# Analysis of MSW Landfill Tipping Fees

April 2017

The Environmental Research & Education Foundation (EREF) maintains a database of 1,540 active Subtitle D MSW landfills across the U.S. (EREF, 2017). This database was used to draw a sample of active facilities for analysis of MSW landfill (MSWLF) tipping fees. Landfill owners were contacted and asked to provide gate rate information on their tipping fee for MSW disposal. For the purpose of this report, the terms gate rate, tip fee, and tipping fee are used interchangeably to refer to the per-ton fee for hauled MSW loads.

The MSWLF database was also used to categorize landfills as large, medium, or small based on their yearly amount of waste disposed. Of the 400 landfills providing gate rate information:

- 55 (14%) were large (i.e. accepting more than 390,000 tons per year),
- 181 (45%) were medium (i.e. accepting between 390,000 and 65,000 tons per year), and
- 164 (41%) were small (i.e. accepting less than 65,000 tons per year).

The large landfills reporting 2017 tip fee data accepted an average of 769,000 tons per year, while medium and small landfills accepted 164,000 tons per year and 28,000 tons per year on average, respectively.

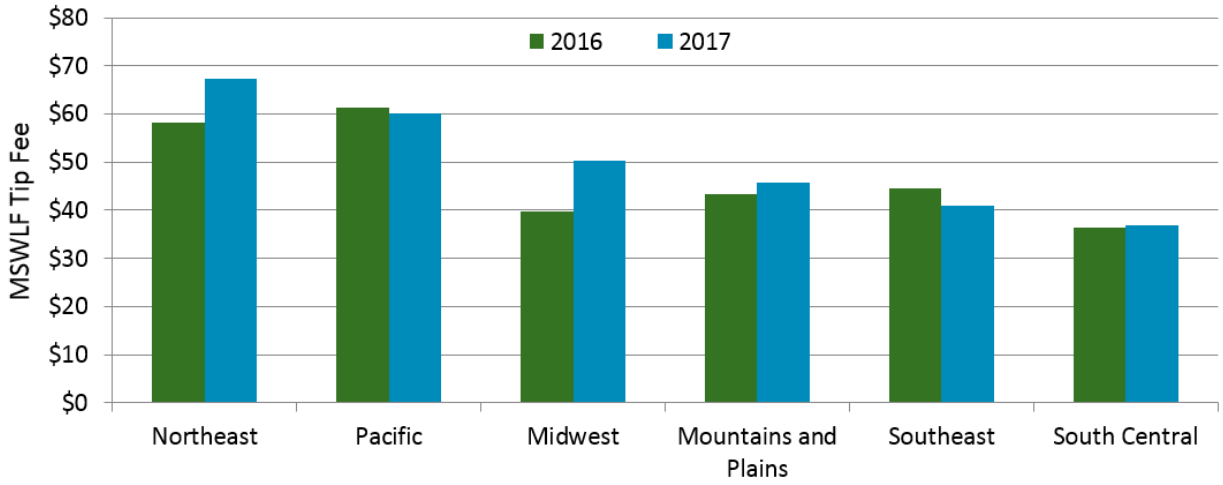
*Summary of 2017 MSW Landfill Tip Fees.* MSWLF tip fee data were compiled by geographic region and basic statistical information were computed. For 2017, the national MSW landfill tip fee average was $51.82/ton. Based on EREF's 2016 analysis (EREF, 2016a), the national average tip fee increased by 6.5% from $48.27 to $51.82 per ton (Table 1). Seventy-two percent of landfills that responded in 2016 also reported 2017 data.

**Table 1. Average MSW Landfill Tip Fees, by region**

| Region | Average Tipping Fee | | |
|---|---|---|---|
| | 2016 | 2017 | Difference |
| Northeast (CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV) | $58.20 | $67.27 | +$9.07 |
| Pacific (AK, AZ, CA, HI, ID, OR, WA) | $61.20 | $60.20 | -$1.00 |
| Midwest (IL, IN, IA, KS, MI, MN, MO, NE, OH, WI) | $39.64 | $50.27 | +$10.63 |
| Mountains/Plains (CO, MT, ND, SD, UT, WY) | $43.38 | $45.84 | +$2.46 |
| Southeast (AL, FL, GA, KY, MS, NC, SC, TN) | $44.46 | $41.01 | -$3.45 |
| South Central (AR, LA, NM, OK, TX) | $36.34 | $36.94 | +$0.60 |
| **National Average** | **$48.27** | **$51.82** | **+$3.55** |

The highest average regional tipping fee was in the Northeast ($67.27 per ton), which overtook the Pacific region to be most expensive for MSWLF disposal in 2017 (Figure 1). The South Central region had the lowest average tip fee ($36.94 per ton), and was the only region where average tip fee was under $40 per ton for 2017. Average tipping fee increased in three of the six regions since 2016, with the largest 1-year increase for the Midwest region where fees increased by $10.63 per ton from $39.64 to $50.27. Average tipping fee was flat from 2016 to 2017 in the Pacific and South Central regions. In one region, the Southeast, there was a decrease in MSWLF tip fee.

