

**Preliminary Decision Report:  
For Approval of Site-Wide CO Emission Cap**

at:

Waste Management of Alameda County; Site # A2066  
APPLICATION # 18819

**A. BACKGROUND**

Waste Management of Alameda County operates the Altamont Landfill and Resource Recovery Facility in Livermore, CA (Site # A2066). This facility includes an active municipal solid waste landfill (S-2 Altamont Landfill). As required by BAAQMD Regulation 8, Rule 34, this landfill is equipped with an active landfill gas collection system and a landfill gas control system. The current landfill gas control system includes: two 3 MW landfill gas fired turbines (S-6 and S-7 Gas Turbines), two 1877 bhp landfill gas fired Engines (S-23 and S-24 IC Engines), and one 71 MM BTU/hour enclosed flare (A-15 Landfill Gas Flare). The District has permitted a liquefied natural gas plant (S-210) and a 132 MM BTU/hour enclosed flare (A-16) that are still under construction. The site also has numerous permitted and exempt devices that support the landfill, including: waste water processing operations, green waste storage and processing operations, portable and emergency standby power generation, and a non-retail gasoline dispensing facility.

Waste Management submitted this application to request a site-wide carbon monoxide (CO) emission cap for the entire facility in order to avoid being considered a major source of CO emissions under federal Prevention of Significant Deterioration (PSD) requirements. The PSD threshold for this facility is 250 tons/year of CO emissions. Waste Management has agreed to accept a site-wide CO emissions cap of 225 tons/year.

When the A-16 Flare was permitted pursuant to Application # 19206, the District limited CO emissions from A-16 to 95 tons/year to prevent triggering a public notice requirement for this application. The District imposed various operating restrictions to ensure compliance with this emission limit. Waste Management is now requesting to remove these operating restrictions and to permit A-16 – on an individual basis - for its full CO emissions potential (115.632 tons/year) but subject to the proposed site-wide CO cap limitations instead.

This application will require a public notice pursuant to Regulation 2-2-405, because it involves a project with more than 100 tons/year of CO emission increases (A-16). This project will also require a significant revision of the Title V permit for this site.

## **B. POSSIBLE OPERATING SCENARIOS AND POTENTIAL CO EMISSIONS**

The existing sources of carbon monoxide (CO) emissions are identified in Table 1, along with either the maximum permitted or maximum potential CO emission level from each device. In addition to these existing devices, Waste Management has submitted permit applications for several proposed devices, which are identified in Table 2. The maximum landfill gas flow rates and heat input capacities for the existing and proposed landfill gas control equipment for this site are present in Table 3. Landfill gas generation and collection rates are presented in Table 4.

From the data provided in Tables 1 and 2, the combined maximum potential CO emission rate for this site will be 419 tons/year of CO (397.2 tons/year of CO from landfill gas fired combustion devices and 21.7 tons/year from diesel fired equipment), if all devices are operating concurrently at their maximum permitted annual operating rates. However, a comparison of the expected collection rates from Table 4 to the maximum equipment capacities in Table 3 illustrates that this operating scenario (all landfill gas control devices operating simultaneously at maximum capacity) is not possible for the current gas collection rate at this site and is not realistically expected to ever occur. In addition, source test data indicates that the existing flare and gas turbines are emitting CO at rates that are well below the maximum permitted emission levels. For these reasons, the District expects that the permit condition revisions proposed in this document will ensure compliance with a site-wide CO emission cap of 225 tons/year.

As shown in Tables 3 and 4, the expected landfill gas collection rate for 2009 (4024 scfm, with an equivalent heat input rate of 120 MM BTU/hour) cannot support the simultaneous operation of all permitted landfill gas control devices. This 2009 collection rate is equal to 60% of the combined annual average capacity of the existing landfill gas control devices (S-6, S-7, S-23, S-24, and A-15) and only about 29% of the combined capacity of all existing and proposed landfill gas control equipment. For Fill Area 1, the maximum expected gas collection rate of 4568 scfm is 68% of the existing control system capacity and 33% of the total proposed control capacity. If the Fill Area 2 expansion is approved, the maximum possible landfill gas collection rate of 9695 scfm will still only be 70% of the total proposed control system capacity. Therefore, it is not possible for all proposed control devices at this site to operate simultaneously at maximum capacity.

**Table 1. Existing or Permitted CO Emitting Equipment at Site # A2066**

Device #	Device Description	Permitted (P) or Exempt (E)	Max. Potential CO Emissions Tons/Year
A-15	Landfill Gas Flare	P	93.268
A-16	Landfill Gas Flare (still under construction) at the proposed new CO limit for this device	P	115.632
S-6	Gas Turbine	P	56.064
S-7	Gas Turbine		
The S-6 and S-7 Gas Turbines have a combined heat input limit that limits the CO emission rate from S-6 and S-7 combined to 93.45 tons/year of CO.			
S-23	Internal Combustion Engine	P	38.062
S-24	Internal Combustion Engine	P	38.062
S-31	Portable Diesel Engine for the Green Waste Grinder	E	5.805
S-193	Diesel Engine (Emergency Generator at Fire Pump)	P	4.047
S-196	Diesel Engine (Emergency Generator at Scale House)	P	0.026
S-197	Diesel Engine (Portable Generator at Break Trailer)	P	2.257
S-198	Diesel Engine (Portable Generator for Vacuum Truck Pump)	P	4.902
S-199	Standby Engine (Flare Station)	P	0.017
S-200	Standby Engine (WWTP)	P	0.054
S-201	Standby Engine (Mntnc. Shop)	P	0.054
	Total From Landfill Gas Fired Equipment		397.152
	Total From Diesel Fired Equipment		17.163
	Total From All Existing or Permitted Devices		414.315

