Preliminary Decision to Approve Permit Condition Revisions

for the
Fill Area 2 Landfill Expansion Project (S-2 Altamont Landfill)

Waste Management of Alameda County; PLANT # 2066

APPLICATION # 14814

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 landfill gas control system includes both energy recovery devices and an enclosed flare. Specifically, the current landfill gas control system consists of: 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 also approved Authorities to Construct for a Liquefied Natural Gas (LNG) Plant (S-210) that will convert landfill gas into vehicle fuel quality LNG and for a 132 MM BTU/hour enclosed flare (A-16) at this site.

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. The current facility equipment list is provided in Appendix A.

Application Summary:

This application concerns the S-2 Altamont Landfill. The maximum design capacity of the landfill is currently 58.9 million cubic yards for the area designated as Fill Area 1. The landfill is currently permitted to accept up to 11,150 tons/day of wastes and to accept a cumulative maximum of 47.1 million tons of decomposable waste (Condition # 19235, Part 18). These limits were imposed on S-2 during the initial Title V permitting process and reflected the limits contained in the Solid Waste Facility Permit for Fill Area 1, which was the basis for the District's initial authority to construct for S-2. The landfill design capacity, cumulative decomposable material limit, and daily waste acceptance limits define the capacity for a landfill source and are used in conjunction with detailed site-specific data to determine the maximum potential emissions for each regulated air pollutant and for each toxic air contaminant emitted from a landfill and its associated landfill gas control system.

Waste Management submitted this application to request an Authority to Construct for an expansion of their current landfill permit. Waste Management is proposing to begin disposal of wastes in a 250 acre area, designated as Fill Area 2, located adjacent to and east of Fill Area 1. Waste disposal will shift to Fill Area 2, when Fill Area 1 has reached full capacity, which is expected to occur in 2013. Fill Area 2 will continue accepting waste at the same current maximum daily rates as Fill Area 1 (11,150 tons/day and 557 refuse vehicles/day). Closure of Fill Area 2 is expected to occur in 2038.

This Fill Area 2 expansion will increase the maximum design capacity for the S-2 Altamont Landfill to 124.4 million cubic yards. Fill Area 2 will allow for the disposal of an additional 40 million tons of decomposable waste. Waste Management requested that the S-2 Altamont Landfill be permitted to have a cumulative total of 87.1 million tons of decomposable waste, which is consistent with the Solid Waste Facility Permit that was issued on August 22, 2005. Since 2000, this facility has been using decomposable materials - primarily shredded green waste – as one of the daily cover materials for the waste disposal operation. When the landfill reaches full capacity, the total amount of decomposable cover materials used at this site is expected to be 900,000 tons. The total cumulative amount of decomposable waste and cover materials placed in this site will be limited to 88.000 million tons.

NSR Applicability:

Waste Management is proposing to increase both the maximum landfill design capacity and the cumulative decomposable material disposal limits for the S-2 Altamont Landfill that are contained in the current Title V permit for this site. Increasing the maximum design capacity of this landfill constitutes a modified source pursuant to Regulation 2-1-234.2.

Increasing the cumulative decomposable material disposal limit constitutes a modification of S-2 pursuant to Regulation 2-1-234.3, if this change will result in an emission increase. The proposed 40 million ton increase in the cumulative total amount of decomposable waste placed in the landfill will result in an increase in the maximum projected landfill gas generation rate for Altamont Landfill compared to the maximum projected gas generation rate for Fill Area 1 alone. (The current and proposed gas generation rates are discussed in detail in Section B of this report.) Both the current and proposed landfills are expected to have 25% fugitive emissions, and the organic and toxic concentrations in the landfill gas will not change appreciably. Consequently, the increase in gas generation rate at S-2 will also result in higher precursor and non-precursor organic compound (POC and NPOC) emission rates and higher toxic air contaminant (TAC) emission rates compared to the current maximum potential emissions from S-2. In accordance with Regulation 2-1-234.3.1, the proposed increase in the cumulative amount of decomposable materials placed in the landfill also constitutes a modification of S-2.