**Figure 1. Regional MSWLF Tip Fees, 2016 and 2017**




[a]Regions, and the states contained therein, are denoted in Table 1.

On a state-basis, there was substantial variation in MSW tipping fee. Average state MSWLF tipping fee ranged from $21.67 per ton (Mississippi, Southeast region) to $200 per ton (Connecticut, Northeast region) (Table 2). State averages are not reported for Oklahoma, Vermont, or Wyoming due to insufficient response rate data.

## Table 1. State and Regional Average Tip Fees, from April 2017 survey[a,b]

| Region/State | Average Tipping Fee |
|---|---|
| Northeast | $67.27 |
| *Connecticut* | *$200.00* |
| *Rhode Island* | *$90.00* |
| *Delaware* | *$85.00* |
| *New Jersey* | *$79.73* |
| *Massachusetts* | *$77.00* |
| *New Hampshire* | *$74.34* |
| *Maine* | *$73.63* |
| *Maryland* | *$68.69* |
| *Pennsylvania* | *$66.61* |
| *New York* | *$62.83* |
| *West Virginia* | *$54.13* |
| *Virginia* | *$52.40* |
| *Vermont* | *N.R.* |
| Pacific | $60.20 |
| *Hawaii* | *$96.33* |
| *Alaska* | *$90.63* |
| *Washington* | *$72.97* |
| *Oregon* | *$66.91* |
| *California* | *$53.57* |
| *Arizona* | *$46.86* |
| *Nevada* | *$42.18* |
| *Idaho* | *$33.00* |
| Midwest | $50.27 |
| *Minnesota* | *$68.92* |
| *Missouri* | *$55.57* |
| *Wisconsin* | *$55.31* |
| *Illinois* | *$50.10* |
| *Indiana* | *$49.37* |
| *Kansas* | *$46.62* |
| *Michigan* | *$45.97* |
| *Ohio* | *$44.75* |
| *Iowa* | *$44.01* |
| *Nebraska* | *$40.84* |
| Mountains/Plains | $45.84 |
| *Montana* | *$67.96* |
| *South Dakota* | *$48.43* |
| *Colorado* | *$45.51* |
| *North Dakota* | *$42.08* |
| *Utah* | *$27.36* |
| *Wyoming* | *N.R.* |
| Southeast | $41.01 |
| *Florida* | *$52.09* |
| *North Carolina* | *$44.92* |
| *Georgia* | *$41.96* |
| *South Carolina* | *$41.60* |
| *Tennessee* | *$37.96* |
| *Kentucky* | *$32.54* |
| *Alabama* | *$32.48* |
| *Mississippi* | *$21.67* |
| South Central | $36.94 |
| *Arkansas* | *$42.07* |
| *Texas* | *$38.19* |
| *New Mexico* | *$34.79* |
| *Louisiana* | *$30.72* |
| *Oklahoma* | *N.R.* |
| **National Average** | **$48.27** |

[a]N.R. – not reported

[b]Regional and national averages computed on a facility-basis, and therefore do no equal the average of the individual state averages reported herein.