**Table 2. Proposed CO Emitting Devices for Site # A2066**

Device #	Device Description	Application #	Proposed Max. CO Emissions Tons/Year
S-206	Portable Diesel Engine for Tipper # 83	Pending Review per Application # 17305	0.988
S-207	Portable Diesel Engine for Tipper # 83		0.411
S-208	Portable Diesel Engine for Tipper # 83		0.988
S-209	Portable Diesel Engine for Tipper # 83		0.411
S-214	Portable Diesel Engine for Air Compressor	Pending Review per Application # 20158	1.738
S-215	Portable Diesel Engine for Emergency Generator		0.031
Total From All Proposed Devices			4.567

**Table 3. Landfill Gas Control Equipment Capacity for Site # A2066**

Device #	Device Description	Maximum Capacity		Annual Limits
		SCFM	MM BTU/hour	MM BTU/year
A-15	Landfill Gas Flare	2,380	70.98	621,785
A-16	Landfill Gas Flare	4,427	132.00	1,156,320
S-6	Gas Turbine	1926	57.42	838,480
S-7	Gas Turbine	1,926	57.42	
S-23	Internal Combustion Engine	587	17.50	153,300
S-24	Internal Combustion Engine	587	17.50	153,300
S-210	LNG Plant	2,725	81.25	711,750
Total For Existing Control Equipment (A-15, S-6, S-7, S-23, S-24)		7,406	220.8	1.767 E6
Total Capacities For All Permitted Landfill Gas Control Equipment		14,558	434.1	3.635 E6

**Table 4. Landfill Gas Collection Rate Estimates for the Altamont Landfill**

	Projected Landfill Gas Generation Rate	Maximum Predicted Collection Rate at 75% Capture Eff.	Realistic Expected Collection Rate *	
	SCFM	SCFM	SCFM	MM BTU / Year
Fill Area 1: 2009	7,592	5,694	4,024	1.051 E6
Fill Area 1: Maximum	8,618	6,464	4,568	1.193 E6
Fill Areas 1 and 2 Combined: Maximum	12,926	9,695	6,851	1.789 E6

\* Based on gas collection rates reported for 2008 and 2008 source test data, Waste Management collected an average of 3669 scfm of landfill gas at 52.8% methane. The equivalent actual collection rate at 50% methane is 3875 scfm of landfill gas. This 2008 standardized collection rate was compared to the projected gas generation rate for 2008 (7340 scfm at 50% methane) to obtain a site-specific capture efficiency of 53% for 2008:  $(3875/7340 = 0.5279)$ . This capture efficiency was multiplied by the projected gas generation rate to obtain the realistic expected capture rates reported in Table 4.

Since it is clearly not feasible for this site to operate all landfill gas control equipment simultaneously, it follows that it is not feasible for this site to emit the total 419 tons/year of CO shown in Tables 1 and 2. The District evaluated several possible operating scenarios to determine the maximum potential CO emission rate that is realistically possible. These operating scenarios and the resulting emissions are discussed in detail below.

From Tables 1 and 2, the maximum potential CO emission rate from all existing and proposed diesel engines operating at this site is:  
 $(17.163 + 4.567) = 21.730$  tons/year of CO

For the Fill Area 1 maximum expected gas collection rate of 4568 scfm (1.193E6 MM BTU/year), there is sufficient gas available to operate the turbines and engines at full capacity with an additional 48,052 MM BTU/year of gas directed to the A-15 Flare. If all the diesel engines are operating at the maximum rates concurrent with the landfill gas control equipment, then the maximum potential site-wide CO emission rate for this operating scenario is:  
 $(21.730 + 46.724*2 + 38.062*2 + 48052/621785*93.268) = 198.5$  tons/year of CO

For the existing landfill, landfill gas control equipment, and diesel engines, it is unlikely that the site-wide maximum potential CO emissions will exceed the PSD threshold of 250 tons/year.

If the Fill Area 2 expansion is approved, the gas collection rate is expected to increase to 6851 scfm of landfill gas. If all of this gas is diverted to the gas turbines, engines, and A-15 flare, an additional 22,135 MM BTU/year of gas will need to be controlled by the A-16 flare. If the diesel engines are operated concurrently with all of these landfill gas control devices, maximum potential CO emissions could be as high as:  
 $(21.730 + 46.724*2 + 38.062*2 + 93.268 + 22135/1156320*115.632)$   
 = 286.8 tons/year of CO

If the Fill Area 2 expansion is approved, site-wide CO emissions could potentially exceed 250 tons/year. Therefore, a CO cap is necessary to prevent site-wide CO emissions from exceeding the PSD threshold.

