debt Covenants

The terms of certain of our financing arrangements require that we comply with financial and other covenants. Our most restrictive financial covenant is the one contained in both our $3.5 billion revolving credit facility and Term Loan, which sets forth a maximum total debt to consolidated earnings before interest, taxes, depreciation, depletion and amortization ratio (the "Leverage Ratio"). This covenant requires that the Leverage Ratio for the preceding four fiscal quarters will not be more than 3.75 to 1, provided that if an acquisition permitted under the $3.5 billion revolving credit facility involving aggregate consideration in excess of $200 million occurs during the fiscal quarter, the Company shall have the right to increase the Leverage Ratio to 4.25 to 1 during such fiscal quarter and for the following three fiscal quarters (the "Elevated Leverage Ratio Period"). There shall be no more than two Elevated Leverage Ratio Periods during the term of the $3.5 billion revolving credit facility, and the Leverage Ratio must return to 3.75 to 1 for at least one fiscal quarter between Elevated Leverage Ratio Periods. The calculation of all components used in the Leverage Ratio covenant are as defined in the $3.5 billion revolving credit facility. As of December 31, 2022 and 2021, we were in compliance with our Leverage Ratio covenant.

Our $3.5 billion revolving credit facility, Term Loan, senior notes and other financing arrangements also contain certain restrictions on the ability of the Company's subsidiaries to incur additional indebtedness as well as restrictions on the ability of the Company and its subsidiaries to, among other things, incur liens, engage in sale-leaseback transactions and engage in mergers and consolidations. We monitor our compliance with these restrictions, but do not believe that they significantly impact our ability to enter into investing or financing arrangements typical for our business. As of December 31, 2022 and 2021, we were in compliance with all covenants and restrictions under our financing arrangements, in addition to our Leverage Ratio covenant, that may have a material effect on our Consolidated Financial Statements.

7. Leases

Our operating lease activities primarily consist of leases for real estate, landfills (refer to Note 2 for further detail) and operating equipment. Our financing lease activities primarily consist of leases for operating equipment, railcars and landfill assets. Leases with an initial term of 12 months or less, which are not expected to be renewed beyond one year, are not recorded on the balance sheet and are recognized as lease expense on a straight-line basis over the lease term. Most leases include one or more options to renew, with renewal terms generally ranging from one to 10 years. The exercise of lease renewal options is generally at our sole discretion. We include the renewal term in the calculation of the right-of-use asset and related lease liability when such renewals are reasonably certain of being exercised. Certain leases also include options to purchase the leased property. The depreciable life of assets and leasehold improvements is limited by the expected lease term, unless there is a transfer of title or purchase option reasonably certain of exercise. Certain of our lease agreements include rental payments based on usage and other lease agreements include rental payments adjusted periodically for inflation; these payments are treated as variable lease payments. Our lease agreements do not contain any material residual value guarantees or material restrictive covenants.

When the implicit interest rate is not readily available for our leases, we discount future cash flows of the remaining lease payments using the current interest rate that would be paid to borrow on collateralized debt over a similar term, or incremental borrowing rate, at the commencement date.

Supplemental balance sheet information for our leases as of December 31 is as follows (in millions):

Leases	Classification	2022	2021
Assets			
Long-term:			
Operating	Other assets	$ 456	$ 451
Financing	Property and equipment, net of accumulated depreciation and depletion	328	364
Total lease assets		$ 784	$ 815
Liabilities			
Current:			
Operating	Accrued liabilities	$ 64	$ 64
Financing	Current portion of long-term debt	44	47
Long-term:			
Operating	Other liabilities	460	459
Financing	Long-term debt, less current portion	258	291
Total lease liabilities		$ 826	$ 861

Operating lease expense was $183 million, $155 million and $140 million during 2022, 2021 and 2020, respectively, and is included in operating and selling, general and administrative expenses in our Consolidated Statements of Operations. Financing lease expense was $55 million, $58 million and $51 million during 2022, 2021 and 2020, respectively, and is included in depreciation, depletion and amortization expense and interest expense, net in our Consolidated Statements of Operations.

Minimum contractual obligations for our leases (undiscounted) as of December 31, 2022 are as follows (in millions):

	Operating	Financing
2023	$ 78	$ 52
2024	71	46
2025	59	56
2026	52	36
2027	40	28
Thereafter	414	169
Total undiscounted lease payments	$ 714	$ 387
Less: interest	(190)	(85)
Discounted lease liabilities	$ 524	$ 302

As of December 31, 2022, we entered into operating and financing leases, primarily for real estate and equipment, that have not yet commenced and therefore are not reflected in the table above, with future lease payments of $52 million and $50 million, respectively. These leases commence through 2024 and have non-cancelable lease terms up to 17 years.

Cash paid during 2022 for our operating and financing leases was $76 million and $56 million, respectively. During 2022, right-of-use assets obtained in exchange for lease obligations for our operating and financing leases were $69 million and $33 million, respectively. Cash paid during 2021 for our operating and financing leases was $70 million and $64 million, respectively. During 2021, right-of-use assets obtained in exchange for lease obligations for our operating and financing leases were $69 million and $36 million, respectively.

As of December 31, 2022, the weighted average remaining lease terms of our operating and financing leases were approximately 19 years and 11 years, respectively. The weighted average discount rates used to determine the lease liabilities as of December 31, 2022 for our operating and financing leases were approximately 3.0% and 4.0%, respectively.

8. Income Taxes

Income Tax Expense

Our income tax expense consisted of the following for the year ended December 31 (in millions):

	2022	2021	2020
Current:			
Federal	$ 456	$ 436	$ 114
State	130	132	91
Foreign	43	41	27
	629	609	232
Deferred:			
Federal	20	(55)	149
State	30	(22)	10
Foreign	(1)	—	6
	49	(77)	165
Income tax expense	$ 678	$ 532	$ 397

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The U.S. federal statutory income tax rate is reconciled to the effective income tax rate for the year ended December 31 as follows:

	2022	2021	2020
Income tax expense at U.S. federal statutory rate	21.00 %	21.00 %	21.00 %
State and local income taxes, net of federal income tax benefit	4.16	4.14	4.46
Federal tax credits	(2.81)	(2.69)	(3.78)
Taxing authority audit settlements and other tax adjustments	0.54	0.53	(0.17)
Tax impact of equity-based compensation transactions	(0.45)	(0.60)	(1.12)
Tax impact of impairments	0.02	(0.29)	(0.35)
Tax rate differential on foreign income	0.27	0.37	0.33
Other	0.51	0.16	0.57
Effective income tax rate	23.24 %	22.62 %	20.94 %

The comparability of our income tax expense for the reported periods has been primarily affected by (i) variations in our income before income taxes; (ii) federal tax credits; (iii) excess tax benefits associated with equity-based compensation transactions; (iv) the realization of state net operating losses and credits; (v) tax audit settlements; (vi) adjustments to our accruals and deferred taxes; (vii) the tax implications of divestitures and (viii) non-deductible transaction costs.

For financial reporting purposes, income before income taxes by source for the year ended December 31 was as follows (in millions):

	2022	2021	2020
Domestic	$ 2,779	$ 2,211	$ 1,780
Foreign	139	138	113
Income before income taxes	$ 2,918	$ 2,349	$ 1,893

Investments Qualifying for Federal Tax Credits — We have significant financial interests in entities established to invest in and manage low-income housing properties. In February 2022, we acquired an additional noncontrolling interest in a limited liability company established to invest in and manage low-income housing properties. Total consideration for this investment is expected to be $253 million, comprised of a $183 million note payable, an initial cash payment of $28 million and $42 million of interest payments expected to be paid over the life of the investment. At the time of the investment, we increased our investments in unconsolidated entities in our Consolidated Balance Sheet by $211 million, representing the principal balance of the note and the initial cash investment. We support the operations of these entities in exchange for a pro-rata share of the tax credits they generate. The low-income housing investments qualify for federal tax credits that we expect to realize through 2033 under Section 42 or Section 45D of the Internal Revenue Code. We also held a residual financial interest in an entity that owned a refined coal facility that qualified for federal tax credits under Section 45 of the Internal Revenue Code through 2019. The entity sold the majority of its assets in the first quarter of 2020, which resulted in a $7 million non-cash impairment of our investment at that time.

We account for our investments in these entities using the equity method of accounting, recognizing our share of each entity's results of operations and other reductions in the value of our investments in equity in net losses of unconsolidated entities within our Consolidated Statements of Operations. During the years ended December 31, 2022, 2021 and 2020, we recognized net losses of $65 million, $51 million and $73 million (including the $7 million impairment of the refined coal facility noted above), respectively, and a reduction in our income tax expense of $99 million, $74 million and $87 million, respectively, due to tax credits realized from these investments as well as the tax benefits from the pre-tax losses realized. In addition, during the years ended December 31, 2022, 2021 and 2020, we recognized interest expense of $14 million, $9 million and $11 million, respectively, associated with our investments in low-income housing properties. See Note 18 for additional information related to these unconsolidated variable interest entities.

Equity-Based Compensation — During 2022, 2021 and 2020, we recognized a reduction in our income tax expense of $17 million, $18 million and $27 million, respectively, for excess tax benefits related to the vesting or exercise of equity-based compensation awards.

State Net Operating Losses and Credits — During 2022, 2021 and 2020, we recognized state net operating losses and credits resulting in a reduction in our income tax expense of $8 million, $15 million and $12 million, respectively.

Tax Audit Settlements — We file income tax returns in the U.S. and Canada, as well as other state and local jurisdictions. We are currently under audit by various taxing authorities, as discussed below, and our audits are in various stages of completion. During the reported periods, we settled various tax audits which resulted in a reduction in our income tax expense of $6 million, $13 million and $10 million for the years ended December 31, 2022, 2021 and 2020, respectively.

We participate in the IRS's Compliance Assurance Process, which means we work with the IRS throughout the year towards resolving any material issues prior to the filing of our annual tax return. Any unresolved issues as of the tax return filing date are subject to routine examination procedures. In the fourth quarter of 2022, the Company received a notice of tax due for the 2017 tax year related to a remaining disagreement with the IRS. In response to the notice, the Company made a deposit of approximately $103 million with the IRS. The Company expects to seek a refund of the entire amount deposited with the IRS and litigate any denial of the claim for refund. As of December 31, 2022, the IRS deposit, net of reserve for uncertain tax positions, is classified as a component of other long-term assets in the Company's Consolidated Balance Sheet.

In addition, we are in the examination phase of an IRS audit for the 2022 tax year and expect the audit to be completed within the next 18 months. We are also currently undergoing audits by various state and local jurisdictions for tax years that date back to 2014.

Adjustments to Accruals and Related Deferred Taxes — Adjustments to our accruals and related deferred taxes primarily due to the filing of our income tax returns, analysis of our deferred tax balances and uncertain tax positions, and changes in state and foreign laws resulted in an increase in our income tax expense of $1 million and $17 million for the years ended December 31, 2022 and 2021, respectively, and a reduction in our income tax expense of $3 million for the year ended December 31, 2020.

Tax Implications of Divestitures — During 2021, we recognized a pre-tax gain from the recognition of cumulative translation adjustments on the divestiture of certain non-strategic Canadian operations. This gain was not taxable, which benefited our effective income tax rate for the year ended December 31, 2021.

Non-Deductible Transaction Costs — During 2020, we recognized the detrimental tax impact of $27 million of non-deductible transaction costs related to our acquisition of Advanced Disposal. The tax rules require the capitalization of certain facilitative costs on the acquisition of stock of a company resulting in the applicable costs not being deductible for tax purposes.

Tax Legislation — The Inflation Reduction Act of 2022 ("IRA") was signed into law by President Biden on August 16, 2022 and contains a number of tax-related provisions. The provisions of the IRA related to alternative fuel tax credits secure approximately $55 million of annual pre-tax benefit (to be recorded as a reduction in our operating expense) from tax credits through 2024. Additionally, we will incur an excise tax of 1% for future common stock repurchases, which will be reflected in the cost of purchasing the underlying shares as a component of treasury stock. The IRA contains a number of additional provisions related to tax incentives for investments in renewable energy production, carbon capture, and other climate actions, as well as the overall measurement of corporate income taxes. We are in the process of evaluating the IRA and identifying all potential impacts that may be applicable.

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Unremitted Earnings in Foreign Subsidiaries — In the third quarter of 2020, we modified our permanent reinvestment assertion and began providing additional income taxes for the undistributed current year earnings of our foreign subsidiaries. No additional income taxes have been provided for any remaining undistributed foreign earnings prior to 2020 not subject to the one-time, mandatory transition tax, or any additional outside basis difference, as these amounts continue to be indefinitely reinvested in foreign operations.

Deferred Tax Assets (Liabilities)

The components of net deferred tax liabilities as of December 31 are as follows (in millions):

	2022	2021
Deferred tax assets:		
Net operating loss, capital loss and tax credit carry-forwards	$ 155	$ 189
Landfill and environmental remediation liabilities	216	238
Operating lease liabilities	131	135
Miscellaneous and other reserves, net	117	113
Subtotal	619	675
Valuation allowance	(143)	(158)
Deferred tax liabilities:		
Property and equipment	(1,061)	(1,064)
Goodwill and other intangibles	(1,034)	(1,027)
Operating lease right-of-use assets	(114)	(120)
Net deferred tax liabilities	$ (1,733)	$ (1,694)

As of December 31, 2022, we had $6 million of federal net operating loss carry-forwards with expiration dates through 2026 and $2.5 billion of state net operating loss carry-forwards with expiration dates through 2042. We also had $27 million of federal capital loss carry-forwards with expiration dates through 2026, $39 million of foreign tax credit carry-forwards with expiration dates through 2032 and $8 million of state tax credit carry-forwards with expiration dates through 2038.

We have established valuation allowances for uncertainties in realizing the benefit of certain tax loss and credit carry-forwards and other deferred tax assets. While we expect to realize the deferred tax assets, net of the valuation allowances, changes in estimates of future taxable income or in tax laws may alter this expectation.

Liabilities for Uncertain Tax Positions

A reconciliation of the beginning and ending amount of gross unrecognized tax benefits, including accrued interest, is as follows (in millions):

	2022	2021	2020
Balance as of January 1	$ 64	$ 37	$ 40
Additions based on tax positions related to the current year	5	22	5
Additions based on tax positions of prior years	—	18	—
Accrued interest	1	3	2
Settlements	—	(12)	—
Lapse of statute of limitations	(6)	(4)	(10)
Balance as of December 31	$ 64	$ 64	$ 37

These liabilities are included as a component of other long-term liabilities or as an offset to other long-term assets in our Consolidated Balance Sheets because the Company does not anticipate that settlement of the liabilities will require payment of cash within the next 12 months. As of December 31, 2022, we had $53 million of net unrecognized tax benefits that, if recognized in future periods, would impact our effective income tax rate.

We recognize interest expense related to unrecognized tax benefits in our income tax expense, which was not material for the reported periods. We did not have any material accrued liabilities or expense for penalties related to unrecognized tax benefits for the reported periods.

9. Employee Benefit Plans

Defined Contribution Plans — Waste Management sponsors a 401(k) retirement savings plan that covers employees, except those working subject to collective bargaining agreements that do not provide for coverage under the plan. U.S. employees who are not subject to such collective bargaining agreements are generally eligible to participate in the plan following a 90-day waiting period after hire and may contribute as much as 50% of their eligible annual compensation and 80% of their annual incentive plan bonus, subject to annual contribution limitations established by the IRS. Under the retirement savings plan, for non-union employees, we match 100% of employee contributions on the first 3% of their eligible annual compensation and 50% of employee contributions on the next 3% of their eligible annual compensation, resulting in a maximum match of 4.5% of eligible annual compensation. Non-union employees are automatically enrolled in the plan at a 3% contribution rate upon eligibility. Both employee and Company contributions are in cash and vest immediately. Certain U.S. employees who are subject to collective bargaining agreements may participate in the 401(k) retirement savings plan under terms specified in their collective bargaining agreement. Certain employees outside the U.S., including those in Canada, participate in defined contribution plans maintained by the Company in compliance with laws of the appropriate jurisdiction. Charges to operating and selling, general and administrative expenses for our defined contribution plans totaled $112 million, $104 million and $92 million for the years ended December 31, 2022, 2021 and 2020, respectively.

Defined Benefit Plans (other than multiemployer defined benefit pension plans discussed below) — WM Holdings sponsors a defined benefit plan for certain employees who are subject to collective bargaining agreements that provide for participation in this plan. Further, certain of our Canadian subsidiaries sponsor defined benefit plans that are frozen to new participants. As of December 31, 2022, the combined benefit obligation of these pension plans was $117 million supported by $113 million of combined plan assets, resulting in an aggregate unfunded benefit obligation for these plans of $4 million. As of December 31, 2021, the combined benefit obligation of these pension plans was $150 million supported by $150 million of combined plan assets.

In addition, WM Holdings and certain of its subsidiaries provided post-retirement health care and other benefits to eligible retirees. In conjunction with our acquisition of WM Holdings in July 1998, we limited participation in these plans to participating retirees as of December 31, 1998. The unfunded benefit obligation for these plans was $8 million and $12 million as of December 31, 2022 and 2021, respectively.

Our accrued benefit liabilities for our defined benefit pension and other post-retirement plans are included as components of accrued liabilities and long-term other liabilities in our Consolidated Balance Sheets.

Multiemployer Defined Benefit Pension Plans — We are a participating employer in a number of trustee-managed multiemployer defined benefit pension plans ("Multiemployer Pension Plans") for employees who are covered by collective bargaining agreements. The risks of participating in these Multiemployer Pension Plans are different from single-employer plans in that (i) assets contributed to the Multiemployer Pension Plan by one employer may be used to provide benefits to employees or former employees of other participating employers; (ii) if a participating employer stops contributing to the plan, the unfunded obligations of the plan may be required to be assumed by the remaining participating employers and (iii) if we choose to stop participating in any of our Multiemployer Pension Plans, we may be required to pay those plans a withdrawal amount based on the underfunded status of the plan. The following table outlines our participation in Multiemployer Pension Plans considered to be individually significant (dollars in millions):

Pension Fund	EIN/Pension Plan Number	Pension Protection Act Reported Status(a) 2022	Pension Protection Act Reported Status(a) 2021	FIP/RP Status(b)(c)	Company Contributions 2022	Company Contributions 2021	Company Contributions 2020	Expiration Date of Collective Bargaining Agreement(s)
Automotive Industries Pension Plan	EIN: 94-1133245; Plan Number: 001	Critical and Declining	Critical and Declining	Implemented	$ 1	$ 1	$ 1	6/30/2025
Midwest Operating Engineers Pension Trust Fund	EIN: 36-6140097; Plan Number: 001	Not Endangered or Critical as of 3/31/2022	Not Endangered or Critical as of 3/31/2021	Implemented	2	2	2	Various dates through 9/30/2026
Suburban Teamsters of Northern Illinois Pension Plan (d)	EIN: 36-6155778; Plan Number: 001	Not Endangered or Critical	Not Endangered or Critical	Implemented	4	4	3	Various dates through 9/30/2027
Western Conference of Teamsters Pension Plan	EIN: 91-6145047; Plan Number: 001	Not Endangered or Critical	Not Endangered or Critical	Not Applicable	37	35	33	Various dates through 6/30/2027
					$ 44	$ 42	$ 39	
Contributions to other Multiemployer Pension Plans					17	19	15	
Total contributions to Multiemployer Pension Plans (e)					$ 61	$ 61	$ 54	

(a) Unless otherwise noted in the table above, the most recent Pension Protection Act zone status available in 2022 and 2021 is for the plan's year-end as of December 31, 2021 and 2020, respectively. The zone status is based on information that we received from the plan and is certified by the plan's actuary. As defined in the Pension Protection Act of 2006, among other factors, plans reported as critical are generally less than 65% funded and plans reported as endangered are generally less than 80% funded. Under the Multiemployer Pension Reform Act of 2014, a plan is generally in critical and declining status if it (i) is certified to be in critical status pursuant to the Pension Protection Act of 2006 and (ii) is projected to be insolvent within the next 15 years or, in certain circumstances, 20 years.

(b) The "FIP/RP Status" column indicates plans for which a Funding Improvement Plan ("FIP") or a Rehabilitation Plan ("RP") has been implemented.

(c) A Multiemployer Pension Plan that has been certified as endangered, seriously endangered or critical may begin to levy a statutory surcharge on contribution rates. Once authorized, the surcharge is at the rate of 5% for the first 12 months and 10% for any periods thereafter. Contributing employers, however, may eliminate the surcharge by entering into a collective bargaining agreement that meets the requirements of the applicable FIP or RP.

(d) Of the Multiemployer Pension Plans considered to be individually significant, the Company was listed in the Form 5500 of the Suburban Teamsters of Northern Illinois Pension Plan as providing more than 5% of the total contributions for plan years ending December 31, 2021 and 2020.

(e) Total contributions to Multiemployer Pension Plans exclude contributions related to withdrawal liabilities.

Our portion of the projected benefit obligation, plan assets and unfunded liability for the Multiemployer Pension Plans is not material to our financial position. However, the failure of participating employers to remain solvent could affect our portion of the plans' unfunded liability. Specific benefit levels provided by union pension plans are not negotiated with or known by the employer contributors.

In connection with our ongoing renegotiations of various collective bargaining agreements, we may discuss and negotiate for the complete or partial withdrawal from one or more of these pension plans. Further, business events, such as the discontinuation or nonrenewal of a customer contract, the decertification of a union, or relocation, reduction or discontinuance of certain operations, which result in the decline of Company contributions to a Multiemployer Pension Plan could trigger a partial or complete withdrawal. In the event of a withdrawal, we may incur expenses associated with our obligations for unfunded vested benefits at the time of the withdrawal. Refer to Note 10 for additional information related to our obligations to Multiemployer Pension Plans.

Multiemployer Plan Benefits Other Than Pensions — During the years ended December 31, 2022, 2021 and 2020, the Company made contributions of $49 million, $51 million and $48 million, respectively, to multiemployer health and welfare plans that also provide other post-retirement employee benefits. Funding of benefit payments for plan participants are made at negotiated rates in the respective collective bargaining agreements as costs are incurred.

