

# Special Report of the Receiver

Regarding a Short-term Construction Loan to Complete Cell Three at  
the Layon Landfill

Civil Case No. 02-00022

United States of America v. Government of Guam  
Guam Solid Waste Management Division

Prepared for:



U.S. District Court of Guam

Submitted by:



Gershman, Brickner & Bratton, Inc.  
2010 Corporate Ridge, Suite 510  
McLean, VA 22102

September 27, 2018

Printed on recycled paper

Page 1 of 6

Civil Case No. 02-00022  
United States of America v Government of Guam

Guam Solid Waste Authority

Regarding a Construction Loan to Complete Cell 3 at the Layon Landfill

In response to this Court's Order<sup>1</sup>, the Receiver proposed in its Report dated October 21, 2015, a dedicated plan of financing to complete the Additional Projects required to complete the Consent Decree<sup>2</sup> and to fully fund the Post-Closure Care of the Ordot Dump Closure Facility.

With the completion of the Additional Projects and with better information on subsequent events we can now reassess the Receiver's financing plan to ascertain if further adjustments are needed. We provided a brief update as a part of our Special Report filed on December 18, 2017 and the purpose of this Special Report is to further update the Court and parties and include recommendations that will assure the timely completion of all its essential elements from a financing perspective.

Two critical elements of the plan remain to be completed. The first critical element is the requirement of full funding of the post-closure care of the Ordot Dump Closure facility<sup>3</sup>. The

---

<sup>1</sup> See Order dated May 27, 2015 relative to full funding of the Post-Closure Care of the Ordot Dump Closure Facility.

<sup>2</sup> These projects included upgrades and permitting of the "Residential Transfer Stations," (see Order of April 20, 2015); "Dero Road," (see Order pf May 1, 2015); "Post-closure Care of the Ordot Dump," (see Order of May 27, 2015); and, "Rt. 4 Safety Enhancements," (see Order of June 29, 2015). In its Order concerning the Rt. 4 Safety Enhancements the Court concluded that these enhancements, while needed, were not to be pursued as a part of the Consent Decree. The other Additional Projects were ordered to be completed.

<sup>3</sup> This obligation should have been funded during the working life of the Ordot Dump but no funds were set aside by GovGuam for this purpose and now it is essential that it be funded as a part of the Consent Decree.

second element – which is an additional and essential part of the plan recommended by the Receiver and subsequently adopted by the Court<sup>4</sup>, is the financing and construction of the required new Cell 3. The financing and construction of Cell 3 is an essential part of the overall plan because the financing is dependent upon the revenue to be generated by the Layon Landfill. Construction of Cell 3 will provide the needed disposal capacity to continue to properly dispose of waste in compliance with Guam and Federal Law, which has a direct impact on the health and well-being of the residents of Guam. Failure to timely complete Cell 3 would deprive GovGuam of the revenue required to fully fund its remaining post-closure obligations. Such a situation would also explicitly violate the Consent Decree<sup>5</sup> and put Guam at great economic peril with no way to legally dispose of its solid waste.

While the financing plan will assure the resources needed to complete post closure maintenance of the Ordot Dump Closure Facility, this can only be accomplished if the new Cell 3 is completed in a timely way since this is vital to the Layon Landfill's revenue production capacity.

Guam EPA's review of the design of Cell 3 has been delayed as a result of a conflict of interest regarding the use of the consulting group Guam plans to use for this review that is also contracted with USEPA. To date, there is no resolution of this issue and the result is the plans have not been reviewed. This issue must get resolved and the plans reviewed expeditiously or Guam risks timely completion of this vital project<sup>6</sup>.

On the financing side a number of developments have occurred that both add cost to the plan in addition to those cost already anticipated and utilize GSWA cash in ways that constrain cash needed to assure timely completion of the new cell. These include:

1. Anticipated use of cash to pay for planned capital expenses (the Additional Projects);
2. The unanticipated requirement for a landfill gas mitigation project to control residual gas on the periphery of the Ordot Dump due to the poor management practices that existed before the Receivership. Estimated cost to date exceeds \$1 million;
3. Increasing estimated cost of new Cell 3. Final cost will be determined by bidding<sup>7</sup>;
4. Unanticipated cost for Lot 450 - \$1,039,200.00;

---

<sup>4</sup> See Order dated May 2, 2016.

<sup>5</sup> The Consent Decree explicitly requires the Government of Guam to open *and operate* [emphasis added] a new and compliant Municipal Solid Waste Landfill.

<sup>6</sup> This review is required in order to issue a permit which is required prior to construction.

<sup>7</sup> Responsibility for Cell 3 was transferred from the Receiver to the GSWA General Manager (GM) in an Order dated February 15, 2018. The responsibility reverted to the Receiver when the GM resigned.

5. Cost of new staffing hired by Board (3 years @ - \$343,912.04 per year - \$1,031,736.12<sup>8</sup>;
6. Cost of transitioning temporary staff hired by the Receiver to full-time GovGuam employees at \$17,414.80 per year - \$52,244.40;
7. Unanticipated cost of historical preservation at Malojloj Residential Transfer Station - \$71,630.00; and
8. Slower than expected growth in waste disposal to date in the current fiscal year.

These unanticipated costs are already having a negative effect on GSWA operating cash reserves. In our Special Report dated December 18, 2017 we reported \$10.2 million in operating cash. As of July 31, 2018, the cash balance has declined to \$6.5 million. While this means that GSWA is going to need a loan to bridge the gap and assure that funds are always available for the construction of the new cell, the gap is short term and will require neither a rate increase and the debt can be limited to 10 years, the expected life of the new cell.

Based on our reading of the GSWA Act, the Guam Economic Development Authority (GEDA) will need to be engaged to effectuate the loan. It is not clear what role the Public Utilities Commission or the Guam Legislature plays in such transactions but Guam Bond Counsel should review and advise on this and all other aspects of the transaction. These discussions should start immediately.

Because GSWA has no credit history, it is likely that the lender will require certain features and guarantees. Such features already included in the plan that should help or be required include:

1. Solid Revenue performance since 2011;
2. Independent audits conducted by Deloitte & Touche LLP since 2010. All audits available upon request;
3. Average cash collections monthly - \$1.5 million per month;
4. Average expenses per month \$951,854.87
5. \$375k per month dedicated by Federal Court Order to project funding for post-closure of the Ordot Dump Closure Facility and the new cell;
6. Funds in hands of Receiver/Trustee appointed by Federal Court;
7. Of the \$375k monthly that is available \$166,000 dedicated to post-closure fund;
8. \$209k dedicated to new cell<sup>9</sup>;

---

<sup>8</sup> Given recent resignations there will be a brief reduction in this cost but given the urgency to get new hires in place we do not believe we should change this assumption.

<sup>9</sup> After the Ordot Dump post-closure reserve is fully funded the entire \$375,000 per month is available to make additional payments to retire the debt.

9. Maximum required credit line \$23.38<sup>10</sup> million plus or minus 10%.

Other features may include an irrevocable pledge of the portion of the funds now dedicated to the Receiver's financing plan with that portion not already dedicated by Court Order to the Ordot Dump Post-Closure Reserve by Court Order to be paid by the Trustee directly to the lender. It may also require an irrevocable pledge that the funds obtained through the Loan be used exclusively for the purpose of constructing the new cell, including any ancillary expenses necessary to complete the Cell and make it fully operational. These should all be achievable to ensure completion without delay.

The following table outlines the financial performance of GSWA for the previous five years together with the cumulative fund balance of the system.

<b>FY 2014 through FY 17 Audited Results with Unaudited FY18 YTD</b>				
<b>cert</b>	<b>Expenditures</b>	<b>Revenue</b>	<b>Excess/ (Shortfall)</b>	<b>Cumulative Fund Balance</b>
FY2014	\$ 16,360,969.00	\$ 17,407,755.00	\$ 1,046,786.00	\$ 14,942,532.00
FY2015	\$ 13,423,821.00	\$ 18,292,651.00	\$ 4,868,830.00	\$ 19,811,302.00
FY2016	\$ 15,771,969.00	\$ 19,363,204.00	\$ 3,591,235.00	\$ 23,402,597.00
FY2017*	\$ 22,872,468.00	\$ 19,277,410.00	\$ (3,595,058.00)	\$ 19,807,539.00
FY2018**	\$ 14,058,739.28	\$ 19,051,517.22	\$ 4,992,777.94	\$ 24,800,316.94
Note: Each year includes fund balance restricted fund balances.				
*Includes \$6,905,897 in capital projects funded through fund balance.				
**Unaudited YTD				

As noted, the fund balance includes restricted fund balances that include some funds dedicated to the remaining capital projects required to complete the Consent Decree. After these projects are completed these funds are dedicated exclusively to fully funding the post-closure reserve of the Ordot Dump and building Cell 3 to ensure that Guam continues to have capacity to legally dispose of their waste in full environmental compliance with all applicable laws and regulations.

Exhibit 1 to this Special Report is an estimate of the cost of a 10-year bank loan to complete Cell 3. Exhibit 2 is an estimate of the cost of a 10-year bond to secure the funds. The monthly allocation to the Reserve for Unfunded Expense is more than sufficient to pay for the cost of

---

<sup>10</sup> Should the successful bid be more or less than the amount estimated above, the construction loan requirement will need to be adjusted accordingly.

either loan type<sup>11</sup>. The type of loan (bond vs. bank loan) should be carefully evaluated to determine which best meets GSWA's needs from a cost and timing perspective.

Exhibits 3, and 4 are publications outlining current performance expectations for credit worthy solid waste systems in the current market. While the current financial situation of GovGuam itself is problematic, we believe GSWA has sufficient revenue and bankable assets to secure such short-term financing on its own.

We thank the Court for its consideration of our views in this matter.

I declare under penalty of perjury under the laws of Guam and the United States that the foregoing is true and correct.

Dated this 27<sup>th</sup> day of September 2018.

A handwritten signature in black ink, appearing to read "David L. Manning", written in a cursive style.

---

David L. Manning  
Receiver Representative

---

<sup>11</sup> Depending on the final loan amount, some internal borrowing may be required in the loan's early years to make the payment. This borrowing would come from other GSWA reserves. After the Ordot Post-Closure Reserve is fully funded, any such internal borrowing can be restored and any the additional funds can be used to pay off the loan early.

# **EXHIBIT**

## **“1”**

# Loan Calculator with Extra Payments

	Enter values
Loan amount	\$ 23,290,000.00
Annual interest rate	4.000%
Loan period in years	10
Start date of loan	1/1/2019
Optional extra payments	

## Instructions

Must be between 1 and 30 years.

If your extra payments vary, enter them in the table below.

Scheduled monthly payment	\$ 235,799.93
Scheduled number of payments	120
Actual number of payments	102
Total of early payments	\$ 3,988,526.73
Total interest	\$ 4,675,287.17

No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance
1	1/1/2019	\$ 23,290,000.00	\$ 235,799.93		\$ 235,799.93	\$ 158,166.59	\$ 77,633.33	\$ 23,131,833.41
2	2/1/2019	\$ 23,131,833.41	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 158,693.82	\$ 77,106.11	\$ 22,973,139.59
3	3/1/2019	\$ 22,973,139.59	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 159,222.79	\$ 76,577.13	\$ 22,813,916.80
4	4/1/2019	\$ 22,813,916.80	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 159,753.54	\$ 76,046.39	\$ 22,654,163.26
5	5/1/2019	\$ 22,654,163.26	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 160,286.05	\$ 75,513.88	\$ 22,493,877.21
6	6/1/2019	\$ 22,493,877.21	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 160,820.34	\$ 74,979.59	\$ 22,333,056.87
7	7/1/2019	\$ 22,333,056.87	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 161,356.40	\$ 74,443.52	\$ 22,171,700.47
8	8/1/2019	\$ 22,171,700.47	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 161,894.26	\$ 73,905.67	\$ 22,009,806.21
9	9/1/2019	\$ 22,009,806.21	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 162,433.91	\$ 73,366.02	\$ 21,847,372.30
10	10/1/2019	\$ 21,847,372.30	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 162,975.35	\$ 72,824.57	\$ 21,684,396.95
11	11/1/2019	\$ 21,684,396.95	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 163,518.60	\$ 72,281.32	\$ 21,520,878.35
12	12/1/2019	\$ 21,520,878.35	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 164,063.67	\$ 71,736.26	\$ 21,356,814.68
13	1/1/2020	\$ 21,356,814.68	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 164,610.54	\$ 71,189.38	\$ 21,192,204.14
14	2/1/2020	\$ 21,192,204.14	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 165,159.25	\$ 70,640.68	\$ 21,027,044.89
15	3/1/2020	\$ 21,027,044.89	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 165,709.78	\$ 70,090.15	\$ 20,861,335.12
16	4/1/2020	\$ 20,861,335.12	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 166,262.14	\$ 69,537.78	\$ 20,695,072.97
17	5/1/2020	\$ 20,695,072.97	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 166,816.35	\$ 68,983.58	\$ 20,528,256.62
18	6/1/2020	\$ 20,528,256.62	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 167,372.40	\$ 68,427.52	\$ 20,360,884.22
19	7/1/2020	\$ 20,360,884.22	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 167,930.31	\$ 67,869.61	\$ 20,192,953.90
20	8/1/2020	\$ 20,192,953.90	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 168,490.08	\$ 67,309.85	\$ 20,024,463.82
21	9/1/2020	\$ 20,024,463.82	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 169,051.71	\$ 66,748.21	\$ 19,855,412.11
22	10/1/2020	\$ 19,855,412.11	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 169,615.22	\$ 66,184.71	\$ 19,685,796.89
23	11/1/2020	\$ 19,685,796.89	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 170,180.60	\$ 65,619.32	\$ 19,515,616.29
24	12/1/2020	\$ 19,515,616.29	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 170,747.87	\$ 65,052.05	\$ 19,344,868.41
25	1/1/2021	\$ 19,344,868.41	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 171,317.03	\$ 64,482.89	\$ 19,173,551.38
26	2/1/2021	\$ 19,173,551.38	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 171,888.09	\$ 63,911.84	\$ 19,001,663.29
27	3/1/2021	\$ 19,001,663.29	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 172,461.05	\$ 63,338.88	\$ 18,829,202.24
28	4/1/2021	\$ 18,829,202.24	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 173,035.92	\$ 62,764.01	\$ 18,656,166.32
29	5/1/2021	\$ 18,656,166.32	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 173,612.71	\$ 62,187.22	\$ 18,482,553.62
30	6/1/2021	\$ 18,482,553.62	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 174,191.41	\$ 61,608.51	\$ 18,308,362.20
31	7/1/2021	\$ 18,308,362.20	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 174,772.05	\$ 61,027.87	\$ 18,133,590.15
32	8/1/2021	\$ 18,133,590.15	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 175,354.63	\$ 60,445.30	\$ 17,958,235.53
33	9/1/2021	\$ 17,958,235.53	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 175,939.14	\$ 59,860.79	\$ 17,782,296.38
34	10/1/2021	\$ 17,782,296.38	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 176,525.61	\$ 59,274.32	\$ 17,605,770.78
35	11/1/2021	\$ 17,605,770.78	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 177,114.02	\$ 58,685.90	\$ 17,428,656.75
36	12/1/2021	\$ 17,428,656.75	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 177,704.40	\$ 58,095.52	\$ 17,250,952.35
37	1/1/2022	\$ 17,250,952.35	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 178,296.75	\$ 57,503.17	\$ 17,072,655.60
38	2/1/2022	\$ 17,072,655.60	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 178,891.07	\$ 56,908.85	\$ 16,893,764.52
39	3/1/2022	\$ 16,893,764.52	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 179,487.38	\$ 56,312.55	\$ 16,714,277.14
40	4/1/2022	\$ 16,714,277.14	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 180,085.67	\$ 55,714.26	\$ 16,534,191.47
41	5/1/2022	\$ 16,534,191.47	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 180,685.96	\$ 55,113.97	\$ 16,353,505.52
42	6/1/2022	\$ 16,353,505.52	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 181,288.24	\$ 54,511.69	\$ 16,172,217.28
43	7/1/2022	\$ 16,172,217.28	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 181,892.54	\$ 53,907.39	\$ 15,990,324.74
44	8/1/2022	\$ 15,990,324.74	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 182,498.84	\$ 53,301.08	\$ 15,807,825.90
45	9/1/2022	\$ 15,807,825.90	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 183,107.17	\$ 52,692.75	\$ 15,624,718.72
46	10/1/2022	\$ 15,624,718.72	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 183,717.53	\$ 52,082.40	\$ 15,441,001.19
47	11/1/2022	\$ 15,441,001.19	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 184,329.92	\$ 51,470.00	\$ 15,256,671.27
48	12/1/2022	\$ 15,256,671.27	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 184,944.36	\$ 50,855.57	\$ 15,071,726.91



