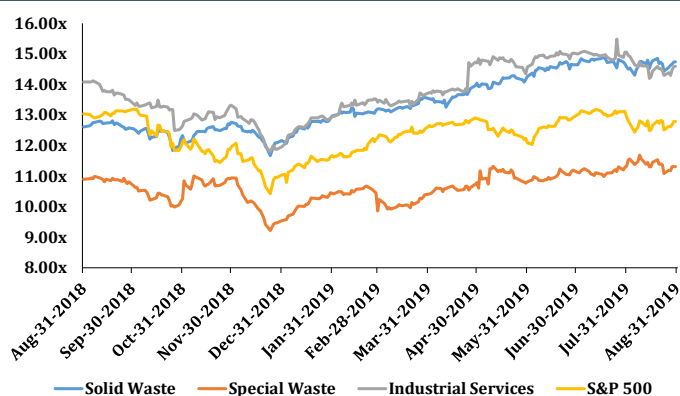


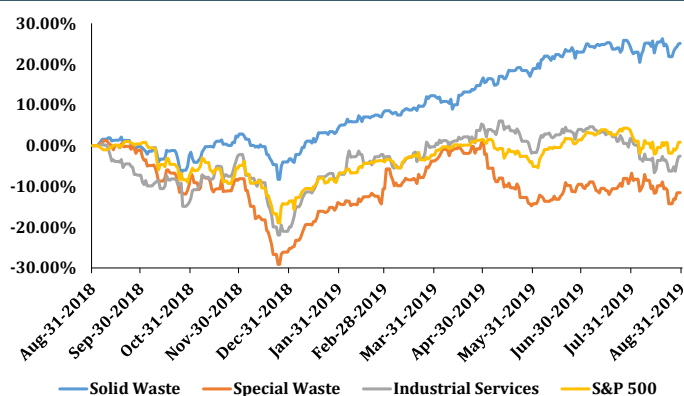
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Environmental Services LTM TEV/EBITDA



Environmental Services LTM Share Price (Shown as % change)



Indices Performance (% change)

	<u>August 2019</u>	<u>LTM</u>		<u>August 2019</u>	<u>LTM</u>
S&P 500	(1.9%)	0.9%	Solid Waste	1.5%	25.1%
Dow Jones	(1.8%)	1.7%	Special Waste	(5.1%)	(11.6%)
NASDAQ	(2.6%)	(1.8%)	Industrial Services	(4.3%)	(2.6%)

(Source: CapitalIQ)

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

Ecology & Environment, Inc.	45.5%	CECO Environmental Corp.	(24.7%)
Industrial Services of America, Inc.	22.6%	Fuel Tech, Inc.	(17.7%)
Quest Resource Holding Corporation	10.0%	Heritage-Crystal Clean, Inc.	(12.7%)
Perma-Fix Environmental Services, Inc.	7.0%	Darling Ingredients Inc.	(8.5%)
Casella Waste Systems, Inc.	4.4%	Clean Harbors, Inc.	(5.5%)

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Select Public Trading Statistics (as of 8/31/2019)

Solid Waste:

(\$ in millions, except per share data)