**C. SOURCE TEST DATA AND ACTUAL CO EMISSION PROJECTIONS**

As required by current permit conditions, Waste Management conducts annual source tests on the flare (A-15), gas turbines (S-6 and S-7), and IC engines (S-23 and S-24). Source test results for these landfill gas combustion devices are summarized and compared in Table 5.

**Table 5. CO Source Test Results for Flare and Gas Turbines**

	<b>Maximum For 2003-2008</b>	<b>Average For 2003-2008</b>	<b>3-Yr Avg. For 2006-2008</b>	<b>Maximum During Last 12 Months</b>	<b>Higher of 3-Yr Avg. and Last 12-Month Max.</b>	<b>Permit Limit</b>
	<b>Lbs CO / MM BTU</b>	<b>Lbs CO / MM BTU</b>	<b>Lbs CO / MM BTU</b>	<b>Lbs CO / MM BTU</b>	<b>Lbs CO / MM BTU</b>	<b>Lbs CO / MM BTU</b>
A-15 C-On *	0.033	0.019	0.017	0.009	0.017	0.300
A-15 C-Off *	0.220	0.081	0.129	0.002	0.129	0.300
S-6	0.079	0.059	0.054	0.055	0.055	0.223
S-7	0.083	0.060	0.056	0.065	0.065	0.223
S-23	0.636	0.549	0.562	0.636	0.636	0.497
S-24	0.603	0.510	0.483	0.518	0.518	0.497

\* Each year, the A-15 Flare is tested for two operating modes: with condensate injection into the flare (C-On) and without condensate injection (C-Off).

For the flares and turbines, the annual source test data confirms that the actual measured CO emission factors for A-15, S-6, and S-7 have been consistently less the permitted CO emission factors for these devices. During 2003 through 2008, the CO emission factors from the flare ranged from <1% to 73% of the CO emission factor limit. All but one source test found that the actual CO emission factor from the flare was less than 20% of the limit. The turbines' CO emission factors ranged from 19%-37% of the limit. The

District will use the higher of: (a) the most recent 3-year average of the measured CO emission factor, or (b) the highest CO emission factor measured during the last 12 months, and the actual landfill gas collections rate for each device to calculate actual 2008 CO emissions from A-15, S-6 and S-7. These 2008 CO emission estimates are presented in Table 6.

The annual source test data for the engines indicates that S-23 and S-24 have been running very close to or above the equivalent permitted CO emission factor for these engines. Between these annual source tests, daily CO monitoring at S-23 and S-24 has revealed that CO exhaust concentrations are often greater than the concentrations measured during annual source tests. The CO exhaust concentrations measured on a daily basis by a hand held monitor may be as much as 50% greater than the levels measured during annual source tests. The District has found a high correlation between the CO emission rate from these engines (lbs CO/MM BTU) and the CO exhaust concentration at 15% O<sub>2</sub>. A worst-case correlation factor of 2.6E-3 lbs CO/MM BTU per ppmv CO a 15% O<sub>2</sub> was used to estimate the actual CO emission rate for the days that the District has hand-held CO exhaust concentration measurements. The 2008 average of these daily CO emission rate estimates was used in conjunction with the actual landfill gas collection rates for the engines to calculate the actual 2008 emissions from S-23 and S-24. These 2008 emission rate estimates are presented in Table 6.

**Table 6. Actual 2008 CO Emissions from LFG Combustion Devices**

	<b>2008 LFG Collection Rate M scf LFG / year</b>	<b>2008 Source Test %CH<sub>4</sub></b>	<b>LFG Heat Content (HHV) BTU/scf</b>	<b>2008 Heat Input Rate MM BTU / year</b>	<b>2008 CO Emission Factor * Pounds / MM BTU</b>	<b>2008 CO Emission Rate Tons/Year</b>
A-15	337610.7	54.34%	540.0	182317	0.087	7.900
S-6	661582.8	50.60%	502.9	332710	0.055	9.150
S-7	639532.1	53.90%	535.7	342596	0.065	11.134
S-23	85095.3	58.10%	577.4	49138	0.648	15.911
S-24	204424.9	51.80%	514.8	105243	0.722	38.013
<b>Total</b>	<b>1928246</b>	<b>52.8%</b>	<b>524.8</b>	<b>1012005</b>	<b>0.162</b>	<b>82.108</b>

\* For the engines, the average daily lbs CO/MM BTU was calculated based on CO concentrations measured by hand held monitor (2008 data) and a worst-case correlation factor (2.6E-3 lbs CO/MM BTU per ppmv CO at 15% O<sub>2</sub>) that was determined from engine source test data.