No.	Payment Date	Beginning		Extra Payment	Total Payment	Principal	Interest	Ending Balance
		Balance	Scheduled Payment					
49	1/1/2023	\$ 15,071,726.91	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 185,560.84	\$ 50,239.09	\$ 14,886,166.08
50	2/1/2023	\$ 14,886,166.08	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 186,179.37	\$ 49,620.55	\$ 14,699,986.70
51	3/1/2023	\$ 14,699,986.70	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 186,799.97	\$ 48,999.96	\$ 14,513,186.73
52	4/1/2023	\$ 14,513,186.73	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 187,422.64	\$ 48,377.29	\$ 14,325,764.09
53	5/1/2023	\$ 14,325,764.09	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 188,047.38	\$ 47,752.55	\$ 14,137,716.71
54	6/1/2023	\$ 14,137,716.71	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 188,674.20	\$ 47,125.72	\$ 13,949,042.51
55	7/1/2023	\$ 13,949,042.51	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 189,303.12	\$ 46,496.81	\$ 13,759,739.39
56	8/1/2023	\$ 13,759,739.39	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 189,934.13	\$ 45,865.80	\$ 13,569,805.26
57	9/1/2023	\$ 13,569,805.26	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 190,567.24	\$ 45,232.68	\$ 13,379,238.02
58	10/1/2023	\$ 13,379,238.02	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 191,202.47	\$ 44,597.46	\$ 13,188,035.55
59	11/1/2023	\$ 13,188,035.55	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 191,839.81	\$ 43,960.12	\$ 12,996,195.75
60	12/1/2023	\$ 12,996,195.75	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 192,479.27	\$ 43,320.65	\$ 12,803,716.47
61	1/1/2024	\$ 12,803,716.47	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 193,120.87	\$ 42,679.05	\$ 12,610,595.60
62	2/1/2024	\$ 12,610,595.60	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 193,764.61	\$ 42,035.32	\$ 12,416,830.99
63	3/1/2024	\$ 12,416,830.99	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 194,410.49	\$ 41,389.44	\$ 12,222,420.50
64	4/1/2024	\$ 12,222,420.50	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 195,058.53	\$ 40,741.40	\$ 12,027,361.98
65	5/1/2024	\$ 12,027,361.98	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 195,708.72	\$ 40,091.21	\$ 11,831,653.26
66	6/1/2024	\$ 11,831,653.26	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 196,361.08	\$ 39,438.84	\$ 11,635,292.17
67	7/1/2024	\$ 11,635,292.17	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 197,015.62	\$ 38,784.31	\$ 11,438,276.55
68	8/1/2024	\$ 11,438,276.55	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 197,672.34	\$ 38,127.59	\$ 11,240,604.22
69	9/1/2024	\$ 11,240,604.22	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 198,331.25	\$ 37,468.68	\$ 11,042,272.97
70	10/1/2024	\$ 11,042,272.97	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 198,992.35	\$ 36,807.58	\$ 10,843,280.62
71	11/1/2024	\$ 10,843,280.62	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 199,655.66	\$ 36,144.27	\$ 10,643,624.96
72	12/1/2024	\$ 10,643,624.96	\$ 235,799.93	\$ -	\$ 235,799.93	\$ 200,321.18	\$ 35,478.75	\$ 10,443,303.78
73	1/1/2025	\$ 10,443,303.78	\$ 235,799.93	\$ 138,958.15	\$ 374,758.08	\$ 339,947.07	\$ 34,811.01	\$ 10,103,356.72
74	2/1/2025	\$ 10,103,356.72	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 334,865.82	\$ 33,677.86	\$ 9,768,490.90
75	3/1/2025	\$ 9,768,490.90	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 335,982.03	\$ 32,561.64	\$ 9,432,508.87
76	4/1/2025	\$ 9,432,508.87	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 337,101.97	\$ 31,441.70	\$ 9,095,406.89
77	5/1/2025	\$ 9,095,406.89	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 338,225.65	\$ 30,318.02	\$ 8,757,181.24
78	6/1/2025	\$ 8,757,181.24	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 339,353.07	\$ 29,190.60	\$ 8,417,828.18
79	7/1/2025	\$ 8,417,828.18	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 340,484.24	\$ 28,059.43	\$ 8,077,343.93
80	8/1/2025	\$ 8,077,343.93	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 341,619.19	\$ 26,924.48	\$ 7,735,724.74
81	9/1/2025	\$ 7,735,724.74	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 342,757.92	\$ 25,785.75	\$ 7,392,966.82
82	10/1/2025	\$ 7,392,966.82	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 343,900.45	\$ 24,643.22	\$ 7,049,066.37
83	11/1/2025	\$ 7,049,066.37	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 345,046.78	\$ 23,496.89	\$ 6,704,019.59
84	12/1/2025	\$ 6,704,019.59	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 346,196.94	\$ 22,346.73	\$ 6,357,822.65
85	1/1/2026	\$ 6,357,822.65	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 347,350.93	\$ 21,192.74	\$ 6,010,471.72
86	2/1/2026	\$ 6,010,471.72	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 348,508.77	\$ 20,034.91	\$ 5,661,962.96
87	3/1/2026	\$ 5,661,962.96	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 349,670.46	\$ 18,873.21	\$ 5,312,292.50
88	4/1/2026	\$ 5,312,292.50	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 350,836.03	\$ 17,707.64	\$ 4,961,456.47
89	5/1/2026	\$ 4,961,456.47	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 352,005.48	\$ 16,538.19	\$ 4,609,450.98
90	6/1/2026	\$ 4,609,450.98	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 353,178.83	\$ 15,364.84	\$ 4,256,272.15
91	7/1/2026	\$ 4,256,272.15	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 354,356.10	\$ 14,187.57	\$ 3,901,916.05
92	8/1/2026	\$ 3,901,916.05	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 355,537.28	\$ 13,006.39	\$ 3,546,378.77
93	9/1/2026	\$ 3,546,378.77	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 356,722.41	\$ 11,821.26	\$ 3,189,656.36
94	10/1/2026	\$ 3,189,656.36	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 357,911.48	\$ 10,632.19	\$ 2,831,744.88
95	11/1/2026	\$ 2,831,744.88	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 359,104.52	\$ 9,439.15	\$ 2,472,640.36
96	12/1/2026	\$ 2,472,640.36	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 360,301.54	\$ 8,242.13	\$ 2,112,338.82
97	1/1/2027	\$ 2,112,338.82	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 361,502.54	\$ 7,041.13	\$ 1,750,836.28
98	2/1/2027	\$ 1,750,836.28	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 362,707.55	\$ 5,836.12	\$ 1,388,128.73
99	3/1/2027	\$ 1,388,128.73	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 363,916.58	\$ 4,627.10	\$ 1,024,212.15
100	4/1/2027	\$ 1,024,212.15	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 365,129.63	\$ 3,414.04	\$ 659,082.52
101	5/1/2027	\$ 659,082.52	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 366,346.73	\$ 2,196.94	\$ 292,735.79
102	6/1/2027	\$ 292,735.79	\$ 235,799.93	\$ 132,743.74	\$ 368,543.67	\$ 367,567.88	\$ 975.79	\$ (74,832.09)

# **EXHIBIT**

## **“2”**

### Estimated Cost of Bond Debt

Term :	10 years
Interest Rate :	4.0%
Funds Needed :	\$ 20,492,000.00
Debt Service Reserve :	\$ 2,329,000.00
Cost of Issuance Financed * :	\$ 465,800.00
Rounding Amount :	\$ 3,200.00
Total Bonds Issued :	\$ 23,290,000.00
Issuance Cost (portion not financeable) :	\$ 465,800.00
Gross Monthly Payment :	\$ 235,800.00
Less Reserve Interest :	\$ 7,763.00
Net Monthly Payment :	\$ 228,037.00

#### About The Loan Calculations:

**Funds Needed** is the amount you will require for your use after the bonds are sold. The other costs (where permitted by law and regulations) are added to the amount borrowed.

**The Debt Service Reserve (DSR)** is an amount put aside with the Trustee to be available in the event you are unable to make a monthly payment on time. You earn interest on this DSR which is credited toward your monthly payments, and the principal of the reserve fund is used to help offset your final year's debt service payments. The rate used to calculate the return on the DSR here is the same as the bond rate.

**Cost of Issuance Financed** - Governmental regulations limit the amount of issuance costs which a 501(c) (3) corporation can finance with tax-exempt financing to 2% of the amount borrowed. Issuing costs beyond this limit will be approximately 2% which can be paid by you at closing or can be financed using taxable financing. \* Governmental entities are not limited to 2% and are therefore able to borrow the entire amount at tax-exempt rates.

**Rounding Amount** - Municipal Bonds are typically issued in denominations of \$5,000 or greater. The amount borrowed will be rounded up to the nearest \$5,000. The Total Loan Amount is used as the basis in determining the payments you will make. This gross payment may be reduced by the interest earned by the Debt Service Reserve.

# EXHIBIT

## “3”

# RatingsDirect®

---

## Criteria | Governments | U.S. Public Finance: Solid Waste System Financings

### **Analytical Contacts:**

Edward R McGlade, New York (1) 212-438-2061; edward.mcglade@spglobal.com  
James M Breeding, Dallas (1) 214-871-1407; james.breeding@spglobal.com  
Robert D Dobbins, CPA, San Francisco (1) 415-371-5054; robert.dobbins@spglobal.com

### **Criteria Contacts:**

Nik Khakee, New York (1) 212-438-2473; nik.khakee@spglobal.com  
Liz E Sweeney, New York (1) 212-438-2102; liz.sweeney@spglobal.com  
Laura J Feinland Katz, CFA, New York (1) 212-438-7893; laura.feinland.katz@spglobal.com

## Table Of Contents

---

### SUMMARY AND OVERVIEW

### METHODOLOGY

Factors That Cap The Indicative And Final Ratings

Factors That Notch From The Initial Indicative Rating

Factors That Affect The Enterprise Risk Profile

A. Assessing Economic Fundamentals

B. Assessing Industry Risk

C. Assessing Market Position

D. Assessing Operational Risk Management

Financial Risk Profile Assessment

Factors That Affect The Financial Risk Profile

## Table Of Contents (cont.)

---

A. Assessing All-In Coverage

B. Assessing Liquidity And Reserves

C. Assessing Debt And Liabilities

D. Assessing Financial Risk Management

Methodology For Assessing The Impact Of Securitized Debt

IMPACT ON OUTSTANDING RATINGS

REVISIONS AND UPDATES

GLOSSARY

RELATED CRITERIA AND RESEARCH

# Criteria | Governments | U.S. Public Finance: Solid Waste System Financings

## SUMMARY AND OVERVIEW

1. S&P Global Ratings is publishing its methodology for assigning issue credit ratings, issuer credit ratings (ICRs), and ratings derived from stand-alone credit profiles (SACPs) for solid waste systems. The public or municipal enterprises within the scope of these criteria include, generally, those with one or more of the following characteristics:
  - Collection and transport of solid waste;
  - Intermediate handling of solid waste (transfer stations, waste-to-energy systems, material recovery facilities); and
  - Providing final disposal of solid waste (landfill services).
2. S&P Global Ratings applies these criteria to solid waste systems of a U.S. municipality or comparable political subdivision whose financial obligations are secured by a pledge of revenues. The issuers and issues in scope typically do not benefit from a guaranty from a state or local government nor do they constitute a general obligation of a state or local government. These criteria assign ratings using a framework that considers the enterprise risk and financial risk profiles of a system.
3. Examples of entities that are not rated under these criteria include investor-owned utilities, master limited partnerships, and limited liability corporations. Investor-owned utilities and corporations are typically rated using "Corporate Methodology", published Nov. 19, 2013, and "Key Credit Factors For The Regulated Utilities Industry", published Nov. 19, 2013. Master limited partnerships are rated based on "Methodology: Master Limited Partnerships And General Partnerships", published Sept. 22, 2014. Solid waste systems whose exposure to an operator's bankruptcy risk is not mitigated are typically out of scope.
4. These criteria provide additional transparency and comparability to help market participants better understand our approach in assigning ratings to enhance the forward-looking nature of these ratings, and to enhance the global comparability of our ratings through a clear, comprehensive, and globally consistent criteria framework. This updated methodology follows our request for comment (RFC), "Request for Comment: Solid Waste Financings", published Aug. 21, 2017. For a comparison of the changes between the RFC and the final criteria, see "RFC Process Summary: Solid Waste System Financings", published Jan. 29, 2018. This article is related to our criteria article "Principles Of Credit Ratings", published Feb. 16, 2011.

### Key Publication Dates

- Original publication date: Jan. 29, 2018.
- Effective date: Jan. 29, 2018.
- These criteria address the fundamentals set out in "Principles Of Credit Ratings", published on Feb. 16, 2011.

## METHODOLOGY

### Criteria Framework

5. These criteria use the same framework as our criteria for other municipal enterprise sectors. Specifically, these criteria assign ratings using a framework that considers enterprise risk (enterprise risk profile) and financial risk (financial risk profile). Chart 1 depicts how the enterprise and financial risk profile assessments interact to arrive at the initial indicative rating. The indicative rating is established after applying any appropriate positive or negative overriding factors. The final outcome--which could be an issue credit rating, SACP, or ICR--is reached after making an appropriate holistic analysis. The final rating may be capped based on the presence or absence of certain conditions or characteristics. If more than one cap is applicable, the final rating would be no higher than the lowest cap.
6. If a system meets the guidelines outlined in "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings" published on Oct. 1, 2012, then the rating will be assigned based on that criteria.
7. To increase the transparency in the rating methodology and improve the comparability of our ratings globally, the revised methodology is intended to:
  - Provide further detail on how we assess and calibrate each of the identified rating factors;
  - Offer a more detailed explanation of how we arrive at a system rating through the analysis of the rating factors; and
  - Identify overriding factors that may result in a rating different from the initial indicative rating identified below.
8. The enterprise risk profile and financial risk profile will be measured through an evaluation of the following factors, with the respective weights in parentheses. The enterprise and financial risk profile assessments are rounded weighted averages of these factors.

### Enterprise Risk Profile

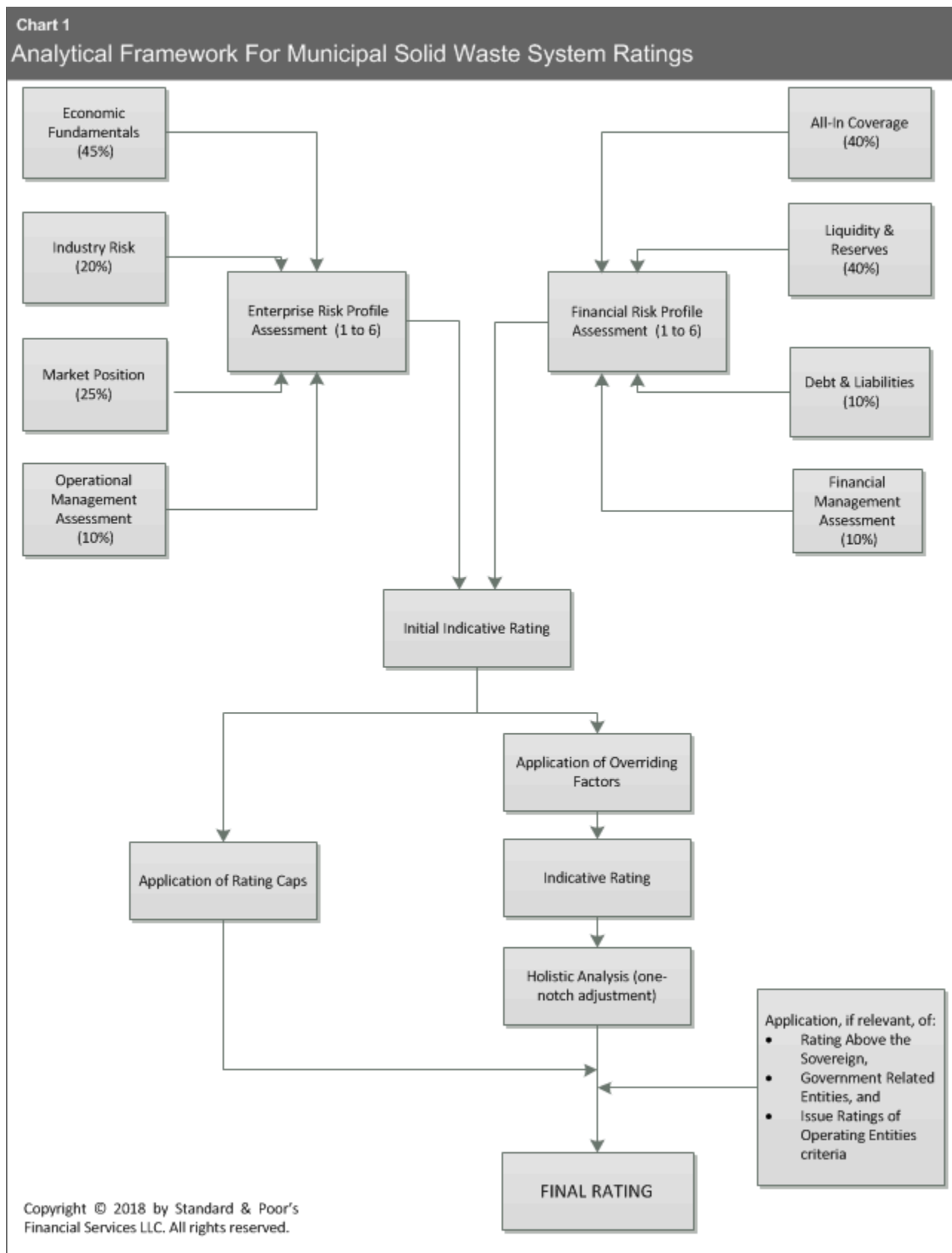
- Economic fundamentals (45% of the enterprise risk profile assessment);
- Industry risk (20%);
- Market position (25%); and
- Operational management assessment (10%).

### Financial Risk Profile

- All-in coverage (40% of the financial risk profile assessment);
  - Liquidity and reserves (40%);
  - Debt and liabilities (10%); and
  - Financial management assessment (10%).
9. The initial assessment of each of the above factors may be strengthened or weakened by certain qualitative factors, as applicable, in order to arrive at the final assessment.
  10. The initial indicative rating results from the combination of the enterprise and financial profile assessments in table 1.
  11. In certain cases, the initial indicative rating in table 1 contains two options for a given combination of enterprise and financial risk profile assessments. In those cases, we would use our expectations of the system's future performance to determine which of the two initial indicative ratings to use.



12. The indicative and the final rating could both be capped by the presence or absence of certain conditions, regardless of the rating outcome suggested by table 1. Rating caps are absolute, meaning that the positive relative adjustments described herein, including holistic analysis, do not apply and the indicative and the final rating cannot exceed the cap, absent expectations of extraordinary support, such as from a related government, which is rare. Examples of related governments include a city or county that can exercise control over the municipal solid waste enterprise. These rating caps are summarized in table 2.
13. The indicative rating could differ from the outcome suggested by table 1 based on certain overriding factors that result in the indicative rating moving a specified number of notches above or below the initial indicative rating. These overriding factors are summarized in table 3.
14. After we apply any relevant overriding factors and caps, we perform our holistic analysis. This helps us capture a more comprehensive analysis of creditworthiness and recognizes our forward-looking view of sustained, predictable operating and financial underperformance or outperformance, which may be informed by competitive analysis and sector-wide data, including ratio analysis. The holistic analysis also includes rare or strongly positive or negative characteristics which the criteria do not separately identify. The holistic analysis can result in an improvement or worsening of the indicative rating by one notch, or no change at all. If a rating cap applies, for example, if the solid waste system is considering a bankruptcy filing resulting in a 'b' category cap, we do not apply a holistic analysis to raise the indicative rating above the level of the cap.
15. The final rating may be constrained by the sovereign rating on the U.S., in accordance with "Ratings Above The Sovereign: Corporate And Government Ratings—Methodology And Assumptions", published on Nov. 19, 2013, as further explained in "Credit FAQ: U.S. Public Finance Ratings And Criteria For Ratings Above The Sovereign", published on Dec. 19, 2013.
16. We deem very few of the systems rated by these criteria to be government-related entities (GREs). In rare cases where we deem a system to be a GRE, we use these criteria to determine the stand-alone credit profile. The final rating is based upon our application of "General Criteria: Rating Government-Related Entities: Methodology And Assumptions", published March 25, 2015.
17. Issue credit ratings, including subordinate-lien debt, will be determined based on our view of the ICR and the legal/covenant package, as more fully described in "Assigning Issue Credit Ratings of Operating Entities", published May 12, 2015. Further guidance regarding our view of debt security and covenants is in the financial risk management section of these criteria.