10. Commitments and Contingencies

Financial Instruments — We have obtained letters of credit, surety bonds and insurance policies and have established trust funds and issued financial guarantees to support tax-exempt bonds, contracts, performance of landfill final capping, closure and post-closure requirements, environmental remediation and other obligations. Letters of credit generally are supported by our $3.5 billion revolving credit facility and other credit lines established for that purpose. These facilities are discussed further in Note 6. Surety bonds and insurance policies are supported by (i) a diverse group of third-party surety and insurance companies; (ii) an entity in which we have a noncontrolling financial interest or (iii) a wholly-owned insurance captive, the sole business of which is to issue surety bonds and/or insurance policies on our behalf.

Management does not expect that any claims against or draws on these instruments would have a material adverse effect on our financial condition, results of operations or cash flows. We have not experienced any unmanageable difficulty in obtaining the required financial assurance instruments for our current operations. In an ongoing effort to mitigate risks of future cost increases and reductions in available capacity, we continue to evaluate various options to access cost-effective sources of financial assurance.

Insurance — We carry insurance coverage for protection of our assets and operations from certain risks including general liability, automobile liability, workers’ compensation, real and personal property, directors’ and officers’ liability, pollution legal liability, cyber incident liability and other coverages we believe are customary to the industry. Our exposure to loss for insurance claims is generally limited to the per-incident deductible under the related insurance policy and any amounts that exceed our insured limits. Our exposure could increase if our insurers are unable to meet their commitments on a timely basis.

We have retained a significant portion of the risks related to our general liability, automobile liability and workers’ compensation claims programs. “General liability” refers to the self-insured portion of specific third-party claims made against us that may be covered under our commercial general liability insurance policy. For our self-insured portions, the exposure for unpaid claims and associated expenses, including incurred but not reported losses, is based on an actuarial valuation or internal estimates. The accruals for these liabilities could be revised if future occurrences or loss development significantly differ from such valuations and estimates. We use a wholly-owned insurance captive to insure the deductibles for our general liability, automobile liability and workers’ compensation claims programs. Our receivable balance associated with insurance claims was $142 million and $155 million as of December 31, 2022 and 2021 respectively. The changes to our insurance reserves for the year ended December 31 are summarized below (in millions):

	2022(a)	2021
Balance as of January 1	$ 734	$ 664
Self-insurance expense	242	240
Cash paid and other	(247)	(170)
Balance as of December 31	$ 729	$ 734
Current portion as of December 31	$ 189	$ 191
Long-term portion as of December 31	$ 540	$ 543

(a) Based on current estimates, we anticipate that most of our insurance reserves will be settled in cash over the next six years.

We do not expect the impact of any known casualty, property, environmental or other contingency to have a material impact on our financial condition, results of operations or cash flows.

Unconditional Purchase Obligations — Our unconditional purchase obligations are generally established in the ordinary course of our business and are structured in a manner that provides us with access to important resources at competitive, market-driven rates and consist primarily of the following:

- *Disposal* — We have several agreements expiring at various dates through 2052 that require us to dispose of a minimum number of tons at third-party disposal facilities. Under these put-or-pay agreements, we are required to pay for the agreed upon minimum volumes regardless of the actual number of tons placed at the facilities. We generally fulfill our minimum contractual obligations by disposing of volumes collected in the ordinary course of business at these disposal facilities.
- *Other* — We are party to certain multi-year service agreements expiring at various dates through 2030 requiring minimum annual payments.

As of December 31, 2022, our estimated minimum obligations associated with unconditional purchase obligations, which are not recognized in our Consolidated Balance Sheets, were $192 million in 2023, $158 million in 2024, $114 million in 2025, $101 million in 2026, $34 million in 2027 and $369 million thereafter. We may also establish unconditional purchase obligations in conjunction with acquisitions or divestitures. Our future minimum obligations under these outstanding purchase agreements are generally quantity driven and, as a result, our associated financial obligations are not fixed as of December 31, 2022. For contracts that require us to purchase minimum quantities of goods or services, we have estimated our future minimum obligations based on the current market values of the underlying products or services or contractually stated amounts. We currently expect the products and services provided by these agreements to continue to meet the needs of our ongoing operations. Therefore, we do not expect these established arrangements to materially impact our future financial position, results of operations or cash flows.

Other Commitments

- *Royalties* — We have various arrangements that require us to make royalty payments to third parties including prior land owners, lessors or host communities where our operations are located. Our obligations generally are based on per ton rates for waste actually received at our transfer stations or landfills. Royalty agreements that are non-cancelable and require fixed or minimum payments are included in our financing leases and other debt obligations in our Consolidated Balance Sheets as disclosed in Note 6.

Guarantees — We have entered into the following guarantee agreements associated with our operations:

- As of December 31, 2022, WM Holdings has fully and unconditionally guaranteed all of WMI's senior indebtedness, including its senior notes which mature through 2050, $3.5 billion revolving credit facility, Term

Loan and certain letter of credit lines. WMI has fully and unconditionally guaranteed the senior indebtedness of WM Holdings, which matures in 2026. Performance under these guarantee agreements would be required if either party defaulted on their respective obligations. No additional liabilities have been recorded for these intercompany guarantees because all of the underlying obligations are reflected in our Consolidated Balance Sheets.

- WMI and WM Holdings have guaranteed subsidiary debt obligations, including tax-exempt bonds, financing leases and other indebtedness. If a subsidiary fails to meet its obligations associated with its debt agreements as they come due, WMI or WM Holdings will be required to perform under the related guarantee agreement. No additional liabilities have been recorded for these intercompany guarantees because all of the underlying obligations are reflected in our Consolidated Balance Sheets. See Note 6 for information related to the balances and maturities of these debt obligations.
- Certain of our subsidiaries have guaranteed the market or contractually-determined value of certain homeowners' properties that are adjacent to or near certain of our landfills. These guarantee agreements extend over the life of the respective landfill. Under these agreements, we would be responsible for the difference, if any, between the sale value and the guaranteed market or contractually-determined value of the homeowners' properties. As of December 31, 2022, we have agreements guaranteeing certain market value losses for certain properties adjacent to or near 17 of our landfills. Any liability associated with the triggering of the home value guarantee has been reflected in our Consolidated Balance Sheets. We do not believe that the remaining contingent obligations will have a material adverse effect on the Company's business, financial position, results of operations or cash flows.
- We have indemnified the purchasers of businesses or divested assets for the occurrence of specified events under certain of our divestiture agreements. Other than certain identified items that are currently recorded as obligations, we do not believe that it is possible to determine the contingent obligations associated with these indemnities. Additionally, under certain of our acquisition agreements, we have provided for additional consideration to be paid to the sellers if established financial targets or other market conditions are achieved post-closing and we have recognized liabilities for these contingent obligations based on an estimate of the fair value of these contingencies at the time of acquisition. We do not currently believe that contingent obligations to provide indemnification or pay additional post-closing consideration in connection with our divestitures or acquisitions will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.
- WMI and WM Holdings guarantee the service, lease, financial and general operating obligations of certain of their subsidiaries. If such a subsidiary fails to meet its contractual obligations as they come due, the guarantor has an unconditional obligation to perform on its behalf. No additional liability has been recorded for service, financial or general operating guarantees because the subsidiaries' obligations are properly accounted for as costs of operations as services are provided or general operating obligations as incurred. No additional liability has been recorded for the lease guarantees because the subsidiaries' obligations are properly accounted for as operating or financing leases, as appropriate.

Environmental Matters — A significant portion of our operating costs and capital expenditures could be characterized as costs of environmental protection. The nature of our operations, particularly with respect to the construction, operation and maintenance of our landfills, subjects us to an array of laws and regulations relating to the protection of the environment. Under current laws and regulations, we may have liabilities for environmental damage caused by our operations, or for damage caused by conditions that existed before we acquired a site. In addition to remediation activity required by state or local authorities, such liabilities include PRP investigations. The costs associated with these liabilities can include settlements, certain legal and consultant fees, as well as incremental internal and external costs directly associated with site investigation and clean-up.

As of December 31, 2022, we have been notified by the government that we are a PRP in connection with 73 locations listed on the Environmental Protection Agency's ("EPA's") Superfund National Priorities List ("NPL"). Of the 73 sites at which claims have been made against us, 14 are sites we own. Each of the NPL sites we own was initially developed by others as a landfill disposal facility. At each of these facilities, we are working in conjunction with the government to characterize or remediate identified site problems, and we have either agreed with other legally liable parties on an arrangement for sharing the costs of remediation or are working toward a cost-sharing agreement. We generally expect to receive any amounts due from other participating parties at or near the time that we make the remedial expenditures. The other 59 NPL sites, which we do not own, are at various procedural stages under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, known as CERCLA or Superfund.

The majority of proceedings involving NPL sites that we do not own are based on allegations that certain of our subsidiaries (or their predecessors) transported hazardous substances to the sites, often prior to our acquisition of these subsidiaries. CERCLA generally provides for liability for those parties owning, operating, transporting to or disposing at the sites. Proceedings arising under Superfund typically involve numerous waste generators and other waste transportation and disposal companies and seek to allocate or recover costs associated with site investigation and remediation, which costs could be substantial and could have a material adverse effect on our consolidated financial statements. At some of the sites at which we have been identified as a PRP, our liability is well defined as a consequence of a governmental decision and an agreement among liable parties as to the share each will pay for implementing that remedy. At other sites, where no remedy has been selected or the liable parties have been unable to agree on an appropriate allocation, our future costs are uncertain.

On October 11, 2017, the EPA issued its Record of Decision (“ROD”) with respect to the previously proposed remediation plan for the San Jacinto River Waste Pits Site in Harris County, Texas. McGinnes Industrial Maintenance Corporation (“MIMC”), a subsidiary of Waste Management of Texas, Inc., operated some of the waste pits from 1965 to 1966 and has been named as a site PRP. In 1998, WMI acquired the stock of the parent entity of MIMC. MIMC has been working with the EPA and other named PRPs as the process of addressing the site proceeds. On April 9, 2018, MIMC and International Paper Company entered into an Administrative Order on Consent agreement with the EPA to develop a remedial design for the EPA’s proposed remedy for the site, and we recorded a liability for MIMC’s estimated potential share of the EPA’s proposed remedy and related costs, although allocation of responsibility among the PRPs for the proposed remedy has not been established. MIMC and International Paper Company have continued to work on a remedial design to support the EPA’s proposed remedy; however, design investigations indicate that fundamental changes are required to the proposed remedy and MIMC maintains its prior position that the remedy set forth in the ROD is not the best solution to protect the environment and public health. Due to further increases in the estimated cost of the remedy set forth in the ROD, we recorded an additional liability of $17 million as of March 31, 2022 for MIMC’s estimated potential share of such costs. As of December 31, 2022 and 2021, the recorded liability for MIMC’s estimated potential share of the EPA’s proposed remedy was $68 million and $53 million, respectively. MIMC’s ultimate liability could be materially different from current estimates and MIMC will continue to engage the EPA regarding its proposed remedy.

Item 103 of the SEC’s Regulation S-K requires disclosure of certain environmental matters when a governmental authority is a party to the proceedings, or such proceedings are known to be contemplated, unless we reasonably believe that the matter will result in no monetary sanctions, or in monetary sanctions, exclusive of interest and costs, below a stated threshold. In accordance with this SEC regulation, the Company uses a threshold of $1 million for purposes of determining whether disclosure of any such environmental proceedings is required. As of the date of this filing, we are not aware of any matters that are required to be disclosed pursuant to this standard.

From time to time, we are also named as defendants in personal injury and property damage lawsuits, including purported class actions, on the basis of having owned, operated or transported waste to a disposal facility that is alleged to have contaminated the environment or, in certain cases, on the basis of having conducted environmental remediation activities at sites. Some of the lawsuits may seek to have us pay the costs of monitoring of allegedly affected sites and health care examinations of allegedly affected persons for a substantial period of time even where no actual damage is proven. While we believe we have meritorious defenses to these lawsuits, the ultimate resolution is often substantially uncertain due to the difficulty of determining the cause, extent and impact of alleged contamination (which may have occurred over a long period of time), the potential for successive groups of complainants to emerge, the diversity of the individual plaintiffs’ circumstances, and the potential contribution or indemnification obligations of co-defendants or other third parties, among other factors. Additionally, we often enter into agreements with landowners imposing obligations on us to meet certain regulatory or contractual conditions upon site closure or upon termination of the agreements. Compliance with these agreements inherently involves subjective determinations and may result in disputes, including litigation.

Litigation — We are subject to various proceedings, lawsuits, disputes and claims arising in the ordinary course of our business. Many of these actions raise complex factual and legal issues and are subject to uncertainties. Actions that have been filed against us, and that may be filed against us in the future, include personal injury, property damage, commercial, customer, and employment-related claims, including purported state and national class action lawsuits related to: alleged environmental contamination, including releases of hazardous material and odors; sales and marketing practices, customer service agreements and prices and fees; and federal and state wage and hour and other laws. The plaintiffs in some actions seek unspecified damages or injunctive relief, or both. These actions are in various procedural stages, and some are covered, in part, by insurance. We currently do not believe that the eventual outcome of any such actions will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.

In June 2022, we and certain of our officers were named as defendants in a complaint alleging violation of the federal securities laws and seeking certification as a class action in the U.S. District Court for the Southern District of New York. A lead plaintiff has been appointed and an amended complaint was filed in January 2023. The amended complaint seeks damages on behalf of a putative class of persons who purchased our SMR Notes (as defined and discussed in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Loss on Early Extinguishment of Debt, Net*), asserting claims under the Securities Exchange Act based on alleged misrepresentations and omissions concerning the time for completion of our acquisition of Advanced Disposal. We will vigorously defend against this pending suit. We believe any potential recovery by the plaintiffs, in excess of applicable deductibles, will be covered by insurance, and we do not believe that the eventual outcome of this suit will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.

WMI's charter and bylaws provide that WMI shall indemnify against all liabilities and expenses, and upon request shall advance expenses to any person, who is subject to a pending or threatened proceeding because such person is or was a director or officer of the Company. Such indemnification is required to the maximum extent permitted under Delaware law. Accordingly, the director or officer must execute an undertaking to reimburse the Company for any fees advanced if it is later determined that the director or officer was not permitted to have such fees advanced under Delaware law. Additionally, the Company has direct contractual obligations to provide indemnification to each of the members of WMI's Board of Directors and each of WMI's executive officers. The Company may incur substantial expenses in connection with the fulfillment of its advancement of costs and indemnification obligations in connection with actions or proceedings that may be brought against its former or current officers, directors and employees.

Multiemployer Defined Benefit Pension Plans — About 20% of our workforce is covered by collective bargaining agreements with various local unions across the U.S. and Canada. As a result of some of these agreements, certain of our subsidiaries are participating employers in a number of Multiemployer Pension Plans for the covered employees. Refer to Note 9 for additional information about our participation in Multiemployer Pension Plans considered individually significant. In connection with our ongoing renegotiation of various collective bargaining agreements, we may discuss and negotiate for the complete or partial withdrawal from one or more of these Multiemployer Pension Plans. A complete or partial withdrawal from a Multiemployer Pension Plan may also occur if employees covered by a collective bargaining agreement vote to decertify a union from continuing to represent them. Any other circumstance resulting in a decline in Company contributions to a Multiemployer Pension Plan through a reduction in the labor force, whether through attrition over time or through a business event (such as the discontinuation or nonrenewal of a customer contract, the decertification of a union, or relocation, reduction or discontinuance of certain operations) may also trigger a complete or partial withdrawal from one or more of these pension plans.

We do not believe that any future liability relating to our past or current participation in, or withdrawals from, the Multiemployer Pension Plans to which we contribute will have a material adverse effect on our business, financial condition or liquidity. However, liability for future withdrawals could have a material adverse effect on our results of operations or cash flows for a particular reporting period, depending on the number of employees withdrawn and the financial condition of the Multiemployer Pension Plan(s) at the time of such withdrawal(s).

Tax Matters — We maintain a liability for uncertain tax positions, the balance of which management believes is adequate. Results of audit assessments by taxing authorities are not currently expected to have a material adverse effect on our financial condition, results of operations or cash flows. We participate in the IRS's Compliance Assurance Process, which means we work with the IRS throughout the year towards resolving any material issues prior to the filing of our annual tax return. Any unresolved issues as of the tax return filing date are subject to routine examination procedures. In the fourth quarter of 2022, the Company received a notice of tax due for the 2017 tax year related to a remaining disagreement with the IRS. In response to the notice, the Company made a deposit of approximately $103 million with the IRS. The Company expects to seek a refund of the entire amount deposited with the IRS and litigate any denial of the claim for refund. As of December 31, 2022, the IRS deposit, net of reserve for uncertain tax positions, is classified as a component of other long-term assets in the Company's Consolidated Balance Sheet.

11. Asset Impairments and Unusual Items

(Gain) Loss from Divestitures, Asset Impairments and Unusual Items, Net

The following table summarizes the major components of (gain) loss from divestitures, asset impairments and unusual items, net for the year ended December 31 (in millions):

	2022	2021	2020
Gain from divestitures, net	$ (5)	$ (44)	$ (33)
Asset impairments	50	8	68
Other	17	20	—
	$ 62	$ (16)	$ 35

For the year ended December 31, 2022, we recognized $62 million of net charges consisting of (i) $50 million of asset impairment charges primarily related to management's decision to close two landfills within our East Tier segment and (ii) a $17 million charge pertaining to reserves for loss contingencies in our Corporate and Other segment to adjust an indirect wholly-owned subsidiary's estimated potential share of the liability for a proposed environmental remediation plan at a closed site, as discussed in Note 10. These losses were partially offset by a $5 million gain from the divestiture of a solid waste business in our West Tier segment.

For the year ended December 31, 2021, we recognized net gains of $16 million primarily consisting of (i) a $35 million pre-tax gain from the recognition of cumulative translation adjustments on the divestiture of certain non-strategic Canadian operations in our East Tier segment and (ii) an $8 million gain from divestitures of certain ancillary operations in our Other segment. These gains were partially offset by (i) a $20 million charge pertaining to reserves for loss contingencies in our Corporate and Other segment and (ii) $8 million of asset impairment charges primarily related to our WM Renewable Energy business within our Other segment.

For the year ended December 31, 2020, we recognized $35 million of net charges primarily related to (i) a $33 million net gain associated with net asset divestitures executed to address requirements of the U.S. Department of Justice in connection with our acquisition of Advanced Disposal, primarily within our West Tier segment; (ii) $41 million of non-cash impairment charges primarily related to two landfills and an oil field waste injection facility in our West Tier segment; (iii) a $20 million non-cash impairment charge in our East Tier segment due to management's decision to close a landfill once its constructed airspace is filled and abandon any remaining permitted airspace and (iv) $7 million of net charges primarily related to non-cash impairments of certain assets within our WM Renewable Energy business in our Other segment.

See Note 2 for additional information related to the accounting policy and analysis involved in identifying and calculating impairments. See Note 19 for additional information related to the impact of impairments on the results of operations of our reportable segments.

Equity in Net Losses of Unconsolidated Entities

For the year ended December 31, 2020, we recorded a non-cash impairment charge of $7 million related to an investment in a refined coal facility which is discussed further in Note 8. The fair value of our investment was not readily determinable; thus, we determined the fair value using management assumptions pertaining to investment value (Level 3 inputs). The remaining losses for the years ended December 31, 2022, 2021 and 2020 were primarily related to our noncontrolling interests in entities established to invest in and manage low-income housing properties. Refer to Notes 8 and 18 for additional information related to these investments.

12. Accumulated Other Comprehensive Income (Loss)

The changes in the balances of each component of accumulated other comprehensive income (loss), net of tax, which is included as a component of WMI stockholders' equity, are as follows (in millions, with amounts in parentheses representing decreases to accumulated other comprehensive income):

	Derivative Instruments	Available-for-Sale Securities	Foreign Currency Translation Adjustments(a)	Post-Retirement Benefit Obligations	Total
Balance, December 31, 2019	$ (24)	$ 38	$ (21)	$ (1)	$ (8)
Other comprehensive income (loss) before reclassifications, net of tax expense (benefit) of $2, $4, $0 and $1, respectively	7	12	20	2	41
Amounts reclassified from accumulated other comprehensive (income) loss, net of tax (expense) benefit of $2, $0, $0 and $(1), respectively	8	(1)	—	(1)	6
Net current period other comprehensive income (loss)	15	11	20	1	47
Balance, December 31, 2020	$ (9)	$ 49	$ (1)	$ —	$ 39
Other comprehensive income (loss) before reclassifications, net of tax expense (benefit) of $0, $(2), $0 and $2, respectively	—	(6)	7	5	6
Amounts reclassified from accumulated other comprehensive (income) loss, net of tax (expense) benefit of $3, $0, $0 and $0, respectively	9	—	(35)	(2)	(28)
Net current period other comprehensive income (loss)	9	(6)	(28)	3	(22)
Balance, December 31, 2021	$ —	$ 43	$ (29)	$ 3	$ 17
Other comprehensive income (loss) before reclassifications, net of tax expense (benefit) of $0, $(8), $0 and $0, respectively	—	(24)	(65)	1	(88)
Amounts reclassified from accumulated other comprehensive (income) loss, net of tax (expense) benefit of $1, $0, $0 and $0, respectively	3	—	—	(1)	2
Net current period other comprehensive income (loss)	3	(24)	(65)	—	(86)
Balance, December 31, 2022	$ 3	$ 19	$ (94)	$ 3	$ (69)

(a) As a result of the divestiture of certain non-strategic Canadian operations in the third quarter of 2021, we reclassified $35 million of cumulative foreign currency translation adjustments from accumulated other comprehensive income to (gain) loss from divestitures, asset impairments and unusual items, net within our Consolidated Statement of Operations.

13. Capital Stock, Dividends and Common Stock Repurchase Program

Capital Stock

We have 1.5 billion shares of authorized common stock with a par value of $0.01 per common share. As of December 31, 2022, we had 407.9 million shares of common stock issued and outstanding. The Board of Directors is authorized to issue preferred stock in series, and with respect to each series, to fix its designation, relative rights (including voting, dividend, conversion, sinking fund, and redemption rights), preferences (including dividends and liquidation) and limitations. We have 10 million shares of authorized preferred stock, $0.01 par value, none of which is currently outstanding.