From Table 6, the 2008 emissions from landfill gas combustion devices are estimated to be 82.1 tons/year of CO using CO emission factors determined from source test measurements and on-site CO monitoring data. If these combustion devices were emitting CO at their maximum permitted emission rates, the CO emissions would have been 140.9 tons/year of CO. On average, the actual CO emission rate has been about 60% of the permitted level, with an overall average emission rate of 0.2 pounds of CO per MM BTU of landfill gas burned. If this same trend continues for gas collected from Fill Area 1, then CO emissions should not exceed 120 tons/year for Fill Area 1 landfill gas control, when the site reaches the realistic peak gas collection rate for Fill Area 1 (4568 scfm of landfill gas from Table 4). If the landfill expansion is approved, the actual CO emission rate could increase to 180 tons/year for the maximum expected collection rate of 1.789E6 MM BTU/year from Table 4. Including the 22 tons/year of maximum potential CO emissions from diesel engines results in a maximum expected actual site-wide emission rate of 202 tons/year of CO. Considering these conservative projections of the actual CO emission rates from the existing and proposed landfill operations, the District concludes that it is feasible for Waste Management to comply with a site-wide CO cap of 225 tons/year.

#### **D. CUMULATIVE EMISSION INCREASES**

As discussed in the Engineering Evaluation for Application # 19206, the A-16 Flare was limited to a maximum of 95 tons/year of CO, and the cumulative increase for this flare project was 95 tons/year of CO. For all other pollutants, the maximum permitted emissions from A-16 were based of the maximum possible operating rate for the flare and the maximum emission factors for the other pollutants.

For this application, the District is proposing to remove the 95 ton/year CO emission limit for A-16. This permit condition change will allow the A-16 Flare to emit up to its maximum potential of 115.632 tons/year of CO. Cumulative emission increases for this change are 20.632 tons/year of CO above the currently permitted CO emission level for A-16. Total CO emission increases for the new A-16 Flare are: 115.632 tons/year of CO. Since total emission increases for this flare are greater than 100 tons/year of CO, this permit condition change constitutes a major modification of an existing major source, and triggers the Regulation 2-2-405 public notice requirements.

From Tables 1 and 2, this site will have a site-wide CO emission potential of 419 tons/year if all landfill gas fired combustion devices were operating simultaneously at maximum capacity. After imposition of the proposed CO cap, the site-wide maximum permitted emission level will be 225.0 tons/year of CO. Thus, the CO cap project reduces the permitted emission level for this site, and there are no cumulative emission increases associated with this CO cap project.



## **E. STATEMENT OF COMPLIANCE**

### Regulation 2, Rule 1:

#### CEQA:

Application # 18819 involves the modification of the existing permit for an abatement device: the A-16 Landfill Gas Flare (this device is still under construction). The A-16 Flare is currently permitted to burn either gas collected from the existing permitted S-2 Altamont Landfill (Fill Area 1) or waste gas from the S-210 LNG Plant, which is also under construction. The proposed permit modification will remove the current CO emissions limitation of 95.0 tons/year, which will allow the flare to operate continuously at maximum capacity, but it will not change any other operating restrictions for A-16, S-2, or S-210. The A-16 Flare will have a new maximum annual emission rate of 115.6 tons/year of CO, which is 20.6 tons/year of CO greater than the current permitted level for this flare. No emission limit changes are necessary for the other pollutants, because the flare was previously permitted at the maximum potential emission rate for all other pollutants.

Application # 18819 also involves the establishment of a site-wide CO emission limit that will allow this site to avoid federal PSD requirements. This site-wide CO cap project does not modify any sources or allow any emission increases.

Although the Application # 18819 projects do not involve modifications of any sources, the District is also concurrently considering a potentially related project in a separate permitting action. Pursuant to Application # 14814, the District has proposed to approve the Fill Area 2 Landfill Expansion Project.<sup>1</sup> If this Fill Area 2 Expansion Project is approved, it will increase the peak landfill gas collection rate for this site. At some time in the future, the District anticipates that Waste Management may need to modify the permits for the A-16 Flare and the S-210 LNG Plant or may need to request permits for new landfill gas control equipment in order to control the landfill gas that will be collected from Fill Area 2. The District has considered this possibility and has demonstrated (see Section C of this report) that site-wide CO emissions are expected to remain below the proposed CO cap at the gas collection rates anticipated for the modified landfill. Since the District's approval of the Application # 14814 landfill expansion project will not impact the District's conclusions or proposed decisions regarding

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<sup>1</sup> Pursuant to Application # 14814, the District has proposed to approve the Fill Area 2 Expansion of the Altamont Landfill. This project was subject to an Environmental Impact Report (EIR). The County of Alameda was the lead agency for this EIR. A revised final EIR was certified for the Fill Area 2 Landfill Expansion Project in January 2000. A lawsuit delayed action on this EIR, but the lawsuit has now been settled. District staff reviewed the certified final EIR and settlement agreement requirements and determined that the proposed operations and equipment described in Application # 14814 will comply with all applicable District requirements. The District has proposed permit condition revisions that will ensure compliance with all applicable requirements. No additional air quality mitigation measures (beyond those required by the final EIR and settlement agreement) were deemed necessary. Application # 14814 satisfied all requirements of Regulation 2-1-310.