## A. Overall Framework For Rating Municipal Solid Waste Systems

18. These criteria are used to assign credit ratings to systems based on quantitative and qualitative analysis of a range of economic, financial, operational, management, and debt factors. The analytical framework is articulated around two major components: the Enterprise Risk Profile and Financial Risk Profile. The enterprise and financial risk profile assessments are determined by combining (see chart 1) and then rounding to the whole number the weighted average of the individual factors. The initial indicative rating results from the combination of the enterprise and financial risk assessments as shown in table 1.

**Table 1**

Determining The Initial Indicative Rating						
Enterprise Risk Profile	Financial Risk Profile					
	1	2	3	4	5	6
	Extremely Strong	Very Strong	Strong	Adequate	Vulnerable	Highly Vulnerable
1 Extremely Strong	aaa	aa+	aa-	a	bbb+/bbb	bb+/bb
2 Very Strong	aa+	aa/aa-	a+	a-	bbb/bbb-	bb/bb-
3 Strong	aa-	a+	a	bbb+/bbb	bbb-/bb+	bb-
4 Adequate	a	a/a-	a-/bbb+	bbb/bbb-	bb	b+
5 Vulnerable	bbb+	bbb/bbb-	bbb-/bb+	bb	bb-	b
6 Highly Vulnerable	bbb-	bb	bb-	b+	b	b-

We use lower case letters to highlight that the outcomes in table 1 are not ratings themselves, but rather indicative credit levels suggested by the enterprise and financial risk profile assessments. In cases where table 1 presents a range of outcomes, the choice between the two outcomes is based on our view of the solid waste system's relative position within the range.

19. The enterprise and financial risk profiles may contain sub-factors. Each factor and sub-factor is assessed on numerical scale, with '1' being the strongest outcome.
20. If the quantitative metric evaluating a particular factor falls at or near a cut-off point, we may assign the stronger assessment if trends are improving or we believe future metrics or attributes will improve, or the worse assessment if trends are weakening or we believe future metrics or attributes will deteriorate.
21. The initial, or anchor, assessment for each factor may be adjusted based on qualitative factors that may be present or lacking for each characteristic or condition. Tables 6, 15, 17, and 19 describe some of the most common qualitative factors that could adjust each of the respective initial assessments. The maximum net adjustment to the initial assessment is two points. For example, if the initial assessment is a '3' and there are two favorable adjustments and one unfavorable adjustment identified, the final assessment for that factor would be a '2'. The liquidity and reserves assessment, however, can be capped at a '5' or worse regardless of the initial assessment.
22. The criteria also include various caps and overrides to arrive at the indicative rating, as well as the ability to raise or lower the indicative rating by one notch based on holistic analysis to establish the final rating. The final rating may be influenced by the rating on the U.S. or its associated country risk, as well as the assignment of issue credit ratings and use of subordinate-lien debt.

## B. Rating Caps And Overriding Factors

23. In certain, but rare, circumstances, the final rating is capped at a certain level. The final rating could be lower than the cap, depending on the severity of the condition present. The rating caps outlined in table 2 are absolute, meaning that the positive relative adjustments described below do not allow the final rating to exceed the cap. If multiple caps are applicable, the rating cap used will be the lower of all those that apply.
24. Related government adjustments and caps do not apply if there is a legal or analytical basis for concluding that there is a de minimis risk the related government will raid the enterprise (e.g., presence of statutory protections or judicial precedents within the jurisdiction). Use of the adjustments and caps may be considered unnecessary if the affected municipal enterprise has a broader customer base than the related government because from a policy perspective the related government may find it difficult to act when the solid waste enterprise serves customers outside the related government's jurisdiction.
25. An enterprise's rating may not be subject to related government caps or adjustments if there is no negative intervention or political interference and one or more of the following conditions is met:
- The enterprise is governed and operates independently with no clear linkage to a related government that has an ability to affect the operations of the enterprise.
  - The enterprise is owned and operated by two or more governments or a regional authority.

**Table 2**

Summary Of Factors That Cap The Final Rating	
Condition	Result
Either the Operational or the Financial Management Assessment is "Vulnerable"	Indicative and final ratings are capped at 'A'
Both the Operational and the Financial Management Assessments are "Vulnerable" or there is a going concern opinion	Indicative and final ratings are capped at 'BBB-'
System or its affiliated LRG is recovering from a financial crisis, emerging out of a recent bankruptcy or receivership, or has significant consultant oversight following an event of default, including a covenant violation	Indicative and final ratings are capped at 'BBB+'
Both the all-in coverage and liquidity and reserve assessments result in a '5' or worse	Indicative and final ratings are capped at 'BB+' although if we view liquidity as especially vulnerable, the final rating would generally be capped at 'B+'
Either the Operational or the Financial Management Assessment is "Vulnerable" and the liquidity and reserve assessment is a '5' or worse	Indicative and final ratings are capped at 'BB+'
Both the Operational and Financial Management Assessment are "Vulnerable" and the liquidity and reserve assessment is a '5' or worse	Indicative and final are ratings are capped at 'B+'
Management demonstrates a lack of willingness to support financial obligations, or we believe the system may be considering bankruptcy or receivership filing	Indicative and final ratings on any rated debt not in default are capped at 'B'
<b>Related Government Linkage</b>	
<b>Factors that generally would cap the rating in the 'a' category</b>	
Related government has consistently very weak fund balance (e.g., Available Fund Balance is less than negative 5% of general fund expenditures for the three most recent reported years)	
Significant and continuous withholdings or delay in payments by related government to support growing general obligation deficit or other evidence of continuous structural imbalance of the general government	

Table 2

## Summary Of Factors That Cap The Final Rating (cont.)

Factors that generally would cap the rating in the 'bbb' category	
Related government has very weak cash (e.g., Total Government Available Cash as % of Total Governmental Funds Expenditures is equal to or less than 1%, or TGAC as % of TGF Debt Service is less than 40%) without external access to the market	
Related government management demonstrates a lack of willingness to support obligations such as lease, appropriation, or moral obligation debt, receives going concern in most recent audit, or discussing bankruptcy	This cap can be lifted to the 'a' category if after one year of the condition there is no indication that the enterprise will be raided, and removed completely if after two to three years there is no indication that the enterprise will be raided
Factors that generally would cap the rating in the 'bb' category	
Related government in bankruptcy, receivership or there is an emergency manager due to bankruptcy concerns and there is uncertainty regarding any impact to the municipal enterprise or its debt as part of the recovery plan or a current lack of willingness to pay an unconditional debt obligation of the government, such as general obligations	This cap can be lifted to the 'bbb' category if it is clear that the enterprise will not be raided, and removed completely if after two to three years there is continued on-time payment with no indication that the enterprise will be raided or bond payments impaired
Factors that generally would notch the Initial Indicative Rating down	
Related government has a consistently low fund balance (e.g., Available Fund balance is less than 1% of general fund expenditures in three most recent years and expected to remain below such a level)	Indicative rating generally would be lowered by one notch for enterprise credits above 'a+'. Lowered by two notches for credits if very weak cash levels or low fund balances are expected to further decline materially
Related government has a debt, pension, and other postemployment benefits (OPEB) burden that is considered very high and management lacks a credible plan to address the situation	Indicative rating generally would be lowered by one notch for enterprise credits above 'a+'. Lowered by two notches for credits if very weak cash levels or low fund balances are expected to further decline materially
Significant change in governance of transfers from municipal enterprise to related government, or related government has withheld funds or delayed payment to the enterprise to support a growing general obligation deficit	Indicative rating generally would be lowered by one notch for enterprise credits above 'a+' at the time of first change if no future changes are anticipated. Lowered by two notches for credits if additional significant changes are anticipated
Other rating cap	
Negative extraordinary intervention, such as significant cash-stripping, diversion of resources from the enterprise for the benefit of the related government, or other actions by the related government that in our opinion demonstrate an ongoing lack of respect for the system's ability to operate as a stand-alone enterprise	Indicative and final ratings are reflective of the related government's credit quality

26. Certain conditions or characteristics result in an indicative rating that is different from the initial indicative rating, as follows in table 3. If multinotch overrides are applicable, the indicative rating is based on the net effect of those overrides.

Table 3

## Summary Of Overriding Factors

Condition	Result
Median household effective buying income is among the top quintile of the U.S.	Indicative rating generally will be one notch above that suggested by table 1.
Median household effective buying income is among the top 10% of the U.S.	Indicative rating generally will be two notches above that suggested by table 1.
Median household effective buying income is among the lowest quintile of the U.S.	Indicative rating generally will be one notch below that suggested by table 1.
All-in coverage is at or above 3x or days' cash on hand equivalent to at least 24 months of operating expenses.	Indicative rating generally will be one notch above that rating suggested by table 1.
U.S. country risk assessment of '4', '5', or '6'.	Final enterprise risk profile assessment is capped at '4', '5', or '6'.

Table 3

Summary Of Overriding Factors (cont.)	
Condition	Result
Total indebtedness is likely to increase substantially, but magnitude, scope, and timing are not fully defined.	Final financial risk profile assessment generally will be worsened by one point.
Exceptional downstream process risk.	Indicative rating generally will be one or more notches below that suggested by table 1.
Economic fundamentals or market position is assessed as "Highly vulnerable" and we believe that it presents sufficient risk to the enterprise.	Enterprise profile generally would be assessed "Highly vulnerable."

## Factors That Cap The Indicative And Final Ratings

### Weak management

27. The decentralized and autonomous nature of U.S. local governments creates a stronger link between management and credit quality. In cases where either the Operational or the Financial Management Assessment (OMA, FMA) is characterized as 'vulnerable', the indicative and final ratings will be no higher than 'A'. In cases where both the OMA and FMA are characterized as 'vulnerable' or if an auditor has delivered a going concern opinion with the most recent review of the system's or associated local regional government's (LRG) financial position, the indicative and final ratings will be no higher than 'BBB-'.

### Emergence from bankruptcy or receivership

28. A system that has just emerged from bankruptcy or receivership or a period of consultant or governmental oversight by definition has just been in a period where the financial risk profile--and possibly the enterprise risk profile as well--is extremely weak. Although a credit may emerge with an improved financial risk profile after debt forgiveness or other negotiated settlements or restructuring, or under a new management team, we will cap the indicative and final ratings at 'BBB+' until the system has re-established a two- or three-year record of audited financial performance, at which time we would re-evaluate it using that new financial history as part of the analysis.

### Weak total liquidity combined with weak all-in coverage

29. If the system's all-in coverage as well as liquidity and reserves assessments are both a '5' or worse, we will cap the indicative and final ratings at 'BB+', although if we view liquidity as a weakness that cannot be rectified by other available resources, then the rating would be no higher than 'B+'. In our view, poor assessments on both of these factors imply that the system has no margin for error in any of its operating, debt service, or capital funds in the event of an unfavorable or unplanned variance to its annual budget.

### Weak management and liquidity and reserves

30. Strong management alone can lend itself to operational and fiscal continuity and can serve as a credit stabilizer. In addition, liquidity and reserves provide working capital, funding for unexpected operational problems, and general budgetary flexibility. For example, if contingent liabilities become actual liabilities, both of these factors can together moderate or even relieve a system from distress. Conversely, their absence creates a limiting factor and often leads to rapid credit deterioration. As such, when the OMA or FMA is characterized as 'vulnerable' and the liquidity and reserves assessment is a '5' or worse, the indicative and final ratings are capped at no higher than 'BB+'. If both management assessments are characterized as 'vulnerable' and the liquidity and reserves assessment is a '5' or worse,

the indicative and final ratings are capped at no higher than 'B+'.

#### **Weak willingness or capacity to support financial obligations**

31. If the system's or sponsoring governmental entities' representatives take actions that indicate active consideration of bankruptcy in the near term, or if there is a perceived change in the willingness or lack of capacity to honor all long-term, legally binding financial obligations in full and on a timely basis, the indicative and final ratings will be capped at 'B'. If applicable, we would apply "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings", published Oct. 1, 2012, or "Rating Implications Of Exchange Offers And Similar Restructurings", published May 12, 2009. Such a condition might be evidenced by way of conversations with management or governance, verifiable reports in the media, public disclosure, or other informational sources we judge to be relevant. The system's issuer ratings would be 'D' or 'SD' following a default on an actual financial obligation, or in a distressed exchange, which we would apply "Rating Implications Of Exchange Offers And Similar Restructurings".

### **Factors That Notch From The Initial Indicative Rating**

#### **Exceptionally strong or weak income indicators**

32. Extremely favorable or unfavorable demographics--measured as well above or below the strongest or weakest initial assessments, respectively--could imply extraordinary flexibility or limitation in a system's ability to enhance its operating revenues on an ongoing basis. Median household effective buying income (MHHEBI) at or above the highest quintile of distribution according to the U.S. Census Bureau's and Bureau of Labor Statistics' joint "Current Population Survey" would generally result in a one-notch rating uplift from the initial indicative rating. Median household effective buying income at or above the top 10% of all households would receive a two-notch rating improvement. Median household effective buying income in the lowest quintile in the U.S. would lower the initial indicative rating by one notch.

#### **Exceptionally strong financial risk profile**

33. Should there be, in our view, a high probability that a system's overall extremely strong financial risk profile is likely to continue on a forward-looking basis even when allowing for stresses, volatility, and additional future obligations, the initial indicative rating would generally be improved by one notch. "Exceptionally strong" is defined specifically to mean: All-in coverage at or above 3x or days' cash on hand equivalent to at least 24 months of operating expenses (without giving favor to an already-existing debt service reserve fund, and calculated consistent with our definition of days' cash).

#### **Exceptional downstream process risk**

34. Generally, the risk associated with waste-to-energy or other value-added processes is captured in our analysis of a solid waste system. Should there be, in our view, the presence of exceptional risk associated with the system's activities that is not captured fully in our credit analysis, we generally would lower the indicative rating. The amount of any downward notching would depend upon our assessment of the severity of the downstream risk.

#### **Enterprise Risk Profile Assessment**

35. The factors that are evaluated for the Enterprise Risk Profile assessment are summarized in table 4.

**Table 4**

Description Of Enterprise Risk Profile Factors
<b>Economic Fundamentals (45% of Enterprise Risk Profile assessment)</b>
Economic fundamentals measure the strength of the system's service area economy, including the system's demographics, characteristics and trends about the customer base, and how crucial the system's principal customers are to operating revenues.
<b>Industry Risk (20%)</b>
The industry risk evaluation aims to evaluate the external environment in which solid waste systems operate and its relevant characteristics, including cyclical, competitive risk, and growth environment.
<b>Market Position (25%)</b>
The market position measures the relative affordability of system rates given the income indicators and relative poverty of the service area, as well as comparability of rates with those of peers in the region or state.
<b>Operational Management Assessment (OMA; 10%)</b>
The OMA evaluates our view of the effectiveness of system management in ensuring that there is alignment of operational, environmental, strategic, and financial goals to support the system's success.

36. The descriptors of outcomes for the overall enterprise risk profile are based on the scale shown below in table 5. The criteria do not round to a whole number until arriving at a final enterprise risk profile.

**Table 5**

Descriptors For Enterprise Risk Profile Factors	
Assessment	Description
1	Extremely Strong
2	Very Strong
3	Strong
4	Adequate
5	Vulnerable
6	Highly Vulnerable

## Factors That Affect The Enterprise Risk Profile

### Country Risk Assessment For The U.S.

37. The relevant credit risks for U.S. municipal utilities are also influenced by country-specific risks (see "Country Risk Assessment Methodology And Assumptions", published Nov. 19, 2013). Country risk is the risk an entity faces by having some of its operations or assets exposed to one or more countries. Country-specific risks consist of economic risks, institutional and governance effectiveness risks, financial system risk, and payment culture/rule of law risk. The country risk assessment is determined on a scale of '1' (very low risk) to '6' (very high risk).
38. The country risk assessment with respect to these criteria derives from the U.S. country risk assessment as determined under the criteria cited above. If the U.S. country risk assessment is a '3' or better, there is generally no positive or negative impact on the final rating. However, if the U.S. country risk assessment is '4' or worse, this could affect the enterprise risk profile assessment. Specifically, if the U.S. country risk assessment is '4', '5', or '6', we will generally assign an enterprise risk profile assessment of no better than '4', '5', or '6', respectively.



## A. Assessing Economic Fundamentals

39. The assessment of economic fundamentals provides insight into the employment, socioeconomic, and demographic environment in which the system operates as well as the health of the service area economy relative to that of the U.S. as a whole.
40. The assessment of economic fundamentals is based on two measures: MHHEBI of the service area as a percentage of the U.S., and the trend in economic output of the service area, as measured by its real (inflation-adjusted) gross county product. If the service area spans multiple counties, these criteria pro rate the metrics based on the estimated population in each county as a percent of the total service area population.
41. The two components are combined (see table 6) to determine an initial economic fundamentals assessment. Positive and negative qualitative factors are then evaluated for applicability to achieve the final economic fundamentals assessment. The cumulative net effect of all adjustments is limited to an improvement or worsening of two points to the initial assessment.

**Table 6**

<b>Assessment Of Economic Fundamentals</b>			
<b>Current Median Household Effective Buying Income (% of U.S.)</b>	<b>Real Gross County Product, Rate Of Change Last Two Years, Plus Projected Next Two Years [1]</b>		
	<b>Stronger than U.S. rate of GDP annual growth by 1% or more</b>	<b>Within +/- 1% of U.S. rate of GDP annual growth</b>	<b>Weaker than U.S. rate of GDP annual growth by 1% or more</b>
125% or more	1	1	2
100% to 125%	1	2	3
75% to 100%	2	3	4
35% to 75%	3	4	5
35% or lower	4	5	6
<b>Qualitative Factors Positively Affecting The Initial Assessment Include:</b>			
Efficiencies and natural economies of scale associated with being a larger system.			
Broad and diverse employment base, or ratepayers living in the service area have access to such a base.			
Unique key local employer, such as a university or military base, that serves to stabilize the economy, even if skewing income indicators unfavorably.			
<b>Qualitative Factors Negatively Affecting The Initial Assessment Include:</b>			
Unemployment rate of the county of 10% or worse.			
A steadily declining population, or dependent population of more than 55%.			
The lack of efficiencies and natural economies of scale because the system is smaller.			
Employment sector concentration, or inauspicious prospects exist for a key major local employer within the next 36 months.			
The 10 largest customers account for 25% or more of operating revenues, or the top one is 10% or more.			
Each applicable qualitative factor changes the initial assessment by one point (with the exception of the economies of scale adjustor, which can result in a one-half point change), but the net total of all adjustments would never improve or worsen the initial assessment by more than two points. [1] For example, if the base/current year is 2015, the time period examined would be 2014 (actual, full-year); 2015 (annualized estimate); 2016 (forecast); and 2017 (forecast).			