In a separate permit application (Application #19045), Waste Management is proposing to install a liquefied natural gas (LNG) plant at this site, which will convert collected landfill gas into liquid methane. The LNG will be used as fuel for garbage truck haul fleets. This LNG Plant will initially be permitted to process gas from collected from Fill Area 1 only. In the future however, the LNG Plant is expected to provide a portion of the additional landfill gas control capacity that will be necessary for Fill Area 2. Waste Management has also received an Authority to Construct for a new landfill gas flare that will control waste gases from the LNG Plant and that will provide additional landfill gas control capacity for Fill Area 1 now and eventually for Fill Area 2. Any residual or secondary emissions from the LNG Plant and New Flare that are caused by burning landfill gas collected from Fill Area 2 are related projects to this landfill expansion. These emissions will be subject to new source review and offset requirements when the LNG plant and new flare are permitted to process gas collected from Fill Area 2. If any other types of landfill gas control devices are proposed for Fill Area 2 in the future, both the residual and secondary emissions from these devices will be similarly linked to this landfill expansion and subject to new source review. Since the residual and secondary emission rates associated with this Fill Area 2 expansion will depend on the type of control device proposed, the specific amount of residual and secondary emissions that are subject to NSR will be determined after Waste Management submits the required application for the Fill Area 2 landfill gas collection and control system.[1]

Although this landfill expansion could potentially have resulted in additional particulate emissions, primarily due to the longer haul route that will be necessary to reach the Fill Area 2 disposal area, Waste Management has proposed to employ additional particulate emission control measures on both their paved and unpaved roads. These dust control measures will ensure that the particulate emissions from the proposed landfill operations will not exceed the current maximum potential particulate emission rate for Fill Area 1. Under these circumstances, this application will not result in particulate emission increases and will not trigger new source review for particulate matter emissions. A particulate emission limit and various monitoring and record keeping requirements will be imposed to ensure that the current maximum potential particulate emission rate (for Fill Area 1 alone) is not exceeded.

[1] To prevent circumvention of offset requirements for residual and secondary emissions from S-210 and A-16, the LNG Plant and the 132 MM BTU/hour flare are currently permitted to burn gas collected from Fill Area 1 only. In accordance with the proposed changes to Condition # 19235, Part 1, Waste Management will be required to submit a permit application for condition changes to identify all equipment that will be used to control gas collected from Fill Area 2. Any emission increases associated with burning gas collected from Fill Area 2 will be subject to offset requirements. The state's offset relief provisions will not apply to secondary emission increases from abatement devices that are controlling gas generated in Fill Area 2.

NSPS Applicability:

This proposed landfill expansion is considered to be an NSPS modification pursuant to the Standards of Performance for Municipal Solid Waste Landfills (40 CFR, Part 60, Subpart WWW, Section 751), because it involves a horizontal expansion of the landfill that results in an increase in the design capacity of the landfill compared to the permitted design capacity as of May 30, 1991. Since the landfill is active, the total design capacity exceeds 2.5 million Mg and 2.5 million m^3, and the NMOC emission rate (calculated in accordance with 40 CFR 60.754) is greater than 50 Mg/year, this expansion triggers the NSPS landfill gas collection and control system requirements of 40 CFR 60.752(b)(2). Condition bases will be revised to include these newly applicable federal requirements. This application will also trigger a significant revision of the MFR Permit pursuant to Regulation 2-6-226.2 (see Application # 14816).

B. EMISSIONS

Overview:

Active MSW landfills are significant sources of precursor organic compound (POC) emissions and toxic air contaminant (TAC) emissions. After waste has been buried in a landfill, biological processes slowly break down the wastes and generate off-gases. These gases, collectively known as landfill gas, contain mainly methane and carbon dioxide, but they also contain small amounts of numerous different precursor and non-precursor organic compounds, toxic air contaminants, and reduced sulfur compounds. As landfill gas generation progresses, the gas pressure within the landfill builds and the gases migrate toward lower pressure areas. Eventually, landfill gas (containing POCs and TACs) will begin to seep through the surface of the landfill.

To minimize these fugitive surface emissions, many landfills are equipped with landfill gas collection systems. Landfill gas collection systems include a series of connected pipes with perforated pipe sections buried within the refuse. Active gas collection systems use blowers to create a vacuum within the piping system, which draws the underground landfill gas into the buried perforated pipe sections. The blowers vent the collected landfill gas to a landfill gas control system.

