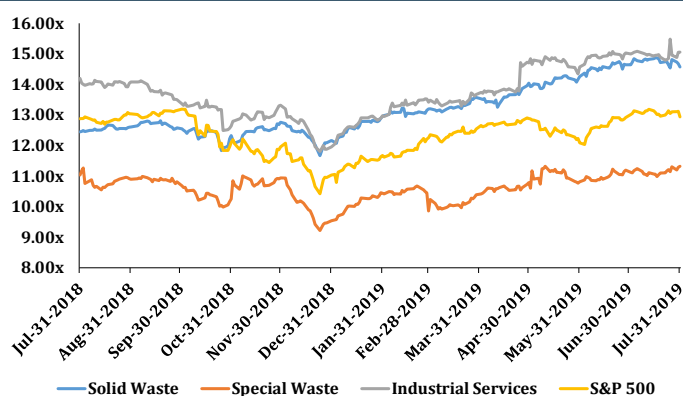




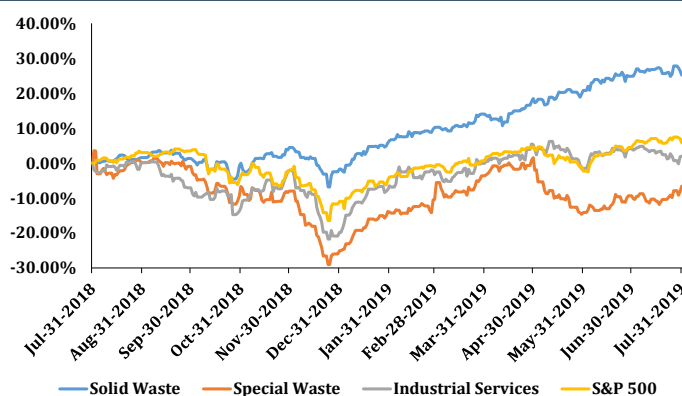
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Environmental Services LTM TEV/EBITDA



Environmental Services LTM Share Price (Shown as % change)



Indices Performance (% change)

	July 2019	LTM		July 2019	LTM
S&P 500	0.6%	5.8%	Solid Waste	0.3%	25.2%
Dow Jones	0.6%	5.7%	Special Waste	2.9%	(6.6%)
NASDAQ	1.1%	6.6%	Industrial Services	(2.1%)	2.0%

(Source: CapitalIQ)

Largest Environmental Services Movers and Losers (largest % changes in the month of July)

Casella Waste Systems, Inc.	10.0%	Fuel Tech, Inc.	(23.6%)
Clean Harbors, Inc.	9.4%	Quest Resource Holding Corporation	(13.0%)
US Ecology, Inc.	6.9%	Perma-Fix Environmental Services, Inc.	(4.6%)
Heritage-Crystal Clean, Inc.	6.6%	Ecology & Environment, Inc.	(4.6%)
Cypress Energy Partners, L.P.	5.7%	Industrial Services of America, Inc.	(4.3%)

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Select Public Trading Statistics (as of 7/31/2019)

Solid Waste:

(\$ in millions, except per share data)