42. For service areas in which there is no specific MHHEBI data available, the data from the next largest measurable

geographic unit will be used. For example, if the service area is that of a small unincorporated portion of a county and if those data is not available, the MHHEBI of that county will be used. An exception could be if there is clear evidence that the service area incomes and macroeconomic trends are materially and measurably different from the geographical unit at large, in which case we will use the best available data.

43. Certain natural operating efficiencies and economies of scale are often present in larger systems. Examples may include physical redundancies or the ability to spread fixed costs over a greater amount of solid waste transported, processed, or buried. These criteria define a system's size based on average annual gross operating revenues of the three most recent audited fiscal years. Table 7 outlines the applicable adjuster that is combined with the result from table 6. Typically, we apply the simple average of the three years. However, should there be, in our view, a sustained trend indicating a divergence from the average, we will generally assign a stronger assessment if revenues are growing or we believe revenues will grow. A weaker assessment generally is assigned if revenue trends are weakening or we believe revenues will be lower.

**Table 7**

<b>Economies Of Scale Qualitative Factor</b>	
<b>Total Operating Revenues (Mil. \$)</b>	<b>Change to Initial Assessment</b>
More than 150	(1)
Between 75 and 150	(0.5)
Between 25 and 75	0
Between 5 and 25	0.5
Less than 5	1

44. Solid Waste Systems tend to be smaller, on average, relative to other utilities. When the negative characteristic associated with smaller size, reflected in relatively lower operating revenue, is offset by comparably better efficiency due to a system's affiliation to larger family of systems (i.e., water and sewer), it may partially or fully offset an initial negative assessment and will not result in an assessment better than neutral ('0' in table 7).
45. We assess whether the system's service area participates in a larger, broad, and diversified economy at the federally defined metropolitan statistical area (MSA) level. The determination is based on an evaluation of employment diversity, employment growth, and the employment base. Each of these three factors is characterized as 'strong', 'moderate', or 'weak' consistent with a similar evaluation in "Local Government GO Ratings Methodology And Assumptions", published Sept. 12, 2013. Participation in a 'strong' MSA would generally lead to a one-point improvement in the initial assessment. Conversely, no adjustment would be applied if we deem the MSA as 'weak' or if the service area does not lie within a defined MSA. If the MSA is described as 'moderate', applying the broad and diverse positive adjustment may still be applicable if the macroeconomic trends of the MSA and our expectations for future performance in the next two years are reasonably likely to cause existing metrics to improve.
46. The diversification of the system's service area's economic structure is important to assess the potential volatility of its employment base and its resilience to stresses. An example of a deep, broad, and well-diversified economy would be employment-sector distribution that closely resembles that of the U.S. at large. This depth and diversity could lessen the impact on the system's operating revenues better than an economy with more exposure to a single employer or industry or only a few employment sectors. A small and concentrated or shallow economic base also tends to be more

exposed to external factors and macroeconomic cycles.

47. If employment in an individual sector--excluding education/health, government, and transportation/trade/utilities--represents more than 30% of the nonfarm work base, the local economy is deemed to be highly susceptible to that employment sector. As such, a one-point worsening of the assessment would be applied. An example would be a small town that does not participate in an MSA and has a major manufacturing component in the local labor force.
48. Regardless of the employment sector or nature of its business, if a major local employer has publicly announced that within the next 36 months it will be reducing or completely shuttering operations within the service area or we expect it to do so, a one-point unfavorable adjustment would be warranted.
49. If we do not deem there to be a broad and diverse economy, the presence of a major employer can still sometimes act as a stabilizing force, possibly even adding context to lower income indicators. In such a case, a favorable adjustment of one point may be applied. Examples of such major employers include higher education institutions, health care facilities, military installations or even, more rarely, a large and stable corporate presence.
50. Employment and customer base characteristics typically have a close correlation to system operating revenues. If a small number of customers provide a large amount of revenues, the system could be exposed to revenue volatility. As such, when the top 10 customers contribute 25% or more of total operating revenues, or the top one customer is 10% or more of total operating revenues, the assessment is worsened by one point.

## B. Assessing Industry Risk

51. Consistent with "General Criteria: Methodology: Industry Risk", published Nov. 19, 2013, we consider industry risk for systems covered under these criteria as low, which equates to a "2", or very strong, on the six-point scale we use for these criteria. We derive the industry risk assessment for Solid Waste Systems from the (2) low risk cyclical risk assessment and (2) low competitive risk and growth assessment.
52. The following are key characteristics of the solid waste industry as relevant to the industry risk factor:
  - Cyclical risk assessment of '2' based on S&P Global Ratings' review of historical economic cycles and peak-to-trough changes in revenues and margins for environmental services. Economic cycles can drive priorities in the capital improvement plan. Population and business growth are generally the largest determinants of a favorable or unfavorable variance to budget in any single fiscal year;
  - Low competitive risk of '2', owing to legal and practical barriers to entry in nearly all jurisdictions. However, while Solid Waste Systems are an essential service, there is some substitution risk; and
  - Nearly all municipally owned solid waste systems are natural--and in most cases statutory-- monopolies with complete autonomy over their own rates by the local decision-making body.
53. The industry risk assessment of low risk applies to all systems rated by these criteria regardless of the state in which they operate. We measure credit-specific factors such as rate structure, through the other enterprise and financial risk factors. Solid Waste Systems' peer industry is "Environmental Services" as described in our industry risk methodology. This reflects both the slightly less, although still high, essentiality of solid waste services, as well as the breadth of

issuers in scope, ranging from traditional carting to recycling services.

## C. Assessing Market Position

54. The relative poverty rate is important because service areas that have not just lower MHHEBI levels, but disproportionately higher percentages of the population located in the lowest quintiles of the MHHEBI distribution curve, may exhibit greater sensitivity toward perceived affordability even if adjusted for low inflation or a favorable cost of living. Therefore, it is possible that the impact of system bills and related rate increases is even more profound in those communities compared to communities with stronger economic fundamentals.
55. Actual waste disposal activity varies from region to region based mainly on population and business growth, use of demand-side management and recycling measures, and economic factors. The market position assessment is based on the actual average monthly solid waste bill. The information generally will be based on the most recent audited fiscal year, unless we believe that historical rates are not indicative of future rates. In those cases we will base the assessment on projected rates.
56. There could be practical limitations to these calculations such as transparent and timely financial reporting and disclosure details, the sophistication of the system's customer information system database, and the possibility that the system may deem this information as competitively sensitive and nonpublic. If the actual average monthly residential bill is not readily available, the market position assessment assumes a monthly household rate based on estimates using tipping fees and a combination of other available factors such as disposal capacity and household size. Any minimum or base charge or 'lifeline rate' is also included in the calculation, as are related fees, surcharges, or taxes regardless of who is levying them since the burden ultimately still lies with the customer to pay it.
57. To gauge the annual system burden to the household, the assumed monthly bill, as calculated above, is multiplied by 12 to estimate the total annual cost to the household for solid waste service.
58. Relative rate affordability is calculated by dividing as follows: in the numerator is the annual household system burden as calculated above, and in the denominator the actual MHHEBI of the service area of the system (or the closest approximation), then multiplied by 100. This produces the cost to the household of its system expense as a percentage of total disposable income.
59. Table 8 summarizes how the criteria evaluate the market position of the system, driven by the rate affordability and relative poverty rate.

**Table 8**

<b>Market Position Assessment, Solid Waste Systems</b>			
	<b>Annual System Bill As A Percent Of Median Household Effective Buying Income</b>		
<b>Percent of county's population living in poverty</b>	<b>Less than 1%</b>	<b>1% to 2%</b>	<b>More than 2%</b>
Less than 10%	1	2	3
10% to 20%	2	3	4
20% to 30%	3	4	5

Table 8

**Market Position Assessment, Solid Waste Systems (cont.)**

Percent of county's population living in poverty	Annual System Bill As A Percent Of Median Household Effective Buying Income		
	Less than 1%	1% to 2%	More than 2%
More than 30%	4	5	6

For systems with an anchor assessment of 5 or 6 that have recently completed or achieved substantial completion of a historically capital-intensive period, the anchor assessment may improve by one point.

60. Rate affordability without context may under- or over-represent credit strengths. For example, a system with rates much higher than comparable peers that has already made the capital commitments to address a regulatory mandate driven by past noncompliance with environmental permits would be viewed more favorably than a system with similarly high rates but that is facing a huge unfunded regulatory mandate. For systems that have relatively high rates--as defined by an initial assessment of a '5' or '6'--but have recently completed or substantially completed an extraordinarily capital-intensive period in its history, the initial market position assessment generally will be improved by one point.
61. The criteria do not establish a preference toward a certain solid waste rate structure. For example, management may use a flat or fixed rate, volume-based rates, or some combination thereof. However, we apply a negative adjustment of typically one point if the system relies upon flow control ordinances.

## D. Assessing Operational Risk Management

62. The Operational Management Assessment (OMA) consists of a review of the following sub-factors, assessed from (1) strong; (2) good; (3) standard; to (4) vulnerable and weighted as shown below to calculate the OMA:
- Asset adequacy and identification of operational risks (40%);
  - Organizational effectiveness, management expertise, and volume variation risk plan (20%); and
  - Rate setting practices (40%).
63. The OMA refers to risks associated with the operations of the system; financial policy is covered by the Financial Management Assessment.
64. The results from the observed evaluations assessed in the OMA are converted to a '1' to '6' scale as shown in table 9.

Table 9

**Operational Management Assessment (OMA) Conversion To Six-Point Scale**

Observed Evaluation	OMA	Characterization
1.0 to 1.2	1	Strong
1.2 to 1.8	2	Good
1.8 to 2.5	3	Good
2.5 to 3.1	4	Standard
3.1 to 3.6	5	Standard
3.6 to 4.0	6	Vulnerable

65. The assessment of all sub-factors is based on a preponderance of evidence. Specifically, in our judgment are most, but

not necessarily all, of the described characteristics applicable? A system receives a neutral assessment of 'standard' for any sub-factors for which there is insufficient evidence to assign either a positive or negative assessment. However, some sub-factors may receive a negative assessment if a system has a record of failing to disclose key relevant information.

66. There is no favored governance structure for the system within the methodology. Some solid waste systems are a department or component unit of the local political subdivision, governed by the same locally elected officials as the LRG. Other systems are governed by an independent or quasi-independent system board. The governance structure will be credit-neutral so long as there seems to be the ability for management to operate the system as an ongoing, viable enterprise, largely independent from politics, with professionals who are capably engaged in risk oversight and can balance interests appropriately.
67. Asset adequacy and identification of operational risks examines how successfully management is faring by owning and operating a solid waste system (see table 10). Systems are subject to federal and municipal regulations and may be in various degrees of compliance or readiness.

**Table 10**

Asset Adequacy And Identification Of Operational Risks Assessment	
Strong	The system has in place or is in the process of securing disposal capacity that is reasonably projected to be at least 25 years or more. The integrity of the distribution and/or collection system, transfer station, landfill, materials recovery facility, and/or resource recovery facility assets is strong, or efforts are ongoing to rehabilitate them. Treatment capacity to meet average and peak day demand is sufficient in virtually every circumstance. Climate risk assessment is incorporated into planning and operations as a potential risk to the system. Other potential risks to the system are identified and mitigated, including among others, waste flow diversions. Relationships with private haulers, where necessary, are amendable and nonlitigious. Postclosure costs, if applicable, are already being fully funded or plans are to fund them long before closure of the landfill. A thorough vulnerability assessment across all critical assets has been performed to industry standards and been completed and incorporated into operations.
Good	The existing disposal capacity is sufficient for the existing customer base. The system may need to enhance the disposal useful life sometime beyond the next 20 to 25 years, depending on growth, but management has identified this risk into its long-term plans. Climate risk assessment is addressed in some key areas. Relationships with haulers have had one or more periods of strain; however, waste flow trends tend to be stable. Postclosure costs are being funded as needed with a reserve that is currently being funded from operating revenues. A vulnerability assessment has been completed in most key areas and incorporated where management most deems relevant.
Standard	The existing solid waste system operations will likely need to be enhanced within the next 10 to 20 years, but options for addressing the need have not yet been identified or, if so, have not been fully priced. Climate risks are identified, but other priorities preclude any immediate actions. Relationship with haulers shows signs of strain and waste flow trends have been erratic. Postclosure costs are not being reserved for but the system has indicated a willingness to fund before the closure of the landfill. A vulnerability assessment has been done, but perhaps only partially or not in accordance with industry standards, and implementation has been either partial or not at all.
Vulnerable	The existing disposal capacity cannot currently and consistently meet daily demand. The relationship with haulers or other stakeholders is strained and litigious. The system's management relies upon flow control regulations to ensure waste flow trends. The system has no plans to deal with postclosure costs. It is highly dependent on/susceptible to another waste flow purveyor. Climate risk is not explicitly addressed either in plans or operations. No vulnerability assessment has been done. The municipality waste flow has been strained in the past, making it difficult to meet contractual obligations.

68. To evaluate organizational effectiveness, management expertise, and volume variation planning, the assessment looks to the key elected or appointed decision-makers and top staff (see table 11). This sub-factor assesses how well system leaders are able to convey the needs of the system to external and internal stakeholders in a manner that is likely to allow the system to continue with stability. While there may be some practical limitations due to civil service regulations, mentoring and succession planning among key staff can ensure continuity. Also evaluated is whether or not the system has a resource management plan (voluntary or mandatory) that outlines steps it would implement in a



situation where volumes significantly change, even if the state has its own rules or guidelines. This would be deemed separate from any existing rate schedule the system may already have in place year-round.

**Table 11**

<b>Organizational Effectiveness And Management Expertise</b>	
Strong	Management communicates the system's long-term needs and strategic goals, such as funding requirements, approval of crucial projects, and resource planning on a regular, credible, and transparent basis, putting the system in the best reasonable position for operational continuity. Examples might include ongoing public education campaigns, town halls, dedicated web sites, and social media. Management has considerable knowledge, experience, or a record of success in operating all of the system's key business units in an integrated fashion. Internal mentoring and succession plans are common. Management is able to put its strategic planning into reality; therefore, the system is successful relative to its peers. There is a clear understanding of the composition of the municipality's waste flows and disposal resources.
Good	Public outreach and transparency is a common part of the organizational culture, even if not comprehensive across all key business units. Management has reasonable expertise and experience and has established pathways for succession and continuity where it can; therefore, operational surprises are rare. Management has a good record of successfully converting strategic decisions into constructive action.
Standard	Management depth or breadth is limited in some areas, such that the loss of key personnel would create, only temporarily, a learning curve for the new staff but not likely to measurably affect the system for long. Public outreach is done generally only when necessary, often associated with a large or controversial project. Operational and financial strategies are generally aligned.
Vulnerable	The system relies on one or only a few key employees or perhaps relies on external consultants. Negative variances are not uncommon. The system has a history of regulatory or legal infractions beyond an isolated episode or outside industry norms, which introduced an as-yet-unaddressed challenge. Operational and financial strategies may have had one or more major misalignment, limiting the ability to move forward on something important.

69. Most, if not all, systems are monopolies with autonomy over their own rates. If the system is rate-regulated, the history of timeliness on rate cases and the magnitude of what was granted versus requested will be examined. The evaluation of rate-setting practices looks beyond magnitude or frequency of rate adjustments. Instead, we evaluate whether management has acted, in our opinion, in a manner generally supportive of credit quality when tough decisions have needed to be made. Such credibility can also aid community support when such increases are needed and help protect future rate-making decisions from short-term political manipulation and decrease the potential for rate shock (see table 12).

**Table 12**

<b>Rate-Setting Practices Assessment</b>	
Strong	When rate increases have been needed, the decision-making body has been supportive and timely, even to the extent that multiyear, preapproved rate increases are common, if not standard. Financial decisions are prudent, in our view, rather than simply politically expedient and that could possibly be to the detriment of the system's near-term financial health. Periodic rate studies (internal or external) are common.
Good	Rate considerations are done on a year-to-year planning horizon rather than over a long-term time frame, but generally are apolitically approved if and when necessary.
Standard	The rate covenant and/or additional bonds test are the de facto guide as to when rate adjustments are necessary, but that is still enough for the political decision makers to agree to a rate increase.
Vulnerable	Rate increases are often in reaction to a weakened financial position, including a technical default or some other legal covenant violation, even if the recent debt service payments were made on time and in full. There is clear evidence of recent political decisions to defer or downsize needed rate increases.

## Financial Risk Profile Assessment

70. The factors that are evaluated for the Financial Risk Profile assessment are summarized in table 13.

**Table 13****Description Of Financial Risk Profile Factors****All-In Coverage (40% of Financial Risk Profile assessment)**

Analysis includes examination of historical and preferably GAAP-based results, the current financial condition of the system, and projected scenarios for the next one to three fiscal years. The focus is on total financial capacity versus total revenue requirements.

**Liquidity and Reserves (40%)**

This factor incorporates all lawfully available cash reserves and external working capital or liquidity sources, including bank lines in force within the life of any short-term obligations.

**Debt and Liabilities (10%)**

This factor incorporates mainly quantitative, but also qualitative, analyses about not just the absolute measure of the system's indebtedness but also the capacity to incur and support additional debt, especially in relation to maintaining any minimum financial metrics as covenanted to bondholders. Measurable liabilities such as pension and postemployment benefits can lead to adjustments to this initial factor.

**Financial Management Assessment (10%)**

Analysis includes an evaluation of ongoing management practices and policies that can be supportive of financial performance and continuity, as well as internal controls and reporting. Examples include establishing a minimum level of acceptable working capital, predictability of cash transfers from the system, and creating and perpetually updating a long-term financial forecast.

71. The descriptors for the overall financial risk profile are based on the scale in table 14.

**Table 14****Descriptors For Financial Risk Profile Factors**

<b>Description</b>	<b>Corresponding Assessment</b>
Extremely Strong	1
Very Strong	2
Strong	3
Adequate	4
Vulnerable	5
Highly Vulnerable	6

72. These criteria use assessments derived from historical and projected financial performance. In most cases, the ratio calculations are based on the three most recent independently audited financial statements. Our analytical assessment of pro forma or projected data will be used for those ratios affected by additional debt issuance or funded from cash reserves, or when we believe that historical financial performance is not representative of expected future performance.
73. For all-in coverage or liquidity and reserves assessments that use multiple years of historical and projected data, each single year receives a preliminary assessment. The preliminary assessments from each applicable year are averaged together to then derive one single assessment for that factor.