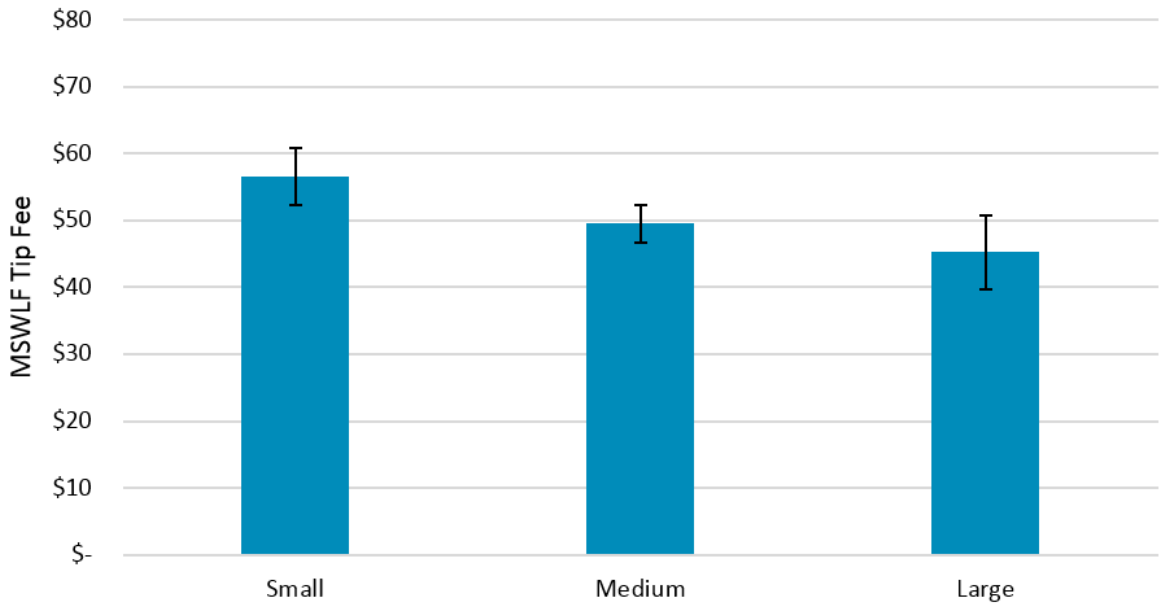
*Relationship between tip fee and other waste industry metrics.* MSWLF tip fees are commonly thought to correlate to facility metrics such as size or ownership. Additionally, tip fees often dictate if market conditions are suitable for the use of alternative waste management facilities (e.g. waste-to-energy incineration). Response rates were higher in 2017 than 2016, giving a higher confidence level to regional and state averages and allowing for analyses to explore these relationships. Reported MSW tipping fees were compared to the following metrics to explore statistical relationship to MSWLF tipping fee:

- Landfill size (annual waste acceptance)
- Landfill ownership (public/private)
- Availability of MSW Waste-to-Energy (WTE) within the state
- Landfill gas (LFG) collection and beneficial use (e.g. electricity production)

*Facility size*

The tip fee was highest for small landfills (i.e. those accepting less than 65,000 tons a year) with an average tip fee of $56.57 per ton. Medium landfills (i.e. those accepting between 65,000 and 390,000 tons per year) had an average fee of $49.51 per ton. Large landfills had average nationwide tipping fee of $45.25 per year (Figure 2).

**Figure 2. Average MSWLF Tipping Fee, by landfill size[1]**

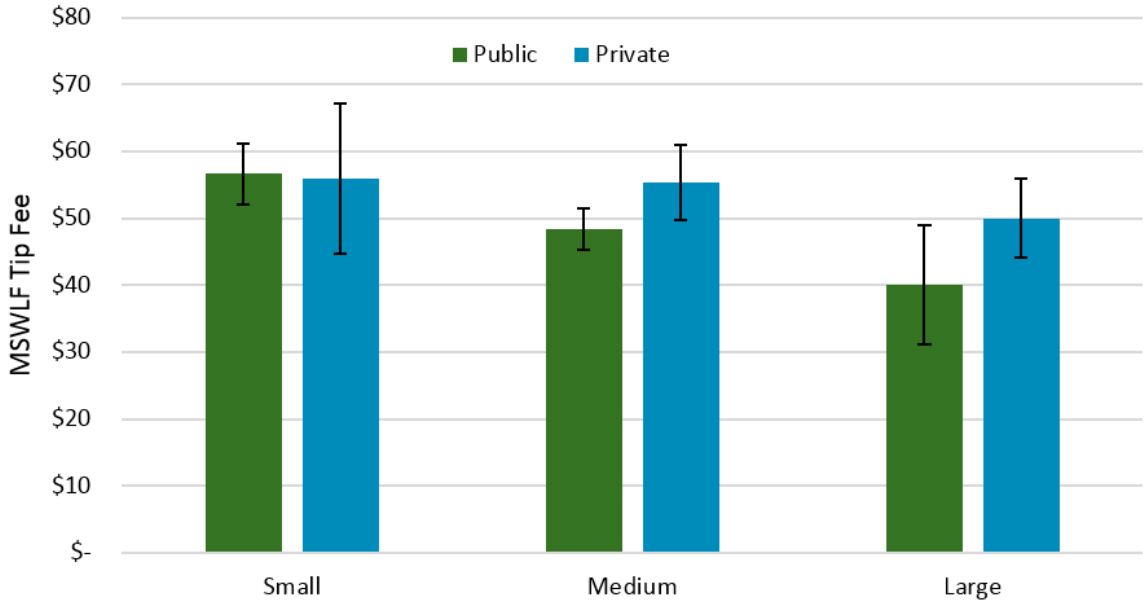



[1]Range shown is the 95% confidence interval.