Dividends

Our quarterly dividends have been declared by our Board of Directors. Cash dividends declared and paid were $1,077 million in 2022, or $2.60 per common share, $970 million in 2021, or $2.30 per common share, and $927 million in 2020, or $2.18 per common share.

In December 2022, we announced that our Board of Directors expects to increase the quarterly dividend from $0.65 to $0.70 per share for dividends declared in 2023. However, all future dividend declarations are at the discretion of our Board of Directors and depend on various factors, including our net earnings, financial condition, cash required for future business plans, growth and acquisitions and other factors the Board of Directors may deem relevant.

Common Stock Repurchase Program

The Company repurchases shares of its common stock as part of capital allocation programs authorized by our Board of Directors. Share repurchases during the reported periods were completed through accelerated share repurchase (“ASR”) agreements and, to a lesser extent, open market transactions. The terms of these ASR agreements required that we deliver cash at the beginning of each ASR repurchase period. In exchange, we received a portion of the total shares expected to be repurchased based on the then-current market price of our common stock. The remaining shares repurchased over the course of each repurchase period are delivered to us once the repurchase period is complete. In the table below, shares repurchased are measured and reported based on the period shares are delivered to us, which can differ from the period cash is delivered to a repurchase agent for the value of such shares. The following is a summary of our share repurchases under our common stock repurchase program for the year ended December 31:

	2022(a)	2021(b)	2020(c)
Shares repurchased (in thousands)	9,796	8,731	3,687
Weighted average price per share	$ 160.26	$ 146.61	$ 108.92
Total repurchases (in millions)	$ 1,570	$ 1,280	$ 402

(a) We executed and completed four ASR agreements during 2022 to repurchase $1.417 billion of our common stock and received 8.8 million shares in connection with these ASR agreements. We also repurchased an additional 0.6 million shares of our common stock in open market transactions in compliance with Rule 10b5-1 and Rule 10b-18 of the Securities Exchange Act of 1934 (“Exchange Act”) for $83 million, inclusive of per-share commissions. Shares repurchased in 2022 include 0.4 million shares of our common stock for $70 million pursuant to our December 2021 ASR agreement that completed in January 2022.

(b) We executed and completed three ASR agreements during 2021 to repurchase $1.0 billion of our common stock and received 7.0 million shares in connection with these ASR agreements. Additionally, in December 2021, we executed an ASR agreement to repurchase $350 million of our common stock. At the beginning of the repurchase period, we delivered $350 million in cash and received 1.7 million shares based on a stock price of $160.67. The ASR agreement completed in January 2022, at which time we received 0.4 million additional shares based on a final weighted average price of $160.33.

(c) During 2020, we executed and completed an ASR agreement to repurchase $313 million of our common stock and received 2.8 million shares in connection with this ASR agreement. We also repurchased an additional 0.9 million shares of our common stock in open market transactions in compliance with Rule 10b5-1 and Rule 10b-18 of the Exchange Act for $89 million, inclusive of per-share commissions.

We announced in December 2022 that the Board of Directors has authorized up to $1.5 billion in future share repurchases. This new authorization replaces our prior $1.5 billion authorization that was fully utilized in 2022. Any future share repurchases will be made at the discretion of management and will depend on factors similar to those considered by the Board of Directors in making dividend declarations, including our net earnings, financial condition and cash required for future business plans, growth and acquisitions.

14. Equity-Based Compensation

Employee Stock Purchase Plan

We have an Employee Stock Purchase Plan ("ESPP") under which employees that have been employed for at least 30 days may purchase shares of our common stock at a discount. The plan provides for two offering periods for purchases: January through June and July through December. At the end of each offering period, enrolled employees purchase shares of our common stock at a price equal to 85% of the lesser of the market value of the stock on the first and last day of such offering period. The purchases are made at the end of an offering period with funds accumulated through payroll deductions over the course of the offering period. Subject to limitations set forth in the plan and under IRS regulations, eligible employees may elect to have up to 10% of their base pay deducted during the offering period. The total number of shares issued under the plan for the offering periods in 2022, 2021 and 2020 was approximately 455,000, 513,000 and 570,000, respectively. After the January 2023 issuance of shares associated with the July to December 2022 offering period, 2.3 million shares remain available for issuance under the ESPP.

As a result of our ESPP, annual compensation expense increased by $13 million, or $10 million net of tax expense, for 2022, $12 million, or $9 million net of tax expense, for 2021 and $13 million, or $10 million net of tax expense, for 2020.

Employee Stock Incentive Plans

In May 2014, our stockholders approved our 2014 Stock Incentive Plan (the "2014 Plan") to replace our 2009 Stock Incentive Plan (the "2009 Plan"). The 2014 Plan authorized 23.8 million shares of our common stock for issuance pursuant to the 2014 Plan, plus the approximately 1.1 million shares that then remained available for issuance under the 2009 Plan, and any shares subject to outstanding awards under both incentive plans that are subsequently cancelled, forfeited, terminate, expire or lapse. In May 2020, the Company's Board of Directors amended the 2014 Plan to provide that the number of future shares surrendered in payment of the exercise or purchase price of an award, and the number of future shares used to satisfy the withholding obligations, shall no longer be credited back to the total number of shares available for issuance under the 2014 Plan. As of December 31, 2022, approximately 16.1 million shares were available for future grants under the 2014 Plan. All of our equity-based compensation awards described herein have been made pursuant to either our 2009 Plan or our 2014 Plan, collectively referred to as the "Incentive Plans." We currently utilize treasury shares to meet the needs of our equity-based compensation programs.

Pursuant to the Incentive Plans, we have the ability to issue stock options, stock appreciation rights and stock awards, including restricted stock, restricted stock units ("RSUs") and performance share units ("PSUs"). The terms and conditions of equity awards granted under the Incentive Plans are determined by the Management Development and Compensation Committee of our Board of Directors.

The 2022 annual incentive plan awards granted to the Company's senior leadership team, which generally includes the Company's executive officers, included a combination of PSUs and stock options. Additionally, several members of the Company's senior leadership team received a grant of RSUs in 2022 in special recognition of leadership and contributions critical to the acquisition of Advanced Disposal and the subsequent integration and synergy generation. Awards granted to other eligible employees under the 2014 Plan included a combination of PSUs, RSUs and stock options in 2022. The Company also periodically grants RSUs to employees working on key initiatives, in connection with new hires and promotions and to field-based managers.

Restricted Stock Units — A summary of our RSUs is presented in the table below (units in thousands):

	Units	Weighted Average Per Share Fair Value
Unvested as of January 1, 2022	343	$ 114.28
Granted	162	$ 147.74
Vested	(107)	$ 100.11
Forfeited	(33)	$ 136.43
Unvested as of December 31, 2022	365	$ 131.26

The total fair market value of RSUs that vested during the years ended December 31, 2022, 2021 and 2020 was $15 million, $12 million and $14 million, respectively. During the year ended December 31, 2022, we issued approximately 77,000 shares of common stock for these vested RSUs, net of approximately 30,000 units deferred or used for payment of associated taxes.

RSUs may not be voted or sold by award recipients until time-based vesting restrictions have lapsed. RSUs primarily provide for three-year cliff vesting and include dividend equivalents accumulated during the vesting period. Unvested units are subject to forfeiture in the event of voluntary or for-cause termination. RSUs are generally subject to pro-rata vesting upon an employee's involuntary termination other than for cause and generally payout at the end of the three-year vesting period and become immediately vested in the event of an employee's death or disability.

Compensation expense associated with RSUs is measured based on the grant-date fair value of our common stock and is recognized on a straight-line basis over the required employment period. Beginning in 2021, the terms of the award agreements for new grants of RSUs were updated to provide for accelerated vesting following retirement as if the employee had remained employed until the end of the vesting period. Accordingly, compensation expense for RSUs granted to retirement eligible employees is recognized over the longer of (i) the period between grant date and the date that the recipient becomes retirement-eligible or (ii) the defined service requirement of the award. Compensation expense is only recognized for those awards that we expect to vest, which we estimate based upon an assessment of expected forfeitures.

Performance Share Units — Two types of PSUs are currently outstanding: (i) PSUs for which payout is dependent on total shareholder return relative to the S&P 500 Index ("TSR PSUs") and (ii) PSUs for which payout is dependent on the Company's performance against pre-established adjusted cash flow metrics ("Cash Flow PSUs"). Both types of PSUs are payable in shares of common stock after the end of a three-year performance period, when the Company's financial performance for the entire performance period is reported, typically in the first half of the first quarter of the succeeding year. At the end of the performance period, the number of shares awarded can range from 0% to 200% of the targeted amount, depending on the performance against the pre-established targets. A summary of our PSUs, at 100% of the targeted amount, is presented in the table below (units in thousands):

	Units	Weighted Average Per Share Fair Value
Unvested as of January 1, 2022	968	$ 129.60
Granted	290	$ 168.49
Vested	(346)	$ 116.26
Forfeited	(48)	$ 147.79
Unvested as of December 31, 2022	864	$ 147.00

The determination of achievement of performance results and corresponding vesting of PSUs for the three-year performance period ended December 31, 2022 was performed by the Management Development and Compensation Committee of our Board of Directors in January 2023. Accordingly, vesting information for such awards is not included in the table above as of December 31, 2022. The "vested" PSUs are for the three-year performance period ended December 31, 2021, as achievement of performance results and corresponding vesting was determined in February 2022. The performance of the Company's common stock for purposes of the TSR PSUs exceeded target performance criteria, and the Company's financial results, as measured for purposes of the Cash Flow PSUs, exceeded the maximum performance criteria. Accordingly, recipients of the PSU awards received a payout of 167.78% of the vested TSR PSUs and 200% of the vested Cash Flow PSUs. In February 2022, approximately 637,000 PSUs vested and we issued approximately 420,000 shares of common stock for these vested PSUs, net of units deferred or used for payment of associated taxes. The shares of common stock that were issued or deferred during the years ended December 31, 2022, 2021 and 2020 for prior PSU award grants had a fair market value of $91 million, $74 million and $89 million, respectively.

PSUs have no voting rights. PSUs receive dividend equivalents that are paid out in cash based on the number of shares that vest at the end of the awards' performance period. Subject to attainment of the performance metrics described above, PSUs are payable to an employee (or his beneficiary) upon death or disability as if that employee had remained employed until the end of the performance period. PSUs are generally subject to pro-rata vesting upon an employee's involuntary termination other than for cause and are subject to forfeiture in the event of voluntary or for-cause termination. The terms of the award agreements for outstanding PSUs provide for continued vesting following retirement as if the employee had remained employed until the end of the performance period, and compensation expense for PSUs granted to retirement-eligible employees is accelerated over the period that the recipient becomes retirement-eligible plus a defined service requirement.

Compensation expense associated with our Cash Flow PSUs is based on the grant-date fair value of our common stock. Compensation expense is recognized ratably over the performance period based on our estimated achievement of the established performance criteria. Compensation expense is only recognized for those awards that we expect to vest, which we estimate based upon an assessment of both the probability that the performance criteria will be achieved and expected forfeitures. The grant-date fair value of our TSR PSUs is based on a Monte Carlo valuation and compensation expense is recognized on a straight-line basis over the vesting period. Compensation expense is recognized for all TSR PSUs whether or not the market conditions are achieved less expected forfeitures.

Deferred Units — Certain employees can elect to defer some or all of the vested RSU or PSU awards until a specified date or dates they choose. Deferred units are not invested, nor do they earn interest, but deferred amounts do receive dividend equivalents paid in cash during deferral at the same time and at the same rate as dividends on the Company's common stock. Deferred amounts are paid out in shares of common stock at the end of the deferral period. As of December 31, 2022, we had approximately 179,000 vested deferred units outstanding.

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Stock Options — Stock options granted prior to 2021 vest in 25% increments on the first two anniversaries of the date of grant with the remaining 50% vesting on the third anniversary. Beginning in 2021, stock options granted vest ratably in three annual increments, beginning on the first anniversary of the date of grant. The exercise price of the options is the average of the high and low market value of our common stock on the date of grant, and the options have a term of 10 years. A summary of our stock options is presented in the table below (options in thousands):

	Options	Weighted Average Per Share Exercise Price
Outstanding as of January 1, 2022	3,206	$ 92.53
Granted	477	$ 145.67
Exercised (a)	(675)	$ 88.54
Forfeited or expired	(85)	$ 124.31
Outstanding as of December 31, 2022 (b)	2,923	$ 101.22
Exercisable as of December 31, 2022 (c)	1,762	$ 83.34

(a) Includes approximately 141,000 stock options exercised pursuant to Rule 10b5-1 trading plans that provided for net share settlement, resulting in the Company withholding approximately 112,000 shares of our common stock to cover the associated stock option exercise price and taxes.

(b) Stock options outstanding as of December 31, 2022 have a weighted average remaining contractual term of 6.2 years and an aggregate intrinsic value of $163 million based on the market value of our common stock on December 31, 2022.

(c) Stock options exercisable as of December 31, 2022 have an aggregate intrinsic value of $130 million based on the market value of our common stock on December 31, 2022.

During 2022, 2021 and 2020, we received cash proceeds of $44 million, $66 million and $63 million, respectively, from the exercise of 675,000, 962,000 and 1,039,000 of employee stock options. The aggregate intrinsic value of stock options exercised during 2022, 2021 and 2020 was $51 million, $66 million and $58 million, respectively.

Stock options exercisable as of December 31, 2022 were as follows (options in thousands):

Range of Exercise Prices	Options	Weighted Average Per Share Exercise Price	Weighted Average Remaining Years
$36.88-$50.00	166	$ 40.31	1.0
$50.01-$70.00	355	$ 55.53	2.7
$70.01-$100.00	888	$ 87.95	5.3
$100.01-$145.67	353	$ 119.87	7.6
$36.88-$145.67	1,762	$ 83.34	5.0

All unvested stock options shall become exercisable upon the award recipient's death or disability. In the event of a recipient's retirement, stock options shall continue to vest pursuant to the original schedule set forth in the award agreement. If the recipient is terminated by the Company without cause or voluntarily resigns, the recipient shall be entitled to exercise all stock options outstanding and exercisable within a specified time frame after such termination. All outstanding stock options, whether exercisable or not, are forfeited upon termination for cause.

We account for our employee stock options under the fair value method of accounting using a Black-Scholes valuation model to measure stock option expense at the date of grant. The weighted average grant-date fair value of stock options granted during the years ended December 31, 2022, 2021 and 2020 was $26.44, $17.25 and $15.82, respectively. The fair value of stock options at the date of grant is amortized to expense over the vesting period less expected forfeitures, except for stock options granted to retirement-eligible employees, for which expense is accelerated over the period that the recipient becomes retirement-eligible. The following table presents the weighted average assumptions used to value employee stock options granted during the year ended December 31 under the Black-Scholes valuation model:

	2022	2021	2020
Expected option life	4.7 years	4.7 years	4.6 years
Expected volatility	23.4 %	23.2 %	16.6 %
Expected dividend yield	1.8 %	2.1 %	1.7 %
Risk-free interest rate	1.6 %	0.6 %	1.4 %

The Company bases its expected option life on the expected exercise and termination behavior of its optionees and an appropriate model of the Company's future stock price. The expected volatility assumption is derived from the historical volatility of the Company's common stock over the most recent period commensurate with the estimated expected life of the Company's stock options, combined with other relevant factors including implied volatility in market-traded options on the Company's stock. The expected dividend yield is the annual rate of dividends per share over the exercise price of the option as of the grant date.

For the years ended December 31, 2022, 2021 and 2020, we recognized $71 million, $94 million and $79 million, respectively, of compensation expense associated with RSU, PSU and stock option awards as a component of selling, general and administrative expenses in our Consolidated Statements of Operations. Our income tax expense for the years ended December 31, 2022, 2021 and 2020 includes related income tax benefits of $14 million, $18 million and $15 million, respectively. We have not capitalized any equity-based compensation costs during the reported periods.

As of December 31, 2022, we estimate that $45 million of currently unrecognized compensation expense will be recognized over a weighted average period of 1.5 years for our unvested RSU, PSU and stock option awards issued and outstanding.

Non-Employee Director Plan

Our non-employee directors currently receive annual grants of shares of our common stock, generally payable in two equal installments, under the 2014 Plan described above.

15. Earnings Per Share

Basic and diluted earnings per share were computed using the following common share data for the year ended December 31 (shares in millions):

	2022	2021	2020
Number of common shares outstanding at end of period	407.9	416.1	422.8
Effect of using weighted average common shares outstanding	4.9	4.3	0.2
Weighted average basic common shares outstanding	412.8	420.4	423.0
Dilutive effect of equity-based compensation awards and other contingently issuable shares	2.2	2.5	2.1
Weighted average diluted common shares outstanding	415.0	422.9	425.1
Potentially issuable shares	5.2	5.7	6.1
Number of anti-dilutive potentially issuable shares excluded from diluted common shares outstanding	1.1	0.6	1.6

Refer to the Consolidated Statements of Operations for net income attributable to Waste Management, Inc.

16. Fair Value Measurements

Assets and Liabilities Accounted for at Fair Value

Fair value is defined as the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. When measuring assets and liabilities that are required to be recorded at fair value, the Company considers the principal or most advantageous market in which the Company would transact. Fair value is estimated by applying the following hierarchy, which prioritizes the inputs used to measure fair value into three levels and bases the categorization within the hierarchy upon the lowest level of input that is available and significant to the fair value measurement:

Level 1 — Quoted prices in active markets for identical assets or liabilities.

Level 2 — Observable inputs other than quoted prices in active markets for identical assets and liabilities, quoted prices for identical or similar assets or liabilities in inactive markets, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3 — Inputs that are generally unobservable and typically reflect management's estimate of assumptions that market participants would use in pricing the asset or liability.

We use valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. In measuring the fair value of our assets and liabilities, we use market data or assumptions that we believe market participants would use in pricing an asset or liability, including assumptions about risk when appropriate. Our assets and liabilities that are measured at fair value on a recurring basis include the following as of December 31 (in millions):

	2022	2021
Quoted prices in active markets (Level 1):		
Cash equivalents and money market funds	$ 240	$ 38
Equity securities	37	25
Significant other observable inputs (Level 2):		
Available-for-sale securities	360	395
Significant unobservable inputs (Level 3):		
Redeemable preferred stock	56	49
Total Assets	$ 693	$ 507

See Note 11 for information related to our nonrecurring fair value measurements and the impact of impairments. See Note 17 for information related to the nonrecurring fair value measurement of assets and liabilities acquired in connection with our acquisitions.

Cash Equivalents and Money Market Funds

Cash equivalents primarily include short-term interest-bearing instruments with maturities of three months or less. We invest portions of our restricted trust funds in money market funds and we measure the fair value of these investments using quoted prices in active markets for identical assets. The fair value of our cash equivalents and money market funds approximates our cost basis in these instruments.

Equity Securities

We invest portions of our restricted trust funds in equity securities and we measure the fair value of these securities using quoted prices in active markets for identical assets. Any changes in fair value of these securities related to unrealized gains and losses have been appropriately reflected as a component of other income (expense).

Available-for-Sale Securities

Our available-for-sale securities include restricted trust funds and an investment in an unconsolidated entity, as discussed in Note 18. We invest primarily in debt securities, including U.S. Treasury securities, U.S. agency securities, municipal securities and mortgage- and asset-backed securities, which generally mature over the next nine years. We measure the fair value of these securities using quoted prices for identical or similar assets in inactive markets. Any changes in fair value of these trusts related to unrealized gains and losses have been appropriately reflected as a component of accumulated other comprehensive income (loss).

Redeemable Preferred Stock

Redeemable preferred stock is related to a noncontrolling investment in an unconsolidated entity and is included in investments in unconsolidated entities in our Consolidated Balance Sheets. The fair value of our investment has been measured based on third-party investors' recent or pending transactions in these securities, which are considered the best evidence of fair value. When this evidence is not available, we use other valuation techniques as appropriate and available. These valuation methodologies may include transactions in similar instruments, discounted cash flow techniques, third-party appraisals or industry multiples and public company comparable transactions.

Fair Value of Debt

As of December 31, 2022 and 2021, the carrying value of our debt was $15.0 billion and $13.4 billion, respectively. The estimated fair value of our debt was approximately $13.8 billion and $14.1 billion as of December 31, 2022 and 2021, respectively. The decrease in the fair value of debt is primarily related to increases in current market rates of our senior notes, the impacts of which were substantially offset by net borrowings of $1.4 billion during 2022.

Although we have determined the estimated fair value amounts using available market information and commonly accepted valuation methodologies, considerable judgment is required in interpreting market data to develop the estimates of fair value. Accordingly, our estimates are not necessarily indicative of the amounts that we, or holders of the instruments, could realize in a current market exchange. The use of different assumptions or estimation methodologies could have a material effect on the estimated fair values. The fair value estimates are based on Level 2 inputs of the fair value hierarchy available as of December 31, 2022 and 2021. These amounts have not been revalued since those dates, and current estimates of fair value could differ significantly from the amounts presented.

17. Acquisitions and Divestitures

Acquisitions

2022 Acquisitions

During the year ended December 31, 2022, we acquired 13 businesses, including the acquisition of a controlling interest in a business intended to allow us to deliver new recycling capabilities for our customers and provide circular solutions for film and clear plastic wrap used commercially, such as plastic stretch wrap for pallets, furniture film, grocery bags and potentially shrink wrap around food and beverage containers. Our other acquisitions in 2022 primarily related to our Solid Waste business. Total consideration, net of cash acquired, for all acquisitions was $507 million, which included $372 million in net cash paid and $135 million in non-cash consideration, primarily related to purchase price holdbacks and the conversion of $67 million in secured convertible promissory notes receivable into equity of the acquired business. In addition, we paid $5 million of holdbacks related to prior year acquisitions.

Total consideration for our 2022 acquisitions was primarily allocated to $138 million of property and equipment, $64 million of other intangible assets, $325 million of goodwill and $14 million of noncontrolling interests. Other intangible assets included $45 million of customer relationships and $19 million of covenants not-to-compete.