## Factors That Affect The Financial Risk Profile

### Significant Additional Upcoming Debt

74. If a system has potentially sizable, but as yet unspecified, capital plans that could result in material additional debt and/or the use of reserves—including when there is or will be high levels of nondiscretionary capital funding, and we determine that such plans have a reasonable likelihood of occurrence but are not specific enough yet to determine pro



forma or projected financial metrics--we generally will worsen the entire financial profile by one point. Compelling factors that would likely preserve credit quality include preapproved rate adjustments multiple years into the future, or an existing debt service schedule that allows for the new debt to be layered on in a manner that we believe is unlikely to worsen financial performance.

## A. Assessing All-In Coverage

75. While there are a variety of financial metrics that measure the ratio of revenues to revenue requirements, including financing obligations, we believe that all-in coverage best gauges the system's true total financial capacity.
76. All-in coverage is our internally adjusted debt service coverage metric that we believe best tracks the use of every dollar of system operating revenues, regardless of lien position, accounting treatment, or ultimate purpose. It also incorporates recognition of fixed charges or costs, which we define as certain long-term recurring items that are debt-like in nature, even if legally treated as an operating expense. Examples of fixed costs would include rental expenses for a sale-leaseback arrangement, or situations that reflect support of off-balance sheet debt. An example of an off-balance sheet debt is when a related government issues general obligation debt that is supported by the solid waste system's revenue. We will generally include this portion of the debt that is not supported by any alternative source of revenue in the solid waste system's all-in coverage calculation. All-in coverage also excludes adjustments to fixed costs for small or nonmaterial financing obligations such as a capital equipment lease for a vehicle or copy machine.
77. These criteria also look to total revenues less expenses (but excluding noncash items), even if the pledge to bondholders is gross operating revenues. This is because we assume that the system must be a viable, ongoing, cash flow-positive enterprise. S&P Global Ratings' defines all-in coverage as:
78. 
$$\frac{[(\text{Revenues} - \text{Expenses} - \text{Total Net Transfers Out}) + \text{Fixed Costs}]}{(\text{All Revenue Bond Debt Service} + \text{Fixed Costs} + \text{Self Supporting Debt Service})}$$
79. Total net transfers out are defined as transfers from the system fund minus transfers into the system fund, including but not limited to:
  - Transfers that are viewed as general fund resources, such as a payment in lieu of taxes, indirect cost reimbursements, and open-ended transfers;
  - Transfers that reimburse the general fund for pension and other postemployment benefit (OPEB) payments the general fund made on behalf of system employees and retirees;
  - Transfers that fund pay-as-you-go capital expenditures in another governmental fund; and
  - Transfers to support any other governmental operations regardless of the destination fund.
80. We deem net transfers out that legally or by practice support debt service of another governmental fund as part of the denominator's self-supporting debt. Cash that does not truly leave the system, such as a set-aside into a rate stabilization reserve or pay-as-you-go fund, are not included as transfers out. Similarly, the application of a rate

stabilization fund (RSF) or other cash on hand as a transfer in would not be included in the all-in coverage calculation, although we would note the presence and use of the RSF as a qualitative adjustment to the all-in coverage assessment.

81. The accounting treatments and even provisions in the bond documents vary; for example, transfers are usually a use of surplus net revenues, but sometimes may be treated as an operating expense. The methodology would treat recurring transfers as an operating expense. An annual transfer payment that is consistent in nature, such as based on a percentage of operating revenues or a fixed dollar amount, is more predictable than one that is not defined and therefore could be as big as the general government decides it should be. For example, an all-in coverage calculation of less than 1x might suggest a net cash withdrawal from the system fund. Table 15 summarizes the all-in coverage evaluation.
82. In cases where an unconditional take-or-pay minimum, capacity payment or demand charge does not exist or is not explicit, these criteria will impute what we deem to be a logical and reasonable equivalent for the purpose of calculating all-in coverage. The methodology uses the system's relative contribution to its wholesaler provider's total operating revenues as the basis for the fixed-cost imputation. For example, if the system being rated accounts for 15% of its wholesale provider's total annual operating revenues, and the wholesaler's total annual debt service payments are \$10 million, then \$1.5 million will be imputed as fixed costs for all-in coverage calculation purposes.

**Table 15**

Assessment Of All-In Coverage	
Initial Assessment	All-In Coverage
1	1.60x or above
2	1.40x to 1.60x
3	1.20x to 1.40x
4	1.10x to 1.20x
5	1.00x to 1.10x
6	Below 1.00x
<b>Qualitative Factors Positively Affecting The Initial Assessment Include:</b>	
A significant portion of operating revenues have a high degree of certainty, such as from wholesale sales with take-or-pay minimums, even if those wholesale sales serve to depress total debt service coverage due to cost-of-service rates.	
The planned, but infrequent use of a rate-stabilization fund indicates the absence of a weakness, all other things being equal, as opposed to the presence of a credit-positive characteristic. Still, it could explain poor coverage that has otherwise been consistently better.	
<b>Qualitative Factors Negatively Affecting The Initial Assessment Include:</b>	
A debt service schedule with large bullet maturities that introduces refinancing risk, or that makes it extremely likely the system will need significant growth or large rate increases to meet future requirements.	
Debt service coverage that is reliant on new customer fees or nonrecurring nonoperating cash inflows just to achieve a ratio of at least 1x.	
Exposure to interest-rate sensitivity via variable-rate debt that is enough to lead to a worse initial assessment.	
Majority of the waste is delivered by the largest customer, generally measured by revenue or tonnage, and we believe that this level of concentration could negatively affect all-in coverage.	
Majority of revenues are not from tax assessments or collected as part of a combined utility bill and we believe the collection method has or will significantly affect the revenue collection rate.	
Significant amount of revenue from spot market waste and recyclable sales.	
Each applicable qualitative factor changes the initial assessment by one point, but the net total of all adjustments would never improve or worsen the initial assessment by more than two points.	

83. The planned use of rate stabilization funds or equivalent designated reserves from time to time could, analytically,

temper measurable declines from a trend of stronger financial performance. Yet recurring reliance on an RSF in lieu of other measures such as rate adjustments to address imbalances among revenues, expenses, and debt service can be evidence of a credit weakness. Systems that perform down to the level of permissive legal covenants--such as the allowance of the use of certain cash balances toward satisfying a rate covenant or additional bonds test and potentially creating a weak alignment between revenues and expenses--would see the initial assessment lowered by one point. This is especially true when actual performance indicates insufficient pledged revenues without the use of cash.

84. It is not uncommon for systems to charge a one-time fee as new accounts are added to the customer base (exclusive of any deposit that may be required), often called a connection or impact fee. The all-in coverage ratio will be stressed by hypothetically removing these nonrecurring items from total revenues, to gauge a system's relative dependence upon these fees just to achieve sufficient financial performance. Such fees are strongest during periods of high growth in the number of customers' accounts. While perhaps they are pledged revenues, impact fees can overstate revenues available for debt service. Conversely, a slowdown or cessation of such growth--especially if not expected by management--could create a precipitous drop in the system's financial performance and expose vulnerability in the financial risk profile. Achieving a ratio of less than 1x solely from recurring revenues on a consistent basis indicates structural budgetary imbalance and would worsen the assessment by one point.
85. These criteria do not establish a guideline as to an allocation of variable-rate debt as a percentage of total long-term debt. However, if all-in coverage by our projections would change between one of the initial assessments to another in table 15 as a result of a change in interest rates, the all-in coverage assessment will reflect the worse of the two possible outcomes.

## B. Assessing Liquidity And Reserves

86. The liquidity and reserves analysis measure is days' cash available to the system as well as the available reserves. As noted in the enterprise risk profile assessment, size is also a factor in the system's financial risk profile. A system may have available reserves, for example, that are equivalent to a high days' cash number yet these reserves may be nominally very small. Both days' cash and available reserves are evaluated based on table 16. The resultant preliminary evaluations are applied to table 17 to produce the initial liquidity and reserves assessment.
87. For example, a system with \$1.2 million of cash on hand, which for this example equated to 74 days of operating expenses, would receive a '3' for the days' cash ratio, and a '4' for the available reserve levels, based on table 16. When each preliminary evaluation is applied to the matrix in table 17, the initial liquidity and reserves assessment would be at the intersection of (3, 4), or an assessment result of '4.' Qualitative factors, if any, would then be applied to improve or worsen the '4' to arrive at the final liquidity and reserves assessment.
88. The liquidity and reserves assessment is intended to measure how the system's internal sources, such as cash reserves and cash flow generation, and external sources--namely undrawn capacity under committed lines of credit--provide it the working capital to fund immediate needs on an ongoing basis. The undrawn, available portion of committed bank lines maturing beyond the next 12 months is included in the available reserves when applying tables 16 and 17; draws are included with both long-term debt and, if due within the next 12 months, debt service.

89. The liquidity analysis looks not only to cash and equivalents that are unrestricted or unassigned (i.e., unencumbered by legally enforceable agreements and not earmarked for specific purposes) and immediately available, but also gives credit to reserves that are designated, but ultimately available, for any lawful purpose. Examples include renewal and replacement funds, RSF, or other similar set-aside (but not truly restricted) cash. The criteria make no distinction between reserves that can only be appropriated by action of the highest decision-making body, or reserves that can be appropriated by simple administrative action, so long as the reserves are ultimately lawfully available for any purpose regardless of the reporting entity's label on it as determined by Governmental Accounting Standards Board (GASB) statement No. 54. Issuers that do not use a generally accepted accounting principles (GAAP) basis of presentation, or for which the financial statements do not provide a transparent and explicit breakdown of cash, must provide details of their cash position.
90. Cash that we deem to be restricted—for example, a debt service payment-to-be-made, customer deposits, a fiduciary responsibility like a pension or decommissioning fund, unspent bond proceeds, or is related to a posting of collateral, among other restrictions—will never be included in the analysis of liquidity. Any debt service reserve fund will also be excluded.
91. Intragovernmental borrowing sometimes occurs between the system and its associated general government, or sometimes even between one division of the system and another division. Cash in other funds in most cases would not be used to calculate the liquidity ratios, since those other funds likely have their own operating requirements. If a system pools its cash with other major operating funds or governmental units, only cash that is truly the system's will be counted in the calculation.

**Table 16**

<b>Liquidity And Reserves Preliminary Evaluation</b>		
<b>Preliminary Assessment</b>	<b>Days' Cash</b>	<b>Available Reserves</b>
1	Greater than 150	More than \$75 million
2	90 to 150	\$20 million to \$75 million
3	60 to 90	\$5 million to \$20 million
4	30 to 60	\$1 million to \$5 million
5	15 to 30	\$500,000 to \$1 million
6	Less than 15	Less than \$500,000

**Table 17**

<b>Liquidity And Reserves Assessment</b>						
<b>Days' Cash Ratio, Preliminary Evaluation</b>		<b>Available Reserves, Preliminary Evaluation</b>				
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1		1	1	2	2	3
2		1	2	2	3	3
3		2	2	3	4	4
4		2	3	4	4	5
5		3	3	4	5	5
6		4	4	5	5	6

Table 17

Liquidity And Reserves Assessment (cont.)						
Days' Cash Ratio, Preliminary Evaluation	Available Reserves, Preliminary Evaluation					
	1	2	3	4	5	6
Qualitative Factors Positively Affecting The Initial Assessment Include:						
The system is a distribution- and/or collection-only system with predictable wholesale costs, reducing the level of working capital the system needs to maintain.						
Qualitative Factors Negatively Affecting The Initial Assessment Include:						
Liquidity is skewed by seasonality or is otherwise not indicative of actual average daily working capital levels.						
High refinancing risk over the next two to three years.						
Exposure to contingent liabilities can cap this assessment at a '5' or a '6'.						
Systems that contract out one or more operational responsibilities and we believe that the systems are at risk for increases in contracts costs.						
Underfunding of a postclosure care cost fund when, in our view, the cost creates a near-term financial pressure.						
Each applicable qualitative factor changes the initial assessment by one point. The outcome of applying table 17 can be no greater than a positive adjustment of one or a negative adjustment of two unless an assessment cap of '5' or '6' is applicable.						

92. In cases where the system is a distribution- and/or collection-only system and off-balance sheet obligations are predictable, the system's working capital requirements, and therefore liquidity levels, may not need to be as high. In those cases, the liquidity and reserves assessment may be improved by one point.
93. As described in "Contingent Liquidity Risks", published March 5, 2012, contingent liabilities correspond to explicit or implicit obligations that a system may incur under certain circumstances. These risks could affect the system's financial position if they materialize and if not otherwise offset by factors such as available liquidity, undrawn capacity under committed lines of credit, or market access. Furthermore, contingent liabilities might arise from a series of smaller risks that, by themselves, may not otherwise appear material, but could cascade in magnitude as proximity to the trigger or timing becomes less remote.
94. These criteria measure both contingent liabilities as a percentage of total long-term debt, as well as available reserves that may be legally utilized to mitigate some or all of the potential claims on the system's available reserves.
95. For systems assessed as a '5' on table 18, the liquidity and reserves assessment is the lower of a one-point worsening of the initial assessment or a cap of '5'. For systems whose table 18 initial assessment results in a '6', the liquidity and reserves assessment is capped at '6'. Any other result does not affect the liquidity and reserves assessment.

Table 18

Contingent Liabilities Assessment						
Available Reserves/Contingent Liabilities (%)	Contingent Liabilities/Total Long-Term Debt (%)					
	<20	20 to 30	30 to 40	40 to 50	50 to 60	>60
Above 250	--	--	--	--	--	--
200 to 250	--	--	--	--	--	--
150 to 200	--	--	--	--	--	--
100 to 150	--	--	--	--	--	5
50 to 100	--	--	--	--	5	6
Below 50	--	--	--	5	6	6

## C. Assessing Debt And Liabilities

96. The analysis of a system's indebtedness is useful for a number of reasons: it can give insight into, for example, whether the system is in the middle of a large growth- or rehabilitation-driven capital program. It can also be closely tied to the system's rates and capacity for additional debt, which incorporates the analysis of the capital improvement plan (CIP). For the debt and liabilities assessment we use debt to capitalization.
97. The debt and liabilities assessment is summarized in table 19.

**Table 19**

<b>Assessment Of Debt And Liabilities</b>	
<b>Initial Assessment</b>	<b>Debt To Capitalization</b>
1	Up to 20%
2	20% to 35%
3	35% to 50%
4	50% to 65%
5	65% to 80%
6	Greater than 80%
<b>Qualitative Factors Positively Affecting The Initial Assessment Include:</b>	
A relatively rapid roll-off of the long-term debt, with 65% or more coming due in 10 years or less, assuming there are no bullet maturities within that schedule that would realistically need to be refinanced. Total debt is not reduced by the presence of a debt service reserve fund.	
<b>Qualitative Factors Negatively Affecting The Initial Assessment Include:</b>	
Concerns about pension funding, which could be evidenced by a funded ratio of less than 80%, an actuarial study that is more than three years old, or a trend of not fully funding the annual required contribution for the pension or postemployment benefits.	
Underfunding postclosure care cost funds or for other environmental liabilities when, in our view, the liabilities create financial pressure in the long term (for example, if the liabilities are sizable and management has no plan to address the underfunding).	
Each applicable qualitative factor changes the initial assessment by one point with the exception of the pension and postemployment benefits adjustment that can change the initial assessment by up to two points. The outcome of applying table 19 can be no greater than a positive adjustment of one or a negative adjustment of two.	

98. Given the recent emphasis on recognition and funding as on-balance sheet long-term liabilities for both pension (GASB Statements 67 and 68) and other postemployment benefits (OPEB; GASB Statement 45), consideration as to the system's share of unfunded liabilities as measured on the balance sheet or accompanying notes will be noted. Although these obligations are debt-like in nature, they are not equivalents to debt because the magnitude and timing of the obligation are not completely certain based on factors such as actuarial assumptions, future benefit levels, and earnings of the fiduciary fund or trust. Similarly, the annual required contributions (ARCs) and pay-as-you-go actual cash outlays are commonly treated as part of total personnel-related expenses if not accounted for in fiduciary funds or net transfers; these criteria focus on actual cash expended, not a noncash item such as one related to fair value reporting. Finally, the unfunded liability may lie elsewhere, as many system employees are civil servants and therefore beneficiaries by way of the associated municipal general government's umbrella plans, rather than a system-specific plan. If the system is part of a larger general government rather than a stand-alone entity, we assume the system's funded ratio is proportionally the same as that of the entire unit of government absent better information.
99. Nevertheless, unfunded or underfunded obligations can be a credit factor. The impact of pension and OPEB

obligations depends on the degree to which such costs will likely escalate and whether the government has plans to address them. If the funded ratio for the largest plan in which the system participates is not at least 80%, and if any of the following also is true, the assessment will be worsened by one point:

- The actuarial study is more than three years old, or
- The system has a trend of not fully funding its pension ARC.

100. If there is no credible plan to address the obligation(s), the assessment will be worsened by two points.

## D. Assessing Financial Risk Management

101. S&P Global Ratings evaluates established and ongoing management practices and policies in the seven areas under control of management that are most likely to affect credit quality. The FMA, like the OMA, ranges from (1) strong; (2) good; (3) standard; or (4) vulnerable. These areas and their weights are:

- Revenue and expense assumptions (10% of total FMA),
- Budget monitoring and interim reporting (10%),
- Long-term financial planning (15%),
- Long-term capital planning and asset management (20%),
- Investment and liquidity policies (20%),
- Debt management policies (10%),
- Transparency and accountability (15%).

102. To convert the FMA to a '1' to '6' scale, see table 20.

**Table 20**

### Financial Management Assessment (FMA) Conversion To Six-Point Scale

Observed Evaluation	FMA	Characterization
1.0 to 1.2	1	Strong
1.2 to 1.8	2	Good
1.8 to 2.5	3	Good
2.5 to 3.1	4	Standard
3.1 to 3.6	5	Standard
3.6 to 4.0	6	Vulnerable
<b>Qualitative Factor Negatively Affecting The Initial Assessment</b>		

Weak legal provisions.

103. The ability of a system's management team to implement measures on a timely basis that will in our opinion proactively shape the system's financial and operating condition can be crucial to maintaining credit stability. The assessment looks at the environment in which financial decisions affecting the system occur. Generally, higher-rated entities will, over time, develop "best practices" that not only serve as guiding rules of thumb (or actual codified policies) to ensure continuity, but also ensure logical rhyme-and-reason to decisions that are made.

104. This assessment is based on a preponderance of evidence. Specifically, in our judgment are most, but not necessarily



all, of the described characteristics applicable? A system receives a neutral assessment of 'standard' for any sub-factors for which there is insufficient evidence to assign either a positive or negative assessment. However, some sub-factors may receive a negative assessment if a system has a record of failing to disclose key relevant information.