Company	Share Price 08/31/2019	% 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	\$119.35	99.0%	\$50,632	\$61,511	4.0x	14.4x	22.4x	29.2x	23.5x	28.6x	38.1%	18.2%	28.2%	2.5x
Republic Services, Inc.	BSG	\$89.25	98.5%	\$28,627	\$37,287	3.7x	13.5x	22.5x	27.6x	24.5x	28.1x	38.9%	16.9%	27.7%	3.1x
Waste Connections, Inc.	WCN	\$91.90	93.8%	\$24,225	\$28,359	5.5x	17.6x	31.8x	43.6x	33.8x	37.9x	41.2%	17.3%	31.2%	2.6x
Advanced Disposal Services, Inc.	ADSW	\$32.42	98.2%	\$2,883	\$4,784	3.0x	12.9x	59.8x	NM	49.1x	90.8x	34.7%	4.9%	23.1%	5.1x
Casella Waste Systems, Inc.	CWST	\$45.50	95.3%	\$2,165	\$2,729	3.9x	21.2x	50.2x	110.6x	52.6x	56.0x	31.0%	7.8%	18.4%	4.4x
Mean				\$21,707	\$26,934	4.0x	15.9x	37.3x	52.7x	36.7x	48.3x	36.8%	13.0%	25.7%	3.5x
Median				\$24,225	\$28,359	3.9x	14.4x	31.8x	36.4x	33.8x	37.9x	38.1%	16.9%	27.7%	3.1x
High				\$50,632	\$61,511	5.5x	21.2x	59.8x	110.6x	52.6x	90.8x	41.2%	18.2%	31.2%	5.1x
Low				\$2,165	\$2,729	3.0x	12.9x	22.4x	27.6x	23.5x	28.1x	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 08/31/2019	% 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.	SICL	\$44.89	71.5%	\$4,090	\$7,284	2.2x	12.4x	22.7x	NM	14.3x	21.0x	38.1%	9.5%	17.4%	5.4x
Clean Harbors, Inc.	CLH	\$73.55	91.9%	\$4,109	\$5,617	1.7x	11.2x	28.1x	49.0x	NM	NM	30.3%	6.0%	14.9%	3.0x
Darling Ingredients, Inc.	DAR	\$18.60	82.2%	\$3,064	\$4,837	1.5x	9.4x	25.5x	40.3x	62.6x	31.8x	21.5%	2.4%	12.1%	4.2x
US Ecology, Inc.	ECOL	\$60.57	78.5%	\$1,333	\$1,671	2.8x	13.6x	22.2x	26.5x	30.5x	30.0x	29.8%	12.6%	20.6%	2.8x
Shaps Compliance Corp.	SMED	\$3.85	86.2%	\$62	\$59	1.3x	NM	132.2x	NM	NM	NM	29.9%	1.0%	4.8%	NM
Perma-Fix Environmental Services, Inc.	PESI	\$3.99	80.6%	\$48	\$54	1.0x	123.1x	NM	NM	NM	NM	21.5%	(1.9%)	0.8%	16.0x
Mean				\$2,118	\$3,254	1.7x	34.0x	46.1x	38.6x	35.8x	27.6x	28.5%	4.9%	11.8%	6.3x
Median				\$2,199	\$3,254	1.6x	12.4x	40.3x	30.5x	30.0x	29.9%	4.2%	13.5%	4.2x	
High				\$4,109	\$7,284	2.8x	123.1x	132.2x	49.0x	62.6x	31.8x	38.1%	12.6%	20.6%	16.0x
Low				\$48	\$54	1.0x	9.4x	22.2x	26.5x	14.3x	21.0x	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 08/31/2019	% 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	\$17.20	93.6%	\$2,248	\$4,804	2.6x	15.2x	49.0x	NM	NM	NM	29.0%	4.9%	16.5%	8.2x
Heritage-Crystal Clean, Inc.	HCCI	\$24.50	84.5%	\$568	\$616	1.4x	15.9x	28.4x	43.0x	38.9x	28.5x	20.5%	5.1%	9.1%	1.2x
CECO Environmental Corp.	CECE	\$6.95	70.6%	\$245	\$312	0.9x	10.0x	16.1x	NM	31.1x	19.7x	32.6%	5.5%	8.9%	2.2x
Cypress Energy Partners, L.P.	CELP	\$7.41	91.5%	\$89	\$193	0.5x	7.4x	9.3x	9.5x	NM	NM	13.3%	5.5%	6.9%	3.1x
Ecology & Environment, Inc.	EEI	\$15.13	99.7%	\$66	\$55	0.6x	NM	NM	NM	NM	NM	43.2%	(2.4%)	(1.2%)	10.1x
Fuel Tech, Inc.	FTEK	\$0.88	28.8%	\$21	\$11	0.2x	8.0x	24.8x	NM	NM	NM	37.7%	0.9%	2.7%	(7.6x)
Quest Resource Holding Corporation	QRHC	\$2.65	85.5%	\$41	\$46	0.4x	33.7x	NM	NM	NM	NM	17.6%	(0.2%)	1.3%	3.6x
Industrial Services of America, Inc.	ISDA	\$1.15	46.9%	\$9	\$24	0.4x	NM	NM	NM	NM	NM	3.0%	(3.5%)	(0.0%)	(508.6x)
Mean				\$411	\$758	0.9x	15.0x	25.5x	26.2x	35.0x	24.1x	24.6%	2.0%	5.5%	-61.0x
Median				\$77	\$124	0.6x	12.6x	24.8x	26.2x	35.0x	24.1x	24.8%	2.9%	4.8%	2.7x
High				\$2,248	\$4,804	2.6x	33.7x	49.0x	43.0x	38.9x	28.5x	43.2%	5.5%	16.5%	10.1x
Low				\$9	\$11	0.2x	7.4x	9.3x	9.5x	31.1x	19.7x	3.0%	-3.5%	-1.2%	(508.6x)

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

❖ **GFL Acquires Alpine Group's Vancouver Island Solid Waste Business**

August 6, 2019 – Toronto-based GFL Environmental Inc. has acquired the Vancouver Island solid waste operations of Evergreen Industries Ltd., part of the Alpine Group. Founded in 1984, the Alpine Group's operations on Vancouver Island include residential, commercial and industrial solid waste and recycling collection and hauling, storage container rentals, as well as recyclable materials drop-off and sorting centers in the Capital Regional District of Victoria and in Nanaimo.