Landfill gas control systems typically involve burning the collected landfill gas. Collected landfill gas typically has a high enough heat content (400-600 BTU/scf) that it may be used directly as fuel in an energy recovery device, or it may be burned in an enclosed ground flare without the need for supplemental fuel. In addition to emitting very small amounts of residual POCs and TACs, these landfill gas combustion devices generate carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM_{10}), and secondary TACs.

Active landfills also have high rates of particulate matter (PM_{10}) emissions resulting from cell construction and other site preparation activities, from vehicle travel on paved and unpaved roads, from waste filling and cover placement activities, from soil excavation processes, from cover material acceptance and preparation activities, and from wind erosion.

The proposed maximum project emissions and project emission increases resulting from each of the processes and activities discussed above are presented below.

Landfill Gas Generation Rates:

A site's landfill gas generation rate varies over the life of the landfill and cannot be measured directly. The amount of landfill gas that a particular landfill is currently generating or is capable of generating depends on many site-specific factors such as the amount of waste accepted annually in the past, the age of the wastes in the landfill, projected fill rates for the future, the types of wastes in the landfill, changes in the waste profile over time, and the temperature, moisture, and oxygen content within the waste at any given time.

Several empirical methods have been developed to estimate the landfill gas generation rate profiles for a site based on various site-specific input factors. The two most commonly used landfill gas generation rate models are: the Intergovernmental Panel on Climate Change (IPCC) Waste Model and the EPA Landfill Gas Emissions Model (LandGEM). The IPCC Waste Model has typically been used for greenhouse gas inventories, while the EPA LandGEM model has historically been used for criteria pollutant inventories and new source review purposes. These models require similar input information, but the IPCC model requires waste profile data in addition to the input parameters used by EPA's model.

For this application, the District used EPA's LandGEM, Version 3.02, to determine the current baseline, current maximum projected, and proposed maximum projected landfill gas generation rates for the S-2 Altamont Landfill. This spreadsheet based program determines the landfill gas generation rate for each year at a site based on annual decomposable material placement data for the site and several other input parameters: the methane generation rate (k, $year^{-1}$), the potential methane generation capacity (L_0, m^3/Mg), and the landfill gas methane content (CH_4, % by volume). For these calculations, the District assumed that the landfill gas generated at this site will contain 50% methane by volume, which is the standard default assumption. Since Livermore weather data indicates that this area receives less than 25 inches of rain per year, the District assumed the methane generation rate was 0.02 $year^{-1}$ ($k = 0.02\ year^{-1}$), which is the standard default k value for arid areas. The District also used the default methane generation capacity that EPA recommends for arid area inventory calculations ($L_0 = 100\ m^3/Mg$).

As mentioned above, both the overall mass of decomposable materials in a landfill and the placement rate will impact the landfill gas generation rate profile for the landfill. For municipal solid waste landfills, the District typically assumes that all of the waste disposed of in the landfill is decomposable waste, unless the site provides site-specific waste profile data or annual disposal rates for inert materials. Decomposable cover materials - such as shredded green waste - contribute to the overall mass of decomposable material in a landfill and should be included in any landfill gas generation rate model for the landfill. For this project, the District calculated the historical decomposable material placement rates using these standard procedures and recently updated waste disposal data and cover usage data provided by Waste Management and SCS Engineers. Waste Management submitted a December 18, 2008 report entitled "2008 Review of Historic Waste Tonnage Reporting" to the District to correct the historic waste placement data that has been reported to the District in the past via the annual information update process. Table 10 of this report identifies the correct annual solid waste disposal rate and cumulative waste-in-place rate for each year from 1980-2007. Since Waste Management did not provide waste profile data or annual inert disposal rates, the District assumed that the solid waste disposed of in the landfill was 100% decomposable material. Since the year 2000, Waste Management has been using shredded green waste as a daily cover material at the Altamont Landfill. In a February 8, 2008 letter to the District, SCS Engineers provided the annual amounts of decomposable cover materials placed in Fill Area 1 of the Altamont Landfill. The District's calculated decomposable material placement history is presented in Appendix B.