Company	Share Price 07/31/2019	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Waste Management, Inc.	WM	\$117.00	98.4%	\$49,635	\$60,514	4.0x	14.2x	22.0x	28.6x	23.5x	28.5x	38.1%	18.2%	28.2%	2.5x
Republic Services, Inc.	BSG	\$88.65	97.8%	\$28,435	\$37,094	3.6x	13.5x	22.4x	27.4x	24.5x	28.0x	38.9%	16.9%	27.7%	3.1x
Waste Connections, Inc.	WCN	\$90.72	92.6%	\$23,920	\$28,054	5.4x	17.4x	31.5x	43.0x	33.8x	37.1x	41.2%	17.3%	31.2%	2.6x
Advanced Disposal Services, Inc.	ADSW	\$32.37	98.1%	\$2,879	\$4,780	3.0x	12.9x	59.7x	NM	49.1x	90.8x	34.7%	4.9%	23.1%	5.1x
Casella Waste Systems, Inc.	CWST	\$43.60	98.8%	\$2,060	\$2,598	3.8x	20.8x	49.1x	222.7x	52.6x	55.1x	31.0%	7.8%	18.4%	4.4x
Mean				\$21,386	\$26,608	4.0x	15.7x	36.9x	80.4x	36.7x	47.9x	36.8%	13.0%	25.7%	3.5x
Median				\$23,920	\$28,054	3.8x	14.2x	31.5x	35.8x	33.8x	37.1x	38.1%	16.9%	27.7%	3.1x
High				\$49,635	\$60,514	5.4x	20.8x	59.7x	222.7x	52.6x	90.8x	41.2%	18.2%	31.2%	5.1x
Low				\$2,060	\$2,598	3.0x	12.9x	22.0x	27.4x	23.5x	28.0x	31.0%	4.9%	18.4%	2.5x

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months

Special Waste:

(\$ in millions, except per share data)

Company	Share Price 07/31/2019	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Stericycle, Inc.	SRCL	\$45.96	64.3%	\$4,184	\$7,342	2.1x	11.2x	18.8x	NM	14.3x	20.8x	38.1%	9.5%	17.4%	5.4x
Clean Harbors, Inc.	CLH	\$77.81	99.5%	\$4,347	\$5,855	1.7x	11.7x	29.3x	51.8x	NM	NM	30.3%	6.0%	14.9%	3.0x
Darling Ingredients Inc.	DAR	\$20.33	89.9%	\$3,349	\$5,136	1.5x	10.1x	27.5x	155.3x	62.6x	31.8x	21.5%	2.4%	12.1%	4.2x
US Ecology, Inc.	ECOL	\$63.63	82.5%	\$1,401	\$1,743	3.0x	14.6x	23.4x	29.1x	30.5x	30.0x	29.8%	12.6%	20.6%	2.8x
Sharps Compliance Corp.	SMED	\$3.71	88.0%	\$60	\$56	1.3x	NM	NM	NM	NM	NM	29.9%	1.0%	4.7%	NM
Perma-Fix Environmental Services, Inc.	PESI	\$3.73	74.6%	\$45	\$50	1.0x	135.4x	NM	NM	NM	NM	21.5%	(1.9%)	0.8%	16.0x
Mean				\$2,231	\$3,364	1.8x	36.6x	24.7x	78.7x	35.8x	27.5x	28.5%	4.9%	11.8%	6.3x
Median				\$2,375	\$3,440	1.6x	11.7x	25.4x	51.8x	30.5x	30.0x	29.9%	4.2%	13.5%	4.2x
High				\$4,347	\$7,342	3.0x	135.4x	29.3x	155.3x	62.6x	31.8x	38.1%	12.6%	20.6%	16.0x
Low				\$45	\$50	1.0x	10.1x	18.8x	29.1x	14.3x	20.8x	21.5%	-1.9%	0.8%	2.8x

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months

Industrial Services:

(\$ in millions, except per share data)