❖ **USA Waste of California Acquires Harvest Power Compost Facilities**

August 9, 2019 – USA Waste of California, a Waste Management company, has acquired two Harvest Power California compost facilities located in Tulare and Lathrop, California. Each compost site is permitted to take up to 156,000 tons of organics per year. Landscape, food waste and manure are accepted at the Tulare location. The Tulare site offers compost services to Tulare County including Visalia, Porterville and Dinuba and surrounding communities. Landscape and food waste are accepted at the Lathrop location. This site serves Lathrop, Stockton, Tracy, Manteca, Ripon, Salida, Modesto, Ceres, Escalon, Riverbank, Oakdale, Lodi, Patterson, Livermore, Pleasanton, Fremont and surrounding communities.

❖ **Stella Environmental Acquires Jack Herod Trucking**

August 15, 2019 – Houston-based Stella Environmental Holdings, Inc., a Hidden Harbor Capital Partners portfolio company that provides transfer station management and municipal waste logistics services, has purchased Jack Herod Trucking, LLC, expanding its geographic footprint, diversifying its customer base and strengthening its existing facility management, hauling and loading capabilities. Headquartered in Dallas, Texas, Jack Herod is a provider of transfer station management and ancillary waste logistics services in the Dallas Fort Worth (DFW) market. Jack Herod will provide significant density to Stella's existing network in DFW.

❖ **J.F. Lehman & Company Acquires Lone Star Disposal**

August 16, 2019 – An investment affiliate of J.F. Lehman & Company (JFLCO), a middle-market private equity firm focused on the aerospace, defense, maritime, government and environmental sectors, has acquired Lone Star Disposal, Delta Waste Services and Tanner Road Facility. The acquisition represents JFLCO's 32nd sponsored platform investment since the firm's inception. Lone Star is a vertically integrated provider of construction and demolition (C&D) and municipal solid waste (MSW) disposal and related environmental services in Houston. The Company's service platform utilizes an asset base consisting of a C&D landfill, a MSW transfer station, a C&D recycling facility and a C&D collection fleet. The Company's highly diversified customer base includes regional and nationwide C&D and MSW haulers and C&D contractors serving the greater Houston metropolitan area.

❖ **Winters Bros. Acquires Harbor Carting and Empire Waste Removal**

August 26, 2019 – Winters Bros. Waste Systems has purchased the assets of Harbor Carting and Empire Waste Removal with operations based in Huntington, New York. Eddie Colatosti and Ronnie Colatosti, two of the owners of Harbor Carting and Empire Waste, will assist with the transition to Winters Bros. and join the Winters Bros. team. All employees of Empire and Harbor will work for Winters Bros. as the Company continues to grow on Long Island. In addition to providing solid waste collection and recycling services, Winters Bros. operates nine transfer stations and recycling centers on Long Island.

❖ **Valicor Environmental Services Acquires Action Environmental**

August 28, 2019 – Valicor Environmental Services, one of North America's largest providers of non-hazardous wastewater treatment services, has expanded its network of wastewater processing facilities through the acquisition of Action Environmental. Action operates a centralized wastewater treatment (CWT) facility in Fort Wayne, Indiana. The acquisition will enable Valicor to enhance its existing Midwest footprint and strengthen its position in the region. Including the Action acquisition, Valicor has increased its number of centralized wastewater treatment plants from five to thirteen in just over 24 months as it focuses on growing its national footprint.

❖ **Meridian Waste Acquires Two Haulers**

August 30, 2019 – Meridian Waste, an integrated, non-hazardous solid waste services company, acquired the contract assets of Waste Solutions and A&L Waste Removal, Inc. this month. The Company is looking to grow exponentially in the Central Savannah River Area marketplace as it has the local experience to provide quality collection and disposal services to an expanding residential and business community. The acquisitions will fold in with Meridian Waste's existing operations and expand collection services to Columbia County and Hephzibah, Georgia.



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Select Industry News

❖ **Plastics Industry Association Names New President, CEO**

August 2, 2019 – The Plastics Industry Association (PLASTICS) has named Tony Radoszewski president and CEO. Radoszewski, a plastics industry veteran with nearly 40 years of experience in the field, joins PLASTICS after serving since 2006 as the president of the Plastics Pipe Institute (PPI). In 1995, Radoszewski joined Advanced Drainage Systems Inc., the world's largest manufacturer of plastic drainage pipe, as director of marketing and business development, a position he held for seven years before being named president of Wentworth Group International, a business-to-business firm specializing in market development for industrial clients. In 2006, Radoszewski was recruited to become the president of PPI. During his 13-year tenure there, he led efforts that increased membership, enhanced member services, improved cash flow and profitability for the association while also strengthening relationships with key stakeholders, including government.