Application # 18819, Application # 18819 will - for the purposes of CEQA - be considered a separate and unrelated project from the landfill expansion.

The Application # 18819 projects discussed above will have no significant impact of biological resources, water quality, dust, smoke, odors, noise, or the need for municipal services. These projects involve a permit change for an abatement device and the establishment of a new site-wide emission limit. Together, these projects will allow an increase in the permitted CO emission level from one abatement device, but will reduce the total permitted CO emission level for the entire facility. Neither of these permit condition changes will allow the modification of any existing sources. There is no possibility that these projects will have any significant adverse environmental impacts. Therefore, Application #18819 is categorically exempt from CEQA review pursuant to Regulations 2-1-312.1 and 2-1-312.2. No further CEQA review is required.

**Public Comment:**

Since this facility is a Title V major facility (because it has the potential to emit more than 100 tons/year of NOx and CO) and this application will result in more than 100 tons/year of CO emission increases, this application is considered a major modification pursuant to 2-2-221. This application triggers the publication and public comment requirements of Regulation 2-2-405. In addition, this application will establish a site-wide CO emissions limit that will reduce the site-wide permitted emission level for this facility and will allow this site to avoid PSD by keeping site-wide CO emissions below the 250 tons/year PSD major facility threshold.

**School Notification:**

The project is over 1000 feet from the nearest school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

**Regulation 2, Rule 2:**

As discussed in Section D, the proposed permit condition revisions for the A-16 Landfill Gas Flare will result in a net cumulative emission increase of 20.6 tons/year of CO and a total cumulative emission increase for A-16 of 115.6 tons/year of CO. Regulation 2, Rule 2 applies to this project because it will result in a cumulative emission increase.

**BACT/RACT:**

Regulation 8, Rule 34 requires emission controls for landfills that meet certain waste capacity and age thresholds to reduce the POC emissions that result from the waste decomposition process. The control requirements in this rule are considered to be Best Available Retrofit Control Technology, or BARCT, for waste decomposition emissions. The S-2 Altamont Landfill exceeds the Regulation 8, Rule 34 size thresholds and is subject to this BARCT requirement to collect and control landfill gas. The A-15 and A-16 Landfill Gas Flares are a necessary part of the BARCT landfill gas control system for the Altamont Landfill.

Pursuant to Regulation 2-2-112, the secondary emission increases from an abatement device are exempt from Best Available Control Technology (BACT) limits if the

abatement device is necessary to achieve a BARCT or BACT control requirement for another pollutant. As explained above, A-16 Flare is necessary to achieve BARCT for landfill POC emissions. Thus, the secondary emissions of NO<sub>x</sub>, CO, SO<sub>2</sub>, and PM<sub>10</sub> from this flare are exempt from the BACT requirements of Regulation 2-2-301 pursuant to Regulation 2-2-112. This exemption also states that NO<sub>x</sub>, CO, SO<sub>2</sub>, and PM<sub>10</sub> emissions from A-16 must comply with RACT instead of BACT.

RACT for CO: RACT for CO is the same as the BACT requirements for POC emissions from a landfill gas flare. RACT for Flare CO emissions includes the use of an enclosed ground flare with (1) a minimum retention time of 0.6 seconds, (2) a minimum combustion zone temperature of 1400 °F, and (3) automatic controls for combustion air, gas shut-off, and flare restart. The new A-16 Flare is an enclosed ground flare and meets the three design criteria identified above. Therefore, A-16 satisfies the RACT requirements for CO emissions. The District typically issues a CO limit of 0.20 pounds CO/MM BTU for new landfill gas flares. Existing permit conditions require A-16 to meet this CO RACT limit. Waste Management will demonstrate compliance with this limit by conducting an annual source test. Annual source testing is a standard method of demonstrating compliance with CO RACT limits.

**Offsets:**

There are no offset requirements for CO emission increases.

**PSD:**

The proposed site-wide cap on CO emissions (225.0 tons/year) and the record keeping requirements in the proposed Condition # 24373 will ensure that this facility will not exceed the federal PSD major facility threshold of 250 tons/year of CO. Since this site is not a PSD major facility, the PSD sections (304-306) of Regulation 2, Rule 2 do not apply to Site # A2066.

**District Prohibitory Rules:**

There are no other applicable District rules that limit CO emissions from landfill gas flares.

**State and Federal Regulations:**

There are no applicable state or federal regulations that limit CO emissions from landfill gas flares.

**F. PERMIT CONDITIONS**

The District is proposing to add a new set of permit conditions (Condition # 24373) that will apply to all non-mobile combustion devices operated at this facility. These conditions will establish the site-wide CO cap of 225 tons/year, which will keep this site from triggering PSD, and will impose additional monitoring and record keeping

requirements to ensure compliance with this site-wide CO cap. The proposed new conditions are listed below.

In addition, the District is proposing to modify Condition # 19235, Parts 4 and 8 by removing the current 95 tons/year CO emission limitation, as discussed in Section D of this report.