Company	Share Price 07/31/2019	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Covanta Holding Corporation	CVA	\$17.22	93.7%	\$2,251	\$4,807	2.6x	15.2x	49.0x	NM	NM	NM	29.0%	4.9%	16.5%	8.2x
Heritage-Crystal Clean, Inc.	HCCI	\$28.05	96.7%	\$650	\$698	1.6x	18.0x	32.2x	49.2x	38.9x	28.5x	20.5%	5.1%	9.1%	1.2x
CECO Environmental Corp.	CECE	\$9.23	93.8%	\$324	\$392	1.1x	12.8x	21.8x	NM	31.1x	19.7x	32.6%	5.5%	8.9%	2.2x
Cypress Energy Partners, L.P.	CELP	\$7.70	91.7%	\$93	\$195	0.6x	8.6x	11.3x	10.8x	NM	NM	13.3%	5.5%	6.9%	3.1x
Ecology & Environment, Inc.	EEI	\$10.40	74.6%	\$45	\$35	0.4x	NM	NM	NM	NM	NM	43.2%	(2.4%)	(1.2%)	10.1x
Fuel Tech, Inc.	FTKX	\$1.07	35.0%	\$26	\$20	0.4x	26.0x	NM	NM	NM	NM	37.7%	0.9%	2.7%	NM
Quest Resource Holding Corporation	QRHC	\$2.41	77.7%	\$37	\$42	0.4x	30.1x	NM	NM	NM	NM	17.6%	(0.2%)	1.3%	3.6x
Industrial Services of America, Inc.	ISAA	\$0.94	34.9%	\$8	\$22	0.4x	11.5x	NM	NM	NM	NM	3.0%	(3.5%)	(0.0%)	NM
Mean				\$429	\$776	0.9x	17.5x	28.6x	30.0x	35.0x	24.1x	24.6%	2.0%	5.5%	4.7x
Median				\$69	\$119	0.5x	15.2x	27.0x	30.0x	35.0x	24.1x	24.8%	2.9%	4.8%	3.4x
High				\$2,251	\$4,807	2.6x	30.1x	49.0x	49.2x	38.9x	28.5x	43.2%	5.5%	16.5%	10.1x
Low				\$8	\$20	0.4x	8.6x	11.3x	10.8x	31.1x	19.7x	3.0%	-3.5%	-1.2%	1.2x

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months





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Select Mergers and Acquisitions & Capital Raising News

❖ ADS Stockholders Approve Waste Management Acquisition

July 1, 2019 – Advanced Disposal stockholders voted to adopt the merger agreement in which the Company would be acquired by an indirect, wholly-owned subsidiary of Waste Management Inc. in an all-cash transaction, which was first announced on April 15. During the special meeting, 76,362,871 shares voted in favor of the proposal to adopt the merger agreement, representing approximately 85.9% of the outstanding shares of Advanced Disposal's common stock entitled to vote at the special meeting. The Company will file the final vote results with the Securities and Exchange Commission. Under the terms of the merger agreement, Advanced Disposal stockholders will be entitled to receive \$33.15 per share in cash upon completion of the merger, which remains subject to the satisfaction of customary closing conditions. The transaction is expected to close by the first quarter 2020. Upon closing of the transaction, Advanced Disposal common stock will be de-listed from the New York Stock Exchange and de-registered under the Securities Exchange Act of 1934, as amended.

❖ GFL to Acquire Canada Fibers

July 8, 2019 – GFL Environmental Inc. has entered into a definitive agreement to acquire Canada Fibers Ltd. and its affiliates. The transaction, which is expected to close in the third quarter of 2019, is subject to customary regulatory approvals. Based in Toronto, Canada Fibers has been an operator of materials recovery facilities (MRFs) for more than 28 years. Canada Fibers provides recycling processing services to municipalities across Ontario through its single stream Arrow Road facility in Toronto and to its institutional, commercial and industrial customers. Additionally, Canada Fibers has been awarded the contract to design, build and operate an advanced single stream MRF in Winnipeg, Canada, which will commence operations in the fourth quarter of 2019.

❖ GFL Environmental Acquires Soil Safe

July 10, 2019 – Toronto-based GFL Environmental Inc. has acquired the Soil Safe group of companies. Since its inception in 1989, Soil Safe has recycled more than 30 million tons of non-hazardous petroleum contaminated soil for reuse outside of landfills. At its facilities in New Jersey and Maryland, Soil Safe recycles contaminated soil into an engineered soil product that is used in a wide range of applications, including capping material, road base and structural and general fill. According to GFL, Soil Safe's California facility is the largest non-hazardous thermal treatment operation in the state that produces a recycled soil product for reuse in both brownfield and greenfield development applications.