105. By focusing on a system's policies and practices, the FMA is not an evaluation of the competency or aptitude of individual finance professionals, nor is it an evaluation of management's ability to handle unique challenges. Moreover, the nature of the system's governing body, the effectiveness of its governance practices, and issues of public policy involved in system-related decisions are beyond the scope of this analysis. The FMA analyzes the environment in which financial decisions are made, including how both the ordinary and extraordinary are identified and addressed as relevant to the system's ability to fund them and to what degree those risks are transparently reviewed and reported to ensure ongoing continuity. Financial results are assumed to manifest themselves in other visible ways and are addressed elsewhere in these criteria. The purpose of the focus on policies and practices is to evaluate the potential for credit quality to move away from that which is currently indicated by results.
106. Transparency and accountability in reporting, regardless of governance structure, is important in order to ascertain key quantitative data. States that require annual audited financial statements increase the likelihood that financial information will be available, and late audits will be noted. The use of GAAP usually enhances reporting detail and consistency across the sector, making it easier to have a sufficient uniform method of interpretation. States that allow cash accounting tolerate a lesser degree of completeness and consistency, and transparency suffers. As noted in "Alternative Financing: Disclosure Is Critical To Credit Analysis In Public Finance", published Feb. 18, 2014, a review of alternative financings and exposure to contingencies is a key component to understanding the entirety of all the risks and revenue requirements to which the system is exposed.
107. We believe that creditor security can be weakened without a minimum set of covenants that constrains the system's behavior. If we view the system's legal provisions as sufficiently weak, the initial FMA would generally be worsened by one point. We believe that in the municipal system sector those minimums generally include the below covenants and that they must exist at all times:
- A rate covenant to maintain an annual debt service coverage ratio of at least 1.0x or higher from recurring or ongoing revenues. However, where indentures permit the system to use cash balances to achieve rate covenants, whether the cash is in the form of a rate stabilization account or other available funds, we factor the use of such funds into the ratings evaluation;
  - An additional bonds test that places some limits on the amount of increased leverage that will otherwise impair credit quality of the entity; and
  - Provisions establishing remedies for when a rate covenant is violated, such as a review of the current rates.
108. In addition, when the liquidity and reserves assessment for existing rated system is a '4' or worse, we will worsen the FMA by one point if there is no debt service reserve fund (DSRF) in an amount equivalent to at least half of the average annual debt service requirements. A DSRF typically provides immediately available supplemental liquidity in the event of pledged revenue insufficiency for the payment on the obligations then due.
- We would not recognize the system as having a DSRF at all if it is only conditionally funded, such as a so-called "springing" DSRF. In such cases, this is, in our view, associated with conditions likely to come at a time when the system is least able to afford additional demands on its cash flow.



- A DSRF may be satisfied with an unconditional surety policy or similar arrangements with another financial counterparty. If we believe that the counterparty would be unable to provide funding for the DSRF in a stress scenario, and the counterparty could not be easily replaced on a timely basis, we would not recognize the system as having a DSRF.

109. The following tables detail each of the seven financial practice areas examined by the FMA.

110. The revenue and expense assumptions assessment evaluates if the organization's financial assumptions that support the annual budget and any financial forecast are realistic and well-grounded from both long-term and recent trend perspectives.

**Table 21**

Revenue And Expense Assumptions Assessment	
Strong	Formal historical trend analysis is performed and updated annually for both revenue and expenses; regular effort is made to determine whether one or more factors will cause revenues or expenses to deviate from their long-term trends over the next few years.
Good	Assumptions for most key line items in pro forma reports are analyzed and updated regularly, while others may assume simplistic changes over time such as linear or inflationary growth or flat from year to year.
Standard	Optimistic assumptions exist that, while supportable, add risk; assumptions are based on recent performance, but little evidence of questioning or validating assumptions exists.
Vulnerable	Assumptions neglect likely shortfalls, expense pressures, or other pending issues; assumptions lack prudent validation.

111. The evaluation of budget monitoring and interim reporting examines how, if at all, management reconciles year-to-date progress versus the budget adopted at the beginning of the fiscal year. This component evaluates if there are procedures for reviewing the budget based on updated information and actual-to-date performance to ensure fiscal targets and revenue requirements are met, and to what degree the interim reporting is disclosed.

**Table 22**

Budget Monitoring And Interim Reporting Assessment	
Strong	At least quarterly budget surveillance is maintained to identify problem areas, which are publicly reported to the system's governing body.
Good	Semiannual budget reviews exist; management identifies causes for variances between budget and actual performance and reports them to the system's governing body.
Standard	A deviation from the budget is only reported because it has occurred; material variances between budget and actual performance are identified after they have occurred but not captured in projections for the remainder of the fiscal period.
Vulnerable	No formal process exists for regular review and timely updating of budget during the year.

112. The long-term financial planning assessment focuses on whether or not a financial forecast exists, the length of the planning horizon is, and if it includes a comprehensive identification of all reasonably likely upcoming revenue requirements to determine how the system will meet those revenue requirements, such as adjusting rates or implementing cost containment measures.

**Table 23**

Long-Term Financial Planning Assessment	
Strong	A regularly updated pro forma financial projection exists with a planning horizon of at least three years beyond the current budget year. The forecast includes future impacts to operating and maintenance (O&M) expenses and total financing obligations--both existing and probable--are identified. Impacts to rates or the ability to generate appropriate levels of pledged revenues through cost containment measures, for example, are clear. Planned use of designated cash reserves may occur infrequently, but structural balance is a clear goal.

**Table 23**

<b>Long-Term Financial Planning Assessment (cont.)</b>	
Good	Pro forma projections exist and are comprehensive as described for a 'strong,' but are typically over a planning horizon of no more than the upcoming budget year plus one to two years into the future.
Standard	Multiyear projections are done but not updated until the last year of the current forecast. Multiyear projections are done, but with focus only on existing revenue requirements and exclude debt financing that is likely to be issued within the planning horizon, or ignore looming infrastructure investment needs such as growth or regulatory mandates.
Vulnerable	No long-term financial planning exists; O&M planning is done on a year-to-year (or budget-to-budget) basis. Near-term challenges are met with short-term fixes.

113. The asset management and long-term capital planning sub-factor assesses if a CIP exists, the length of the planning horizon, how and why projects make the list, and a summary of the most likely funding sources for the identified projects.

**Table 24**

<b>Asset Management And Long-Term Planning Assessment</b>	
Strong	Strategic and comprehensive planning focusing on the system's infrastructure requirements, physical and other assets, and ability to continue to meet service levels is combined with likely sources of funding for identified projects; the plan and its priorities are regularly updated and transparently communicated. A characterization of "strong" will include planning not only the current budget year but also for at least five years beyond that.
Good	A comprehensive multiyear capital improvement program exists as described for a "strong" assessment but the planning horizon is less than five years.
Standard	The current-year capital expenditures are identified in the budget, but any future projects are currently nothing more than a wish list; a multiyear capital plan exists but funding sources are unclear or absent.
Vulnerable	Capital planning is done as needs arise, but no more frequently than on a year-to-year (or budget-to-budget) basis.

114. Seasonal cash flow needs, capital requirements, unbudgeted or unanticipated items, and contingency hedges all suggest at least some level of working capital cushion to be maintained. The investments and liquidity policies assessment evaluates if management has identified preferred cash reserves by way of an adopted policy or even a target. Liquidity policies and targets must be grounded in reality; these criteria would not give credit for a liquidity policy if it is set at a level so far above current or recent financial performance that we would not view it as attainable. Further, this sub-factor identifies if there are locally adopted permitted investments guidelines, and if management reconciles and reports on its cash and investments with any regularity.

**Table 25**

<b>Investment And Liquidity Policies Assessment</b>	
Strong	The system has embedded policies on the maintenance of minimum reserves, regardless of whether such reserves are deemed by management to be unrestricted or designated yet available for any lawful purpose; the policies are reflective of realistically attainable and sustainable levels. Permitted investments guidelines or policies exist, even if the system's policies reflect or even mimic the state's policies. Reports on the system's investment portfolio are prepared and reported to the system's governing body at least quarterly.
Good	Targets for reserve levels exist by practice, are tied to meaningful levels, and are generally met or exceeded. While the system's de facto cash management guidelines may defer to the state's permitted investment statutes, no local policy exists. The system's management reports on its investments at least semiannually to its governing body.
Standard	Management has a target for a preferred level of cash reserves but it seems to be unrealistic given financial performance, or is so newly defined that it may be many years before such reserves are accumulated. Informal or nonpublished investment policies exist, are tracked by administrative staff but only irregularly or at the end of the fiscal year.
Vulnerable	Absence of informal reserve policies; even if they exist, they have been suspended or ignored. Weakness in cash flow adequacy has resulted in a greater appetite for risk in its investments. Investments are monitored irregularly and an external auditor deems there to be weakness or risk in cash handling and monitoring duties.

115. The debt management assessment evaluates if the system has in place robust guidelines on the use of debt, excluding

any covenant already established in its legal provisions. Examples include minimum savings thresholds for refunding bonds, stated preferences regarding final maturity, structure, and overall tenor of its debt, and the use of variable-rate debt, derivative products, floating-rate notes, or direct placement arrangements. If the debt instrument requires a financial institution counterpart, this assessment looks to any policies the system may have regarding counterparty risk.

**Table 26**

<b>Debt Management Policies Assessment</b>	
Strong	Debt policies exist and are thorough and well-defined, even if they reflect or mimic state statutes. These policies are widely communicated and followed. While management has a general tendency toward risk-aversion, robust policies and sophistication among key finance officials make it likely that debt instruments that may require heightened levels of monitoring will make surprises a remote occurrence.
Good	Policies exist but may not address some key areas. In the absence of policies, management defers to state statutes that themselves are strong; some of the system's financing obligations may be of the type that require a heightened level of monitoring, and management has some reliance on external consultants to help ensure remoteness of risks associated with those particular debt instruments.
Standard	Legal provisions and state laws are the sole guiding influences on management's use of and attitudes toward debt, or any internal guidelines are not meaningful beyond very basic or minimum debt management or are identified as unwritten goals.
Vulnerable	Absence of basic policies or clear evidence that basic policies are not being followed. Nontraditional financing options are utilized but there is no internalized knowledge, or system management relies very heavily on consultants to monitor or manage the risk.

116. The transparency and accountability sub-factor assesses whether or not management has established for the independent review of important financial and operational data as well as the quality, regularity, and timeliness of its continuing disclosure practices, even for things that the system may not be legally required to disclose. Even with annual audited financial statements produced according to GAAP, nonpublic disclosure of an alternative financing such as a direct placement arrangement would result in an assessment of 'vulnerable' for this sub-factor.

**Table 27**

<b>Transparency And Accountability Assessment</b>	
Strong	Management produces annual independently audited financial statements that comply with GAAP. Alternative financings and exposure to contingent risks are voluntarily disclosed as they are entered into, and overall continuing disclosure is deemed as robust and timely.
Good	Management produces annual independently audited financial statements that comply with GAAP. Alternative financings, exposure to contingent risks, and overall continuing disclosure are done, but generally only on an annual basis.
Standard	Management produces independently audited annual financial statements, but on a cash or other non-GAAP basis of presentation. Audits typically are released more than 180 days after fiscal year-end. The disclosure of alternative financings and contingent risk is not always timely but generally updated on an annual basis.
Vulnerable	Management produces independently audited financial statements, but cash or other non-GAAP basis of presentation is permitted. Audits typically are late or not produced each year. Regardless of frequency and quality of the audited financial statements, alternative financings and contingent risk are not voluntarily disclosed or overall continuing disclosure is poor and not timely.

## Methodology For Assessing The Impact Of Securitized Debt

117. This section addresses the financial adjustments we may make when the issuer's debt portfolios include securitization debt. When the securitization financing meets the elements of our securitization criteria, and there is statutory provision for a mandated recovery of the securitization costs, the securitization effectively makes all consumers responsible for principal and interest payments, and the system is simply a pass-through entity for servicing the debt.

As such, we deconsolidate securitization debt. The ratings evaluation of the securitization debt is distinct from this methodology, and is addressed exclusively by our securitization criteria, "Securitizing Stranded Costs", published Jan. 18, 2001.

118. Segregated securitized debt that securitizes a portion of an enterprise's revenue debt reduces an issuer's exposure to direct debt obligations because securitization financings create a revenue pledge that is legally separate from the revenues that fund system operations and debt service because of a statutory authorization that mandates recovery, even when securitization and nonsecuritization charges are billed together on customers' billing statements. At the same time, even where system financial statements consolidate securitization debt, a securitization financing does not have a claim on system revenues that fund system operations and unsecuritized debt service.
119. When securitization financings contain the structural features described in this paragraph, we deconsolidate segregated securitized debt from the system's financial statements, meaning we remove securitization debt, revenues, and expenses from the system's financial statements, and we remove the securitization-related debt service from our debt service calculations. The securitization financing must be pursuant to statutes enacted by a government entity constitutionally authorized to mandate recovery of securitization financing costs that are segregated for specialized recovery. Also, the securitization financing structure needs to exhibit protective features, including: an irrevocable, non-bypassable charge and an absolute transfer and first-priority security interest in transition property; periodic adjustments ("true-up") of the charge to remediate over- or under-collections compared with the debt service obligation to ensure collections match debt service over time and do not diverge significantly in the short run; and reserve accounts to cover any temporary shortfall in collections.
120. Specifically, S&P Global Ratings makes the following financial adjustments for segregated securitized debt:
  - Adjustment to debt: We subtract the securitized debt from total debt.
  - Adjustment to revenues: We reduce revenue allocated to securitized debt principal and interest. The adjustment is the sum of securitization interest and principal payments made during the year.
  - Adjustment to interest expense: We remove the interest expense of the securitized debt from total interest expense.
  - Adjustment to debt service: We reduce debt service by netting out the securitization debt's principal and interest payments.
121. After deconsolidating segregated securitized debt, we assign our ratings to the system's unsecuritized debt in accordance with these criteria.
122. Systems generally act as the servicers for segregated securitized debt and collect securitization debt service requirements for the benefit of securitization debt bondholders. Systems aggregate these charges on customer bills together with ordinary charges covering operating expenses and unsecuritized debt service. It is our view that customers focus on the total amount of a system bill, rather than its component parts. We believe that customers do not disaggregate securitization charges from traditional system charges in assessing whether the system's traditional charges are favorable or onerous following a securitization. Consequently, while we exclude securitization-related revenue collections, debt, and debt service from the analysis of a system's financial metrics, we do not make any adjustment for securitization in our qualitative assessments of financial and rate-making flexibility. As such, the analysis of a system's capacity to adjust rates, a fundamental element of the qualitative analysis of system credit

quality, takes into consideration the entire amount of the customer bill, including securitization-related charges.

## IMPACT ON OUTSTANDING RATINGS

123. S&P Global Ratings maintains approximately 40 ratings on the debt obligations included in the scope of these criteria. Assuming that the obligations maintain their current credit characteristics, testing suggests that approximately 55% of the system ratings in scope would not change. Approximately 35% of the system ratings in scope would have a one-notch change from their current rating, and 10% of the system ratings will be two to three notches above or below the current rating level. The majority of the rating downgrades would be within one notch of the existing rating. We believe the majority of rating changes would be due to the clarification of key and secondary drivers of creditworthiness for the sector in combination with adoption of the framework we apply to ratings of water and sewer systems. Among the ratings being raised, we would observe improvements in the financial risk profile due mainly to improving all-in coverage as a result of the sector's strong performance over time which the updated criteria better recognize through clarification of key and secondary drivers. Similarly, among the ratings being lowered, we would observe weakening of financial metrics such as declines in cash and coverage that are issuer specific.

## REVISIONS AND UPDATES

124. The final criteria is largely unchanged from what was proposed in the RFC except for minor editorial revisions, a change in table 2, where we clarified how we incorporate potential related government linkage, and in table 15, where we clarified the risk related to customer concentration. See the article, "RFC Process Summary: Solid Waste System Financings" for details.

## GLOSSARY

125. In our criteria, "system" refers to a municipally owned system or other legally authorized political subdivision that provides solid waste transport, processing, or treatment services at the retail level, or with wholesale (sales for resale) service not more than 49% of total operating revenues. The system is most often, but not always, an enterprise within a larger general government, or an independent system with its own governing board.
126. The following terms are based on the definitions provided in the article "Methodology: Definitions And Related Analytic Practices For Covenant And Payment Provisions In U.S. Public Finance Revenue Obligations", published on Nov. 29, 2011:

### Other terms

127. **Annual required contribution:** The actuarially calculated amount that the system (or its sponsoring plan provider) must make to completely fund its next associated payment on its pension and/or OPEB liability.
128. **Available reserves:** Unrestricted cash and equivalents plus any working capital that resides on the system's balance sheet and is lawfully available for any purpose plus any undrawn capacity under committed lines of credit. Examples include emergency and contingency funds, rate stabilization reserves and other cash that may be designated in purpose but not restricted for debt service, fiduciary purposes, or asset retirement obligations.

129. **Contingent liabilities:** Variable-rate demand bonds, commercial paper, bullet payments due within five years, bonds with mandatory tender dates in five years or less, direct bank debt with acceleration clauses, the potential for a wholesale provider to reallocate its costs to the system in an unbudgeted or otherwise unpredictable manner or the obligation is not based on an availability payment structure, swap or related termination payments if the current rating is two notches or less from the termination trigger, and other identifiable contingencies.
130. **Days' cash:** A measure of cash, investments and equivalents, calculated as follows:
  131. Numerator: Available reserves.
  132. Denominator: 1/365th of income statement operating expenses. For operating expenses, depreciation, amortization, and other noncash items, such as those that update a fair value on a derivative or pension obligation, are excluded. Transfers are included in operating expenses.
133. **Debt to capitalization:** A measure of the relative leverage of the system, as follows:
  134. Numerator: The sum total of all short- and long-term debt both on the system's balance sheet and that which is allocable to the system, including draws on credit lines, commercial paper notes and other loans, debt, or material obligations even if not rated by S&P Global Ratings.
  135. Denominator: The total debt as calculated in the numerator plus the system's net position, which we view as public sector accounting's closest approximation of equity.
136. **Dependent population:** The total population of the service area that is younger than 15 years old plus the total population of the same area older than 65 years old.
137. **GAAP:** Generally accepted accounting principles are the common set of accounting principles, standards, and procedures that most governments and systems in the U.S. follow. GAAP is determined by the Governmental Accounting Standards Board.
138. **Off-balance sheet:** An obligation for which the system is legally responsible, but which may appear only in the rated system's financial statement notes, or another entity's balance sheet, but not within the long-term debt of the rated system itself.
139. **Other postemployment benefits:** Health care, along with dental, vision, disability, long-term care, and life insurance benefits offered to qualified retirees of the system.
140. **Self-supporting debt:** Debt is considered self-supported if the debt issued by the affiliated unit of government on behalf of the system--such as a city issuing GO or special tax to fund projects for the betterment of its system--is fully paid by practice from the system's surplus net revenues. Full self-support means surplus net revenues must be at least as large as the principal and interest payments then-due on that tax-secured debt.
141. **Tax-secured debt:** Debt that is secured by a full faith and credit general obligation pledge (whereby revenues are commonly derived by the levy of a property tax) or special tax--such as a local option sales tax or parcel tax.