The District evaluated landfill gas generation rates for various possible filling scenarios. The District and Waste Management agreed to base emission calculations on a fill rate of approximately 1.6 million tons/year of waste. The projected amount of decomposable cover materials placed in S-2 is assumed to decrease by about 5,000 tons/year for the remaining life of Fill Area 1 from the current 40,000 tons/year usage rate in 2008 to about 15,000 tons/year in 2013. For Fill Area 2 (2014 through 2038), the decomposable cover material usage rate is expected to be no more than 10,000 tons/year. Detailed future fill rate projections are presented in Appendix B.

The maximum amounts of decomposable materials placed in each fill area and the maximum projected landfill gas generation rates determined by the LandGEM program are summarized below. As shown in Table 1, the peak projected gas generation rate for Fill Area 2 is 7691 scfm of landfill gas. After waste placement shifts from Fill Area 1 to Fill Area 2, gas generation rates will decline in Fill Area 1 while they increase at Fill Area 2. The overall increase in the maximum projected landfill gas generation rate for the Altamont Landfill is 4308 scfm (Total Peak Generation for Fill Areas 1 and 2 Combined – Peak Generation for Fill Area 1).

Since the emissions from Fill Area 1 were never offset, cumulative emission increases for this landfill will be determined in accordance with Regulation 2-2-604.2, which requires a "Peak – Baseline" emissions comparison. For this application, the New Peak LFG Generation Rate minus the Current Baseline Landfill Gas Generation Rate is (12926 scfm – 6974 scfm) = 5952 scfm of LFG generation increases. All fugitive emissions associated with this 5952 scfm increase in landfill gas generation rate are part of this landfill expansion project and are subject to all applicable New Source Review requirements for these emission increases. In addition, any residual or secondary emission increases resulting from the future abatement of this landfill gas increase will be subject to NSR and, in particular to offset requirements for residual POC and secondary NO_x emission increases.

The detailed LandGEM results for Fill Area 1 alone, Fill Area 2 alone, and for the total projected Altamont Landfill (Fill Areas 1 and 2 combined) are presented in Appendix C.

Table 1. Summary of Fill Area Contents and Projected Landfill Gas Generation Rates

	Decomposable Waste Tons-in-Place	Decomposable Cover Tons-in-Place	Total Decomposable Materials Tons-in-Place	As of Year	LFG Generation Rate scfm
Fill Area 1 Baseline (Average of 2005-2007)	1,296,246 Tons/Year	37,933 Tons/Year	38,571,729 As of 2007	2005-2007	6,974
Fill Area 1 Maximum Rates	47,100,000	650,000	47,750,000	2014	8,618
Fill Area 2 Maximum Rates	40,000,000	250,000	40,250,000	2039	7,691
Total Altamont Landfill	87,100,000	900,000	88,000,000	2038	12,926

Fugitive Emissions from the Altamont Landfill:

As required by BAAQMD Regulation 8, Rule 34 and the federal Emission Guidelines for MSW Landfills, the S-2 Altamont Landfill is equipped with an active landfill gas collection in Fill Area 1. BAAQMD Regulation 8, Rule 34 and the NSPS for MSW Landfills will require that the landfill expansion (Fill Area 2) be equipped with an active landfill gas collection system as well. The Fill Area 2 gas collection system must be operational by no later than 60 days after the date when Fill Area 2 has reached 1,000,000 tons of decomposable materials in place (approximately 9 months after waste disposal in

Fill Area 2 commences for a fill rate of 1.6 million tons/year). The adequacy of the current and proposed gas collection systems are discussed in Section C of this report.

As discussed previously, this landfill expansion project is expected to result in emission increases for POCs, NPOCs, and individual TACs. Since POC emissions were not previously offset, cumulative POC emission increases for this project must be determined in accordance with Regulation 2-2-604.2. Thus, POC emission increases are the maximum permitted POC emissions for the proposed project (Proposed POC) minus the baseline POC emissions (Baseline POC). NPOC emission increases and individual TAC emission increases will be determined in a similar manner.

Proposed POC and NPOC:

Usually, the District calculates the total POC and NPOC emissions for a landfill as the fugitive emissions from the landfill surface plus the residual emissions from the gas control system. In this case however, Waste Management has numerous existing control devices (and each device type has a different emission factor for residual POCs and NPOCs), the current flare has more capacity than is currently being utilized, and Waste Management has proposed to install additional control devices (a new and unique LNG Plant plus a new Flare that will both abate the LNG Plant emissions and provide additional landfill gas control capacity) under separate applications. The maximum permitted residual emissions from the new proposed control processes should be based on the capacities of each process or device rather than associated with the projected gas generation rate increases for the landfill in order to allow the site maximum flexibility in choosing which combination of control devices to operate. Therefore, the additional residual emissions from each control device will be assessed in the application that will be required in the future for the Fill Area 2 landfill gas collection and control systems. Consequently, this application (#14814) for a change of conditions at the landfill will only include the fugitive emission increases at the landfill.