**Condition # 24373**

**FOR: ALL NON-MOBILE COMBUSTION EQUIPMENT AT SITE # A2066 INCLUDING BUT NOT LIMITED TO LANDFILL GAS FIRED DEVICES (A-15, A-16, S-6, S-7, S-23, S-24) AND DIESEL FIRED ENGINES (S-31, S-193, S-196, S-197, S-198, S-199, S-200, S-201, S-206, S-207, S-208, S-209, S-214, S-215):**

1. Carbon monoxide (CO) emissions from each landfill gas fired combustion device located at Site # A2066 shall not exceed the emission rate identified below, during any consecutive rolling 12-month period. Each CO limit in this part is derived from but does not replace source-specific emissions related limitations that may be contained in other permit conditions for these devices. (Basis: Cumulative Increase and Regulation 2-1-301)

A-15	Landfill Gas Flare:	93.268 tons of CO per year
A-16	Landfill Gas Flare:	115.632 tons of CO per year
S-6	Gas Turbine:	56.064 tons of CO per year
S-7	Gas Turbine:	56.064 tons of CO per year
S-23	IC Engine:	38.062 tons of CO per year
S-24	IC Engine:	38.062 tons of CO per year
2. Total site-wide carbon monoxide (CO) emissions from all non-mobile combustion equipment located at Site # A2066 shall not exceed 225.0 tons of CO during any consecutive rolling 12-month period. For the purposes of this condition, non-mobile combustion equipment includes all stationary and portable combustion devices other than mobile sources, as defined in 40 CFR Part 51.50. (Basis: Regulation 2-1-403: Avoidance of PSD)
3. To demonstration compliance with Parts 1 and 2, the owner or operator of Site # A2066 shall comply with the following record keeping procedures. (Basis: Regulations 2-1-301 and 2-1-403)
  - a. For each stationary or portable non-mobile combustion device that is operated at Site # A2066 and has the potential to emit more than 2 tons per year of a regulated air pollutant, the owner or operator shall, on a monthly basis, calculate and record the CO emissions (tons of CO per calendar month) from the device. The CO emissions shall be calculated using District approved procedures, emission factors, and operating records, as described below for each type of device.
    - i. For the A-15 and A-16 Landfill Gas Flares, the monthly CO emissions from each flare shall be calculated using the monthly heat input rate (MM BTU per month) to each flare and the District approved CO emission factor (pounds of CO per MM BTU). The

- monthly heat input rate to each flare is recorded pursuant to Condition # 19235, Part 15c. The District approved CO emission factor for each flare is the highest of the CO emission rates measured for any particular flare operating condition during the most recent annual source test for that flare. These CO emission rates shall be determined from data collected pursuant to Condition # 19235, Parts 13a-d.
- ii. For the S-6 and S-7 Gas Turbines, the monthly CO emissions from each turbine shall be calculated using the monthly heat input rate (MM BTU per month) to each gas turbine and the District approved CO emission factor (pounds of CO per MM BTU) for each turbine. The monthly heat input rate to each turbine shall be calculated from data recorded pursuant to Condition # 18773, Part 8. The District approved CO emission factor for each turbine is the CO emission rate reported during the most recent annual source test for that turbine pursuant to Condition # 18773, Part 11g.
  - iii. For the S-23 and S-24 Internal Combustion Engines, the monthly CO emissions from each engine shall be calculated using the monthly heat input rate (MM BTU per month) to each engine and the monthly average CO emission factor (pounds of CO per MM BTU) for each engine. The monthly heat input rate to each engine is recorded pursuant to Condition # 18773, Part 11c. The monthly average CO emission factor for each engine shall be calculated and recorded using the monthly average CO concentrations recorded pursuant to Condition # 19237, Part 9a and a CO emissions correlation factor (pounds of CO per MM BTU per PPMV of CO at 15% O<sub>2</sub>). This CO emissions correlation factor shall be determined from the most recent annual source test for each engine using data recorded pursuant to Condition # 19237, Parts 10a-d and 10g.
  - iv. For diesel fired IC engines subject to this subpart (S-31, S-193, S-197, S-198, S-206, S-207, S-208, and S-209), the monthly CO emissions from each engine shall be calculated using the monthly operating rate (operating hours per month) for each engine, the rated power output (bhp) for each engine, the CARB certified emission factor (grams/bhp-hour) for each engine, and appropriate conversion factors. The monthly operating rates for each engine shall be determined from monthly records of the totalizing hour meter readings for each engine. If the engine is not equipped with a totalizing hour meter, monthly operating hours shall be determined based on daily operating time records for the engine while it is operating at this site.
  - v. For any other types of combustion devices subject to this subpart, the monthly CO emissions shall be calculated using District approved monthly operating rate records and District approved CO emission factors. The District approved CO emission factors are the same as those described below in Part 3b(i-ii) The District