❖ Casella Acquires TAM Waste Management

July 19, 2019 – Trevor Mance, a 2016 Waste360 40 Under 40 award recipient and owner of TAM Waste Management in Vermont, has sold his waste hauling, recycling and composting businesses to Casella Waste Systems. Mance will continue running operations at a local division under Casella. The acquisition was effective as of June 1 and included waste hauling operations in communities around the county, a composting facility in Bennington and a recycling facility in Pownal.

❖ GFL Environmental Files IPO Statement

July 22, 2019 – Toronto-based GFL Environmental Inc.—together with GFL Environmental Holdings Inc.—has filed a registration statement with the U.S. Securities and Exchange Commission and a preliminary base PREP prospectus for a proposed initial public offering (IPO) of subordinate voting shares concurrently in the United States and Canada. The number of shares to be offered and the price range for the IPO have not yet been determined. Last month, GFL announced its plans to raise up to \$1.98 billion Canadian (\$1.5 billion USD) for an IPO this fall. The registration statement relating to the proposed IPO has not yet become effective, and the preliminary base PREP prospectus is still subject to completion or amendment.

❖ Valet Living Expands with WasteRetriever Acquisition

July 23, 2019 – Valet Living, an amenities provider to the multifamily housing industry has acquired the doorstep trash and recycling collection company WasteRetriever LLC. Valet Living explained that its interest in WasteRetriever stems from many parallels between the two companies, including alignment on core values. WasteRetriever services approximately 30,000 apartment homes in nine states, all of which will move to the Valet Living portfolio. WasteRetriever has approximately 150 associates including its founder, John Lis, who will transition to become Valet Living associates. The acquisition will further enhance its national presence and increase strong synergies in its primary markets, given WasteRetriever's presence in Arizona, Colorado, Florida, Georgia, Kentucky, Maryland, North Carolina, South Carolina and Texas.

❖ Sierra Energy Closes \$33 Million Series A Funding Round

July 30, 2019 – Sierra Energy Corporation has closed a \$33 million Series A investment round led by Breakthrough Energy Ventures and joined by Cox Investment Holdings, Inc., BNP Paribas SA, Twynam Investments Pty Ltd, Formica Ventures AB and The March Fund I LP. The funding will help Sierra Energy further develop and commercialize its FastOx gasification technology, which converts waste into clean, renewable energy and fuels without burning. Sierra Energy's FastOx



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technology, developed by Sierra Energy and supported by grant funding from the Department of Defense and the California Energy Commission, uses oxygen and steam to heat waste to 4,000 degrees Fahrenheit (2,200 degrees Celsius). At this temperature, waste breaks down at the molecular level, converting organic material into an energy-dense syngas and allowing the recovery of inorganic material as either a non-leaching stone or molten metal. Sierra Energy's FastOx waste-to-energy (WTE) technology, which is modular and can be scaled to large size, does not produce any process emissions and all outputs are saleable. The company's first commercial-scale demonstration facility is located at U.S. Army Garrison Fort Hunter Liggett in Monterey County, California.

Select Industry News

❖ Enforcement of NYC Foam Ban Begins

July 2, 2019 – The City of New York Department of Sanitation (DSNY) began enforcing its foam ban law on July 1—the end of its six-month warning period. The foam ban, which officially took effect January 1, prohibits New York City stores and foodservice businesses from offering, selling or possessing single-use expanded polystyrene, commonly known as Styrofoam, food containers such as takeout clamshells, cups, plates, bowls, coolers and trays. Additionally, manufacturers and stores may no longer sell or offer for sale loose fill packaging, typically known as “packing peanuts,” in the city. Single-use foam items are not recyclable and are instead collected as trash in the city. The ban encourages businesses to use one of many alternative packaging options, including compostable products, or recyclable paper, plastic and aluminum.