For the purposes of new source review, the District determines fugitive landfill emissions based on projected gas generation rates (determined in accordance with AP-42 Chapter 2.4) and the AP-42 average landfill gas collection system efficiency of 75%. Thus, the fugitive landfill gas flow rate is 25% (1-0.75) of the projected landfill gas generation rate for any given year.

Maximum permitted POC and NPOC emissions are based on the maximum projected landfill gas flow for Fill Areas 1 and 2 combined (13,030 scfm of landfill gas with 50% methane), the 25% fugitive gas flow rate explained above, and the following additional assumptions: the maximum non-methane organic compound concentration is 600 ppmv of NMOC (expressed as hexane) in landfill gas with 50% methane, the maximum POC emission rate is equal to 98% of the NMOC emission rate, and the maximum NPOC emission rate is equal to 2% of the NMOC emission rate. From Appendix C, the NMOC generation rate at 12,926 scfm of landfill gas and 600 ppmv of NMOC is: 455.125

tons/year of NMOC (expressed as hexane). Maximum permitted POC and NPOC emissions are:
(455.125 tons NMOC generated/year)*(0.25 tons NMOC emitted/ton NMOC generated) *(0.98 tons POC/ton NMOC) = 111.506 tons/year of POC

(455.125 tons NMOC generated/year)*(0.25 tons NMOC emitted/ton NMOC generated) *(0.02 tons NPOC/ton NMOC) = 2.276 tons/year of NPOC

Baseline POC and NPOC:

In accordance with Regulation 2-2-605, baseline POC and NPOC emissions for this project are the actual average emissions over the baseline period. For this application, the baseline period is the most recent three year period for which data is available: 2005, 2006, and 2007.

For consistency, baseline fugitive emissions will be calculated in the same manner as the proposed project fugitive emissions. The projected gas generation rates for 2005, 2006, and 2007 were determined using LandGEM with the same input assumptions used for the proposed project, except for the NMOC concentration. The baseline Fill Area 1 gas generation rates are presented in Appendix C and are summarized below. The standard fugitive emission rate assumption (25% emitted) was applied to these projected gas generation rates for 2005-2007.

Source testing data is available for each of the existing landfill gas control devices for the last three years. The NMOC concentrations measured during these tests were normalized to a methane concentration of 50% and then averaged for each year to determine the average landfill gas NMOC concentration for each year. The average NMOC concentrations and the resulting annual NMOC emissions are presented below.

Baseline POC and NPOC emissions were determined using the same distribution assumptions as the assumptions for maximum proposed emissions (98% by weight POC and 2% by weight NPOC). Baseline POC and NPOC emissions are presented below.

Table 2. Baseline POC and NPOC Fugitive Emissions from S-2

Year	Projected LFG Generation Rate Scfm	NMOC Concentration ppmv as C6	NMOC Generated tons/year	NMOC Emitted tons/year	POC Emitted tons/year	NPOC Emitted tons/year
2005	6785	443.4	176.551	44.138	43.255	0.883
2006	6976	560.6	229.488	57.372	56.225	1.147
2007	7161	898.3	377.509	94.377	92.490	1.888
average	6974	634.1	261.183	65.296	63.990	1.306

POC and NPOC Emission Increases:

For this application, the emission increases related to waste decomposition are equal to the proposed fugitive POC and NPOC emissions minus the baseline POC and NPOC emissions. These emission increases are summarized below.

Table 3. Emission Increases Resulting from Waste Decomposition at S-2

	POC tons/year	NPOC tons/year
Proposed Fugitive Emissions	111.506	2.276
Baseline Fugitive Emissions	63.990	1.306
Fugitive Emission Increases	47.516	0.970

Residual and Secondary Emissions from Landfill Gas Control Devices:

As discussed previously, the residual and secondary emissions from devices that will be used to control landfill gas from the Fill Area 2 expansion will be determined in A separate future application for the Fill Area 2 Collection and Control System. Due to the multiple types of existing control devices, the unique LNG Plant proposal for this site, and the unspecified nature of the Fill Area 2 abatement strategy, it is not possible at this time to exactly determine the proposed control device emissions, nor what portion of these emissions are due to the Fill Area 2 expansion.