## RELATED CRITERIA AND RESEARCH

**Article superseded by the criteria:**

**Articles complementing the criteria:**

- General Criteria: Rating Government-Related Entities: Methodology And Assumptions, March 25, 2015
- Methodology: Master Limited Partnerships And General Partnerships, Sept. 22, 2014
- Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Ratings Above The Sovereign: Corporate And Government Ratings—Methodology And Assumptions, Nov. 19, 2013
- Key Credit Factors For The Regulated Utilities Industry, Nov. 19, 2013
- Key Credit Factors For The Environmental Services Industry, Feb. 12, 2014
- Corporate Methodology, Nov. 19, 2013
- Methodology: Industry Risk, Nov. 20, 2013
- Timeliness Of Payments: Grace Periods, Guarantees, And Use Of 'D' And 'SD' Ratings, Oct. 24, 2013
- Local Government GO Ratings Methodology And Assumptions, Sept. 12, 2013.
- Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings, Oct. 1, 2012
- Contingent Liquidity Risks, March 5, 2012
- Methodology: Definitions And Related Analytic Practices For Covenant And Payment Provisions In U.S. Public Finance Revenue Obligations, Nov. 29, 2011
- Methodology: Rating Approach To Obligations With Multiple Revenue Streams, Nov. 29, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- Stand-Alone Credit Profiles: One Component Of A Rating, Oct. 1, 2010
- Use Of CreditWatch And Outlooks, Sept. 14, 2009
- Rating Implications Of Exchange Offers And Similar Restructurings, May 12, 2009
- Appropriation-Backed Obligations, June 13, 2007.
- Wholesale Utilities, May 24, 2005
- Securitizing Stranded Costs, Jan. 18, 2001
- Rating Methodology And Assumptions For U.S. Municipal Waterworks And Sanitary Sewer Utility Revenue Bonds, Jan. 19, 2016
- Credit FAQ: All-In Coverage, Transfer Payments, And Credit Quality, Jan. 19, 2016
- Management Is Key For U.S. Water Utilities To Align Operations And Finances, Jan. 19, 2016
- The Broad And Diverse Economy Adjustment: 2015 Updated Scores For U.S. Metropolitan Statistical Areas Based On Local Government GO Criteria, Dec. 15, 2015
- Alternative Financing: Disclosure Is Critical To Credit Analysis In Public Finance, Feb. 18, 2014
- Credit FAQ: U.S. Public Finance Ratings And Criteria For Ratings Above The Sovereign, Dec. 19, 2013
- U.S. Public Finance Rating Characteristics, March 7, 2008
- Assigning Issue Credit Ratings Of Operating Entities, May 20, 2015

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as S&P Global Ratings assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.

Copyright © 2018 by Standard & Poor's Financial Services LLC. All rights reserved.

No content (including ratings, credit-related analyses and data, valuations, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of Standard & Poor's Financial Services LLC or its affiliates (collectively, S&P). The Content shall not be used for any unlawful or unauthorized purposes. S&P and any third-party providers, as well as their directors, officers, shareholders, employees or agents (collectively S&P Parties) do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Parties are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, for the results obtained from the use of the Content, or for the security or maintenance of any data input by the user. The Content is provided on an "as is" basis. S&P PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs or losses caused by negligence) in connection with any use of the Content even if advised of the possibility of such damages.

Credit-related and other analyses, including ratings, and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. S&P's opinions, analyses and rating acknowledgment decisions (described below) are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P assumes no obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P does not act as a fiduciary or an investment advisor except where registered as such. While S&P has obtained information from sources it believes to be reliable, S&P does not perform an audit and undertakes no duty of due diligence or independent verification of any information it receives.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P reserves the right to assign, withdraw or suspend such acknowledgment at any time and in its sole discretion. S&P Parties disclaim any duty whatsoever arising out of the assignment, withdrawal or suspension of an acknowledgment as well as any liability for any damage alleged to have been suffered on account thereof.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, [www.standardandpoors.com](http://www.standardandpoors.com) (free of charge), and [www.ratingsdirect.com](http://www.ratingsdirect.com) and [www.globalcreditportal.com](http://www.globalcreditportal.com) (subscription), and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at [www.standardandpoors.com/usratingsfees](http://www.standardandpoors.com/usratingsfees).

STANDARD & POOR'S, S&P and RATINGSDIRECT are registered trademarks of Standard & Poor's Financial Services LLC.



# **EXHIBIT**

## **“4”**

# U.S. Public Finance Solid Waste Revenue Bond Rating Criteria

## Sector-Specific Criteria

This report replaces the prior criteria report titled "Solid Waste Revenue Bond Rating Criteria," dated Aug. 12, 2016.

### Scope

This sector-specific criteria report is used by Fitch Ratings' analysts in conjunction with the master "Rating Criteria for Public Sector Revenue-Supported Debt" report. The criteria describe the factors considered in rating debt obligations supported by revenues generated within or from governmentally owned or operated solid waste systems located within the U.S.

The criteria apply to new and existing ratings. Ratings derived under the criteria are typically assigned to individual debt instruments and are therefore issue ratings. The ratings are based on the operations that generate the revenues backing the debt. They are not capped by the overall entity's Issuer Default Rating unless either some form of external support is provided by an issuer (as discussed on page 5 under "Third-Party Participants") or Fitch does not view the revenues pledged to bond repayment as clearly special revenues under Chapter 9 of the U.S. Bankruptcy Code.

### Key Rating Drivers

Of the key rating drivers listed below, revenue structure and its variability are the starting point in the rating analysis. However, the relative influence on a rating of qualitative and quantitative factors varies when rating debt issues in the sector as well as over time. As a guideline, where one key rating factor is significantly weaker than the others, this weakest element carries greater weight in the analysis.

**Revenue Structure and Variability:** Revenue structures that rely on user fees or assessments collected with property tax or utility bills, typically found in Tier I systems, are considered by Fitch to be a positive credit factor and associated with higher-rated systems.

**Operating Profile:** Operational effectiveness is demonstrated by generation of sufficient revenues to support operating expenses, service debt and make facility improvements. Operation and management agreements, as well as the collection and disposal methods employed by the system, are part of Fitch's analysis. Fitch's highest ratings for solid waste revenue bonds are associated with municipal ownership and operation, with flow control ordinances in place and/or strong contracts for waste supply with other municipalities.

**Financial Performance:** Systems with flexible rate-making ability and a history of positive operating results, providing for strong debt service coverage (DSC), are rated higher by Fitch. Competitiveness of rates, when competition is a factor, is also a key rating factor.

**Service Area and Customer Base:** Fitch analyzes the service area's economic and demographic fundamentals, including customer diversity, to assess expected waste generation from customers and other revenue trends, including property-based fees.

**Debt and Capital Needs:** Fitch assesses the system's ability to absorb the costs associated with capital needs and their impact on the debt burden. Legal provisions within bond documents that limit leverage are also considered.

**Balance Sheet Resources and Liquidity:** Available liquidity is evaluated relative to the operating risk profile. Tier I systems require less liquidity to achieve the same rating as Tier II or III systems.

### Related Criteria

Rating Criteria for Public Sector Revenue-Supported Debt (June 2017)

### Analysts

Kevin Dolan  
+1 212 908-0538  
[kevin.dolan@fitchratings.com](mailto:kevin.dolan@fitchratings.com)

Amy Laskey  
+1 212 908-0568  
[amy.laskey@fitchratings.com](mailto:amy.laskey@fitchratings.com)

## Summary

Solid waste systems can be classified into one of three general categories, or tiers. The basic credit and risk factors of governance and management, operational profile, debt profile and financial profile build in complexity as the analysis moves from Tier I to Tier III credits. Each category includes the attributes of the prior tier(s). Tier I credits are basic collection systems with disposal contracted to another facility or system. Tier II credits are collection and landfill disposal systems. Tier III credits include waste-to-energy facilities and sometimes include components of collection and landfill disposal systems.

## Key Attributes of Solid Waste System Tiers

Attribute	Tier I (Collection/Transfer Station)	Tier II (Landfill Disposal)	Tier III (Resource Recovery)
<b>Equipment/Facilities</b>	Transfer station	Landfill	Waste-to-energy facility
<b>Governance/Management</b>	Municipal enterprise	Authority or JPA	Authority or JPA
<b>Ownership</b>	Publicly owned and operated	Publicly owned and operated; publicly owned and privately operated	Publicly owned and operated; publicly owned and privately operated
<b>Debt/Capital Profile</b>	Less capital-intensive	More capital intensive	Highly capital intensive
<b>Contracts</b>	Collection; disposal; transfer station operation	Tier I plus landfill operating contract; sales of methane gas	Tier II plus waste-to-energy operating contract; electric sales contract
<b>Revenue Profile</b>	Household assessment collected on property tax bill; fees on utility bill	Tier I plus sales of recyclables; landfill gas recovery sales; tipping fees	Tier II plus sales of electric energy
<b>Expense Profile</b>	Collection and disposal expenses; operating expenses for transfer station	Tier I plus landfill operation, landfill closure and post-closure	Tier II plus waste-to-energy operating contract
<b>Competitive Factors</b>	Minimal	Potential exposure to reductions in contracted or spot waste	Tier II plus exposure to fluctuations in energy sales

JPA – Joint power agency.

Fitch's ratings in this sector are mostly on well-established systems that tend to have strong credit characteristics, as reflected in their average 'A+' rating. The strongest ratings for solid waste revenue bonds are associated with municipal ownership and operation, including revenue structures benefiting from fixed user fees or assessments collected with property tax or utility bills rather than volumetric-based fees. These features are typically found in Tier I systems. Lower solid waste system ratings are associated with Tier III systems. These include waste-to-energy plant operations which typically have components of more market-based revenue structures leading to more variable revenue results over time.

Capital and maintenance requirements tend to be more intensive for these credits, and higher DSC ratios (closer to or above 1.50x) than Tier I systems are generally associated with ratings at the higher end of the 'A' rating category. Other positive credit attributes that can offset a more market-based revenue structure include strong contracts for waste supply, limited contract renewal risks, an economically competitive system, a strong service area and high levels of unrestricted operating reserves. Tier I systems tend to have more operational stability and can achieve high ratings with lower DSC ratios.

Fitch is unlikely to rate a solid waste enterprise system above the 'AA' rating category, as revenue variability is inherent in this sector due mostly to changes in waste volume. Where revenues are from a more fixed source, the variability of expenses associated with capital and equipment and regulatory costs can constrain DSC ratios, limiting overall financial flexibility. Other credit concerns include a narrow or concentrated customer base or waste contracts with significant renewal risks that could expose the entity to a gap in revenues. Strong cash balances, legal covenants and

historical DSC, as well as the demonstrated ability to replace private-sector operators and haulers, can mitigate such credit risks. If such concerns are not mitigated, such credits would likely fall within Fitch's 'BBB' rating category or lower.

### Typical Credit Attributes of Solid Waste Systems

Characteristics	Revenue Structure and Variability	Operating Profile	Financial Performance	Service Area	Capital/Debt Requirements	Balance Sheet Resources and Liquidity
<b>Stronger</b>	High portion of revenue derived from a fixed fee or assessment collected on property tax or utility bill. High rate flexibility exists. Generally stable revenue performance. Typical of Tier I systems.	Limited operational risk; municipal ownership and limited contractual risks. Typical of Tier I systems.	Consistent track record of a break-even to slightly positive operating margin generated by typically stable revenue base. Typical of Tier I systems. Coverage of pro forma debt service from net revenues is greater than 1.25x for Tier I systems; 1.35x for Tier II systems; 1.50x for Tier III systems.	Service area with no concentration of waste generation and solid growth prospects. Higher tolerance for concentration in Tier I systems.	Capital needs exist but are not extensive and require little or no debt. Typical of Tier I systems.	Available funds provide a significant financial cushion (more than six months for Tier II and more than one year for Tier III) relative to operating expenditures. Not a critical factor for Tier I systems unless liquidity falls below 60 days.
<b>Midrange</b>	Revenues derived from a mix of fixed fees or assessments collected on property tax or utility bill. Moderate rate flexibility exists. Moderately variable revenue performance.	Modest level of operational risk supported by long-term contracts or contracts with moderate renewal risks.	Fairly consistent track record of break-even performance, although occasional deficits do occur. Operations may be subsidized periodically by surplus cash. Revenues and expenditures may be somewhat volatile. Coverage of pro forma debt service from net revenues is generally 1.15x or greater for Tier I and 1.25x or greater for Tier II and III systems.	Stable service area with some concentration of waste generation.	Capital needs are more evident and include plans where needs are addressed over multiple time spans. Low to moderate level of regulatory demands. Modest to moderate additional debt needed relative to resource base.	Available funds provide a solid financial cushion (generally six months) relative to operating expenditures.
<b>Weaker</b>	Volatile and/or concentrated revenue structure typically more volume-based. Limited rate flexibility.	Higher level of operational risk. Contractual agreements have less flexibility in pricing or stringent waste requirements. Renewal risks more evident.	Volatile operating performance, with break-even years offset by years of deficits. Coverage of pro forma debt service from net revenues is generally below 1.15x for Tier I systems and below 1.25x for Tier II and III systems.	Declining service area and/or higher commercial concentration of waste.	Sizable capital needs either due to age and condition of facilities or stringent regulatory requirements. Moderate to high debt needs relative to resource base.	Limited; available funds provide a lower financial cushion (generally three months or less) relative to operating expenditures.

### Revenue Structure and Variability

Revenue structures that rely on non-volumetric user fees or assessments collected with property tax or utility bills, typically found in Tier I systems, are considered by Fitch to be a positive credit factor and associated with higher-rated systems. This type of revenue structure provides for more stability and predictability of system revenues, usually leading to consistent levels of DSC. Where a high degree of revenue concentration exists, either from an individual source or industry, for example, this would be considered a negative rating factor.

A high level of rate flexibility is considered by Fitch to be a strong rating characteristic. Low rate flexibility can be a limiting factor and could constrain a rating.

For systems that rely on a volume-based fee structure, Fitch will identify the portions being derived from contractual agreements versus open-market-generated waste (spot waste), which is more variable.

## Operating Profile

A key focus of the analysis of operational effectiveness is the system's ability to collect and dispose of sufficient waste to provide revenues to pay expenses, service debt and improve facilities. Fitch will assess the system's ability to obtain waste flows through the use of legal flow control ordinances, franchise agreements with private haulers, competitive pricing, municipal agreements, private contracts or some combination of these.

Fitch reviews stability in operational performance, such as availability factors, capacity factors, electric-generating output and steam-generating output. With respect to landfill capacity, Fitch will look at projections for the estimated useful life of a landfill and assess the system's future disposal alternatives and the potential risk of higher disposal costs that could affect future net revenues.

Collection, disposal and billing methods are also evaluated, including the determination of which party is responsible for each function and what may prevent the responsible parties from delivering and billing for services. A regular billing cycle with high collection rates is typical for the systems currently rated by Fitch.

Fitch considers the timeliness of the budget and rate-setting process. Fitch views as a credit positive a system where management can set rates and adopt budgets unilaterally through its board, and believes the need for consensus among multiple municipal participants can lead to contention or delays in approval.

For joint power agencies (JPAs) or other regional authorities, efficient and cost-effective waste collection and disposal depend on a JPA's working relationship with its municipal members and private contractors. JPA budgets and capital plans generally must be approved by municipal members, who may also participate in budget and/or capital plan development. Therefore, Fitch views positively open and frequent communication between the municipal members and the JPA.

## Contracts

Solid waste systems have typically supplemented flow control ordinances with contracts and interlocal agreements to ensure that the supply of waste to the system is adequate for the operation of system facilities as well as the sale of recyclables, electricity or methane gas.

### *Types of Contracts*

Tier I solid waste systems typically have contracts for waste collection; the operation of municipal transfer stations with private franchise haulers (if not municipally operated); and disposal with a landfill or waste-to-energy facility. Tier II systems can also have contracts for the private operation of landfills or the sale of recyclable material and methane gas. Tier III systems can have contracts for the operation of waste-to-energy facilities, landfills and transfer stations, as well as for the sale of electricity. Contracts that are put or pay, meaning minimum payments are required regardless of the amount of waste actually processed, provide greater revenue stability and are considered a positive credit attribute.

Fitch will evaluate the ability of each municipal partner in a JPA to honor the provisions of joint and several contracts and agreements. In the absence of a Fitch public rating of the municipal entity, Fitch will assign its own credit opinion if the rating is based on such performance.

### *Contract Terms*

To assess whether waste services and revenues will be uninterrupted, Fitch will review the terms of the operating contract that affect system operations. Fitch will analyze the ability of system

management to replace private participants on a timely basis, if necessary, due to failure to perform under the contract. Fitch also examines the presence of alternate service providers in the area.

Risk can be mitigated to some extent when contractual arrangements require that payment and performance bonds be obtained by operators and major haulers to insulate the system from service and cash flow interruptions due to nonperformance. Fitch considers systems having strong municipal oversight, with the ability to intercede to ensure performance requirements are met, as a positive credit factor.

An important consideration will be the duration of the contracts and, if shorter than the term of the related bonds, the renewal provisions. Risk of nonrenewal is mitigated by market-based pricing structures for private partner services, which create incentives for renewal by the private partner.

Operating permit renewal terms can also affect credit quality. Permits that must be periodically renewed raise the risk of future nonrenewal, interruption in operations and disruption in revenues. The ability to mitigate a material loss of revenues is determined in Fitch's analysis based on the availability of replacement facilities or service providers if necessary.

### ***Contract Remedies***

Fitch will examine each system's exposure to any variables in the pricing formula and the potential impact on bondholder security arising from provisions of operating and management contracts. Contracts based on complex formulas and provisions regarding the sharing of increased costs and penalties that could reduce municipal control and financial flexibility are generally considered to be a negative rating factor. Rate stabilization and/or renewal and replacement reserve funds will mitigate these risks. These funds are included in Fitch's analysis of balance sheet resources and a system's days cash on hand to cover operating expenses.

### **Third-Party Participants**

When any form of general government assistance is pledged directly or indirectly to a solid waste system, such as municipal guaranties or deficiency makeup agreements, the credit quality of such participant will be a key driver in the rating assignment on the system's obligations. Analysts will rely on Fitch's "U.S. Public Finance Tax-Supported Rating Criteria" to perform an analysis of the government's credit quality. Fitch will review the legal enforceability of the support as well as the significance to the system to determine the level of credit enhancement, if any, such support provides.

