Palo Alto, California
Energy/Compost Feasibility Study

May 31, 2011

Summary of Tipping Fee Projections

Scenarios

Scenario 1

1. Public ownership and financing (below market I-Bank loan combined with market-rate tax-exempt financing).
2. 15% grant on construction costs assumed.
3. No site rent cost included.
4. Costs for CO_2 "carbon adder" included.
5. 15% contingency added to cost of export options.

Scenario 2

1. Private ownership and financing at market rate.
2. 15% grant on construction costs assumed.
3. $108,000/year site rent cost included.
4. Costs for CO_2 "carbon adder" included.
5. 15% contingency added to cost of export options.

Scenario 3

1. Private ownership and financing at market rate.
2. No construction grant assumed.
3. $908,000/year site rent cost included.
4. No CO_2 "carbon adder" costs included.
5. No contingency added to cost of export options.

Alternatives (All Scenarios)

1. Alternative 1

Case 1a - - Food scraps, yard trimmings and biosolids processed by dry anaerobic digestion (AD) at a facility at the Palo Alto Landfill (PALF) site. Separate AD cells for food scraps/yard trimmings and bisolids All AD gas processed at PALF.
Case 1b - - Food scraps and yard trimmings processed by dry anaerobic digestion, biosolids processed by wet anaerobic digestion; all at a facility at the PALF site. All AD gas processed at PALF.
Case 1c - - Food scraps and yard trimmings processed by dry anaerobic digestion at a facility at the PALF, biosolids processed by wet anaerobic digestion at the Palo Alto wastewater treatment plant (RWQCP). All AD gas processed at PALF.
Case 1d - - Food scraps and yard trimmings processed by dry anaerobic digestion at a facility at the PALF. Food scraps and yard trimmings gas only processed at PALF. Biosolids incinerated at RWQCP, with ash transported to/disposed of at Kettleman Hills Landfill. Existing incinerator replaced by new fluidized bed incinerator in 2030.

2. Alternatives 2 and 2a

Case 2 - - Food scraps taken to and processed at new San Jose AD facility (Zanker). Yard trimmings taken to SMaRT, transferred to and processed at Gilroy composing facility (ZBest). All biosolids incincerated at RWQCP. Existing incinerator replaced by fluidized bed incinerator in 2030. Biosolids incinerator ash transported to and disposed of at Kettleman Hills Landfill. Existing incinerator replaced by new fluidized bed incinerator in 2030.
Case 2a - - Same as Case 2, except biosolids processed via wet AD facility at RWQCP.

3. Alternatives 3 and 3a

Case 3 - - Food scraps taken to San Jose transfer facility, transferred to and processed at Gilroy composting facility (ZBest). Yard trimmings taken to SMaRT, transferred to and processed at Gilroy composting facility (ZBest). All biosolids incinerated at RWQCP. Existing incinerator replaced by fluidized bed incinerator in 2030.Biosolids incinerator ash transported to and disposed of at Kettleman Hills Landfill. Existing incinerator replaced by new fluidized bed incinerator in 2030.
Case 3a - - Same as Case 3, except biosolids processed via wet AD facility at RWQCP.