❖ Carbios Granted U.S. Patent Focused on Recycling PET Waste

July 5, 2019 – The United States Patent and Trademark Office (USPTO) has issued a Notice of Allowance for an additional U.S. patent for Carbios' process of recycling polyethylene terephthalate (PET) plastic waste. This patent application recognizes Carbios for its invention of a proprietary method of recycling complex plastics, including colored, opaque and multilayer products containing a mix of PET and at least one additional component (e.g., polyolefins, vinyl polymers, rubber, cotton or nylon fibers, paper, aluminum, starch, wood, etc.). This patent is the second one in the U.S. that has been applied to Carbios' recycling technology and protects Carbios' innovation through 2033. In addition to this patent, Carbios owns 116 titles worldwide representing 30 patent families, six of which protect its proprietary method of recycling in full and five of which are related to enzymes that degrade PET.

❖ TerraCycle Partners with EZ Products to Recycle Cigarettes

July 9, 2019 – TerraCycle has joined forces with EZ Products CLS for “The Butt Stops Here” initiative. Through the initiative, golf carts at Rolling Hills, a golf course in Tempe, Arizona, have been outfitted with cup ash trays, and collected cigarette waste will be recycled into new products through TerraCycle. As the world's most littered item, billions of cigarette butts get tossed on shorelines, park grounds and sidewalks across the United States every year. If not addressed, cigarette waste persists for several years and poses a serious environmental threat as toxic chemicals leach into soil and bodies of water become contaminated with substances hazardous to marine life. To prevent cigarette litter pollution, The Butt Stops Here program equipped seven golf carts at Rolling Hills with custom-made cigarette receptacles through a grant provided by Keep America Beautiful (KAB) and with assistance from Keep Phoenix Beautiful, a KAB affiliate. After being shipped to TerraCycle, the waste collected through the program is processed into plastic pellets for use in a variety of recycled products, and the remaining tobacco is composted.

❖ Senate Approves Wright to Head EPA's Waste Programs

July 12, 2019 – After a 493-day delay and opposition from Senate Democrats, the Senate approved the former Dow Chemical lawyer to head EPA's Superfund and waste programs. Following a Senate vote on July 11, former Dow Chemical Co. managing counsel Peter C. Wright received the Senate's approval to head the U.S. Environmental Protection Agency's (EPA) Superfund and waste programs. Wright's approval, however, did not come without controversy and opposition from Senate Democrats. Some Democratic Senators claimed Wright and the EPA haven't done enough to address contamination from per- and polyfluoroalkyl substances, known as PFAS, in drinking water across the U.S. PFAS compounds could cause adverse health effects, including developmental harm to fetuses, testicular and kidney cancers, liver tissue damage, immune system or thyroid effects and changes in cholesterol, according to the EPA.

❖ 12 New Companies Join Alliance to End Plastic Waste

July 16, 2019 – The Alliance to End Plastic Waste (AEPW) recently welcomed 12 new companies from across the plastics value chain. The new members expand both the global footprint of the alliance and the participation of companies across the plastics value chain seeking to develop and bring to scale solutions to help eliminate plastic waste in the environment. Launched in January 2019 with 27 founding members, the alliance now includes 39 companies around the world that make, use, sell, process, collect and recycle plastics. This includes chemical and plastic manufacturers, consumer goods companies, retailers, converters and waste management companies. Member companies have committed more than \$1.0 billion with the goal of investing \$1.5 billion over the next five years to help end plastic waste in the environment. The World Business Council for Sustainable Development is a founding strategic partner.

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❖ U.S. Requests Nations to Omit Plastic Trade Restrictions

July 22, 2019 – In a letter to the Organization of Economic Cooperation and Development (OECD) earlier this month, U.S. Environmental Protection Agency (EPA) Administrator Andrew Wheeler requested that the nations buying U.S. recyclables refrain from implementing trade restrictions outlined in the Basel Convention. Back in May, the U.N. Basel Convention voted to add new measures to restrict and bring disclosure to plastic waste trade. Under the measure, countries now have the right to be notified in advance about plastic waste trade shipments and have the right to refuse those shipments.

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