When bond security includes a parent company guaranty on the performance of the private participant, Fitch determines its value by examining the terms of the guaranty and whether notification procedures ensure timely payment. The credit quality of the guarantor will be reviewed by the appropriate rating group within Fitch when the rating relies on the performance of the private entity.

### **Environmental and Regulatory Profile**

Solid waste systems are subject to a variety of federal, state and local laws and regulations. Fitch analyzes the cost of complying with these requirements and the impact on the competitive and financial position of the system. Systems with landfills must comply with regulatory issues relating to upgrades, closure and groundwater contamination. Tier III systems must also observe air quality emission standards.

Most systems must also comply with recycling regulations. Fitch determines whether management's plans for meeting these requirements appear to be comprehensive, realistic and affordable.



Residential development trends will be examined for systems with landfills and transfer stations, as land constraints can hinder management's ability to implement the projects needed to comply with environmental regulations.

## Financial Performance

Fitch assesses the organization's financial profile, reviewing trends in operating performance, non-operating results, absolute and relative levels of balance sheet assets, and liabilities. Generation of revenues sufficient to cover operating expenses and debt service requirements is a key component of the financial profile. Fitch prepares a base case and ratings case in accordance with Fitch's master criteria for revenue-supported debt. The base and rating case are based on a cash flow scenario taking into consideration any approved rate increases, changes in economic factors affecting waste flow and trends in expenditures to determine changes in DSC and potential operating pressures. Issuer forecasts, when provided, will be evaluated and used to inform Fitch's base case.

Fitch will evaluate potential losses of commercial activity over the life of the bonds. When considering spot waste tonnage, Fitch will examine the competitive environment, focusing on rates, location and transportation costs and the level at which financial performance relies on this activity.

Fitch analyzes the system's ability to adjust rates to provide sufficient financial cushion while taking into account market conditions. Fitch becomes concerned when tip fees are high relative to competing systems and need to be increased to provide adequate operating revenue. Lack of competitive tipping fees may be offset by the ability to raise other charges to subsidize tipping fees. For Tier I systems, Fitch reviews the flexibility to adjust rates in the future relative to any legal revenue-raising limitations.

Tier III systems tend to be more vulnerable than Tier I or Tier II systems to reduced waste tonnage due to a generally higher fixed-cost burden. Alternatively, Tier III systems may encounter capacity constraints and potential breach of operating benchmarks.

## Performance Metrics

Historical and projected coverage of debt service is considered in relation to rate and fee increases, along with waste generation trends. Coverage is also viewed in relation to management's internal targets. Solid internal targets, in the 1.40x–1.50x range, that are consistently met can offset liberal rate covenants and additional bonds tests, including targets allowing the use of rate stabilization funds or unrestricted reserves to meet tests.

As part of its analysis, Fitch will compute a system's annual DSC from net revenues (net revenues = [operating revenues + investment income] less [operating expenditures – depreciation]). All outstanding liens with debt are combined, and Fitch uses maximum annual debt service (MADS) for all outstanding liens in the agency's calculation. A high coverage ratio is considered to be a positive credit factor, as it allows for more protection against a variable revenue stream, annual increases in expenses and surplus for capital and maintenance costs.

Fitch considers DSC ratios of 1.50x or greater to be strong. In addition, Fitch looks at the contribution of the components of pledged revenues. A system with a stable, largely fixed-charge base can achieve a high rating with lower coverage than a system whose revenue base is more dependent on variable, market-dependent revenues.

Fitch will perform stress analysis as appropriate based on the revenue structure to determine the margin of revenue decline or spending increases above 100% annual and MADS coverage. Other stress cases include the loss of a top franchise hauler, customer or municipal participant

when concentration is a concern and its potential effect on future operating revenues and debt service coverage. Fitch also analyzes the volatility of recycling revenues, if a significant portion of overall revenues, as market value and demand can fluctuate over time.

### Revenue and Cost Stress

Fitch will develop a rating case scenario to reflect the agency's through-the-cycle approach to ratings and evaluate the demand and revenue stress an issuer may experience in an economic downturn. The scenario will measure the largest historical revenue decline experienced by the issuer during the past 10 years and consider the impact of one-half of that decline on operating performance over the relevant forecast period (typically three years).

### Service Area and Customer Base

Fitch reviews the trends of system tonnage as well as the types of waste (household, construction, corporate, industrial or recycling) to assess whether a system is meeting projections in customer accounts and waste tonnage. Waste generation is generally expected to track economic growth in the service area unless the customer base includes a high proportion of noncontracted or spot waste. Fitch considers household waste to be the least volatile, typically resulting in stable revenues for a system.

Analysis of the continuing financial viability of a solid waste system is in part determined by historical trends and current economic activity in the service area and customer base. Fitch will analyze the economic and demographic fundamentals, including income levels, population and growth, as well as residential and commercial composition, to determine if revenue projections are realistic. Fitch's expectations for the economy inform the agency's assessment of prospects for revenue growth, spending demands, the affordability of debt and the ability of an issuer to generate sufficient revenues over time to service its obligations. If a particular economy is very concentrated, small or remote, such that the issuer is susceptible to a sudden and unpredictable change in profile, this represents an additional risk factor that will constrain a rating. For additional information on Fitch's analysis of service area characteristics, see Fitch's "U.S. Public Finance Tax-Supported Rating Criteria," dated May 31, 2017, available on the agency's website at [www.fitchratings.com](http://www.fitchratings.com).

A customer base that generates a higher proportion of waste from residential rather than commercial activity is generally viewed by Fitch as a more positive rating characteristic. Residentially generated waste volume is typically more stable, as it is usually collected under flow control ordinances, franchise hauling agreements or supply agreements with municipal participants. Systems that have a high proportion of commercial waste are exposed to flow diversion if rates are not competitive and to declining tonnage in periods of recession. Such variability in waste flow is a limiting factor and can constrain a rating.

### Debt and Capital Needs

Fitch assesses the system's ability to absorb the costs associated with capital needs and the costs' impact on the debt burden. Legal provisions that limit leverage of debt are also considered as a rating factor. Fitch considers Tier I systems to be less capital intensive due to the limited operational risk associated with the collection and transfer of waste. Tier II and III systems are considered more capital intensive by Fitch, as they have a higher degree of operating risk associated with landfill management and/or waste-to-energy facilities. Capital needs for solid waste systems are typically associated with the management, handling and disposal of waste flow; compliance with stringent environmental regulations; and development of recycling, composting and materials recovery programs.



## Capital Planning and Management

Fitch assesses capital improvement plans, consultants' reports, demand reports and any internal and independent feasibility analysis as part of a review of investment in physical plant capacity. Plans that are dynamic, incorporating proven technology that addresses facility needs over multiple time spans, and specify funding sources are viewed more credibly in the rating process. Fitch will evaluate the available feasibility studies to determine whether operating projections are realistic when coupled with economic projections and capital plans. This is especially relevant for the timing of debt issued to expand facilities for a growing service area.

Fitch will also evaluate the impact of projected capital needs based on provisions in contracts and agreements and the expenses associated with such needs compared to the revenue base. Although Tier I systems are typically less capital intensive than Tier II and III systems, Tier I systems may be vulnerable to contract provisions that could increase expenses based on the volume of waste processed or consumer price indicator escalators.

## Debt Profile

Fitch reviews the system's debt structure and debt capacity as well as the system's legal covenants. This analysis also evaluates a facility's useful life and growth projections against the amortization schedule of existing debt and anticipated future debt associated with projected capital and maintenance needs. Ascending debt service schedules are generally considered a negative rating factor, as such schedules are dependent on economic growth or increased rates and fees and can constrain future debt issuance capacity. A high level of short-term or variable-rate debt is a negative credit consideration.

## Legal Provisions

Fitch analyzes several legal factors to ensure that bondholders are adequately protected against excessive leveraging or insufficient resources to service debt.

## Pledged Revenues

The most common security for solid waste transactions is a pledge of net system revenues. As these revenues are generally special revenues under the definition in Chapter 9 of the U.S. Bankruptcy Code, Fitch believes they would not be subject to disruption or diversion in the event of a local government's bankruptcy filing. Fitch's revenue bond ratings are neither notched from the general government's Issuer Default Rating (IDR), nor is the IDR considered a cap. Nevertheless, Fitch will analyze the flow of funds to ensure it provides for the separation of pledged revenues from the local government's operating fund.

In addition to analyzing the sources and amounts of revenues pledged, Fitch verifies that a third-party legal opinion deems the pledges valid and binding. The value of a first lien on net revenues will be diluted if system revenues have been previously committed to other obligors of the system.

## Reserves

Fitch views as stronger those systems that consistently retain reserves and have limited commitments to transferring excess money to other funds. These criteria do not have specific expectations for the funding of debt service reserve funds (DSRFs) but consider whether there is liquidity within the structure commensurate with the rating assigned to the bonds. A DSRF may be important in situations where liquidity is a concern based on a weak operating system and/or the level of DSC. Instances that may affect the bond rating include cases where revenues cover debt

service narrowly and liquidity is limited or a large swap termination payment(s) exists, which would have a material impact on an entity's financial capacity if required to be paid.

Typical Tier II and III structures often include required reserves for operations in the form of two to three months of operating expenses. Maintenance and repair reserve requirements are usually determined by technical consultants.

Rate stabilization funds offset risks associated with systems that rely on tipping fees for a large percentage of revenues, as such funds allow systems more flexibility to maintain consistently competitive rates. Fitch examines the priority of funding and conditions for drawing on the reserves. The period for replenishment following a reserve fund draw is also reviewed to determine the likelihood that these funds will be available if needed on a periodic basis.

### **Tests and Covenants**

Fitch will assess whether a system's finances and competitive flexibility may be compromised by overly restrictive covenants. Rate covenants as provided in bond indentures typically range from 1.10x–1.25x annual debt service. Although a higher coverage requirement implies adequate funds to meet debt service and is generally perceived as a credit positive, such requirement could limit the system's ability to adjust rates downward to remain competitive in circumstances where there is a high level of spot waste disposal or waste flow ordinances are not in place.

Additional bonds tests (ABTs) that are based on historical operating results and are at least equal to the rate covenant are considered a stronger credit attribute. This demonstrates that the system is able to carry additional debt on current operations.

To remain competitive, structures for some Tier II and III credits allow the ABT and the rate covenant to include a specified percentage of reserve funds. These liberal legal provisions are a credit negative, as they often allow less than sum-sufficient coverage of debt service from system operations and may allow issuance of more debt than the system operations can comfortably cover.

### **Balance Sheet Resources and Liquidity**

Fitch considers various metrics when determining a system's liquidity, including days cash on hand, which compares available resources to operating expenses. Other relevant measurements include quick and current ratios, which gauge a system's ability to meet near-term liabilities.

Liquidity is not as critical a rating factor for Tier I systems because of their stable revenue base as opposed to Tier II and III systems, where liquidity is more important to offset revenue variability and support capital and maintenance costs. Liquidity becomes a more important factor for Tier I systems and warrants additional consideration when available cash on hand is less than 60 days.

### **Rating Sensitivities**

**Operating Performance:** Ratings are sensitive to changes in a system's operating profile, including revenue generation, expenditure pressure, DSC and reserves. A decline in the rating could occur, for example, if DSC declined, because operating expenses increased significantly with no appropriate rate increase by management. Alternatively, a rating could be upgraded if costs are stabilized through long-term contracts or new waste disposal facilities that lead to lower capital costs and improvements in DSC for a sustainable period.

### Data Sources

The key rating assumptions used in these criteria are based on Fitch's analysis of transaction documents for various solid waste projects; information received from local government issuers or obligors for financed projects; and reports issued by engineers, fiscal consultants and other third parties.

### Limitations

Ratings, including Rating Watches and Outlooks, assigned by Fitch are subject to the limitations specified in Fitch's [Ratings Definitions page](http://www.fitchratings.com), at [www.fitchratings.com](http://www.fitchratings.com).

### Variations from Criteria

Fitch's criteria are designed to be used in conjunction with experienced analytical judgment exercised through a committee process. The combination of transparent criteria, analytical judgment applied on a transaction-by-transaction or issuer-by-issuer basis, and full disclosure via rating commentary strengthens Fitch's rating process while assisting market participants in understanding the analysis behind our ratings.

A rating committee may adjust the application of these criteria to reflect the risks of a specific transaction or entity. Such adjustments are called variations. All variations will be disclosed in the respective rating action commentaries, including variations' impact on the rating where appropriate.

A variation can be approved by a ratings committee where the risk, feature or other factor relevant to the assignment of a rating and the methodology applied to the rating are both included within the scope of the criteria, but where the analysis described in the criteria requires modification to address factors specific to the particular transaction or entity.

ALL FITCH CREDIT RATINGS ARE SUBJECT TO CERTAIN LIMITATIONS AND DISCLAIMERS PLEASE READ THESE LIMITATIONS AND DISCLAIMERS BY FOLLOWING THIS LINK: [HTTPS://FITCHRATINGS.COM/UNDERSTANDINGCREDITRATINGS](https://fitchratings.com/understandingcreditratings). IN ADDITION, RATING DEFINITIONS AND THE TERMS OF USE OF SUCH RATINGS ARE AVAILABLE ON THE AGENCY'S PUBLIC WEB SITE AT [WWW.FITCHRATINGS.COM](http://WWW.FITCHRATINGS.COM). PUBLISHED RATINGS, CRITERIA, AND METHODOLOGIES ARE AVAILABLE FROM THIS SITE AT ALL TIMES. FITCH'S CODE OF CONDUCT, CONFIDENTIALITY, CONFLICTS OF INTEREST, AFFILIATE FIREWALL, COMPLIANCE, AND OTHER RELEVANT POLICIES AND PROCEDURES ARE ALSO AVAILABLE FROM THE CODE OF CONDUCT SECTION OF THIS SITE. FITCH MAY HAVE PROVIDED ANOTHER PERMISSIBLE SERVICE TO THE RATED ENTITY OR ITS RELATED THIRD PARTIES. DETAILS OF THIS SERVICE FOR RATINGS FOR WHICH THE LEAD ANALYST IS BASED IN AN EU-REGISTERED ENTITY CAN BE FOUND ON THE ENTITY SUMMARY PAGE FOR THIS ISSUER ON THE FITCH WEBSITE.

Copyright © 2017 by Fitch Ratings, Inc., Fitch Ratings Ltd. and its subsidiaries. 33 Whitehall Street, NY, NY 10004. Telephone: 1-800-753-4824, (212) 908-0500. Fax: (212) 480-4435. Reproduction or retransmission in whole or in part is prohibited except by permission. All rights reserved. In issuing and maintaining its ratings and in making other reports (including forecast information), Fitch relies on factual information it receives from issuers and underwriters and from other sources Fitch believes to be credible. Fitch conducts a reasonable investigation of the factual information relied upon by it in accordance with its ratings methodology, and obtains reasonable verification of that information from independent sources, to the extent such sources are available for a given security or in a given jurisdiction. The manner of Fitch's factual investigation and the scope of the third-party verification it obtains will vary depending on the nature of the rated security and its issuer, the requirements and practices in the jurisdiction in which the rated security is offered and sold and/or the issuer is located, the availability and nature of relevant public information, access to the management of the issuer and its advisers, the availability of pre-existing third-party verifications such as audit reports, agreed-upon procedures letters, appraisals, actuarial reports, engineering reports, legal opinions and other reports provided by third parties, the availability of independent and competent third-party verification sources with respect to the particular security or in the particular jurisdiction of the issuer, and a variety of other factors. Users of Fitch's ratings and reports should understand that neither an enhanced factual investigation nor any third-party verification can ensure that all of the information Fitch relies on in connection with a rating or a report will be accurate and complete. Ultimately, the issuer and its advisers are responsible for the accuracy of the information they provide to Fitch and to the market in offering documents and other reports. In issuing its ratings and its reports, Fitch must rely on the work of experts, including independent auditors with respect to financial statements and attorneys with respect to legal and tax matters. Further, ratings and forecasts of financial and other information are inherently forward-looking and embody assumptions and predictions about future events that by their nature cannot be verified as facts. As a result, despite any verification of current facts, ratings and forecasts can be affected by future events or conditions that were not anticipated at the time a rating or forecast was issued or affirmed.

The information in this report is provided "as is" without any representation or warranty of any kind, and Fitch does not represent or warrant that the report or any of its contents will meet any of the requirements of a recipient of the report. A Fitch rating is an opinion as to the creditworthiness of a security. This opinion and reports made by Fitch are based on established criteria and methodologies that Fitch is continuously evaluating and updating. Therefore, ratings and reports are the collective work product of Fitch and no individual, or group of individuals, is solely responsible for a rating or a report. The rating does not address the risk of loss due to risks other than credit risk, unless such risk is specifically mentioned. Fitch is not engaged in the offer or sale of any security. All Fitch reports have shared authorship. Individuals identified in a Fitch report were involved in, but are not solely responsible for, the opinions stated therein. The individuals are named for contact purposes only. A report providing a Fitch rating is neither a prospectus nor a substitute for the information assembled, verified and presented to investors by the issuer and its agents in connection with the sale of the securities. Ratings may be changed or withdrawn at any time for any reason in the sole discretion of Fitch. Fitch does not provide investment advice of any sort. Ratings are not a recommendation to buy, sell, or hold any security. Ratings do not comment on the adequacy of market price, the suitability of any security for a particular investor, or the tax-exempt nature or taxability of payments made in respect to any security. Fitch receives fees from issuers, insurers, guarantors, other obligors, and underwriters for rating securities. Such fees generally vary from US\$1,000 to US\$750,000 (or the applicable currency equivalent) per issue. In certain cases, Fitch will rate all or a number of issues issued by a particular issuer, or insured or guaranteed by a particular insurer or guarantor, for a single annual fee. Such fees are expected to vary from US\$10,000 to US\$1,500,000 (or the applicable currency equivalent). The assignment, publication, or dissemination of a rating by Fitch shall not constitute a consent by Fitch to use its name as an expert in connection with any registration statement filed under the United States securities laws, the Financial Services and Markets Act of 2000 of the United Kingdom, or the securities laws of any particular jurisdiction. Due to the relative efficiency of electronic publishing and distribution, Fitch research may be available to electronic subscribers up to three days earlier than to print subscribers.

For Australia, New Zealand, Taiwan and South Korea only: Fitch Australia Pty Ltd holds an Australian financial services license (AFS license no. 337123) which authorizes it to provide credit ratings to wholesale clients only. Credit ratings information published by Fitch is not intended to be used by persons who are retail clients within the meaning of the Corporations Act 2001.