We remain in the measurement period for most of our 2022 acquisitions, and further adjustments to our preliminary purchase price allocations may occur, specifically for the valuation of certain acquired intangibles. The goodwill related to our 2022 acquisitions was primarily a result of expected synergies from combining the acquired businesses with our existing operations, of which less than half was tax deductible.

2021 Acquisitions

During the year ended December 31, 2021, we acquired 11 businesses primarily related to our Solid Waste business. Total consideration, net of cash acquired, for all acquisitions was $94 million, which included $73 million in net cash paid and $21 million of other consideration, primarily purchase price holdbacks and the settlement of a preexisting promissory note with one of the acquired businesses. In addition, we paid $3 million of holdbacks, primarily related to current year acquisitions.

Our 2021 acquisitions discussed above include our acquisition of the remaining ownership interest in a waste diversion technology company. Concurrent with our acquisition, the acquired entity issued shares to an unrelated third-party, diluting our ownership interest. We determined the entity constituted a variable interest entity and concluded that we did not have the power to direct its significant activities. As a result, we subsequently deconsolidated the entity and account for our remaining ownership interest as an equity method investment.

2020 Acquisitions

During the year ended December 31, 2020, we acquired four businesses related to our Solid Waste business, including the acquisition of Advanced Disposal discussed further below. Total consideration, net of cash acquired of $36 million, for all acquisitions was $4.1 billion, none of which related to other consideration such as purchase price holdbacks. In 2020, we paid $3 million of holdbacks, all of which related to prior year acquisitions. Contingent consideration obligations are primarily based on achievement by the acquired businesses of certain negotiated goals, which generally include targeted financial metrics.

Advanced Disposal — On October 30, 2020, we completed our acquisition of all outstanding shares of Advanced Disposal for $30.30 per share in cash, pursuant to an Agreement and Plan of Merger dated April 14, 2019, as amended on June 24, 2020. Total enterprise value of the acquisition was $4.6 billion when including approximately $1.8 billion of Advanced Disposal's net debt. This acquisition grew our footprint and allows us to provide differentiated, sustainable waste management and recycling services to approximately three million new commercial, industrial and residential customers, primarily located in the Eastern half of the U.S. The acquisition was funded using a $3.0 billion, 364-day, U.S. revolving credit facility and our commercial paper program. In November 2020, we issued $2.5 billion of senior notes and used a portion of the proceeds to repay all outstanding borrowings under the $3.0 billion, 364-day, U.S. revolver and terminated the facility.

For the year ended December 31, 2022 and 2021, we incurred integration related costs of $10 million and $51 million, respectively, and for the year ended December 31, 2020, we incurred acquisition and integration related costs of $156 million, which were primarily classified as "Selling, general and administrative expenses." The post-closing operating results of Advanced Disposal have been included in our consolidated financial statements, within our existing reportable segments. Post-closing through December 31, 2020, Advanced Disposal recognized $205 million, $142 million and $60 million of revenue, operating expenses and selling, general and administrative expenses, respectively, which are included in our Consolidated Statement of Operations.

Our consolidated financial statements have not been retroactively restated to include Advanced Disposal's historical financial position or results of operations. The acquisition was accounted for as a business combination. In accordance with the purchase method of accounting, the purchase price paid has been allocated to the assets and liabilities acquired based upon their estimated fair values as of the acquisition date, with the excess of the purchase price over the net assets acquired recorded as goodwill. The Company valued the customer relationship asset using an income approach; specifically, the multi-period excess earnings method. The significant assumptions used to value customer relationships included, among others, attrition rates, revenue growth rate, and discount rate. The Company valued the landfill assets using an income approach; specifically, the multi-period excess earnings method. The significant assumptions used to value landfill assets included, among others, the forecasted revenue and revenue growth (including forecasted waste volumes and rate per ton), discount rate, and forecasted capital expenditures. The allocation of the purchase price was finalized in October 2021.

Goodwill of $2.5 billion was calculated as the excess of the consideration paid over the net assets recognized and represents the future economic benefits expected to arise from other assets acquired that could not be individually identified and separately recognized. Goodwill has been assigned to our reporting units that have integrated these operations as they are benefitting from the synergies of the combination. Goodwill related to this acquisition is not deductible for income tax purposes.

The following table shows the purchase price allocation as of the date acquired, and adjustments to October 30, 2021 (in millions):

	October 30, 2020	Adjustments	October 30, 2021
Accounts and other receivables	$ 159	$ 1	$ 160
Parts and supplies	8	(1)	7
Other current assets	17	(1)	16
Assets held for sale (a)	1,022	—	1,022
Property and equipment	1,278	(12)	1,266
Goodwill	2,470	26	2,496
Other intangible assets	604	(3)	601
Investments in unconsolidated entities	9	—	9
Other assets	27	(2)	25
Accounts payable	(107)	1	(106)
Accrued liabilities	(155)	(3)	(158)
Deferred revenues	(19)	—	(19)
Current portion of long-term debt	(12)	—	(12)
Liabilities held for sale (a)	(234)	—	(234)
Long-term debt, less current portion (b)	(441)	—	(441)
Landfill and environmental remediation liabilities	(242)	(13)	(255)
Deferred income taxes	(223)	9	(214)
Other liabilities	(79)	(2)	(81)
Total purchase price	$ 4,082	$ —	$ 4,082

(a) In connection with our acquisition of Advanced Disposal, we and Advanced Disposal entered into an agreement that provided for GFL Environmental to acquire a combination of assets from us and Advanced Disposal to address divestitures required by the U.S. Department of Justice. Upon acquisition these assets met the criteria for reporting discontinued operations and were classified as held for sale and included within the "Assets held for sale" and "Liabilities held for sale" line items in the above final allocation of purchase price. Immediately following the acquisition, the divestiture transactions were consummated and the Company subsequently received cash proceeds from the sale of $856 million.

(b) At the time of acquisition, Advanced Disposal had outstanding $425 million of 5.625% senior notes due November 2024, the fair value of which was $438 million. In November 2020, we redeemed the notes pursuant to an optional redemption feature.

The final allocation of $601 million for other intangibles includes $572 million for customer relationships with an amortization period of 15 years and $29 million of other intangibles with a weighted average amortization period of seven years.

The unaudited pro forma financial information in the table below summarizes the combined results of operations for the Company and Advanced Disposal as though the companies had been combined as of January 1, 2020. Examples of adjustments made to arrive at the pro forma amounts include, but are not limited to, the following:

- The effect of divestitures required by the U.S. Department of Justice;
- Intercompany true-ups based on acquisition/divestiture activity;
- Transaction expenses incurred by us and Advanced Disposal;
- Adjustments to depreciation and amortization expense due to step-up in fair value of the acquired assets; and
- Interest expense adjustments.

The following unaudited pro forma financial information is for informational purposes only and is not necessarily indicative of the results of operations that would have been achieved as if the acquisition had taken place as of January 1, 2020 for the year ended December 31 (in millions, except per share amounts):

	2020
Operating revenues	$ 16,192
Net income attributable to Waste Management, Inc.	1,685
Basic earnings per common share	3.99
Diluted earnings per common share	3.96
Weighted average common shares outstanding:	
Basic	423
Diluted	425

Divestitures

In 2022, 2021 and 2020, the aggregate sales price for divestitures of certain landfill assets, as well as collection, hauling, disposal and ancillary operations, was $6 million, $48 million and $856 million, and we recognized net gains of $5 million, $44 million and $33 million, respectively. In 2021, divestitures primarily related to the sale of certain non-strategic Canadian operations, as discussed in Note 11. In 2020, divestitures primarily consisted of assets required to be sold by the U.S. Department of Justice in connection with our acquisition of Advanced Disposal, as discussed above. The remaining amounts reported in the Consolidated Statements of Cash Flows generally relate to the sale of fixed assets.

18. Variable Interest Entities

The following is a description of our financial interests in unconsolidated and consolidated variable interest entities that we consider significant:

Low-Income Housing Properties

We do not consolidate our investments in entities established to manage low-income housing properties because we are not the primary beneficiary of these entities as we do not have the power to individually direct the activities of these entities. Accordingly, we account for these investments under the equity method of accounting. Our aggregate investment balance in these entities was $321 million and $178 million as of December 31, 2022 and 2021, respectively. The debt balance related to our investments in low-income housing properties was $295 million and $156 million as of December 31, 2022 and 2021, respectively. Additional information related to these investments is discussed in Note 8.

Trust Funds for Final Capping, Closure, Post-Closure or Environmental Remediation Obligations

Unconsolidated Variable Interest Entities — Trust funds that are established for both the benefit of the Company and the host community in which we operate are not consolidated because we are not the primary beneficiary of these entities as (i) we do not have the power to direct the significant activities of the trusts or (ii) power over the trusts' significant activities is shared. Our interests in these trusts are accounted for as investments in unconsolidated entities and receivables. These amounts are recorded in other receivables, investments in unconsolidated entities and long-term other assets in our Consolidated Balance Sheets, as appropriate. We also reflect our share of the unrealized gains and losses on available-for-sale securities held by these trusts as a component of our accumulated other comprehensive income (loss). Our investments and receivables related to these trusts had an aggregate carrying value of $93 million and $110 million as of December 31, 2022 and 2021, respectively.

Consolidated Variable Interest Entities — Trust funds for which we are the sole beneficiary are consolidated because we are the primary beneficiary. These trust funds are recorded in restricted funds in our Consolidated Balance Sheets. Unrealized gains and losses on available-for-sale securities held by these trusts are recorded as a component of accumulated other comprehensive income (loss). These trusts had a fair value of $113 million and $117 million as of December 31, 2022 and 2021, respectively.

19. Segment and Related Information

Our senior management evaluates, oversees and manages the financial performance of our Solid Waste operations through two operating segments. Our East Tier primarily consists of geographic areas located in the Eastern U.S., the Great Lakes region and substantially all of Canada. Our West Tier primarily includes geographic areas located in the Western U.S., including the upper Midwest region, and British Columbia, Canada. Each of our Solid Waste operating segments provides integrated environmental services, including collection, transfer, recycling, and disposal. The East and West Tiers are presented in this report and constitute our existing Solid Waste business.

The operating segments not evaluated and overseen through our East and West Tiers are presented herein as "Other" as these operating segments do not meet the criteria to be aggregated with other operating segments and do not meet the quantitative criteria to be separately reported.

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Summarized financial information concerning our reportable segments as of December 31 and for the year then ended is shown in the following table (in millions):

Years Ended December 31:	Gross Operating Revenues	Intercompany Operating Revenues(d)	Net Operating Revenues	Income from Operations(e)	Depreciation, Depletion and Amortization	Capital Expenditures (f)	Total Assets (g)(h)
2022							
Solid Waste:							
East Tier	$ 10,283	$ (1,977)	$ 8,306	$ 2,249	$ 998	$ 1,129	$ 14,741
West Tier	10,190	(2,123)	8,067	2,346	878	1,047	11,916
Solid Waste (a)	20,473	(4,100)	16,373	4,595	1,876	2,176	26,657
Other (b)	3,545	(220)	3,325	26	66	328	1,972
	24,018	(4,320)	19,698	4,621	1,942	2,504	28,629
Corporate and Other (c)	—	—	—	(1,256)	96	305	3,048
Total	$ 24,018	$ (4,320)	$ 19,698	$ 3,365	$ 2,038	$ 2,809	$ 31,677
2021							
Solid Waste:							
East Tier	$ 9,278	$ (1,738)	$ 7,540	$ 2,037	$ 970	$ 708	$ 14,269
West Tier	9,369	(1,908)	7,461	2,103	883	579	11,476
Solid Waste (a)	18,647	(3,646)	15,001	4,140	1,853	1,287	25,745
Other (b)	3,046	(116)	2,930	34	70	181	1,275
	21,693	(3,762)	17,931	4,174	1,923	1,468	27,020
Corporate and Other (c)	—	—	—	(1,209)	76	571	2,372
Total	$ 21,693	$ (3,762)	$ 17,931	$ 2,965	$ 1,999	$ 2,039	$ 29,392
2020							
Solid Waste:							
East Tier	$ 7,873	$ (1,503)	$ 6,370	$ 1,672	$ 801	$ 537	$ 14,274
West Tier	8,241	(1,657)	6,584	1,800	738	465	11,501
Solid Waste (a)	16,114	(3,160)	12,954	3,472	1,539	1,002	25,775
Other (b)	2,364	(100)	2,264	(42)	87	75	2,064
	18,478	(3,260)	15,218	3,430	1,626	1,077	27,839
Corporate and Other (c)	—	—	—	(996)	45	508	1,810
Total	$ 18,478	$ (3,260)	$ 15,218	$ 2,434	$ 1,671	$ 1,585	$ 29,649

(a) Income from operations provided by our Solid Waste business is generally indicative of the margins provided by our collection, landfill, transfer and recycling lines of business. From time to time, the operating results of our reportable segments are significantly affected by certain transactions or events that management believes are not indicative or representative of our results.

Income from operations in our Solid Waste business increased in 2022, as compared with 2021, primarily due to revenue growth in our collection and disposal businesses driven by both yield and volume. This increase was partially offset by (i) inflationary cost pressures; (ii) labor cost increases from frontline employee wage adjustments; (iii) divestitures, asset impairments and unusual items, discussed in Note 11 above, that impacted our East Tier results and (iv) reduced profitability in our recycling business from the decline in recycling commodity prices and lower volumes.

Income from operations in our Solid Waste business increased in 2021, as compared with 2020, primarily due to (i) revenue growth in our collection and disposal businesses driven by both yield and volume, as well as the acquisition of Advanced Disposal; (ii) improved profitability in our recycling business from higher market prices for recycling commodities and improved costs at facilities where we have made investments in enhanced technology and equipment and (iii) changes from divestitures, asset impairments and unusual items, discussed in Note 11, that impacted both Tiers' results. These increases were partially offset by (i) labor cost pressure from frontline employee wage adjustments, increased turnover driving up training costs and higher overtime due to driver shortages and volume growth; (ii) increased landfill depletion from higher volumes and revisions in landfill estimates, including the anticipated timing of capping, closure and post-closure activities at certain landfills and adjustments in 2020 to the inflation rate used to estimate capping, closure, and post-closure asset retirement obligations that benefitted costs in 2020 and (iii) inflationary cost pressures. During 2021, the positive earnings contributions from Advanced Disposal were offset by elevated depreciation, depletion and amortization of acquired assets.

(b) "Other" includes (i) elements of our Strategic Business Solutions ("WMSBS") business that are not included in the operations of our reportable segments; (ii) elements of our sustainability business that includes landfill gas-to-energy operations managed by our WM Renewable Energy business, our SES business and recycling brokerage services and not included in the operations of our reportable segments; (iii) certain other expanded service offerings and solutions and (iv) the results of non-operating entities that provide financial assurance and self-insurance support for our Solid Waste business, net of intercompany activity.

The decrease in income from operations in 2022, as compared with 2021, was due to the recognition of acquisition and integration-related costs, as well as, a prior year gain from divestitures of certain ancillary operations in our Other segment, discussed in Note 11, partially offset by improved profitability in our SES and WMSBS businesses. The increase in income from operations for 2021, as compared to 2020, was primarily driven by increased market values for renewable energy credits generated by our WM Renewable Energy business.

(c) "Corporate and other" operating results reflect certain costs incurred for various support services that are not allocated to our reportable segments. These support services include, among other things, treasury, legal, digital, tax, insurance, centralized service center processes, other administrative functions and the maintenance of our closed landfills. Income from operations for "Corporate and Other" also includes costs associated with our long-term incentive program.

These costs increased in 2022, as compared with 2021, primarily due to strategic investments in our digital platform and sustainability initiatives, partially offset by lower acquisition and integration related costs.

These costs increased in 2021, as compared with 2020, due to (i) higher incentive compensation costs; (ii) increased labor, support and integration costs following our acquisition of Advanced Disposal; (iii) strategic investments in our digital platform; (iv) increased health and welfare costs attributable to medical care activity generally returning to pre-pandemic levels from the lower levels experienced during 2020 and (v) charges pertaining to reserves for certain loss contingencies during 2021. These increases were partially offset by lower consulting, advisory and legal fees following the completion of our acquisition of Advanced Disposal in the fourth quarter of 2020 and changes in the measurement of our environmental remediation obligations and recovery assets in both 2020 and 2021.

(d) Intercompany operating revenues reflect each segment's total intercompany sales, including intercompany sales within a segment and between segments. Transactions within and between segments are generally made on a basis intended to reflect the market value of the service.

(e) For those items included in the determination of income from operations, the accounting policies of the segments are the same as those described in Note 2.

(f) Includes non-cash items. Capital expenditures are reported in our reportable segments at the time they are recorded within the segments' property and equipment balances and, therefore, include timing differences for amounts accrued but not yet paid.

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(g) The reconciliation of total assets reported above to total assets in the Consolidated Balance Sheets as of December 31 is as follows (in millions):

	2022	2021	2020
Total assets, as reported above	$ 31,677	$ 29,392	$ 29,649
Elimination of intercompany investments and advances	(310)	(295)	(304)
Total assets, per Consolidated Balance Sheet	$ 31,367	$ 29,097	$ 29,345

(h) Goodwill is included within each segment's total assets. For segment reporting purposes, our material recovery facilities are included as a component of their respective Tiers and our recycling brokerage services are included as part of our "Other" operations. The following table presents changes in goodwill during the reported periods by segment (in millions):

	Solid Waste			
	East Tier	West Tier	Other	Total
Balance, December 31, 2020	$ 5,101	$ 3,823	$ 70	$ 8,994
Acquired goodwill (a)	27	15	34	76
Divested goodwill	(11)	(7)	(29)	(47)
Foreign currency translation and other	3	2	—	5
Balance, December 31, 2021	$ 5,120	$ 3,833	$ 75	$ 9,028
Acquired goodwill	92	24	209	325
Divested goodwill	—	—	—	—
Foreign currency translation and other	(30)	—	—	(30)
Balance, December 31, 2022	$ 5,182	$ 3,857	$ 284	$ 9,323

(a) Includes $26 million of post-closing acquisition adjustments related to our acquisition of Advanced Disposal.

The mix of operating revenues from our major lines of business for the year ended December 31 are as follows (in millions):

	2022	2021	2020
Commercial	$ 5,450	$ 4,760	$ 4,102
Industrial	3,681	3,210	2,770
Residential	3,339	3,172	2,716
Other collection	699	533	465
Total collection	13,169	11,675	10,053
Landfill	4,600	4,153	3,667
Transfer	2,143	2,072	1,855
Recycling	1,701	1,681	1,127
Other (a)	2,405	2,112	1,776
Intercompany (b)	(4,320)	(3,762)	(3,260)
Total	$ 19,698	$ 17,931	$ 15,218

(a) The "Other" line of business includes (i) certain services provided by our WMSBS business; (ii) certain services within our sustainability business including our landfill gas-to-energy operations managed by our WM Renewable Energy business and (iii) certain other expanded service offerings and solutions and reflects the results of non-operating entities that provide financial assurance and self-insurance support for our Solid Waste business, net of intercompany activity. Revenue attributable to collection, landfill, transfer and recycling services provided by our "Other" businesses has been reflected as a component of the relevant line of business for purposes of presentation in this table.

(b) Intercompany revenues between lines of business are eliminated in the Consolidated Financial Statements included within this report.

WASTE MANAGEMENT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Fluctuations in our operating results may be caused by many factors, including period-to-period changes in the relative contribution of revenue by each line of business, changes in commodity prices and general economic conditions. Our revenues and income from operations typically reflect seasonal patterns. Our operating revenues tend to be somewhat higher in summer months, primarily due to the higher construction and demolition waste volumes. The volumes of industrial and residential waste in certain regions where we operate also tend to increase during the summer months. Our second and third quarter revenues and results of operations typically reflect these seasonal trends.

Our 2020 operating results were negatively impacted by COVID-19, as volume declines began in March 2020 in our landfill, industrial and commercial collection businesses due to steps taken by national and local governments to slow the spread of the virus, including travel bans, prohibitions on group events and gatherings, shutdowns of certain businesses, curfews, shelter-in-place orders and recommendations to practice social distancing. Throughout 2021 and 2022, our volumes recovered from the sharp decline experienced in 2020, with minimal impact from the resurgence in transmission of COVID-19 associated with recent virus variants, as communities and businesses remained open. However, the potential for future resurgence in transmission of COVID-19 and related business closures, due to virus variants or other pandemic conditions, could adversely impact our volumes and costs in the future.

Service or operational disruptions caused by severe storms, extended periods of inclement weather or climate events can significantly affect the operating results of the geographic areas affected. Extreme weather events may also lead to supply chain disruption and delayed project development, or disruption of our customers' businesses, reducing the amount of waste generated by their operations.

On the other hand, certain destructive weather and climate conditions, such as wildfires in the Western U.S. and hurricanes that most often impact our operations in the Southern and Eastern U.S. during the second half of the year, can increase our revenues in the geographic areas affected as a result of the waste volumes generated by these events. While weather-related and other event-driven special projects can boost revenues through additional work for a limited time, due to significant start-up costs and other factors, such revenue can generate earnings at comparatively lower margins.

Net operating revenues relating to operations in the U.S. and Canada for the year ended December 31 are as follows (in millions):

	2022	2021	2020
U.S.	$ 18,860	$ 17,136	$ 14,505
Canada	838	795	713
Total	$ 19,698	$ 17,931	$ 15,218

Property and equipment, net of accumulated depreciation and depletion, relating to operations in the U.S. and Canada for the year ended December 31 are as follows (in millions):

	2022	2021	2020
U.S.	$ 14,725	$ 13,428	$ 13,168
Canada	994	991	980
Total	$ 15,719	$ 14,419	$ 14,148

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

None.

Item 9A. *Controls and Procedures.*

Effectiveness of Disclosure Controls and Procedures

Our management, with the participation of our principal executive and financial officers, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended) in ensuring that the information required to be disclosed in reports that we file or submit under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, including ensuring that such information is accumulated and communicated to management (including the principal executive and financial officers) as appropriate to allow timely decisions regarding required disclosure. Based on such evaluation, our principal executive and financial officers have concluded that such disclosure controls and procedures were effective as of December 31, 2022 (the end of the period covered by this Annual Report on Form 10-K) at a reasonable assurance level.