*Facility ownership*

Of the 400 landfills providing tip fee information in the study, 330 were publicly owned facilities (82.5%) and the remaining 70 were privately owned (17.5%). A comparison of national average tipping fee for public and private landfills suggests tipping fees were not statistically different based on ownership ($p>0.05$), with the national average slightly lower at publicly-owned landfills ($51.53/ton MSW) than privately-owned landfills ($53.18/ton MSW). When explored by landfill size, difference in tipping fee between public and private facilities appears to increase as landfill size increases (Figure 3). However, given there are relatively few of both small private landfills and large public landfills the confidence in this trend is low. As a result, no relationship between ownership could be confirmed.

**Figure 3. Average MSWLF Tipping Fee, by landfill size and ownership[1]**




[1]Range shown is the 95% confidence interval.

*Availability of waste-to-energy (WTE) facilities*

MSW is managed via WTE (i.e. incineration with energy recovery) in 22 states, accounting for approximately 9% of total managed MSW each year (EREF, 2016). Sufficient MSWLF tipping fee data was collected for 21 of the 22 states that manage MSW via WTE, and 26 of the 28 states without active MSW WTE facilities. States with active MSW WTE facilities had significantly higher tipping fees than states without WTE ($p<0.05$). For the 21 states with WTE, the average MSWLF tipping fee was $67.64 per ton, or $19.56 higher per ton than the average of states without WTE (Table 4). This suggests that MSWLF fees indicate, in part, if market conditions are suitable for the use of WTE for MSW management.

## Table 3. Difference in MSWLF Tipping Fee, by WTE availability

| Region | Number of States with WTE | Average MSWLF Tip Fee | | Difference in MSWLF Tip Fee | |
|---|---|---|---|---|---|
| | | States with WTE | States without WTE | Fee ($) | Percent Increase (%) |
| Northeast | 9 | $ 83.91 | $76.38 | +$7.54 | 10% |
| Pacific | 4 | $72.45 | $52.83 | +$9.62 | 37% |
| Midwest | 5 | $52.71 | $46.66 | +$6.06 | 13% |
| Mountains/Plains | 1 | $27.36 | $52.82 | -$25.47 | -48% |
| Southeast | 2 | $42.29 | $36.77 | +$5.51 | 15% |
| South Central | 1[a] | N.R.[a] | $37.64 | N.R.[a] | 0% |
| **National Average** | **22[a]** | **$67.64** | **$48.08** | **+$19.56** | **41%** |

[a]MSW-WTE is available in Oklahoma, however sufficient tipping fee data could not be obtained. It was excluded from the analysis

The relationship between WTE availability and higher tipping fee varies by region. The relationship is most pronounced in the Pacific, where states with WTE had an average MSWLF tipping fee 37% higher than those without WTE. It is less pronounced in the Southeast, Midwest, and Northeast regions where WTE states averaged 15%, 13% and 10% higher MSWLF tipping fees respectively. In the Mountains/Plains, however, the trend was reversed. The average MSWLF tipping fee in Utah was more than $25 lower than the average of the remaining states in the region.

*Landfill gas collection and beneficial use*

Average tipping fees calculated based on landfill gas (LFG) collection status, and if collected LFG were put toward beneficial use (e.g. production of electricity). Sufficient gas collection information was available for 320 MSWLFs. Although a slightly higher average MSWLF tipping fee is observed for facilities with LFG beneficial use systems (Table 5), the differences in tipping fees were not statistically different between those with and without gas collection ($p>0.05$) or those with and without beneficial gas use ($p>0.05$). This suggests that tip fees are relatively unaffected by whether or not a LFG collection and beneficial use is employed.

## Table 4. Difference in MSWLF Tipping Fee, by LFG management

| Landfill Gas (LFG) Management | Number of Landfills | Average Tip Fee |
|---|---|---|
| No LFG Collection | 126 | $48.80 |
| LFG Collection with Flare Only | 60 | $46.39 |
| LFG Collection with Beneficial Use | 131 | $52.60 |

## *References*

Environmental Research & Education Foundation [EREF] (2017) "MSW Management Facilities in the U.S.: 2010 & 2013". Retrieved from www.erefdn.org

Environmental Research & Education Foundation [EREF] (2016a) "Analysis of MSW Tipping Fees, January 2016" Retrieved from www.erefdn.org

Environmental Research & Education Foundation [EREF] (2016b) "Municipal Solid Waste Management in the U.S.: 2010 & 2013". Retrieved from www.erefdn.org

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