- approved operating rate records shall be expressed in units appropriate for the CO emission factor for that device. If the device is equipped with a totalizing hour meter, fuel flow meter, or other continuous meter, the owner or operator shall use monthly records of meter readings to determine the monthly operating rate. If the device is not equipped with a meter, the owner or operator shall use either daily operating records or monthly fuel usage records to determine the monthly operating rate.
- vi. The owner or operator shall maintain records of any supporting data used to determine the monthly CO emission rate from each device subject to this subpart. This data may include but is not limited to equipment capacities, fuels used, fuel heating values, certifications, guarantees, compliance demonstration test results, meter readings, operating records, calculation procedures, and conversion factors.
  - vii. When CO emission factors need to be increased to reflect new source test data or new hand-held CO monitor data, the new emission factor shall become effective for the month in which the test was conducted and each subsequent month. If the new CO emission factor is lower than the factor currently in effect, the owner or operator has the option to continue using the higher factor and to not use this new lower factor. Any changes to the list of devices subject to this subpart, the CO emission factors, the monthly operating rates, and the resulting monthly CO emissions records shall be incorporated into these records within 6 months of the effective date of the new data.
- b. For each stationary or portable non-mobile combustion device that is operated at Site # A2066 and has the potential to emit 2 tons per year or less of a regulated air pollutant, the owner or operator shall maintain a record of the maximum potential annual CO emissions (tons of CO per year) from each subject device and the total monthly CO emissions potential (tons of CO per month) from all of these less than significant sources. The maximum potential annual CO emissions from each device and the total monthly CO emissions potential from all devices shall be calculated using District approved procedures, emission factors, and maximum operating rates, as described below.
- i. For internal combustion engines, District approved emission factors include (in order of priority): CARB certified emissions factors, CARB tier standards, EPA tier standards, and AP-42 emission factors.
  - ii. For combustion devices other than engines, District approved emission factors include (in order of priority): factors derived from an applicable District, state, or federal standards; factors derived from manufacturer's not to exceed emission rate guarantees; and AP-42 emission factors.
  - iii. The District approved maximum operating rate for a device is equal to: either the maximum rated output (bhp) for an IC engine

- or the maximum rated heat input (MM BTU per hour based on the HHV of the fuel) for other combustion devices multiplied by either the maximum possible or maximum allowable annual operating rate for the device. An annual operating rate of less than 8760 hours/year (24 hrs/day and 365 days/year) may only be used if the device is subject to a District permit condition, District regulation, state ATCM, or federal NSPS/NESHAP that limits the annual operating time for that device.
- iv. The maximum potential annual CO emissions (tons per year) from a device is equal to the District approved emission factor for the device multiplied by the District approved maximum operating rate for the device and any necessary conversion factors.
  - v. The total monthly CO emissions potential from less than significant sources (tons of CO per month) is equal to the sum of the maximum potential annual CO emissions from all less than significant sources subject to this subpart divided by 12.
  - vi. The owner or operator shall maintain records that identify all non-mobile combustion devices subject to this subpart. The owner or operator shall also maintain records of any data used to demonstrate that a source qualifies for this subpart or used to determine the maximum potential CO emissions from a device. This supporting data may include but is not limited to equipment capacities, fuels used, fuel heating values, certifications, guarantees, AP-42 emission factors, regulatory limits, calculation procedures, and conversion factors.
  - vii. The total monthly CO emissions potential for less than significant sources shall be updated within 6 months of operating a new device to this site that is subject to this subpart. For PERP registered engines that may be changed or replaced frequently, the operator may determine a worst-case maximum potential annual CO emission rate for the activity based on the highest possible CO emission factor, the highest possible engine capacity, and the highest possible operating rate. If this worst-case engine scenario is used, total monthly CO emissions would not need to be updated for PERP engine replacements, provided the replacement PERP engine does not exceed any of the worst-case engine assumptions for that activity.
- c. Using the monthly CO emissions data from each device recorded pursuant to subparts a and b above, the owner or operator shall calculate and record the total monthly CO emissions from all non-mobile combustion devices operated at this site.
  - d. Using the monthly site-wide CO emissions total from subpart c, the owner or operator shall calculate and record the total annual site-wide CO emissions from all non-mobile combustion devices, for each rolling consecutive 12-month period.
  - e. All records required by Parts 3a-d above shall be available for District inspection within 6 months of the final APCO approval date for the

Change of Conditions associated with Application # 18819. All records shall be kept on-site or made readily available to District staff upon request, and all records shall be retained for at least five years from the date of entry.

**Condition # 19235**

**FOR: S-2 ALTAMONT LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM, A-15 LANDFILL GAS FLARE, AND A-16 LANDFILL GAS FLARE:**