In order to evaluate the ranges of the residual and secondary emissions that may be related to this Fill Area 2 expansion project, the District will estimate residual and secondary emissions for two gas flow rate scenarios and two types of possible abatement devices. This project will result in an increase of 5952 scfm of landfill gas generated: Peak Proposed Landfill Gas Generation Rate minus the Baseline (2005-2007 Average) Landfill Gas Generation Rate. If this site collects at least 75% of the generated gas, the minimum collection rate increase will be 4464 scfm of landfill gas. At 50% methane, landfill gas has a heat content of 497 BTU/scf. Thus, the minimum increase in control device capacity that will be necessary for the Fill Area 2 landfill expansion project is 133 MM BTU/hour. At the projected fill rates for Fill Area 2, the peak gas generation rate for Fill Area 2 alone will be 7691 scf of landfill gas. If Waste Management proposes to install a control device for Fill Area 2 alone and the device capacity is equal 100% of the maximum projected gas generation rate for Fill Area 2, the maximum heat input rate for a Fill Area 2 abatement project would be 229 MM BTU/hour. Landfill gas flares are generally the lowest emitting landfill gas control option for a site, while landfill gas fired IC engines typically have the highest emissions. The potential residual and secondary emissions for each type of device and each heat input scenario are presented in Table 4.

Table 4. Potential Residual and Secondary Emissions due to Fill Area 2 Expansion

	Flare Emission Factor	Flare Emissions at 133 MM BTU/hr	Flare Emissions at 229 MM BTU/hr
	lbs/MM BTU	Tons/Year	Tons/Year
POC	0.0125	7.3	12.5
NPOC	0.0003	0.2	0.3
NO_x	0.0600	35.0	60.2
CO	0.2000	116.5	200.6
SO_2	0.0500	29.1	50.2
PM_{10}	0.0171	10.0	17.2
	IC Engine Emission Factor	Engine Emissions at 133 MM BTU/hr	Engine Emissions at 229 MM BTU/hr
	lbs/MM BTU	Tons/Year	Tons/Year
POC	0.0501	29.2	50.3
NPOC	0.0010	0.6	1.0
NO_x	0.1520	88.5	153.0
CO	0.6340	369.3	635.9
SO_2	0.0500	29.1	50.2
PM_{10}	0.0483	28.1	48.4

When an exact abatement strategy for Fill Area 2 is proposed and submitted in the form of a permit application, the District will calculate the exact amount of residual and secondary emissions that are associated with this landfill expansion project and the exact amount of POC and NO_x offsets required due to NSR. As shown in Table 4, residual POC emission increases could range form 7-50 tons/year, while secondary NO_x emission increases could range from 35-153 tons/year. The minimum additional offset requirements for residual and secondary emissions resulting from this landfill expansion project are: 8.4 tons/year of POC offsets and 40.3 tons/year of NO_x offsets. However, these offset requirements could increase significantly depending on the type of emission control device chosen for Fill Area 2.

To ensure that these offset requirements are not circumvented, the District is requiring that Waste Management submit the collection and control system design plan for Fill Area 2 in the form of a permit application for a Change of Conditions (see Condition # 19235, Part 1). This permit application will enable the District's review of the adequacy of the proposed collection and control systems for Fill Area 2 and will trigger the necessary new source review determination for any existing sources or abatement devices that will be burning gas collected from Fill Area 2.

Particulate Emissions:

Both the current landfill operations and the proposed landfill operations will result in particulate matter emissions due to the delivery and placement of wastes, the excavation and storage of cover soil, the delivery and storage of alternative cover materials, and the placement of cover materials over the waste. The largest source of particulate emissions is vehicle travel on on-site roads. Vehicle travel emissions depend on the type of road, the silt content of the road surface materials, the weight of the vehicle fleet on the roads, the distance traveled by the vehicle fleet, rainfall and watering frequency, and other PM control measures employed by the facility.