Management's Report on Internal Control Over Financial Reporting

Management of the Company, including the principal executive and financial officers, is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the Securities Exchange Act of 1934, as amended. Our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Our internal controls are designed to provide reasonable assurance as to the reliability of our financial reporting and the preparation of the consolidated financial statements for external purposes in accordance with accounting principles generally accepted in the United States and includes those policies and procedures that:

i. pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;

ii. provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and

iii. provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

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

Management of the Company assessed the effectiveness of our internal control over financial reporting as of December 31, 2022 based on the 2013 framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Based on this assessment, management has concluded that our internal control over financial reporting was effective as of December 31, 2022.

The effectiveness of our internal control over financial reporting has been audited by Ernst & Young LLP, the independent registered public accounting firm that audited our consolidated financial statements, as stated in their report, which is included in Item 8 of this Annual Report on Form 10-K.

Changes in Internal Control over Financial Reporting

In 2022, we implemented a new general ledger accounting system, complementary finance enterprise resource planning system and a human capital management system. These new system implementations were achieved after a multi-year review of existing accounting, reporting and human capital processes and the design and configuration of system-enabled enhancements to such processes. The changes in our general ledger, finance enterprise resource planning and human capital management systems were subject to thorough testing and review by internal and external parties both before and after implementation.

While these systems implementations enhance our framework for internal control over financial reporting, management, together with our CEO and CFO, has determined that the changes in our internal controls over financial reporting during the quarter ended December 31, 2022 have not been material and are not reasonably likely to materially affect our internal controls over financial reporting.

Item 9B. ***Other Information.***

None.

PART III

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

The information required by this Item is incorporated by reference to the sections entitled “Board of Directors,” “Election of Directors” and “Executive Officers” in the Company’s definitive Proxy Statement for its 2023 Annual Meeting of Stockholders (the “Proxy Statement”), to be held May 9, 2023. The Proxy Statement will be filed with the SEC within 120 days of the end of our fiscal year.

We have adopted a code of ethics that applies to our CEO, CFO and Chief Accounting Officer, as well as other officers, directors and employees of the Company. The code of ethics, entitled “Code of Conduct,” is posted on our website at www.wm.com in the section “ESG — Corporate Governance” on the “Investors” page.

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

The information required by this Item is incorporated herein by reference to the sections entitled “Board of Directors — Compensation Committee Report,” “— Compensation Committee Interlocks and Insider Participation,” “— Non-Employee Director Compensation,” “Executive Compensation — Compensation Discussion and Analysis,” “— Executive Compensation Tables” and “— Pay Versus Performance” in the Proxy Statement.

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

The information required by this Item is incorporated herein by reference to the sections entitled “Executive Compensation — Executive Compensation Tables — Equity Compensation Plan Table,” “Director and Officer Stock Ownership,” and “Security Ownership of Certain Beneficial Owners” in the Proxy Statement.

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

The information required by this Item is incorporated herein by reference to the sections entitled “Board of Directors — Related Party Transactions” and “— Independence of Board Members” in the Proxy Statement.

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

The information required by this Item is incorporated herein by reference to the section entitled “Ratification of Independent Registered Public Accounting Firm — Independent Registered Public Accounting Firm Fee Information” in the Proxy Statement.

PART IV

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

(a) (1) Consolidated Financial Statements:

Reports of Independent Registered Public Accounting Firm
Consolidated Balance Sheets as of December 31, 2022 and 2021
Consolidated Statements of Operations for the years ended December 31, 2022, 2021 and 2020
Consolidated Statements of Comprehensive Income for the years ended December 31, 2022, 2021 and 2020
Consolidated Statements of Cash Flows for the years ended December 31, 2022, 2021 and 2020
Consolidated Statements of Changes in Equity for the years ended December 31, 2022, 2021 and 2020
Notes to Consolidated Financial Statements

(a) (2) Consolidated Financial Statement Schedules:

All schedules have been omitted because the required information is not significant or is included in the financial statements or notes thereto, or is not applicable.

(a) (3) Exhibits:

Exhibit No.		Description
3.1	—	Third Restated Certificate of Incorporation of Waste Management, Inc. [incorporated by reference to Exhibit 3.1 to Form 10-Q for the quarter ended June 30, 2010].
3.2	—	Amended and Restated By-laws of Waste Management, Inc. [incorporated by reference to Exhibit 3.2 to Form 8-K dated November 8, 2022].
4.1	—	Specimen Stock Certificate [incorporated by reference to Exhibit 4.1 to Form 10-K for the year ended December 31, 1998].
4.2	—	Third Restated Certificate of Incorporation of Waste Management Holdings, Inc. [incorporated by reference to Exhibit 4.2 to Form 10-K for the year ended December 31, 2014].
4.3	—	Amended and Restated By-laws of Waste Management Holdings, Inc. [incorporated by reference to Exhibit 4.3 to Form 10-Q for the quarter ended June 30, 2014].
4.4	—	Indenture for Subordinated Debt Securities dated February 1, 1997, among the Registrant and The Bank of New York Mellon Trust Company, N.A. (the current successor to Texas Commerce Bank National Association), as trustee [incorporated by reference to Exhibit 4.1 to Form 8-K dated February 7, 1997].
4.5	—	Indenture for Senior Debt Securities dated September 10, 1997, among the Registrant and The Bank of New York Mellon Trust Company, N.A. (the current successor to Texas Commerce Bank National Association), as trustee [incorporated by reference to Exhibit 4.1 to Form 8-K dated September 10, 1997].
4.6	—	Description of Waste Management, Inc.'s Common Stock [incorporated by reference to Exhibit 4.9 to Form 10-K for the year ended December 31, 2019].
4.7*	—	Schedule of Officers' Certificates delivered pursuant to Section 301 of the Indenture dated September 10, 1997 establishing the terms and form of Waste Management, Inc.'s Senior Notes. Waste Management and its subsidiaries are parties to debt instruments that have not been filed with the SEC under which the total amount of securities authorized under any single instrument does not exceed 10% of the total assets of Waste Management and its subsidiaries on a consolidated basis. Pursuant to paragraph 4(iii)(A) of Item 601(b) of Regulation S-K, Waste Management agrees to furnish a copy of such instruments to the SEC upon request.
4.8	—	Officers' Certificate delivered pursuant to Section 301 of the Indenture dated September 10, 1997 establishing the terms and form of the 4.15% Senior Notes due 2032 [incorporated by reference to Exhibit 4.1 to Form 10-Q for the quarter ended June 30, 2022].
4.9	—	Guarantee Agreement by Waste Management Holdings, Inc. in favor of The Bank of New York Mellon Trust Company, N.A., as Trustee for the holders of the 4.15% Senior Notes due 2032 [incorporated by reference to Exhibit 4.2 to Form 10-Q for the quarter ended June 30, 2022].

10.1†	—	2014 Stock Incentive Plan [incorporated by reference to Exhibit 10.1 to Form 8-K dated May 13, 2014].
10.2†	—	First Amendment to 2014 Stock Incentive Plan [incorporated by reference to Exhibit 10.2 to Form 8-K dated May 12, 2020].
10.3†	—	Second Amendment to 2014 Stock Incentive Plan [incorporated by reference to Exhibit 10.3 to Form 10-Q for the quarter ended June 30, 2022].
10.4†	—	2009 Stock Incentive Plan [incorporated by reference to Appendix B to the Proxy Statement on Schedule 14A filed March 25, 2009].
10.5†	—	2005 Annual Incentive Plan [incorporated by reference to Appendix D to the Proxy Statement on Schedule 14A filed April 8, 2004].
10.6†	—	Waste Management, Inc. Employee Stock Purchase Plan (As Amended and Restated effective May 12, 2020) [incorporated by reference to Exhibit 10.1 to Form 8-K dated May 12, 2020].
10.7†	—	Waste Management, Inc. 409A Deferral Savings Plan as Amended and Restated effective January 1, 2014 [incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2014].
10.8	—	$3.5 Billion Sixth Amended and Restated Revolving Credit Agreement dated as of May 27, 2022 by and among Waste Management, Inc., Waste Management of Canada Corporation, WM Quebec Inc. and Waste Management Holdings, Inc., certain banks party thereto, and Bank of America, N.A., as administrative agent [incorporated by reference to Exhibit 10.1 to Form 8-K dated May 27, 2022].
10.9	—	$1.0 Billion Term Loan Credit Agreement dated as of May 27, 2022 by and among Waste Management, Inc., Waste Management Holdings, Inc., certain banks party thereto, and Bank of America, N.A., as administrative agent [incorporated by reference to Exhibit 10.2 to Form 8-K dated May 27, 2022].
10.10	—	Commercial Paper Dealer Agreement, substantially in the form as executed with each of Mizuho Securities USA LLC, BofA Securities, Inc., J.P. Morgan Securities LLC, MUFG Securities Americas Inc., Wells Fargo Securities, LLC, RBC Capital Markets, LLC and Siebert Williams Shank & Co., LLC as Dealer [incorporated by reference to Exhibit 10.11 to Form 10-K for the year ended December 31, 2016].
10.11*	—	Commercial Paper Issuing and Paying Agent Agreement between Waste Management, Inc. and U.S. Bank Trust Company, National Association dated October 28, 2022.
10.12†	—	First Amended and Restated Employment Agreement between USA Waste-Management Resources, LLC and James C. Fish, Jr. dated December 22, 2017 [incorporated by reference to Exhibit 10.2 to Form 8-K dated December 22, 2017].
10.13†	—	Employment Agreement between USA Waste-Management Resources, LLC and Devina A. Rankin dated December 22, 2017 [incorporated by reference to Exhibit 10.3 to Form 8-K dated December 22, 2017].
10.14†	—	First Amended and Restated Employment Agreement between USA Waste-Management Resources, LLC and John J. Morris, Jr. [incorporated by reference to Exhibit 10.4 to Form 8-K dated December 22, 2017].
10.15†	—	Employment Agreement between USA Waste-Management Resources, LLC and Charles C. Boettcher dated December 22, 2017 [incorporated by reference to Exhibit 10.23 to Form 10-K for the year ended December 31, 2017].
10.16†	—	Form of Director and Executive Officer Indemnity Agreement [incorporated by reference to Exhibit 10.43 to Form 10-K for the year ended December 31, 2012].
10.17†	—	Waste Management Holdings, Inc. Executive Severance Plan [incorporated by reference to Exhibit 10.1 to Form 8-K dated December 22, 2017].
10.18†	—	Form of 2020 Long Term Incentive Compensation Award Agreement for Senior Leadership Team [incorporated by reference to Exhibit 10.1 to Form 8-K dated February 19, 2020].
10.19†	—	Form of 2021 Long Term Incentive Compensation Award Agreement for Senior Leadership Team [incorporated by reference to Exhibit 10.1 to Form 8-K dated February 23, 2021].
10.20†	—	Form of 2021 Long Term Incentive Compensation RSU Award Agreement [incorporated by reference to Exhibit 10.19 to Form 10-K for the year ended December 31, 2021].
10.21†	—	Form of 2022 Long Term Incentive Compensation Award Agreement for Senior Leadership Team [incorporated by reference to Exhibit 10.1 to Form 8-K dated March 1, 2022].
10.22†	—	Form of 2022 Long Term Incentive Compensation RSU Award Agreement [incorporated by reference to Exhibit 10.2 to Form 8-K dated March 1, 2022].
21.1*	—	Subsidiaries of the Registrant.
22.1*	—	Guarantor Subsidiary.

23.1*	—	Consent of Independent Registered Public Accounting Firm.
31.1*	—	Certification Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934 of James C. Fish, Jr., President and Chief Executive Officer.
31.2*	—	Certification Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934 of Devina A. Rankin, Executive Vice President and Chief Financial Officer.
32.1**	—	Certification Pursuant to 18 U.S.C. §1350 of James C. Fish, Jr., President and Chief Executive Officer.
32.2**	—	Certification Pursuant to 18 U.S.C. §1350 of Devina A. Rankin, Executive Vice President and Chief Financial Officer.
95*	—	Mine Safety Disclosures.
101.INS*	—	Inline XBRL Instance.
101.SCH*	—	Inline XBRL Taxonomy Extension Schema.
101.CAL*	—	Inline XBRL Taxonomy Extension Calculation.
101.LAB*	—	Inline XBRL Taxonomy Extension Labels.
101.PRE*	—	Inline XBRL Taxonomy Extension Presentation.
101.DEF*	—	Inline XBRL Taxonomy Extension Definition.
104*	—	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

* Filed herewith.

** Furnished herewith.

† Denotes management contract or compensatory plan or arrangement.

Item 16. ***Form 10-K Summary.***

None.

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.

WASTE MANAGEMENT, INC.

By: /s/ JAMES C. FISH, JR.
James C. Fish, Jr.
President, Chief Executive Officer and Director

Date: February 7, 2023

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

Signature	Title	Date
/s/ JAMES C. FISH, JR. James C. Fish, Jr.	President, Chief Executive Officer and Director (Principal Executive Officer)	February 7, 2023
/s/ DEVINA A. RANKIN Devina A. Rankin	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 7, 2023
/s/ LESLIE K. NAGY Leslie K. Nagy	Vice President and Chief Accounting Officer (Principal Accounting Officer)	February 7, 2023
/s/ ANDRÉS R. GLUSKI Andrés R. Gluski	Director	February 7, 2023
/s/ VICTORIA M. HOLT Victoria M. Holt	Director	February 7, 2023
/s/ KATHLEEN M. MAZZARELLA Kathleen M. Mazzarella	Director	February 7, 2023
/s/ SEAN E. MENKE Sean E. Menke	Director	February 7, 2023
/s/ WILLIAM B. PLUMMER William B. Plummer	Director	February 7, 2023
/s/ JOHN C. POPE John C. Pope	Director	February 7, 2023
/s/ MARYROSE T. SYLVESTER Maryrose T. Sylvester	Director	February 7, 2023
/s/ THOMAS H. WEIDEMEYER Thomas H. Weidemeyer	Chairman of the Board and Director	February 7, 2023

Exhibit 4.7

Schedule of Officers' Certificates
delivered pursuant to Section 301 of the Indenture dated September 10, 1997
by and between Waste Management, Inc. and The Bank of New York Mellon Trust Company, N.A., as Trustee, establishing the terms and form of Waste Management, Inc.'s Outstanding Senior Notes

Principal Amount Issued	Principal Amount Outstanding	Interest Rate (per annum)	Issue Date	Maturity Date	CUSIP	Interest Payment Dates
$ 600 million	$ 258 million	7.00%	7/17/1998	7/15/2028*	902917AH6	January 15; July 15
$ 250 million	$ 81 million	7.375%	1/21/2000	5/15/2029*	94106LAG4	May 15; November 15
$ 500 million	$ 144 million	7.75%	1/3/2003	5/15/2032*	94106LAN9	May 15; November 15
$ 600 million	$ 246 million	6.125%	11/17/2009	11/30/2039	94106LAV1	May 30; November 30
$ 350 million	$ 156 million	3.50%	5/8/2014	5/15/2024	94106LAZ2	May 15; November 15
$ 600 million	$ 422 million	3.125%	2/26/2015	3/1/2025	94106LBA6	March 1; September 1
$ 450 million	$ 297 million	3.90%	2/26/2015	3/1/2035	94106LBB4	March 1; September 1
$ 750 million	$ 416 million	4.10%	2/26/2015	3/1/2045	94106LBC2	March 1; September 1
$ 500 million	$ 500 million	2.40%	5/16/2016	5/15/2023	94106LBD0	May 15; November 15
$ 750 million	$ 750 million	3.15%	11/8/2017	11/15/2027	94106LBE8	May 15; November 15
$ 1 billion	$ 684 million	4.15%	5/22/2019	7/15/2049	94106LBK4	January 15; July 15
$ 500 million	$ 500 million	0.75%	11/17/2020	11/15/2025	94106LBL2	May 15; November 15
$ 500 million	$ 500 million	1.15%	11/17/2020	3/15/2028	94106LBN8	March 15; September 15
$ 1 billion	$ 1 billion	1.50%	11/17/2020	3/15/2031	94106LBP3	March 15; September 15
$ 500 million	$ 500 million	2.50%	11/17/2020	11/15/2050	94106LBM0	May 15; November 15
$ 475 million	$ 475 million	2.00%	5/12/2021	6/1/2029	94106LBQ1	June 1; December 1
$ 475 million	$ 475 million	2.95%	5/12/2021	6/1/2041	94106LBR9	June 1; December 1
$ 1 billion	$ 1 billion	4.15%	5/12/2022	4/15/2032	94106LBS7	April 15; October 15

* Only these series of Senior Notes do not contain a Change of Control Offer covenant. Such covenant provides that, if a change of control triggering event occurs, each holder of the notes may require us to purchase all or a portion of such holder's notes at a price equal to 101% of the principal amount, plus accrued interest, if any, to the date of purchase.

This schedule is provided in accordance with Instruction 2 to Regulation S-K Item 601, as each of the series of Senior Notes is governed by an instrument that differs only in the material respects set forth in the schedule above from the Officers' Certificate identified as Exhibit 4.8 to this Form 10-K. Each of the series of Senior Notes identified above is also guaranteed by Waste Management Holdings, Inc. in favor of The Bank of New York Mellon Trust Company, N.A., as Trustee for the holders of Waste Management, Inc.'s Senior Notes.

Exhibit 10.11

ISSUING AND PAYING AGENT AGREEMENT

THIS ISSUING AND PAYING AGENT AGREEMENT (the "Agreement") is entered into as of October 28, 2022 by and between U.S. Bank Trust Company, National Association (the "Agent") and Waste Management, Inc. (the "Company") regarding the Company's commercial paper program of Company (hereinafter referred to as the "Program").

WHEREAS, at the request of Company, Agent is prepared to act (a) as depositary for the safekeeping of certain notes of Company which may be issued and sold in the United States commercial paper market under the Program (the "Commercial Paper Notes"; such Commercial Paper Notes when issued in book-entry form being hereinafter referred to as "Book-Entry Commercial Paper Notes" and when issued in the form of certificated promissory notes being hereinafter referred to as "Certificated Commercial Paper Notes"), (b) as issuing agent on behalf of Company in connection with the issuance of the Commercial Paper Notes, (c) as paying agent to undertake certain obligations to make payments in respect of the Commercial Paper Notes, and (d) as depositary to receive certain funds on behalf of Company, as set forth herein, and

WHEREAS, this Agreement will govern Agent's rights, powers and duties as such depositary, issuing agent and paying agent for the Commercial Paper Notes and Company's rights and obligations in connection therewith.

NOW THEREFORE, for good and valuable consideration, the parties hereto agree as follows:

1. **Appointment of Agent.** Company hereby appoints Agent and Agent hereby agrees to act, on the terms and conditions specified herein, as depositary with respect to funds received by Agent pursuant to Sections 6 and 7 hereof (the "Note Funds"), and as issuing and paying agent for the Commercial Paper Notes issued under the Program. The Commercial Paper Notes will be sold through such commercial paper dealers and/or placement agents as Company shall have notified Agent in writing from time to time (collectively, the "Dealers"). The Dealer(s) is/are currently Mizuho Securities, BofA Merrill Lynch, J.P. Morgan Securities LLC, MUFG Securities Americas Inc, and Wells Fargo Securities.

2. **Letter of Representations.** Company will promptly deliver to Agent an executed version of the form of Letter of Representations (the "Letter of Representations") provided by the Depository Trust Company ("DTC"). Company understands and agrees that such Letter of Representations when executed by Company and Agent and accepted by DTC shall supplement the provisions of this Agreement and that Company, Agent, and DTC shall be bound by the terms and provisions of the Letter of Representations, including any procedures and operational arrangements applicable thereunder.

3. Commercial Paper Notes.

(a) The Company's Book-Entry Commercial Paper Notes shall be represented by one or more master notes ("Master Note" or "Master Notes") which shall be executed by manual or facsimile signature by an Authorized Representative (as hereafter defined). Agent will hold the Master Note(s) in safekeeping for the account of DTC, in accordance with Agent's customary practice.

(b) If Certificated Commercial Paper Notes are to be issued, they shall be in the form provided by Company, shall be serially numbered and shall have been executed by manual or facsimile signature of an Authorized Representative, but shall otherwise be uncompleted. Company will from time to time furnish Agent with an adequate supply of Certificated Commercial Paper Notes, as Company in its sole and absolute discretion considers appropriate. Each Certificated Commercial Paper Note delivered to Agent shall be accompanied by a letter from Company identifying the Certificated Commercial Paper Note transmitted therewith, and Agent shall acknowledge receipt of such Certificated Commercial Paper Note(s) on the copy of such letter or pursuant to some other form of written receipt deemed appropriate by Agent at the time of delivery to Agent of such Certificated Commercial Paper Note(s). Pending the issuance of Certificated Commercial Paper Notes as provided in Section 5 hereof, all Certificated Commercial Paper Notes delivered to Agent shall be held by Agent for the account of Company, for safekeeping in accordance with Agent's customary practice.

4. Authorized Representatives. With the delivery of this Agreement, Company is furnishing to Agent, and from time to time thereafter may furnish to Agent, and shall furnish to Agent upon Agent's request, certificates ("Incumbency Certificates") of a Company officer certifying the incumbency and specimen signatures of officers or agents of Company authorized to execute Commercial Paper Notes on behalf of Company by manual or facsimile signature and/or to take other action hereunder on behalf of Company (each an "Authorized Representative"). Until Agent receives and has a reasonable time to act upon a subsequent Incumbency Certificate of Company, Agent is entitled to rely on the last such Incumbency Certificate delivered to Agent for purposes of determining the Authorized Representatives. Agent shall not have any responsibility to Company to determine by whom or by what means a facsimile signature may have been affixed on the Commercial Paper Notes, or to determine whether any facsimile or manual signature resembles the specimen signature(s) filed with Agent by a duly authorized officer of Company. Any Commercial Paper Notes bearing the manual or facsimile signature of a person who is an Authorized Representative on the date such signature is affixed shall be binding on Company after the authentication thereof by Agent notwithstanding that such person shall have died or shall have otherwise ceased to hold his office on the date such Commercial Paper Note is countersigned or delivered to Agent. Company represents and warrants that each Authorized Representative may appoint other officers, employees and agents of the Company (an **"Authorized Person"**) including without limitation any Dealers, to give notices and /or issuance instructions to Agent under this Agreement, provided that notice of the appointment of each Authorized Person is delivered to Agent in writing. Each such appointment shall remain in effect unless and until revoked by Company in a written notice to Agent.