❖ **Otto Environmental Names Michael Costello as President**

August 2, 2019 – Otto Environmental Systems North America Inc. has named Michael P. Costello the Company's new president. Costello takes over the leadership role from departing CEO Dave Piejak. Callidus Capital Corporation, the owner of Otto, appointed Costello to strategically align with the customers it serves in the waste and recycling industry as it continues to grow its market share. Costello has more than two-and-a-half decades of leadership experience in the waste industry and is committed to what originally made Otto a force in the industry: the manufacturing, sales and service of waste containers.

❖ **DSNY Promotes New Three-star Chiefs**

August 6, 2019 – City of New York Department of Sanitation (DSNY) Commissioner Kathryn Garcia announced the promotion of three new Three-star Chiefs, as well as the new head of its Operations Management Division. Garcia announced the promotion of Anthony Bianculli to head the Bureau of Information Technology, which manages DSNY's computing and technology functions. Garcia announced the promotion of Paul Brown to head DSNY's Personnel Management Division, which monitors, controls and supports uniform and civilian staffing needs for the Bureau of Cleaning and Collection. Garcia promoted Garrett O'Reilly to head DSNY's Collection Office, which is responsible for daily oversight of all collection activities, including trash, recycling, organic material and all other waste. Garcia also announced that Javier Lojan will serve as the head of the department's Operations Management Division, the bureau responsible for monitoring, analyzing and strategizing ways to improve operations, productivity and performance.

❖ **DASANI Takes New Steps to Reduce Plastic Waste**

August 15, 2019 – DASANI launched a robust pipeline of sustainable packaging innovations in support of The Coca-Cola Company's global World Without Waste goal to make its bottles and cans with an average of 50 percent recycled material by 2030. Updates to DASANI's packaging lineup are designed to reduce plastic waste and increase the use of recycled and renewable materials in the United States, while ensuring that all DASANI bottles continue to be fully recyclable. DASANI has been at the forefront of sustainable innovation since 2009 with the launch of the first fully recyclable bottle made partially from plants (PlantBottle). In 2018, the brand continued its sustainability journey by becoming the first major water brand to debut a package-less water dispensing unit with DASANI PureFill. Earlier this year, The Coca-Cola Company expanded access to the PlantBottle IP to encourage industrywide adoption of PlantBottle.

❖ **New Jersey Legislators Work to Fix Statewide Recycling System**

August 19, 2019 – Legislators in New Jersey are examining ways to fix the state's recycling system, where many communities are paying more to recycle than dispose of their trash. The state seeks to not abandon three decades of recycling mandates but rather to take a new look at how to redevelop recycling markets and create new incentives to revive the sector. A hearing before the legislature's top environmental committees is expected to lead to new bills to ban single-use plastic bags, straws and polystyrene foam containers, a measure vetoed by Governor Phil Murphy last year, and to recycle food waste, a bill currently on his desk.

❖ **Alliance to End Plastic Waste Appoints Duer as President & CEO**

August 23, 2019 – The Alliance to End Plastic Waste (AEPW) has named Jacob Duer to serve as the inaugural president and CEO of the newly formed nonprofit, effective October 1. Duer joins AEPW from the United Nations (U.N.), where he most recently served as a program director for the U.N. Environment Programme. In this newly created role, Duer will advance AEPW's mission to develop, deploy and bring to scale solutions that will minimize and manage plastic waste and promote solutions for used plastics. This includes plastic reuse, recovery and recycling to keep it out of the environment. Since launching in January, the alliance has initiated projects focused on: river renewal, municipal and city partnerships, idea incubation and IT infrastructure.



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❖ **EPA Amends Emission Guidelines for MSW Landfills**

August 27, 2019 – The U.S. Environmental Protection Agency (EPA) is amending the 2016 Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (MSW Landfills EG). The general requirements for state and federal plans implementing emission guidelines (EG) are referred to as implementing regulations, which are cross referenced in the MSW Landfills EG. In a separate regulatory action titled “Revisions to Emission Guidelines Implementing Regulations,” the EPA finalized changes to modernize the implementing regulations governing EG under a new subpart. This action updates the cross references to the implementing regulations in the MSW Landfills EG to harmonize with the new requirements for state and federal plans. The final rule became effective on September 6, 2019.

❖ **Micron Waste Receives Health Canada Cannabis Research License**

August 30, 2019 – Micron Waste Technologies Inc., a developer of waste treatment systems for cannabis and food waste, has received a Health Canada Cannabis Research License to develop its aerobic waste digester technology for the treatment of cannabis waste. The license, effective for five years beginning August 23, will be used to further develop the first waste treatment system that alters and denatures cannabis waste while recovering reusable water. The Company's research and development (R&D) team, led by CTO and Founder Bob Bhushan, will employ the new license to accelerate and expand the cannabis waste and wastewater programs, both through its Cannavore waste processing system and through its developing facility wastewater management program at the Micron Waste Innovation Centre in Delta, British Columbia.

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