WESTERN PLACER WASTE MANAGEMENT AUTHORITY
LANDFILL GAS STRATEGIC PLAN

OCTOBER 5, 2015

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Landfill Gas Strategic Plan

Executive Summary

The Western Placer Waste Management Authority (WPWMA) has engaged a consulting team led by Capitol Public Finance Group ("Capitol PFG") to produce this Landfill Gas Strategic Plan. Its purpose is to guide the WPWMA towards maximizing the value of the Landfill Gas (LFG) asset while continuing to meet all applicable regulatory and legal operating requirements. The consulting team includes Golder Associates and TSS Consultants.

The Western Regional Sanitary Landfill (WRSL) is a Class II/Class III municipal solid waste landfill with a total capacity of approximately 36.5 million cubic yards. The WPWMA estimates that the WRSL will reach capacity in 2058. The WPWMA has installed and has periodically expanded its LFG collection system at the WRSL. The collection system generally consists of 73 vertical extraction wells, 14 horizontal extraction wells, above ground conveyance piping and a blower/flare station. The WPWMA leases approximately 15,000 square feet of land to an independent private party (Energy 2001) and provides them with LFG for the purpose of producing and selling electricity generated from the combustion of LFG. In exchange, Energy 2001 pays the WPWMA a ground lease and remits a portion of their electricity sales revenue to the WPWMA.

The primary mission of the WPWMA is to safely and cost-effectively manage the disposition of all materials accepted at its facilities, productively using recyclable materials when feasible. With respect to the management of LFG produced through the decomposition of materials buried at the Landfill, the WPWMA has adopted the following additional Guiding Principles, in order of priority[1]:

1. Remain in regulatory compliance
2. Maximize the value realized for the LFG asset to benefit the WPWMA customer base
3. WPWMA ownership of infrastructure needed to collect, treat and utilize LFG is preferred over private ownership
4. Protect the environment
5. Protect public health and safety
6. Demonstrate environmental leadership in our community
7. Job creation

[1] Guiding Principles and Goals and Priorities were adopted by the WPWMA Board in April 2015.

Golder Associates conducted a lengthy review of LFG utilization options, included in Sections 4 through 6 of Exhibit A to this report. This review includes a discussion of the technologies employed to treat and use LFG, risk factors, screening criteria and feasibility for use by WPWMA.

Although on-site electrical load displacement and Renewable Natural Gas (RNG) for vehicle fuel appeared to show the most promise as uses for WPWMA LFG, both of these uses have limitations with regard to the amount of LFG they can consume. Golder Associates projects that only the richest gas wells (25% of the total supply) are of sufficient quality to produce vehicle fuel. Likewise, on-site uses through PG&E's NEM program are limited to 1 MW of electricity generation out of a current potential 5 MW of capacity. To utilize either of these methods, then, requires combining uses or flaring large quantities of excess gas.

When developing alternatives for the use of LFG it is not sufficient to simply choose a utilization method (e.g. "electricity production"), because choices about ownership, contracting, marketing and project delivery methods all have a major impact on the financial outcome. Capitol PFG worked with WPWMA staff and the LFG Strategic Plan Advisory Committee to choose Alternatives that best matched the Guiding Principles adopted for this Plan. For example, WPWMA has expressed a clear preference for ownership of infrastructure needed to collect, treat and utilize LFG; as such, Capitol PFG has assumed that four of the five Alternatives subjected to a comparative financial analysis would involve WPWMA ownership of some or all of the infrastructure. The following five Alternatives were developed for further review:

***Alternative 1a*:** All LFG would go towards off-site electricity generation under the terms of a lease agreement. The lessee would retain ownership of all generating assets and pay royalties to WPWMA at amounts equivalent to WPWMA's agreement with Energy 2001 as it will exist in 2018.

***Alternative 1b*:** The best quality LFG would be converted to RNG for transportation fuel and sold to the City of Roseville and Recology at a fueling station dedicated to their use. Some of the remaining LFG would be used to generate 0.8 MW of electricity (from one assigned genset) to power the MRF through a Net Energy Metering agreement with PG&E. All remaining gas would be used by Energy 2001 to generate electricity for outside sale through their existing Power Purchase Agreement (PPA) with Marin Clean Energy.[2]

***Alternative 8a*:** A portion of the LFG would be used to generate 0.8 MW of electricity (from one assigned genset) to power the MRF through a Net Energy Metering agreement with PG&E. All remaining gas would be used to generate electricity for outside sale through a PPA.

***Alternative 8b*:** Similar to 1b, except all assets would be owned by WPWMA and operated by one energy management contractor.

[2] LFG supply headers would be physically separated to prevent conflicts.

***Alternative 8c*:** The best quality LFG would be converted to RNG for transportation fuel and sold to the City of Roseville and Recology at a fueling station dedicated to their use. All remaining gas would be used to generate electricity for outside sale through a PPA.

Alternatives 8a, 8b and 8c were structured assuming that WPWMA would construct or purchase (from Energy 2001) any necessary buildings and equipment and own them throughout the term of the Agreement. WPWMA would also own the permits, interconnection agreements, PPAs, ERCs, and etc. These alternatives assume that WPWMA will contract with an energy management firm (EMF) that will accept raw LFG as an input from the WPWMA and manage all aspects of using the LFG to create a marketable energy product[3]. In return for the use of this asset, the EMF will pay WPWMA a royalty on gross sales. Both parties will enter into an Agreement that defines the products to be marketed, who will purchase those products and the terms of sale. WPWMA would also assist in marketing the products by facilitating the purchase of electricity for powering the MRF (Alternatives 8a and 8b) and/or facilitating the purchase of RNG by Member Agency garbage collection trucks (Alternatives 8b and 8c).

Alternative 1b assumes that an EMF would handle RNG production and on-site electricity generation, but Energy 2001 would retain rights to all remaining LFG and ownership of the assets needed to utilize that LFG.

Capitol PFG prepared Excel spreadsheets (Appendix D) comparing the expected financial performance of the five Alternatives over the twenty-year Planning Horizon using consistent assumptions whenever possible. Due to the difficulty in accurately predicting events over twenty years, this analysis should be used only as an indication of the potential feasibility of each Alternative as compared to the other Alternatives.

The financial comparison of the five Alternatives is shown in the "Summary" worksheet and presented in Table 2 below. The capital investment required over the twenty year Planning Horizon, the total Net Revenue over the same period and the Net Present Value of the Net Revenue are shown for each of the Alternatives.

[3] Potential EMFs could include Energy 2001 or Nortech in addition to other experienced firms.