5. <u>Completion, Authentication and Delivery of Commercial Paper Notes</u>.

(a) In the case of Book-Entry Commercial Paper Notes, instructions by an Authorized Representative or an Authorized Person to the Agent for the issuance of Book-Entry Commercial Paper Notes shall include the following information with respect to each Book-Entry Commercial Paper Note:

i. the date of issuance of each such Book-Entry Commercial Paper Note (which shall be a Business Day);

ii. the maturity date of each such Book-Entry Commercial Paper Note (provided that the Authorized Representative or Authorized Person shall ensure that such date is a Business Day and that it shall not be more than 397 days from the date of issue);

iii. the face amount (provided that the Authorized Representative or the Authorized Person shall ensure that such face amount is $250,000 or integral multiples of $1,000 in excess thereof) in figures; and

iv. the interest rate and applicable discount or interest amount.

(b) From time to time during the term of this Agreement and subject to the terms and conditions hereof, and upon Agent's timely receipt from such Authorized Representative or Authorized Person of instructions pursuant to Section 5(a) delivered to Agent prior to 1:00 pm, New York City time, on a day, other than a Saturday or Sunday, on which Agent is open to the public for all banking purposes(a "**Business Day**") in accordance with Section 19, Agent shall transmit such issuance instructions to DTC for the issuance of Book-Entry Commercial Paper Notes as instructed pursuant to Section 5(a) in a manner set forth in, and take other actions as are required by, the Letter of Representations and DTC's applicable rules, regulations and procedures for book-entry commercial paper program.

(c) Company hereby directs Agent to effect each delivery of a Commercial Paper Note before receipt of payment in immediately available funds. Therefore, once Agent has delivered a Commercial Paper Note to a Dealer or its agent as provided herein, Company shall bear all risk that a Dealer or its agent fails to remit payment for the Commercial Paper Note to Agent. Agent shall have no liability to Company for any failure or inability on the part of the Dealer to make payment for Commercial Paper Notes. Nothing in this Agreement shall require Agent to purchase any Commercial Paper Note or expend Agent's own funds for the purchase price of a Commercial Paper Note or Commercial Paper Notes.

(d) Company agrees that Agent is not under any obligation to assess or review the financial condition or creditworthiness of any person to or for whose account Agent delivers a

Commercial Paper Note pursuant to instructions from an Authorized Representative or Authorized Person or advise Company as to the results of any such appraisal or investigation Agent may have conducted on its own or of any adverse information concerning any such person that may in any way have come to Agent's attention.

(e) It is understood that DTC may request the delivery of Certificated Commercial Paper Notes in exchange for Book-Entry Commercial Paper Notes upon the termination of DTC's services pursuant to the DTC Letter of Representations. Accordingly, upon such termination, Agent is authorized to complete and deliver Certificated Commercial Paper Notes in partial or complete substitution for Book-Entry Commercial Paper Notes of the same face amount and maturity as requested by DTC.

(f) In the case of Certificated Commercial Paper Notes, during the term of this Agreement and subject to the terms and conditions hereof, upon Agent's timely receipt from an Authorized Representative or an Authorized Person of instructions delivered to Agent in accordance with Section 19 prior to 12:30 pm New York time on a Business Day, on the date of issuance of any Certificated Commercial Paper Notes, Agent shall withdraw the respective Certificated Commercial Paper Notes from safekeeping and take the following actions in accordance with such instructions:

i. complete each such Certificated Commercial Paper Note as to the face amount, net dollar amount, payee, the date of issue and maturity date, (provided that the Authorized Representative or Authorized Person shall ensure that such maturity date is a Business Day and that it shall not be more than 397 days from the date of issue and that such face amount is 250,000 or integral multiples of $1,000 in excess thereof in figures);

ii. authenticate (by countersigning) each such Certificated Commercial Paper Note in the appropriate space provided thereon; and

iii. deliver each such Certificated Commercial Paper Note to the Dealer, or the consignee, if any, designated by such Authorized Representative or Authorized Person for the account of the Dealer.

(g) If Agent shall receive written instructions from Company pursuant to Section 19 not to issue or deliver Commercial Paper Notes, until such instructions are revoked in writing or superseded by further written instructions from Company, Agent shall not issue or deliver Commercial Paper Notes, provided, however, that notwithstanding contrary instructions from Company, Agent shall deliver Commercial Paper Notes with respect to agreements for the sale of Commercial Paper Notes concluded by an Authorized Representative or Authorized Person prior to receipt by the Authorized Representative or Authorized Person of the Company's instructions not to issue or deliver such Commercial Paper Notes, which the Authorized Representative or Authorized Person shall be required to confirm to Agent in writing prior to Agent's delivery of the Commercial Paper Notes. For purposes of the preceding provision, Agent may conclusively rely on written notice given or delivered to Agent by an Authorized Representative or Authorized Person as to whether any particular Commercial Paper Notes are to be issued in respect of such agreements concluded by such Authorized Representative or Authorized Person, and Agent shall have no obligation to make any other or further investigation.

6. Proceeds of Sale of the Commercial Paper Notes. Contemporaneously with the execution and delivery of this Agreement, and for the purposes of this Agreement, Agent will establish an account designated as the Waste Management Inc Note Account (the "Note Account"). On each day on which a Dealer or its agent receives Commercial Paper Notes (whether through the facilities of DTC in the manner set forth in the Letter of Representations or by delivery in accordance with the provisions of this Agreement), all proceeds received by Agent in connection with such sale shall be credited in immediately available funds to the Note Account. From time to time upon written instructions received by Agent from an Authorized Person or Authorized Representative, Agent agrees to transfer immediately available funds from the Note Account to any Agent or trust company in the United States for Company's account. If Agent chooses, in its sole discretion, to credit Company's account before Agent has collected funds for delivery of Commercial Paper Notes, it is understood that such credit shall be an advance to Company to be promptly repaid to Agent from the proceeds of sale of Commercial Paper Notes. If any such advance is not repaid by 5:00 pm New York time on the day it is made, Company shall repay such advance on the next Business Day together with interest thereon at the rate charged by Agent for such advance (which rate shall be no less than the Prime Rate). As used in this Agreement, "Prime Rate" means the rate of per annum interest which U.S. Bank National Association ("USBNA") announces publicly or otherwise makes available to the public from time to time as its "prime rate" (currently calculated on the basis of the actual number of days elapsed over a year of 360 days) with any change in the "prime rate" to be effective on and as of the date of any change in said "prime rate". The Prime Rate and the calculation thereof may be established by USBNA in its sole discretion and is not necessarily the lowest rate of interest offered by USBNA to its most creditworthy customers. The Prime Rate is a variable or fluctuating rate which increases or decreases from time to time. Funds in the Note Account will be held by Agent uninvested.

7. Payment of Matured Commercial Paper Notes.

(a) By 1:00 pm New York time on the date that any Commercial Paper Notes any payment of interest or principal is due or are scheduled to mature, Company shall ensure that there shall have been transferred to Agent for deposit in the Note Account immediately available funds at least equal to the amount of Commercial Paper Notes maturing on such date. When any matured Commercial Paper Note is presented to Agent for payment by the holder thereof (which may, in the case of Book-Entry Commercial Paper Notes, be DTC or a nominee of DTC), payment shall be made from and charged to the Note Account to the extent funds are available in said account.

(b) Each Commercial Paper Note presented to Agent for payment at or prior to 2:15 pm New York time on any Business Day at or after the maturity date of such Commercial Paper Note shall be paid by Agent on the same day as such presentation (or if presented after 2:15 pm New York time on any such Business Day, then on the next succeeding Business Day) to the extent funds are available in the Note Account.

(c) Agent may, but shall have no obligation to, make a payment pursuant to Section 7(a) hereof prior to receipt from Company of sufficient immediately available funds. In such case, Company agrees to promptly repay such advance provided that, if such advance is not repaid by 5:00 pm New York time on the day it is made, Company shall repay such advance on the next Business Day together with interest thereon at the Prime Rate. No prior action or course of dealing on the part of Agent with respect to advances of the purchase price or payments of matured Commercial Paper Notes shall give rise to any claim or cause of action by Company against Agent in the event that Agent refuses to pay or settle any Commercial Paper Notes for which Company has not timely provided funds as required by this Agreement.

8. Representations and Warranties of Company. Company hereby warrants and represents to Agent, and, each request to issue Commercial Paper Notes shall constitute Company's continuing warranty and representation, as follows:

(a) This Agreement is, and all Commercial Paper Notes delivered to Agent pursuant to this Agreement will be, duly authorized, executed and delivered by Company. Agent's appointment to act for Company hereunder is duly authorized by Company.

(b) The issuance and delivery of the Commercial Paper Notes will not violate any state or federal law and the Commercial Paper Notes do not require registration under the Securities Act of 1933, as amended.

(c) This Agreement constitutes, and the Commercial Paper Notes, when completed, countersigned, and delivered pursuant hereto, will constitute, Company's legal, valid and binding obligations enforceable against Company in accordance with their terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting the rights of creditors generally and by general principles of equity.

(d) Company is a corporation duly organized and validly existing under the laws of Delaware [SPECIFY STATE/COUNTRY OF INCORPORATION] and no liquidation, dissolution, bankruptcy, windup or similar proceedings have been instituted with respect to Company.

(e) Company has, and at all relevant times has had, all necessary power and authority to execute, deliver and perform this Agreement and to issue the Commercial Paper Notes.

(f) Company has taken all actions which are required for the authorization of the issuance of the Commercial Paper Notes, and for the authorization, execution, delivery and performance of this Agreement, and such actions do not require the approval or consent of any holder or trustee of any indebtedness or obligations of Company.

(g) The issuance of Commercial Paper Notes by Company (i) does not and will not contravene any provision of any governmental law, regulation or rule applicable to Company, and (ii) does not and will not conflict with, breach or contravene the provisions of any contract or other instrument binding upon Company.

(h) Each instruction given to Agent in accordance with Section 5 hereof shall constitute a representation and warranty by Company that the issuance and delivery of such Commercial Paper Note(s) have been duly and validly authorized by Company.

9. <u>Reliance on instructions.</u> Agent shall incur no liability to Company in acting hereunder upon instructions contemplated hereby which Agent believed in good faith to have been given by an Authorized Representative or an Authorized Person, as the case may be. Instructions transmitted via SPANS Online (as defined in Section 18 hereof) shall be the equivalent to the giving of a duly authorized written instruction which Agent may act upon without liability. In the event a discrepancy exists between any telephonic instructions and any other such instructions, the telephonic instructions as understood by Agent will be deemed to control.

10. <u>Cancellation of Commercial Paper Notes.</u> Upon payment by Agent of Certificated Commercial Paper Note(s) presented for payment, Agent shall mark such Certificated Commercial Paper Note(s) as paid and (i) in due course cancel Certificated Commercial Paper Note(s) presented for payment and from time to time return such canceled Certificated Commercial Paper Notes to Company, or (ii) destroy such Certificated Commercial Paper Notes(s) and deliver to Company from time to time a destruction certificate identifying all Certificated Commercial Paper Notes destroyed since the issuance of the prior destruction certificate. Upon the written request of Company, Agent agrees to cancel and return to Company all unissued Certificated Commercial Paper Notes in Agent's possession at the time of such request.

11. <u>Termination.</u>

(a) This Agreement may be terminated at any time by either Agent or Company by 30 days' prior written notice to the other, provided that, so long as Company continues to pay the fees and expenses of Agent as set forth herein, Agent agrees to continue acting as issuing and paying agent hereunder until such time as Agent’s successor has been selected and has entered into an agreement with Company to that effect. Such termination shall not affect the respective liabilities of the parties hereunder arising prior to such termination.

(b) If no successor has been appointed within such 30-day period, then Agent shall have the right to petition a court of competent jurisdiction for the appointment of Agent’s successor hereunder. Agent shall be reimbursed for any and all expenses in connection with any such petition and appointment.

(c) Promptly following the date of termination of this Agreement, Agent shall destroy all Certificated Commercial Paper Notes in Agent's possession and shall transfer to Company all funds, if any, then on deposit in the Note Account after deduction and payment to Agent of all fees and expenses (including court costs and attorneys' fees) payable to, incurred by, or expected to be incurred by Agent in connection with the performance of its duties and the exercise of its rights hereunder. Agent shall promptly notify Company of all Certificated Commercial Paper Notes so destroyed.

12. Binding Effect; Successors. This Agreement shall be binding upon the respective parties hereto and their heirs, executors, successors or assigns. If Agent consolidates, merges or converts into, or transfers all or substantially all of its corporate trust business (including this Agreement) to another corporation, the successor or transferee corporation without any further act shall be the successor Agent.

13. Liability of Agent.

(a) Agent’s duties and obligations shall be determined solely by the express provisions of this Agreement and the Letter of Representations (including the documents referred to therein) and Agent shall be responsible for the performance of only such duties and obligations as are specifically set forth herein and therein, and no implied duties or covenants shall be read into any such document against Agent. Agent has no fiduciary or discretionary duties of any kind. Agent shall have no liability under and no duty to inquire as to the provisions of any agreement other than this Agreement. Agent shall not be required to ascertain whether any issuance or sale of Commercial Paper Note(s) (or any amendment or termination of this Agreement) has been duly authorized or is in compliance with any other agreement to which Company is a party (whether or not Agent is a party to such other agreement). Agent shall not be liable for any action taken or omitted by it in good faith except to the extent that a court of competent jurisdiction determines that Agent’s gross negligence or willful misconduct was the sole cause of any loss to Company.

(b) Agent shall not be charged with knowledge or notice of any fact or circumstance not specifically set forth herein. Agent may rely upon any notice, instruction, request or other instrument, not only as to its due execution, validity and effectiveness, but also as to the truth and accuracy of any information contained therein, which Agent shall believe to be genuine and to have been signed or presented by the person or parties purporting to sign the same. In no event shall Agent be liable for incidental, indirect, special, consequential or punitive damages or penalties (including, but not limited to lost profits), even if Agent has been advised of the likelihood of such damages or penalty and regardless of the form of action. Agent shall not be responsible for delays or failures in performance resulting from acts beyond its control, including without limitation acts of God, strikes, lockouts, riots, acts of war or terror, epidemics, governmental regulations, fire, communication line failures, computer viruses, intrusions or attacks, power failures, earthquakes or other disasters.

(c) Agent shall not be obligated to take any legal action or commence any proceeding in connection with this Agreement, the Note Funds or any account in which Note Funds are deposited or to appear in, prosecute or defend any such legal action or proceeding or to take any other action that Agent determines, in its sole judgment, may expose it to liability or expense. Agent may consult legal counsel selected by it concerning this Agreement or of its duties hereunder and shall incur no liability and shall be fully indemnified from any liability whatsoever in acting in accordance with the advice of such counsel. Company shall promptly pay, upon demand, the reasonable fees and expenses of any such counsel. Company agrees to perform or procure the performance of all further acts and things, and execute and deliver such further documents, as may be required by law or as Agent may reasonably request in connection with its duties hereunder.

(d) Agent is authorized, in its sole discretion, to comply with final orders issued or process entered by any court with respect to the Note Funds, without determination by Agent of such court's jurisdiction in the matter. If any portion of the Note Funds is at any time attached, garnished or levied upon under any court order, or in case the payment, assignment, transfer, conveyance or delivery of any such property shall be stayed or enjoined by any court order, or in case any order, judgment or decree shall be made or entered by any court affecting such property or any part thereof, then and in any such event, Agent is authorized, in its sole discretion, to rely upon and comply with any such order, writ, judgment or decree which it is advised by legal counsel selected by it is binding upon it without the need for appeal or other action; and if Agent complies with any such order, writ, judgment or decree, it shall not be liable to any of the parties hereto or to any other person or entity by reason of such compliance even though such order, writ, judgment or decree may be subsequently reversed, modified, annulled, set aside or vacated.

(e) If, at any time Agent is unable to determine, to Agent's sole satisfaction, the proper disposition of all or any portion of the Note Funds or Agent's proper actions with respect to its obligations hereunder, then Agent may, in its sole discretion, take either or both of the following actions:

(i) suspend the performance of any of its obligations (including without limitation any disbursement obligations) under this Agreement until such uncertainty shall be resolved to the sole satisfaction of Agent.

(ii) petition (by means of an interpleader action or any other appropriate method) any court of competent jurisdiction, in any venue convenient to Agent, for instructions with respect to such dispute or uncertainty, and to the extent required or permitted by law, pay into such court, for holding and disposition in accordance with the instructions of such court, all Note Funds, after deduction and payment to Agent of all fees and expenses (including court costs and attorneys' fees) payable to, incurred by, or expected to be incurred by Agent in connection with the performance of its duties and the exercise of its rights hereunder.

14. **Indemnification of Agent**. From and at all times after the date of this Agreement, Company shall, to the fullest extent permitted by law, indemnify and hold harmless Agent and each director, officer, employee and affiliate of Agent (collectively, the "Indemnified Parties") against any and all actions, claims (whether or not valid), losses, damages, liabilities, penalties, costs and expenses of any kind or nature (including without limitation reasonable attorneys' fees, costs and expenses) incurred by or asserted against any of the Indemnified Parties, whether direct, indirect or consequential, as a result of or arising from or in any way relating to any claim, demand, suit, action or proceeding (including any inquiry or investigation) by any person or entity, including without limitation Company, any Dealer or any purchaser of Commercial Paper Notes, whether threatened or initiated, asserting a claim for any legal or equitable remedy against any person under any statute or regulation, including, but not limited to, any federal or state securities laws, or under any common law or equitable cause or otherwise, arising from or in connection with the negotiation, preparation, execution, performance or failure of performance in connection with this Agreement or any transactions contemplated herein, whether or not any such Indemnified Party is a party to any such action, proceeding, suit or the target of any such inquiry or investigation; provided, however, that no Indemnified Party shall have the right to be indemnified hereunder for any liability finally determined by a court of competent jurisdiction, subject to no further appeal, to have been directly caused solely from the gross negligence or willful misconduct of such Indemnified Party. Company further agrees to indemnify each Indemnified Party for all costs, including without limitation reasonable attorney’s fees, incurred by such Indemnified Party in connection with the enforcement of Company’s indemnification obligations hereunder. Each Indemnified Party shall, in its sole discretion, have the right to select and employ separate counsel with respect to any action or claim brought or asserted against it, and the reasonable fees of such counsel shall be paid upon demand by Company. The foregoing indemnity includes, but is not limited to, (a) any action taken or omitted to be taken by Agent or any of Agent's officers or employees upon written, facsimile, telephonic or other electronically transmitted instructions received by Agent from, or believed by Agent to have been given by, the proper person or persons, (b) Agent's improperly executing or failing to execute any instruction because of unclear instructions, failure of communications media or any other circumstances beyond Agent's control, and (c) the actions or inactions of DTC or its nominees. The obligations of Company under this Section 14 shall survive any termination of this Agreement and the resignation or removal of Agent.

15. **Compensation of Agent.**

(a) Fees and Expenses. Company agrees to compensate Agent on demand for its services hereunder in accordance with the Schedule of Fees furnished by Agent to Company from time to time and to reimburse Agent, upon its request, for all reasonable expenses, disbursements, and advances made or incurred in connection with this Agreement, including with respect to investigating and defending itself against any claim or potential liability and the enforcement of Company’s compensation and reimbursement obligations hereunder. Agent will provide the Company thirty days’ written notice prior any changes to the Schedule of Fees. The obligations of Company under this Section 15 shall survive any termination of this Agreement and the resignation or removal of Agent.

(b) Security and Offset. Company hereby grants to Agent and the Indemnified Parties a security interest in, lien upon and right of offset against the Note Funds with respect to any compensation or reimbursement due any of them hereunder (including any claim for indemnification hereunder). If for any reason the Note Funds are insufficient to cover such compensation and reimbursement, Company shall promptly pay such amounts to Agent or any Indemnified Party upon receipt of an itemized invoice. All disbursements of funds from the Note Funds shall be subject to the fees and claims of Agent and the Indemnified Parties pursuant to this Section and Section 14 hereof.

16. Identifying Information. To help the government fight the funding of terrorism and money laundering activities, Federal law requires all financial institutions to obtain, verify, and record information that identifies each person who opens an account. For a non-individual person such as a business entity, a charity, a trust, or other legal entity, Agent requires documentation to verify its formation and existence as a legal entity. Agent may ask to see financial statements, licenses, and identification and authorization documents from individuals claiming authority to represent the entity or other relevant documentation. The parties acknowledge that a portion of the identifying information set forth herein is being requested by Agent in connection with the USA Patriot Act, Pub.L.107-56 (the "Act"), and each agrees to provide any additional information requested by Agent in connection with the Act or any other legislation or regulation to which Agent is subject, in a timely manner.

17. Consent to Jurisdiction and Venue. Each party irrevocably and unconditionally submits to the exclusive jurisdiction of the United States federal courts located in the Borough of Manhattan and the courts of the State of New York located in the Borough of Manhattan and waives any objection to such jurisdiction or venue. The parties hereto consent to and agree to submit to the jurisdiction of any of the courts specified herein and agree to accept service of process to vest personal jurisdiction over them in any of these courts.

18. **SPANS Online**

(a) Company and each Authorized Representative may use the U.S. Bank Securities Processing Automated Notes System Online (“SPANS Online”) instruction and reporting communication service to transmit instructions to Agent or obtain reports with respect to the Commercial Paper Notes. Company may, by separate agreement between Company and one or more of its Authorized Persons, authorize the Authorized Person to directly access SPANS Online for the purposes of transmitting instructions to Agent or obtaining reports with respect to the Commercial Paper Notes. Company acknowledges that (i) some or all of the services utilized in connection with SPANS Online are furnished by SS&C Technologies, Inc. (“SS&C”), (ii) SPANS Online is provided to Company “AS IS” without warranties or representations of any kind whatsoever, and (iii) SPANS Online is proprietary and confidential property disclosed to Company in confidence and may be utilized only on the SPANS Online Terms and Conditions as set forth in the SPANS Online website and for purposes set forth in this Agreement.