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Alternative 1 (At PALF)	Base Cases								
	Year 1 (2015) Tipping Fee ($/Ton)	Year 20 (2034) Tipping Fee ($/Ton)	NPV Total Costs Over 20 Years	Year 1 (2015) Tipping Fee ($/Ton)	Year 20 (2034) Tipping Fee ($/Ton)	NPV Total Costs Over 20 Years	Year 1 (2015) Tipping Fee ($/Ton)	Year 20 (2034) Tipping Fee ($/Ton)	NPV Total Costs Over 20 Years
Low-Cost Range	Scenario 1			Scenario 2			Scenario 3		
Case 1a Food Scraps, Yard Trimmings & Biosolids Dry AD In Separate Cells @ Palo Alto Landfill (PALF)	$69	$32	$58,568,589	$86	$50	$71,993,438	$120	$73	$96,226,397
	Uncertainty remains regarding Case 1a costs, limited data.			*Uncertainty remains regarding Case 1a costs, limited data.*			*Uncertainty remains regarding Case 1a costs, limited data.*		
Case 1b Food Scraps, Yard Trimmings Dry AD Biolsolids Wet AD - - All @ PALF	$130	$71	$112,537,531	$157	$102	$133,759,937	$209	$138	$170,950,938
Case 1c Food Scraps, Yard Trimmings Dry AD @ PALF Biosolids Wet AD @ RWQCP	$129	$71	$111,355,915	$155	$101	$133,119,590	$207	$137	$169,007,164
Case 1d Food Scraps, Yard Trimmings Dry AD @ PALF Biosolids Incinerated @ RWQCP/New Fluidized Bed Incinerator in 2030	$101	$441	$137,096,645	$113	$453	$146,947,702	$129	$459	$154,505,010
High-Cost Range	Scenario 1			Scenario 2			Scenario 3		
Case 1a Food Scraps, Yard Trimmings & Biosolids Dry AD In Separate Cells @ Palo Alto Landfill (PALF)	$238	$135	$201,195,623	$281	$183	$235,149,874	$361	$245	$294,370,715
Case 1b Food Scraps, Yard Trimmings Dry AD Biolsolids Wet AD - - All @ PALF	$213	$109	$179,740,533	$254	$156	$211,590,278	$331	$214	$268,294,477
Case 1c Food Scraps, Yard Trimmings Dry AD @ PALF Biosolids Wet AD @ RWQCP	$212	$109	$178,939,857	$253	$155	$210,617,095	$329	$213	$267,027,894
Case 1d Food Scraps, Yard Trimmings Dry AD @ PALF Biosolids Incinerated @ RWQCP/New Fluidized Bed Incinerator in 2030	$177	$472	$199,061,822	$206	$502	$221,509,086	$248	$530	$249,502,488

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	Scenarios 1 & 2			Scenario 3		
Alternatives 2 & 3 (Export)	**Year 1 (2015) Tipping Fee ($/Ton)**	**Year 20 (2034) Tipping Fee ($/Ton)**	**NPV Total Costs Over 20 Years**	**Year 1 (2015) Tipping Fee ($/Ton)**	**Year 20 (2034) Tipping Fee ($/Ton)**	**NPV Total Costs Over 20 Years**
Case 2 - - Food Scraps to San Jose AD Facility, Yard Trimmings to Gilroy Composting Facility (via SMaRT) Biosolids Incinerated at RWQCP/New Fluidized Bed Incinerator in 203(	$93	$486	$139,527,960	$72	$455	$116,714,351
Case 3 - - (Food Scraps to San Jose Transfer, Yard Trimmings to SMaRT - Then Both to Gilroy Composting Facility Biosolids Incinerated at RWQCP/New Fluidized Bed Incinerator in 2030	$89	$477	$134,349,833	$68	$448	$112,511,650

Alternatives 2a & 3a (Export)	**Year 1 (2015) Tipping Fee ($/Ton)**	**Year 20 (2034) Tipping Fee ($/Ton)**	**NPV Total Costs Over 20 Years**	**Year 1 (2015) Tipping Fee ($/Ton)**	**Year 20 (2034) Tipping Fee ($/Ton)**	**NPV Total Costs Over 20 Years**
Case 2a - - Food Scraps to San Jose AD Facility, Yard Trimmings to Gilroy Composting Facility (via SMaRT) Biosolids Processed via Wet AD @ RWQCP	$103	$129	$94,312,261	$92	$107	$81,747,002
Case 3a - - Food Scraps to San Jose Transfer, Yard Trimmings to SMaRT - Then Both to Gilroy Composting Facility Biosolids Processed via Wet AD @ RWQCP	$97	$121	$89,266,458	$89	$100	$77,544,302