The current maximum potential PM_{10} emission rate for the Fill Area 1 landfill operations and the proposed maximum PM_{10} emissions for the landfill operations after the Fill Area 2 expansion are compared in Table 5. Since the proposed PM_{10} emissions will not exceed the current maximum potential PM_{10} emission rate, this application will not result in any PM_{10} emission increases. Permit conditions will be imposed to ensure compliance with the current Fill Area 1 maximum potential PM_{10} emission rate of 387.5 tons/year.

Table 5. Comparison of Current and Proposed Maximum Potential PM_{10} Emissions

Description of Activity	Fill Area 2 Proposed PM10 Tons/Year	Fill Area 1 Maximum PTE PM10 Tons/Year
Vehicle and Mobile Equipment Travel on Paved and Unpaved Roads, including: main haul roads, perimeter roads, on-site cover soil delivery routes, and temporary fill area access routes	360.344	379.882
On-Site Cover Soil Excavation	4.031	2.755
Waste & Cover Material Delivery, Placement, and Compaction	6.018	4.882
Total Particulate Emissions from S-2	**370.393**	**387.519**

Detailed particulate emission calculations are presented in Appendix D for each current and proposed activity that will generate particulate emissions. The calculation procedures, throughput basis, and other major assumptions for each activity type and for each emission scenario are provided below.

Paved Roads:

Emissions from paved roads are calculated in accordance with the procedures identified in AP-42 Chapter 13.2.1 (November 2006). The PM_{10} emission factor (pounds PM_{10} per vehicle mile traveled) is determined using Equation 2:
E = [k * (sL/2)^0.65 * (W/3)^1.5 – C] * [1 – (P/4N)]

From Table 13.2.1-1, the particle size multiplier (k) is 0.016 lbs/VMT for PM_{10}. From Table 13.2.1-2, the brake and tire wear factor (C), is 0.00047 lbs/VMT for PM_{10}.

Rainfall will provide some natural mitigation of particulate emissions. Based on historical rainfall data for Livermore, Altamont Landfill receives an average of 59 days/year with at least 0.01 inches of precipitation (P). The number of days in the averaging period (N) is 365. Thus, rainfall is expected to control about 4% of the paved roadway emissions.

The road surface silt loading (sL) is different for each emissions scenario. For the current Fill Area 1 maximum potential emissions, sL is determined from Table 13.2.1-4. The mean silt loading for municipal solid waste landfills is 7.4 g/m^2. For proposed Fill Area 2 emissions, Waste Management will employ several PM_{10} emission reduction measures that are intended to reduce the mean silt loading on the paved roads. These emission reduction measures include truck wash stations near the unpaved portion of the travel route to reduce particulate drag-out onto the paved road, frequent roadway sweeping and/or vacuuming, and roadway water flushing as necessary. Waste Management expects these measures to reduce the mean silt loading on the paved haul roads to 2.0 g/m^2.

The weighted average vehicle fleet weight (W) is determined for each emissions scenario based on the number of vehicle trips for each type of vehicle and each paved road section, and the average vehicle weight on the paved road section for each type of vehicle. For Fill Area 1, the average vehicle fleet weight is 26.09 tons. For Fill Area 2, the vehicle fleet weight ranges from 25.22-25.75 tons for the vehicle fleets expected to be traveling on the various paved roadway segments.

Unpaved Roads:

Emissions from unpaved industrial roads are calculated in accordance with the procedures identified in AP-42 Chapter 13.2.2 (November 2006). The uncontrolled PM_{10} emission factor (pounds PM_{10} per vehicle mile traveled) is determined using Equation 1a:
E = k * (s/12)^a * (W/3)^b

From Table 13.2.2-2, the particle size multiplier (k) is 1.5 lbs/VMT and the empirical constants (a and b) are 0.9 and 0.45, respectively, for PM_{10} emissions from industrial roads.

