



STATE OF CALIFORNIA

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TO COUNTY ASSESSORS:

### **PRODUCTION OF METHANE GAS FROM LANDFILL OPERATIONS**

Questions have arisen as to the taxability of landfill sites that produce methane gas. If they are taxable, how should they be appraised and how should they be enrolled? Because of the uniqueness of this gas and its production at such sites the following comments should not be regarded as applicable to so-called hard mineral or oil and gas properties.

#### **BACKGROUND**

Some landfill operations, particularly those rich in organic matter, produce gas as the refuse decomposes. This gas can have value as a fuel, with a heating value normally about half that of pure methane, the chief constituent of natural gas. If uncollected, this gas escapes into the atmosphere, a common situation at all landfill sites. In 1980, there were only eight landfill methane recovery projects in the nation, seven of them were in California.

The first commercial-scale landfill gas recovery and utilization facility in the United States occurred on the Palos Verdes peninsula in Los Angeles County. That system has been operating since June 1975. The recovered gas contains both liquid and gaseous contaminants which are removed at the site for blending into the Southern California Gas Company's distribution grid. The property is owned by the Sanitation District of Los Angeles County, and Getty Synthetic Fuels, Inc., is the operator of the gas recovery system. The disposition of the gas varies from facility to facility. In some cases the gas is upgraded in BTU quality. In others it is not. If the gas is not upgraded it is not suitable for use by residential consumers but may have other commercial use.

The number of these facilities in the state is expected to grow. However, not all landfills are adaptable to the recovery of gas. Recently, Pacific Gas and Electric Company surveyed 32 landfills in the San Francisco Bay Area as potential producers of gas. Fourteen of these sites were found to have the potential to produce a combined total of 21 MMScfd of 450 BTU/Scf gas, equivalent to 1,600 barrels of oil a day, or the average gas requirement of 30,000 homes. The other 18, or 56 percent, were not considered as good candidates for development.

The production of methane at landfill operations is usually secondary to the importance and value of the landfill operation itself. Methane recovery agreements usually stipulate that the fill operation shall take precedence over the recovery of gas.

#### **RESOURCE DEVELOPMENT**

Recovery of the gas is accomplished by drilling holes in the landfill and lining the holes with perforated plastic pipe. The outside of the pipe is sealed against the landfill near the surface. Flexible hose is then connected to the top of the pipe and controlled suction is used to produce the gas. Too much suction causes oxygen enrichment of the fill and may kill bacteria that generates the gas. Failure to produce the gas results in its loss to the atmosphere. Also, the generation process slows and stops after the fill becomes inactive. Most fills probably have a maximum life of 10 to 15 years, but this can vary greatly depending on conditions, i.e., site capacity for refuse, kind of refuse, etc. The landfill itself has been described as being like a bowl of jelly—it is in constant movement. Plastic pipe has a tendency to "give," but it can also rupture as a result of movement, forcing the well's abandonment.

A number of parties may be involved in a landfill methane recovery project, such as:

- (1) The ownership of the land where the fill is located (public or private ownership)
- (2) The operator of the fill
- (3) Parties who collect and dispose of the solid waste
- (4) The gas recovery system installer and operator
- (5) The purchaser of the gas

#### TAXABILITY

To the extent that a landfill site or an area within a landfill site becomes suitable for resource development by the addition of refuse, a new property interest is created. The right to extract or produce the gas, whether held by the landfill owner or by an operator who purchases the right, constitutes property not previously taxed, that, under the provision of Section 1, Article XIII, must be appraised and when found to have value, shall be added to the assessment roll. When an operator purchases the right, that change-in-ownership of the right provides an additional basis, under the provisions of Article XIII A and Section 61 of the Revenue and Taxation Code, for establishing a base-year value. Likewise, the development by the owner of the landfill site for methane production would constitute an alteration converting the property to a different use under Section 70(a)(2) of the Revenue and Taxation Code. Arguments can be made for and against the proposition that methane gas is a mineral. Such discussion, however, appears immaterial since it is the right to gather, extract, and produce that constitutes the property interest subject to assessment. Since the interest is so integrally related to the possession of land, we believe it is properly categorized as an interest in real property.

As mentioned above, assessment should normally occur whenever the right to extract or produce changes ownership, or the owner alters the property to produce the gas. This does not help to define the point in time as of which the value should be determined. Without statutory or judicial guidance in the matter, we believe it is most reasonable to value the right as of the date gas is first produced, whether production is by the landfill operator or his agent or by a purchaser of the right to produce. A valuation prior to that time involves so much speculation and conjecture that it would be more in

the nature of roulette than appraising. While it may be technically correct to conclude that the right exist, until it has some measurable value, it is not taxable.

### VALUATION

The most appropriate method of valuing a production interest in a landfill gas property is similar to that employed in valuing an oil or gas property, i.e., the income approach to value. The income approach, of course, should include anticipated future gross income and expenses. This approach yields a property value which includes the value of improvements associated with the production of landfill methane and the right to produce. If the royalties paid are deemed to be economic, the royalty approach would also be a valid technique for valuing the right to produce. This approach is a form of the income approach and yields a direct value for the right to produce exclusive of the value of associated improvements.

The initial base-year value for a methane-producing landfill is based on a cash flow projection. The appraiser should carefully examine both the production agreement and the producer's sales agreement(s) before making his projection to determine the capacity of the production facilities, stipulations in the sales contract concerning annual deliverability of the gas, and, of course, pricing.

Because of the totally unstable nature of the landfill methane gas it is appropriate to think of it in terms of reserves, proved or otherwise, and there should therefore be no adjustment for depletion as is called for under Property Tax Rule 468. Since the life of the gas recovery operation is limited, the market value of the right to produce may, in a rather short period of time, fall below the adjusted base-year value. When that occurs, the market value becomes the value to be enrolled for property tax purposes.

The right to extract or produce landfill gas is usually granted for a period of from 10 to 20 years, depending on the anticipated active gas generating cycle of the fill. In other words, by the end of the agreed production period the economic generation of gas will have ceased. Therefore, for all intents and purposes, the producer is the beneficial owner of the right to produce all the gas and should be the assessee.

If you have any questions about the valuation of such properties, please call Ray Rothermel at (916) 445-4982.

Sincerely,

Verne Walton, Chief  
Assessment Standards Division

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