(b) To permit the use of SPANS Online to transmit instructions and/or obtain reports with respect to the Commercial Paper Notes, Agent will supply Company with a customer identification number and initial passwords. Company may thereafter change its passwords directly through SPANS Online. Company will keep all information relating to its identification number and passwords strictly confidential and will be responsible for the maintenance of adequate security over its customer identification number and passwords. Instructions transmitted over SPANS Online and received by Agent pursuant to this Agreement shall be deemed conclusive evidence that such instructions are correct and complete and that the issuance or redemption of the Commercial Paper Notes directed thereby has been duly authorized by Company.

19. **Notices**.

(a) All communications to Agent by or on behalf of Company or a Dealer, by writing or telephone, which relate to the completion, delivery or payment of any Commercial Paper Note, are to be delivered to Agent via SPANS Online or directed to Commercial Paper Operations at the address or telephone number indicated below or to such other address or telephone number as Agent specifies to Company in writing.

U.S. Bank Trust Company, National Association
100 Wall Street, Suite 600
New York, NY 10005

Attention: Money Market Operations

Facsimile No.: (212)
Telephone No.: (212) 951-8508
Email address: mmi.processing@usbank.com

(b) Notices and other communications hereunder to Agent (other than communications that relate to the completion, delivery or payment of any Commercial Paper Note) or to Company are to be directed to the address or telephone number indicated below, or to such other address or telephone number as the party receiving such notice shall have previously specified in writing to the party sending such notice:

If to Company at:

800 Capitol Street, Suite 3000
Houston, Texas, 77002
Attention: Treasurer
Telephone:
Email: GCLegal@wm.com

If to Agent at:

U.S. Bank Trust Company, National Association
100 Wall Street, Suite 600
New York, NY 10005

Attention: Global Corporate Trust – IPA Administration

Telephone No.: (646) 971- 4954

Notices shall be deemed delivered when received at the applicable address specified above. For purposes of this Section 19, "when received" shall mean actual receipt (i) of an electronic communication by facsimile or email transmission or SPANS Online; or (ii) of an oral communication by any person answering the telephone at the office of the individual or department specified in or pursuant to this Agreement; or (iii) of a written communication hand-delivered, by national overnight courier service, or by first class, certified or registered mail, return receipt requested, at the office specified in or pursuant to this Agreement.

20. **<u>Optional Security Procedures</u>**. In the event funds transfer instructions, address changes or change in contact information are given (other than in writing at the time of execution of this Agreement), whether in writing, by facsimile or otherwise, Agent is authorized but shall be under no duty to seek confirmation of such instructions by telephone call-back to an Authorized Representative, and Agent may rely upon the confirmation of anyone purporting to be the person or persons so designated. The persons and telephone numbers for call-backs may be changed only in writing actually received and acknowledged by Agent and shall be effective only after Agent has a reasonable opportunity to act on such changes. Company agrees that Agent may at its option record any telephone calls made pursuant to this Section. Agent in any funds transfer may rely solely upon any account numbers or similar identifying numbers provided by Company to identify (a) the beneficiary, (b) the beneficiary's bank, or (c) an intermediary bank. Agent may apply funds for any payment order it executes using any such identifying number, even when its use may result in a person other than the beneficiary being paid, or the transfer of funds to a bank other than the beneficiary's bank or an intermediary bank designated. Company acknowledges that these optional security procedures are commercially reasonable.

21. **Amendment, Waiver and Assignment**. None of the terms or conditions of this Agreement may be changed, waived, modified, discharged, terminated or varied in any manner whatsoever unless in writing duly signed by each party to this Agreement. No course of conduct shall constitute a waiver of any of the terms and conditions of this Agreement, unless such waiver is specified in writing, and then only to the extent so specified. A waiver of any of the terms and conditions of this Agreement on one occasion shall not constitute a waiver of the other terms of this Agreement, or of such terms and conditions on any other occasion. Except as provided in Section 12 hereof, this Agreement may not be assigned by any party without the written consent of the other party.

22. **Severability**. To the extent any provision of this Agreement is prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

23. **Governing Law**. This Agreement shall be governed and construed in accordance with laws of the State of New York applicable to contracts made and performed in the State of New York and, to the extent applicable, operating circulars of the Federal Reserve Agent, federal laws and regulations as amended, New York Clearing House rules and, to the extent not otherwise inconsistent with this Agreement, general commercial Agent practices applicable to commercial paper issuance and payment.

24. **Entire Agreement, No Third-Party Beneficiaries**. This Agreement, together with the Letter of Representations, constitutes the entire agreement between the parties relating to Agent’s issuing agent, paying agent and depositary duties and obligations to Company. Except as provided in Section 14 hereof, nothing in this Agreement, express or implied, is intended to or shall confer upon any person or entity other than the signatory parties hereto any right, benefit or remedy of any nature whatsoever under or by reason of this Agreement.

25. **Execution in Counterparts, Facsimiles**. This Agreement may be executed in two or more counterparts, which when so executed shall constitute one and the same agreement. The delivery of copies of this Agreement as executed by PDF or facsimile transmission shall constitute effective execution and delivery as to the parties and may be used in lieu of originals for all purposes.

26. **Dealings**. Agent and any stockholder, director, officer or employee of Agent may buy, sell, and deal in any of the securities of Company, any Dealer or any purchaser of the Commercial Paper Notes and become financially interested in any transaction in which Company, any Dealer or any such purchaser may be interested, and contract and lend money to Company, any Dealer or any such purchaser and otherwise act as fully and freely as though it were not a depositary, issuing or paying agent under this Agreement. Nothing herein shall preclude Agent from acting in any other capacity for Company, any Dealer or any such purchaser or for any other person or entity.

27. **Tax Reporting**. Agent shall have no responsibility for the tax consequences of this Agreement and Company shall consult with independent counsel concerning any and all tax matters. Company shall provide IRS Form W-9 or Form W-8, as applicable, for each payee, together with any other documentation and information requested by Agent in connection with Agent's reporting obligations under any applicable U.S. federal law or regulation. If such tax documentation is not so provided, Agent is authorized to withhold taxes as required by applicable U.S. federal law or regulation.

28. **WAIVER OF TRIAL BY JURY**. EACH PARTY TO THIS AGREEMENT HEREBY WAIVES ANY RIGHT THAT IT MAY HAVE TO A TRIAL BY JURY ON ANY CLAIM, COUNTERCLAIM, SETOFF, DEMAND, ACTION OR CAUSE OF ACTION ARISING OUT OF OR IN ANY WAY RELATED TO THIS AGREEMENT.

29. **Publicity**. No party will (a) use any other party's proprietary indicia, trademarks, service marks, trade names, logos, symbols, or brand names, or (b) otherwise refer to or identify any other party in advertising, publicity releases, or promotional or marketing publications, or correspondence to third parties without, in each case, securing the prior written consent of such other party.

30. **Electronic Transmission; Electronic Signatures.** Agent shall not have any duty to confirm that the person sending any notice, instruction or other communication (a "Notice") by electronic transmission (including by e-mail, facsimile transmission, web portal or other electronic methods) is, in fact, a person authorized to do so. Electronic signatures believed by Agent to comply with the ESIGN Act of 2000 or other applicable law (including electronic images of handwritten signatures and digital signatures provided by DocuSign, Orbit, Adobe Sign or any other digital signature provider acceptable to Agent) shall be deemed original signatures for all purposes. Company assumes all risks arising out of the use of electronic signatures and electronic methods to send Notices to Agent, including without limitation the risk of Agent acting on an unauthorized Notice, and the risk of interception or misuse by third parties. Notwithstanding the foregoing, Agent may in any instance and in its sole discretion require that an original document bearing a manual signature be delivered to Agent in lieu of, or in addition to, any such electronic Notice.

[signature page follows]

IN WITNESS WHEREOF, the parties have caused this Issuing and Paying Agent Agreement to be duly executed and delivered as of the day and year first above written.

Waste Management, Inc.

/s/ David L. Reed
Authorized Officer's Signature

Name: David L. Reed

Title: VP & Treasurer

Date: 10/20/22

U.S. BANK TRUST COMPANY, NATIONAL ASSOCIATION

/s/ Michelle Lee
Authorized Officer's Signature

Name: Michelle Lee

Title: Vice President

Date: October 21, 2022

Exhibit 21.1

Entity Name	*Jurisdiction of Formation / Incorporation*
635952 Ontario Inc.	Ontario
ADS Renewable Energy - Stones Throw, LLC	Delaware
ADS Renewable Energy - Wolf Creek, LLC	Delaware
ADS Solid Waste of NJ, Inc.	New Jersey
Advanced Disposal Acquisition Sub, LLC	Delaware
Advanced Disposal Recycling Services Atlanta, LLC	Delaware
Advanced Disposal Recycling Services Gulf Coast, LLC	Delaware
Advanced Disposal Services Alabama Holdings, LLC	Delaware
Advanced Disposal Services Alabama, LLC	Delaware
Advanced Disposal Services Biloxi MRF, LLC	Delaware
Advanced Disposal Services Birmingham, Inc.	Alabama
Advanced Disposal Services Blackfoot Landfill, Inc.	Indiana
Advanced Disposal Services Blue Ridge Landfill, Inc.	Kentucky
Advanced Disposal Services Carolinas, LLC	Delaware
Advanced Disposal Services Cedar Hill Landfill, Inc.	Alabama
Advanced Disposal Services Central Florida, LLC	Delaware
Advanced Disposal Services Cobb County Recycling Facility, LLC	Delaware
Advanced Disposal Services Cranberry Creek Landfill, LLC	Wisconsin
Advanced Disposal Services Cypress Acres Landfill, Inc.	Florida
Advanced Disposal Services East, Inc.	Delaware
Advanced Disposal Services Evergreen Landfill, Inc.	Georgia
Advanced Disposal Services Grand Bahama Limited	New Providence
Advanced Disposal Services Hancock County, LLC	Delaware
Advanced Disposal Services Jones Road, LLC	Delaware
Advanced Disposal Services Lancaster Landfill, LLC	Pennsylvania
Advanced Disposal Services Magnolia Ridge Landfill, LLC	Georgia
Advanced Disposal Services Maple Hill Landfill, Inc.	Missouri
Advanced Disposal Services Midwest, LLC	Wisconsin
Advanced Disposal Services Mississippi Holdings, Inc.	Delaware
Advanced Disposal Services Mississippi, LLC	Delaware
Advanced Disposal Services Morehead Landfill, Inc.	Kentucky
Advanced Disposal Services National Accounts Holdings, Inc.	Delaware
Advanced Disposal Services National Accounts, Inc.	North Carolina
Advanced Disposal Services North Alabama Landfill, LLC	Delaware
Advanced Disposal Services Oak Ridge Landfill, Inc.	Missouri
Advanced Disposal Services Orchard Hills Landfill, Inc.	Illinois
Advanced Disposal Services Pasco County, LLC	Delaware
Advanced Disposal Services Pecan Row Landfill, LLC	Georgia
Advanced Disposal Services Pontiac Landfill, Inc.	Michigan
Advanced Disposal Services Renewable Energy, LLC	Delaware
Advanced Disposal Services Rogers Lake, LLC	Delaware
Advanced Disposal Services Solid Waste Leasing Corp.	Wisconsin
Advanced Disposal Services Solid Waste Midwest, LLC	Wisconsin
Advanced Disposal Services Solid Waste Southeast, Inc.	Florida
Advanced Disposal Services South, LLC	Delaware
Advanced Disposal Services Star Ridge Landfill, Inc.	Alabama
Advanced Disposal Services Sumner Landfill, Inc.	Illinois
Advanced Disposal Services Taylor County Landfill, LLC	Georgia
Advanced Disposal Services Tennessee Holdings, Inc.	Delaware
Advanced Disposal Services Transport, LLC	Delaware
Advanced Disposal Services Valley Meadows Landfill, LLC	Wisconsin
Advanced Disposal Services Valley View Landfill, Inc.	Illinois
Advanced Disposal Services Vasko Rubbish Removal, Inc.	Minnesota
Advanced Disposal Services Vasko Solid Waste, Inc.	Minnesota
Advanced Disposal Services Wayne County Landfill, Inc.	Illinois
Advanced Disposal Services, Inc.	Delaware
Advanced Disposal Subsidiary Holding Company, LLC	Delaware
Advanced Environmental Technical Services, L.L.C.	Delaware
Agave Investment Holdings, LLC	Delaware
Akron Regional Landfill, Inc.	Delaware
Alabama Waste Disposal Solutions, L.L.C.	Alabama
Alliance Sanitary Landfill, Inc.	Pennsylvania
Alpharetta Transfer Station, LLC	Georgia
American Landfill, Inc.	Ohio
Ameriwaste, LLC	Maryland
Anderson Landfill, Inc.	Delaware
Antelope Valley Recycling and Disposal Facility, Inc.	California
Arden Landfill, Inc.	Pennsylvania

Entity Name	*Jurisdiction of Formation / Incorporation*
Atlantic Waste Disposal, Inc.	Delaware
Automated Salvage Transport Co., L.L.C.	Delaware
Avalon South, LLC	Delaware
Azusa Land Reclamation, Inc.	California
B&B Landfill, Inc.	Delaware
Baton Rouge Renewable Energy LLC	Delaware
Big Dipper Enterprises, Inc.	North Dakota
Blackwood Land Development, LLC	Delaware
Bluegrass Containment, L.L.C.	Delaware
Burlington Transfer Station, Inc.	Delaware
Burney Disposal, Inc.	California
Burnsville Sanitary Landfill, Inc.	Minnesota
CA Newco, L.L.C.	Delaware
Cal Sierra Disposal	California
Caldwell Partnership, LLC	Indiana
California Asbestos Monofill, Inc.	California
Canadian Waste Services Holdings Inc.	Ontario
Capels Landfill, LLC	Delaware
Capital Sanitation Company	Nevada
Capitol Disposal, Inc.	Alaska
Carolina Grading, Inc.	South Carolina
Caruthers Mill C&D Landfill, LLC	Delaware
Cedar Ridge Landfill, Inc.	Delaware
Central Disposal Systems, Inc.	Iowa
CGS Leasing, Inc.	Indiana
CGS Services, Inc.	Indiana
Chadwick Road Landfill, Inc.	Georgia
Chambers Clearview Environmental Landfill, Inc.	Mississippi
Chambers Development Company, Inc.	Delaware
Chambers Development of Ohio, Inc.	Ohio
Chambers of Georgia, Inc.	Delaware
Chambers of Mississippi, Inc.	Mississippi
Chemical Waste Management of Indiana, L.L.C.	Delaware
Chemical Waste Management of the Northwest, Inc.	Washington
Chemical Waste Management, Inc.	Delaware
Chesser Island Road Landfill, Inc.	Georgia
City Environmental Services, Inc. of Waters	Michigan
Cleburne Landfill Company Corp.	Alabama
Coast Waste Management, Inc.	California
Coastal Recyclers Landfill, LLC	Delaware
Community Refuse Service, LLC	Pennsylvania
Connecticut Valley Sanitary Waste Disposal, Inc.	Massachusetts
Conservation Services, Inc.	Colorado
Continuus Materials Group, LLC	Delaware
Continuus Materials HoldCo, LLC	Delaware
Continuus Materials Intellectual Property, LLC	Delaware
Continuus Materials of Fairless Hills, LLC	Delaware
Continuus Materials of Iowa, LLC	Delaware
Continuus Materials of PA, LLC	Delaware
Continuus Materials, LLC	Delaware
Coshocton Landfill, Inc.	Ohio
Cougar Landfill, Inc.	Texas
Countryside Landfill, Inc.	Illinois
CR Group, LLC	Utah
Curtis Creek Recovery Systems, Inc.	Maryland
Cuyahoga Landfill, Inc.	Delaware
CWM Chemical Services, L.L.C.	Delaware
Dauphin Meadows, Inc.	Pennsylvania
Deep Valley Landfill, Inc.	Delaware
Deer Track Park Landfill, Inc.	Delaware
Deffenbaugh Disposal, Inc.	Delaware
Deffenbaugh Group Holdings, Inc.	Delaware
Deffenbaugh Industries, Inc.	Missouri
Deffenbaugh of Arkansas, LLC	Kansas
Deffenbaugh Recycling Company, L.L.C.	Kansas
Del Almo Landfill, L.L.C.	Delaware
Delaware Basin Landfills, LLC	Delaware
Delaware Recyclable Products, Inc.	Delaware
Dickinson Landfill, Inc.	Delaware
Disposal Service, Incorporated	West Virginia
DLD Limited Partnership	Indiana

Entity Name	*Jurisdiction of Formation / Incorporation*
Dolphin Services & Chemicals, LLC	Texas
Dolphin-One, LLC	Texas
Earthmovers Landfill, L.L.C.	Delaware
East Liverpool Landfill, Inc.	Ohio
Eastern One Land Corporation	Delaware
Eco-Safe Systems, LLC	Tennessee
Eco-Vista, LLC	Arkansas
eCycling Services, L.L.C.	Delaware
ELDA Landfill, Inc.	Delaware
Elk River Landfill, Inc.	Minnesota
Energy Injection Services of Mississippi, LLC	Mississippi
Envirofil of Illinois, Inc.	Illinois
EnviroSolutions Dulles, LLC	Virginia
EnviroSolutions Holdings, Inc.	Delaware
EnviroSolutions Real Property Holdings, Inc.	Delaware
Evergreen Landfill, Inc.	Delaware
Evergreen Recycling and Disposal Facility, Inc.	Delaware
Farm Properties LLC	Indiana
FDS Disposal II, LLC	Florida
Firetower Landfill, LLC	Delaware
Fred J. Eckert Sanitary Service, Inc.	Oregon
Furnace Associates, Inc.	Virginia
G.I. Industries	Utah
GA Landfills, Inc.	Delaware
Gallia Landfill, Inc.	Delaware
Garnet of Maryland, Inc.	Maryland
Gateway Transfer Station, LLC	Georgia
Georgia Waste Systems, LLC	Georgia
Giordano Recycling, L.L.C.	Delaware
Glades Landfill, LLC	Florida
Glen's Sanitary Landfill, Inc.	Michigan
Grand Central Sanitary Landfill, Inc.	Pennsylvania
Greenbow, LLC	Alabama
Greenstar Allentown, LLC	Delaware
Greenstar Georgia, LLC	Delaware
Greenstar Managed Services - Connecticut, LLC	Delaware
Greenstar Managed Services - RLWM, LLC	Illinois
Greenstar Mid-America, LLC	Delaware
Greenstar New Jersey, LLC	Delaware
Greenstar Ohio, LLC	Delaware
Greenstar Paterson, LLC	Delaware
Greenstar Pittsburgh, LLC	Delaware
Greenstar Recycled Holdings, LLC	Delaware
Greenstar, LLC	Delaware
Guadalupe Mines Mutual Water Company	California
Guadalupe Rubbish Disposal Co., Inc.	California
Ham Lake Haulers, Inc.	Minnesota
Harmony Landfill, LP	Delaware
Harris Sanitation, Inc.	Florida
Harwood Landfill, Inc.	Maryland
Hedco Landfill Limited	England
High Mountain Fuels LLC	Delaware
Highstar Royal Oaks I, Inc.	Delaware
Highstar Royal Oaks II, Inc.	Delaware
Hillsboro Landfill Inc.	Oregon
Holyoke Sanitary Landfill, Inc.	Massachusetts
HWStar Holdings Corp.	Delaware
IN Landfills, L.L.C.	Delaware
IWStar Waste Holdings Corp.	Delaware
Jahner Sanitation, Inc.	North Dakota
Jay County Landfill, L.L.C.	Delaware
Jones Road Landfill and Recycling, Ltd.	Florida
K and W Landfill Inc.	Michigan
Keene Road Landfill, Inc.	Florida
Kelly Run Sanitation, Inc.	Pennsylvania
King George Landfill Properties, LLC	Virginia
King George Landfill, Inc.	Virginia
Kirby Canyon Holdings, LLC	California
L&K Group Holdings LLC	Kansas
Lakeville Recycling, L.P.	Delaware
Land South Holdings, LLC	Delaware

Entity Name	*Jurisdiction of Formation / Incorporation*
Landfill Services of Charleston, Inc.	West Virginia
Landsouth, Inc.	Wisconsin
Laurel Highlands Landfill, Inc.	Pennsylvania
LCS Services, Inc.	West Virginia
Liberty Landfill, L.L.C.	Delaware
Liquid Waste Management, Inc.	California
Longleaf C&D Disposal Facility, Inc.	Florida
Looney Bins, Inc.	California
Mac Land Disposal, Inc. II	Mississippi
Mahoning Landfill, Inc.	Ohio
Mass Gravel Inc.	Massachusetts
Mc Ginnes Industrial Maintenance Corporation	Texas
McDaniel Landfill, Inc.	North Dakota
McGill Landfill, Inc.	Michigan
Meadowfill Landfill, Inc.	Delaware
Michigan Environs, Inc.	Michigan
Midwest One Land Corporation	Delaware
Modesto Garbage Co., Inc.	California
Moor Refuse, Inc.	California
Moretown Landfill, Inc.	Delaware
Mostoller Landfill, LLC	Pennsylvania
Mountain Indemnity Insurance Company	Texas
Mountainview Landfill, Inc.	Utah
Nassau County Landfill, LLC	Delaware
Nassau Landfill, L.L.C.	Delaware
National Guaranty Insurance Company of Vermont	Vermont
Natura PCR, LLC	Delaware
New England CR L.L.C.	Delaware
New Milford Landfill, L.L.C.	Delaware
New Orleans Landfill, L.L.C.	Delaware
NEWS MA Holdings, Inc.	Delaware
NEWS Mid-Atlantic Holdings, Inc.	Delaware
NEWS North East Holdings, Inc.	Delaware
NEWStar Waste Holdings Corp.	Delaware
North East Waste Services, Inc.	Delaware
North East Waste Transport, Inc.	New Jersey
North Manatee Recycling and Disposal Facility, L.L.C.	Florida
Northwestern Landfill, Inc.	Delaware
Nu-Way Live Oak Reclamation, Inc.	Delaware
Oak Grove Disposal Co., Inc.	Oregon
Oakleaf Global Holdings, Inc.	Delaware
Oakleaf Waste Management, Inc.	Delaware
Oakridge Landfill, Inc.	South Carolina
Oakwood Landfill, Inc.	South Carolina
OGH Acquisition Corporation	Delaware
Okeechobee Landfill, Inc.	Florida
Old Kings Road Solid Waste, LLC	Delaware
Old Kings Road, LLC	Delaware
Orla Landfill, LLC	Delaware
Ozark Ridge Landfill, Inc.	Arkansas
P & R Environmental Industries, L.L.C.	North Carolina
Pacific Waste Management L.L.C.	Delaware
Pappy, Inc.	Maryland
Parker Sanitation II, Inc.	Florida
Pasco Lakes Inc.	Florida
PDC Disposal Co., Inc.	New Jersey
Peltz H.C., LLC	Wisconsin
Pen-Rob, Inc.	Arizona
People's Landfill, Inc.	Delaware
Peterson Demolition, Inc.	Minnesota
Petro Waste DeWitt-Hohn Disposal Facility LP	Delaware
Petro Waste Disposal GP, LLC	Delaware
Petro Waste Environmental LP	Delaware
Petro Waste Holdings LP	Delaware
Petro Waste Howard County Disposal Facility LP	Delaware
Petro Waste McMullen County Disposal Facility LP	Delaware
Petro Waste Pecos County Disposal Facility LP	Delaware
Petro Waste Reagan County Disposal Facility LP	Delaware
Phoenix Resources, Inc.	Pennsylvania
Pine Grove Landfill, Inc.	Pennsylvania
Pine Tree Acres, Inc.	Michigan