*No Changes to Parts 1-2*

3. The A-15 and A-16 Landfill Gas Flares shall be fired on landfill gas collected from Fill Area 1 of the S-2 Altamont Landfill. The permit holder shall apply for and receive a Change of Permit Conditions before using these flares to control landfill gas collected from the proposed Fill Area 2. Propane may be used as a start-up fuel only. Landfill gas condensate may be injected into these flares, provided that the flares comply with all limits in Parts 3-10 and any other applicable emission limits during all times that condensate is being injected into these flares. (Basis: Regulation 2-1-301)
  - a. The condensate injection rate at A-15 shall not exceed 3600 gallons during any day, and
  - b. The condensate injection rate at A-16 shall not exceed 7200 gallons during any day.
4. The A-15 and A-16 Landfill Gas Flares shall comply with all of the heat input limits specified below. (Basis: Offsets and Cumulative Increase)
  - a. For A-15, the heat input rate shall not exceed 1704 million BTU per day.
  - b. For A-15, the heat input rate shall not exceed 621,785 million BTU per year.
  - c. For A-16, the heat input rate shall not exceed 3168 million BTU per day.
  - d. For A-16, the heat input rate shall not exceed 1,156,320 million BTU per year.
5. The Landfill Gas Flares (A-15 and A-16) shall be equipped with both local and remote alarm systems. The local and remote alarms shall be activated whenever the total landfill gas collection for the site is less than the target landfill gas collection rate in Part 2a. When operation of A-15 or A-16 is necessary to meet the target landfill gas collection rate, the local and remote alarms shall be activated if the flare shuts down unexpectedly or if the combustion zone temperature is less than the minimum temperature required by Part 10 below. (Basis: Regulation 8-34-301)
6. Each Landfill Gas Flare (A-15 and A-16) shall be equipped with one flow meter and one recorder meeting the requirements of Regulation 8-34-508. (Basis: Offsets, Cumulative Increase, and Regulations 2-1-301, 8-34-301, 8-34-501.10, and 8-34-508)

**Deleted:** d. For A-16, the heat input rate shall not exceed 950,000 million BTU per year, unless the permit holder has demonstrated that A-16 is complying with the CO emission limit specified in Part 8c.¶  
e



7. Nitrogen oxide (NO<sub>x</sub>) emissions from each Landfill Gas Flare (A-15 and A-16) shall comply with the following emission limits:
- a. For A-15, the exhaust concentration shall not exceed 45 ppmv of NO<sub>x</sub>, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.06 pounds of NO<sub>x</sub> (calculated as NO<sub>2</sub>) per million BTU.
  - b. For A-16, the exhaust concentration shall not exceed 45 ppmv of NO<sub>x</sub>, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.06 pounds of NO<sub>x</sub> (calculated as NO<sub>2</sub>) per million BTU.
- (Basis: RACT and Offsets)

8. Carbon monoxide (CO) emissions from each Landfill Gas Flare (A-15 and A-16) shall comply with the following emission limits:
- a. For A-15, the exhaust concentration shall not exceed 369 ppmv of CO, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.30 pounds of CO per million BTU.
  - b. For A-16, the exhaust concentration shall not exceed 246 ppmv of CO, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.20 pounds of CO per million BTU.
- (Basis: RACT and Cumulative Increase)

9. The Landfill Gas Flares (A-15 and A-16) shall comply with either the destruction efficiency or outlet concentration limit specified in Regulation 8-34-301.3. (Basis: Offsets, Cumulative Increase, and Regulation 8-34-301.3)

10. For each Landfill Gas Flare (A-15 and A-16), the combustion zone temperature shall be maintained at a minimum of 1400 degrees Fahrenheit, averaged over any 3-hour period during all times that landfill gas is vented to the flare. If a source test demonstrates compliance with all applicable requirements at a different temperature the APCO may revise the minimum combustion zone temperature limit in accordance with the procedures identified in Regulations 2-6-414 or 2-6-415 and the following criteria. The minimum combustion zone temperature for a flare (T<sub>min</sub>) shall be equal to the average combustion zone temperature determined during the most recent complying source test (T<sub>avg</sub>) minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F:
- $$T_{\min} = T_{\text{avg}} - 50, \text{ for } T_{\text{avg}} \geq 1450 \text{ degrees F}$$
- $$T_{\min} = 1400, \text{ for } T_{\text{avg}} < 1450 \text{ degrees F}$$
- (Basis: RACT, Offsets, Cumulative Increase, Toxic Risk Management Policy, and Regulation 8-34-301.3)

**Deleted:** c. To prevent triggering the requirements of Regulation 2-2-405, carbon monoxide emissions from A-16 shall not exceed 95 tons per year. Compliance with the Part 4d heat input limit and the Part 8b exhaust limits shall demonstrate compliance with this annual CO emission limit. If the heat input rate to A-16 exceeds the Part 4d limit, compliance with this annual CO emission rate limit shall be demonstrated by complying with the Part 4e heat input limit and the following exhaust limits (instead of the Part 8b exhaust limits): the concentration in the exhaust from A-16 shall not exceed 202 ppmv of CO, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate from A-16 does not exceed 0.164 pounds of CO per million BTU. ¶

No Changes to Parts 11-23

**G. RECOMMENDATION**

After completion of the public comment period required by Regulation 2-2-405, and after considering any comments received about this project, the District intends adopt Condition # 24373 that will apply to:

**Site # A2066 Waste Management of Alameda County:  
Adoption of Site-Wide CO Cap**

The District also intends to issue a Change of Conditions for Condition # 19235 that applies to:

**S-2 Altamont Landfill:  
Increase Annual CO Limit for A-16 Flare**

By: Signed by Carol S. Allen  
Carol S. Allen  
Principal Air Quality Engineer

June 12, 2009  
Date