Entity Name	*Jurisdiction of Formation / Incorporation*
Prime Westport, LLC	Florida
Quail Hollow Landfill, Inc.	Delaware
Questquill Limited	England
R & B Landfill, Inc.	Georgia
RAA Colorado, L.L.C.	Colorado
RAA Trucking, LLC	Wisconsin
RCI Hudson, Inc.	Massachusetts
Recycle America Co., L.L.C.	Delaware
Recycle America Holdings, Inc.	Delaware
Redwood Landfill, Inc.	Delaware
Refuse Services, Inc.	Florida
Refuse, Inc.	Nevada
Reliable Landfill, L.L.C.	Delaware
Remote Landfill Services, Inc.	Tennessee
Reno Disposal Co.	Nevada
Resco Holdings L.L.C.	Delaware
Resource Control Composting, Inc.	Massachusetts
Resource Control, Inc.	Massachusetts
Richland County Landfill, Inc.	South Carolina
Riverbend Landfill Co.	Oregon
RTS Landfill, Inc.	Delaware
Rust Engineering & Construction Inc.	Delaware
Rust International Inc.	Delaware
S & J Landfill Limited Partnership	Texas
S & S Grading, Inc.	West Virginia
S&T Materials, LLC	Florida
Sanifill de Mexico (US), Inc.	Delaware
Sanitation Services Company Limited	Bahamas
SC Holdings, Inc.	Pennsylvania
Shade Landfill, Inc.	Delaware
Shawnee Rock Company	Missouri
Sierra Estrella Landfill, Inc.	Arizona
Sister's Sanitation Services, LLC	Indiana
South Hadley Landfill, LLC	Delaware
South Suburban, LLC	Wisconsin
Southern One Land Corporation	Delaware
Southern Waste Services, L.L.C.	Delaware
Spruce Ridge, Inc.	Minnesota
SSI Southland Holdings, Inc.	Delaware
St. Johnsbury Transfer Station, Inc.	Delaware
St. Paul Haulers, LLC	Minnesota
Stony Hollow Landfill, Inc.	Delaware
Suburban Landfill, Inc.	Delaware
Summit Disposal Inc.	California
Summit, Inc.	Wisconsin
Superior Waste Services of New York City, Inc.	New York
T2L Trucking, LLC	Delaware
Texarkana Landfill, L.L.C.	Delaware
Texas Pack Rat - Austin #1 LLC	Texas
Texas Pack Rat - Dallas #1 LLC	Texas
Texas Pack Rat - Houston #1 LLC	Texas
Texas Pack Rat - Houston #2 LLC	Texas
Texas Pack Rat - Houston #3 LLC	Texas
Texas Pack Rat - San Antonio #1 LLC	Texas
Texas Pack Rat Service Company LLC	Texas
The Peltz Group, LLC	Wisconsin
The Waste Management Charitable Foundation	Delaware
The Woodlands of Van Buren, Inc.	Delaware
TN'T Sands, Inc.	South Carolina
Trail Ridge Landfill, Inc.	Delaware
Transamerican Waste Central Landfill, Inc.	Delaware
Trash Hunters, Inc.	Mississippi
TW PWE GP, LLC	Delaware
Twin Bridges Golf Club, L.P.	Indiana
TX Newco, L.L.C.	Delaware
United Waste Systems Leasing, Inc.	Michigan
Urban Sanitation Limited	Bahamas
USA South Hills Landfill, Inc.	Pennsylvania
USA Valley Facility, Inc.	Delaware
USA Waste Geneva Landfill, Inc.	Delaware
USA Waste Landfill Operations and Transfer, Inc.	Texas

Entity Name	*Jurisdiction of Formation / Incorporation*
USA Waste of California, Inc.	Delaware
USA Waste of Texas Landfills, Inc.	Delaware
USA Waste of Virginia Landfills, Inc.	Delaware
USA Waste Services of NYC, Inc.	Delaware
USA Waste-Management Resources, LLC	New York
USA-Crinc, L.L.C.	Delaware
USB LIHTC Fund 2010-1, LLC	Delaware
USB LIHTC-NMTC FUND 2018-2, LLC	Delaware
USB LIHTC-NMTC FUND 2019-1, LLC	Delaware
USB LIHTC-NMTC Fund 2022-1, LLC	Delaware
UWS Barre, Inc.	Massachusetts
Valley Garbage and Rubbish Company, Inc.	California
Vermont Hauling, Inc.	Delaware
Vern's Refuse Service, Inc.	North Dakota
Vickery Environmental, Inc.	Ohio
Vista Landfill, LLC	Florida
Voyageur Disposal Processing, Inc.	Minnesota
Waitsfield Transfer Station, Inc.	Delaware
Warner Company	Delaware
Waste Away Group, Inc.	Alabama
Waste Management Arizona Landfills, Inc.	Delaware
Waste Management Buckeye, L.L.C.	Delaware
Waste Management Collection and Recycling, Inc.	California
Waste Management Disposal Services of Colorado, Inc.	Colorado
Waste Management Disposal Services of Maine, Inc.	Maine
Waste Management Disposal Services of Maryland, Inc.	Maryland
Waste Management Disposal Services of Massachusetts, Inc.	Massachusetts
Waste Management Disposal Services of Oregon, Inc.	Delaware
Waste Management Disposal Services of Pennsylvania, Inc.	Pennsylvania
Waste Management Disposal Services of Virginia, Inc.	Delaware
Waste Management Energy Services of Texas, LLC	Texas
Waste Management Holdings, Inc.	Delaware
Waste Management Inc. of Florida	Florida
Waste Management Indycoke, L.L.C.	Delaware
Waste Management International, Inc.	Delaware
Waste Management Milam Property, LLC	Texas
Waste Management National Services, Inc.	Delaware
Waste Management National Transportation Services, Inc.	Delaware
Waste Management of Alameda County, Inc.	California
Waste Management of Alaska, Inc.	Delaware
Waste Management of Arizona, Inc.	California
Waste Management of Arkansas, Inc.	Delaware
Waste Management of California, Inc.	California
Waste Management of Canada Corporation	Nova Scotia
Waste Management of Carolinas, Inc.	North Carolina
Waste Management of Colorado, Inc.	Colorado
Waste Management of Connecticut, Inc.	Delaware
Waste Management of Delaware, Inc.	Delaware
Waste Management of Fairless, L.L.C.	Delaware
Waste Management of Five Oaks Recycling and Disposal Facility, Inc.	Delaware
Waste Management of Georgia, Inc.	Georgia
Waste Management of Hawaii, Inc.	Delaware
Waste Management of Idaho, Inc.	Idaho
Waste Management of Illinois, Inc.	Delaware
Waste Management of Indiana Holdings One, Inc.	Delaware
Waste Management of Indiana Holdings Two, Inc.	Delaware
Waste Management of Indiana, L.L.C.	Delaware
Waste Management of Iowa, Inc.	Iowa
Waste Management of Kansas, Inc.	Kansas
Waste Management of Kentucky Holdings, Inc.	Delaware
Waste Management of Kentucky, L.L.C.	Delaware
Waste Management of Leon County, Inc.	Florida
Waste Management of Londonderry, Inc.	Delaware
Waste Management of Louisiana Holdings One, Inc.	Delaware
Waste Management of Louisiana, L.L.C.	Delaware
Waste Management of Maine, Inc.	Maine
Waste Management of Maryland, Inc.	Maryland
Waste Management of Massachusetts, Inc.	Massachusetts
Waste Management of Metro Atlanta, Inc.	Georgia
Waste Management of Michigan, Inc.	Michigan
Waste Management of Minnesota, Inc.	Minnesota

Entity Name	Jurisdiction of Formation / Incorporation
Waste Management of Mississippi, Inc.	Mississippi
Waste Management of Missouri, Inc.	Delaware
Waste Management of Montana, Inc.	Delaware
Waste Management of Nebraska, Inc.	Delaware
Waste Management of Nevada, Inc.	Nevada
Waste Management of New Hampshire, Inc.	Connecticut
Waste Management of New Jersey, Inc.	Delaware
Waste Management of New Mexico, Inc.	New Mexico
Waste Management of New York, L.L.C.	Delaware
Waste Management of North Dakota, Inc.	Delaware
Waste Management of Ohio, Inc.	Ohio
Waste Management of Oklahoma, Inc.	Oklahoma
Waste Management of Oregon, Inc.	Oregon
Waste Management of Pennsylvania Gas Recovery, L.L.C.	Delaware
Waste Management of Pennsylvania, Inc.	Pennsylvania
Waste Management of Rhode Island, Inc.	Delaware
Waste Management of South Carolina, Inc.	South Carolina
Waste Management of South Dakota, Inc.	South Dakota
Waste Management of Texas Holdings, Inc.	Delaware
Waste Management of Texas, Inc.	Texas
Waste Management of Tunica Landfill, Inc.	Mississippi
Waste Management of Utah, Inc.	Utah
Waste Management of Virginia, Inc.	Virginia
Waste Management of Washington, Inc.	Delaware
Waste Management of West Virginia, Inc.	Delaware
Waste Management of Wisconsin, Inc.	Wisconsin
Waste Management of Wyoming, Inc.	Delaware
Waste Management Partners, Inc.	Delaware
Waste Management Recycling and Disposal Services of California, Inc.	California
Waste Management Recycling of New Jersey, L.L.C.	Delaware
Waste Management Service Center, Inc.	Delaware
Waste Management, Inc. of Tennessee	Tennessee
Waste Management-Green Ridge RDF, LLC	Delaware
WBLF Acquisition Company, LLC	Pennsylvania
Western One Land Corporation	Delaware
Western Waste Industries	California
Western Waste of Texas, L.L.C.	Delaware
Westminster Land Acquisition, LLC	Massachusetts
Wheelabrator Technologies International Inc.	Delaware
White Lake Landfill, Inc.	Michigan
Willow Oak Landfill, LLC	Georgia
WM Avon, Inc.	Delaware
WM Bagco, LLC	Delaware
WM Billerica, Inc.	Delaware
WM Biloxi Hauling, LLC	Mississippi
WM Biloxi Transfer Station, LLC	Delaware
WM Boston CORE, Inc.	Delaware
WM CCP Solutions, LLC	Delaware
WM Compactor Solutions, Inc.	Arizona
WM Conversion Fund, LLC	Delaware
WM Corporate Services, Inc.	Delaware
WM Curbside, LLC	Delaware
WM DC 1, LLC	Delaware
WM Dutch Holdings B.V.	Netherlands
WM Emergency Employee Support Fund, Inc.	Delaware
WM Energy Resources, Inc.	Delaware
WM Energy Services Holdings, LLC	Delaware
WM Energy Services of Ohio, LLC	Ohio
WM Energy Solutions, Inc.	Delaware
WM European Holdings, Inc.	Delaware
WM Green Squad, LLC	Delaware
WM GreenOps, LLC	Delaware
WM GTL JV Holdings, LLC	Delaware
WM GTL, Inc.	Delaware
WM GTL, LLC	Delaware
WM Healthcare Solutions, Inc.	Delaware
WM Illinois Renewable Energy, L.L.C.	Delaware
WM Intellectual Property Holdings, L.L.C.	Delaware
WM International Holdings, Inc.	Delaware
WM KS Energy Resources, LLC	Delaware
WM LampTracker, Inc.	Delaware

Entity Name	*Jurisdiction of Formation / Incorporation*
WM Landfills of Ohio, Inc.	Delaware
WM Landfills of Tennessee, Inc.	Delaware
WM Leasing of Arizona, L.L.C.	Delaware
WM Leasing of Texas, L.P.	Delaware
WM Leasing Services of Texas, LLC	Delaware
WM LNG, Inc.	Delaware
WM Logistics, LLC	Delaware
WM Middle Tennessee Environmental Center, L.L.C.	Delaware
WM Mobile Bay Environmental Center, Inc.	Delaware
WM National Field Services, LLC	Delaware
WM ND Energy Resources II, LLC	Delaware
WM ND Energy Resources, LLC	Delaware
WM Nevada Renewable Energy, L.L.C.	Delaware
WM North Broward, Inc.	Delaware
WM of North Dakota Energy Disposal Solutions, LLC	North Dakota
WM Organic Growth, Inc.	Delaware
WM Organics, LLC	Delaware
WM PA Holdings, LLC	Delaware
WM Pack-Rat of California, LLC	Delaware
WM Pack-Rat of Illinois, LLC	Delaware
WM Pack-Rat of Kentucky, LLC	Delaware
WM Pack-Rat of Maryland, LLC	Delaware
WM Pack-Rat of Massachusetts, LLC	Delaware
WM Pack-Rat of Michigan, LLC	Delaware
WM Pack-Rat of Nevada, LLC	Delaware
WM Pack-Rat of Ohio, LLC	Delaware
WM Pack-Rat of Rhode Island, LLC	Delaware
WM Pack-Rat, LLC	Delaware
WM Partnership Holdings, Inc.	Delaware
WM Phoenix Energy Resources, LLC	Delaware
WM PRG, L.L.C.	Colorado
WM Propane, LLC	Delaware
WM Quebec Inc.	Federally Chartered
WM RA Canada Inc.	Ontario
WM Recycle America, L.L.C.	Delaware
WM Recycle Europe, L.L.C.	Delaware
WM Recycling Latin America, LLC	Delaware
WM Refined Coal, LLC	Delaware
WM Renewable Energy, L.L.C.	Delaware
WM Resource Recovery & Recycling Center, Inc.	Delaware
WM Resources, Inc.	Pennsylvania
WM Safety Services, L.L.C.	Delaware
WM Security Services, Inc.	Delaware
WM Storage II, Inc.	Delaware
WM Storage, Inc.	Delaware
WM Texas Pack Rat, LLC	Delaware
WM Transport of Indiana, LLC	Indiana
WM Trash Monitor Plus, L.L.C.	Delaware
WM TX Energy Resources II, LLC	Delaware
WM TX Energy Resources, LLC	Delaware
WM Universal Solutions Private Limited	India
WM Waste, Inc.	Delaware
WM WY Energy Resources II, LLC	Delaware
WM WY Energy Resources III, LLC	Delaware
WM WY Energy Resources, LLC	Delaware
WMI Mexico Holdings, Inc.	Delaware
WMNA Container Recycling, L.L.C.	Delaware
WMRE of Kentucky, LLC	Delaware
WMRE of Michigan, LLC	Delaware
WMRE of Ohio, LLC	Delaware
WMRE of Ohio-American, LLC	Texas
WMSALSA, Inc.	Texas
Wolf Creek Landfill, LLC	Delaware
WSI Medical Waste Systems, Inc.	Delaware
WSI of New York, Inc.	Delaware
WTI Air Pollution Control Inc.	Delaware
WTI Rust Holdings Inc.	Delaware

Exhibit 22.1

GUARANTOR SUBSIDIARY

As of December 31, 2022, Waste Management Holdings, Inc. ("WM Holdings"), a Delaware corporation and a direct wholly-owned subsidiary of Waste Management, Inc. ("WMI"), has fully and unconditionally guaranteed all registered Senior Notes issued by WMI, as listed below. Additionally, WMI has fully and unconditionally guaranteed the 7.10% Senior Notes due 2026 issued by WM Holdings.

Principal Amount Issued	Interest Rate (per annum)	Issue Date	Maturity Date
$ 600 million	7.00%	7/17/1998	7/15/2028
$ 250 million	7.375%	1/21/2000	5/15/2029
$ 500 million	7.75%	1/3/2003	5/15/2032
$ 600 million	6.125%	11/17/2009	11/30/2039
$ 350 million	3.50%	5/8/2014	5/15/2024
$ 600 million	3.125%	2/26/2015	3/1/2025
$ 450 million	3.90%	2/26/2015	3/1/2035
$ 750 million	4.10%	2/26/2015	3/1/2045
$ 500 million	2.40%	5/16/2016	5/15/2023
$ 750 million	3.15%	11/8/2017	11/15/2027
$ 1 billion	4.15%	5/22/2019	7/15/2049
$ 500 million	0.75%	11/17/2020	11/15/2025
$ 500 million	1.15%	11/17/2020	3/15/2028
$ 1 billion	1.50%	11/17/2020	3/15/2031
$ 500 million	2.50%	11/17/2020	11/15/2050
$ 475 million	2.00%	5/12/2021	6/1/2029
$ 475 million	2.95%	5/12/2021	6/1/2041
$ 1 billion	4.15%	5/12/2022	4/15/2032

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-8 No. 333-240211) of Waste Management, Inc. pertaining to the issuance of shares of common stock pursuant to the Waste Management, Inc. Employee Stock Purchase Plan,

(2) Registration Statement (Form S-8 No. 333-195980) of Waste Management, Inc. pertaining to the issuance of shares of common stock pursuant to the 2014 Stock Incentive Plan,

(3) Registration Statement (Form S-8 No. 333-253683) of Waste Management, Inc. pertaining to the issuance of shares of common stock pursuant to the Waste Management Retirement Savings Plan,

(4) Registration Statement (Form S-4 No. 333-32805 and Post-Effective Amendment No. 1 thereto) of Waste Management, Inc.,

(5) Registration Statement (Form S-8 No. 333-159476 and Post-Effective Amendment No. 1 thereto) of Waste Management, Inc. pertaining to the issuance of shares of common stock pursuant to the 2009 Stock Incentive Plan, and

(6) Registration Statement (Form S-3 Automatic Shelf Registration No. 333-264493) of Waste Management, Inc.,

of our reports dated February 7, 2023, with respect to the consolidated financial statements of Waste Management, Inc. and the effectiveness of internal control over financial reporting of Waste Management, Inc. included in this Annual Report (Form 10-K) of Waste Management, Inc. for the year ended December 31, 2022.

/s/ ERNST & YOUNG LLP

Houston, Texas
February 7, 2023

**CERTIFICATION PURSUANT TO RULES 13a-14(a) AND 15d-14(a)
UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, James C. Fish, Jr., certify that:

1. I have reviewed this report on Form 10-K of Waste Management, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a — 15(e) and 15d — 15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a — 15(f) and 15d — 15(f)) for the registrant and have:

(a). Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b). Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c). Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d). Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

(a). All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b). Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

By: /s/ JAMES C. FISH, JR.

James C. Fish, Jr.
President and Chief Executive Officer

Date: February 7, 2023

Exhibit 31.2

**CERTIFICATION PURSUANT TO RULES 13a-14(a) AND 15d-14(a)
UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Devina A. Rankin, certify that:

1. I have reviewed this report on Form 10-K of Waste Management, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a — 15(e) and 15d — 15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a — 15(f) and 15d — 15(f)) for the registrant and have:

(a). Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b). Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c). Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d). Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

(a). All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b). Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

By: /s/ DEVINA A. RANKIN
Devina A. Rankin
Executive Vice President and
Chief Financial Officer

Date: February 7, 2023

Exhibit 32.1

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

In connection with the Annual Report of Waste Management, Inc. (the “Company”) on Form 10-K for the period ended December 31, 2022 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, James C. Fish, Jr., Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By: /s/ JAMES C. FISH, JR.
James C. Fish, Jr.
President and Chief Executive Officer

February 7, 2023

Exhibit 32.2

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

In connection with the Annual Report of Waste Management, Inc. (the “Company”) on Form 10-K for the period ended December 31, 2022 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Devina A. Rankin, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By: /s/ DEVINA A. RANKIN
Devina A. Rankin
Executive Vice President and
Chief Financial Officer

February 7, 2023

Mine Safety Disclosures

This exhibit contains certain specified disclosures regarding mine safety required by section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K. Certain of our subsidiaries have permits for surface mining operations that are incidental to excavation work for landfill development.

During the year ended December 31, 2022, we did not receive any of the following: (a) a citation from the U.S. Mine Safety and Health Administration ("MSHA") for a violation of mandatory health or safety standards that could significantly and substantially contribute to the cause and effect of a coal or other mine safety or health hazard under section 104 of the Federal Mine Safety and Health Act of 1977 (the "Mine Safety Act"); (b) an order issued under section 104(b) of the Mine Safety Act; (c) a citation or order for unwarrantable failure of the mine operator to comply with mandatory health or safety standards under section 104(d) of the Mine Safety Act; (d) a flagrant violation under section 110(b)(2) of the Mine Safety Act; (e) an imminent danger order under section 107(a) of the Mine Safety Act or (f) a proposed assessment from the MSHA.

In addition, during the year ended December 31, 2022, we had no mining-related fatalities, we had no pending legal actions before the Federal Mine Safety and Health Review Commission involving a coal or other mine, and we did not receive any written notice from the MSHA involving a pattern of violations, or the potential to have such a pattern, of mandatory health or safety standards that are of such nature as could have significantly and substantially contributed to the cause and effect of coal or other mine health or safety hazards under section 104(e) of the Mine Safety Act.