The surface material silt content (s) is different for each type of unpaved road. For Fill Area 1, the District assumes that all unpaved roads are dirt roads made from on-site material. From Table 13.2.2.1, the mean silt content for disposal routes at MSW landfills is 6.4% (the range is 2.2%-21%). Several years ago, Waste Management measured the silt content on unpaved roads at the Altamont Landfill for Application # 3421. The measured surface silt content ranged from 54%-80%. This measured surface silt content data for Altamont Landfill is extraordinarily high compared to silt content data reported by EPA for other landfills and other industrial facilities. In addition, Equation 1a was determined based on unpaved road silt contents ranging from 1.8%-25.2%. The quality

of Equation 1a is seriously degraded for silt content values outside of this range. In order to preserve the validity of Equation 1a, the District assumed that the surface silt content for Fill Area 1 unpaved roads is at the high end of the range for this equation (s=25.2%). This assumption is more consistent with the surface silt content expected for landfills, and will result in a conservative estimate of PM_{10} emissions for Altamont Landfill.

For Altamont Landfill after the expansion into Fill Area 2, Waste Management is proposing to use gravel or other low silt content materials for temporary roads within Fill Area 2 and for the roads from the on-site soil stockpiles to the active face. Waste Management expects to maintain surface silt contents of 6.4% or less at these new unpaved roads (s=6.4%). Existing perimeter roads and roads to the green waste processing area will remain dirt roads. For these dirt roads, the District uses the same silt content assumption as for the Fill Area 1 analysis (s=25.2%).

As with paved roads, the weighted average vehicle fleet weight (W) is determined for each emissions scenario based on the number of vehicle trips for each type of vehicle and each unpaved road section, and the average vehicle weight on the unpaved road section for each type of vehicle.

Soil Excavation:

The PM_{10} emission factor for cover soil excavation is determined using AP-42 Chapter 11.9. From Table 11.9-4, the emission factor for topsoil removal by scrapers is 0.058 lbs of TSP per ton of soil removed. The District assumes that 50% of the TSP emissions from this activity are PM_{10}.

Waste and Cover Material Delivery:

The AP-42 Chapter 13.2.4 drop loading equation is used to calculate the PM_{10} emission factors for the delivery of waste or cover materials to the active face. Equation 1 states:
E (lbs PM_{10}/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4
For PM_{10}, k is 0.35. The average wind speed for the site (U) is 7.8 mph. Although the moisture content of wastes and cover materials are expected to be 11%-20%, this range exceeds the moisture content range for the equation. To retain the quality rating for this emission factor, the District will use the maximum moisture content for which the equation as evaluated (M=4.8%).

Waste and Cover Material Placement and Compaction:

Bulldozers are used to distribute the waste and cover materials over the active face of the landfill. Large compactors compact the wastes and cover materials. The emissions during the bulldozing activity are based on AP-42 Chapter 11.9, Table 11.9-1. For overburden, PM10 emissions are: 0.75*1.0*(s^1.5)/(M^1.4) pounds/hour. From Table 13.2.3-1, AP-42 states that this dozer equation should be used for compactor emissions as well. From Table 13.2.4-1, the average silt (s) and moisture (M) values for waste are:

s=12% and M=11%; the average silt and moisture values for cover materials are: s=9% and M=12%. Waste Management provided daily and annual operating time estimates for waste bulldozing activities. The District estimated operating times for cover bulldozing activities and for compactor activities based on Waste Management's data. The hourly emission rates were converted to pounds/ton emission factors based on the annual waste and cover throughput rates.

Current Maximum Potential PM_{10} Emission Calculations for Fill Area 1:

According to the updated waste acceptance records provided for this application, the maximum waste acceptance rate for the landfill was 1.9 million tons/year from 1992-1998. Based on more recent actual throughput and vehicle travel records reported by Waste Management, the District estimated that the cover material usage rate during the 1992-1998 peak waste acceptance period was 50% of the annual waste disposal rate (950,000 tons/year of cover). Green waste was not used as cover material for the Altamont Landfill during the 1990s. The District assumed that 80% of the cover soil was delivered from off-site locations (760,000 tons/year), while 20% of the cover soil was excavated on-site (190,000 tons/year). The District assumed that the vehicle weights and load weights for this time period were the same as the proposed vehicle fleet. The District used waste and cover soil throughput rates and the expected vehicle load weights to determine the number of vehicle trips for each type of vehicle. The District calculated trip distances using Waste Management's detailed route maps for Fill Area 1.

Proposed Maximum Potential PM_{10} Emission Calculations for Fill Area 2:

For the Altamont Landfill, the maximum annual waste throughput was determined based on the peak waste acceptance rate of 11,150 tons/day and 312 days of operation (3,478,800 tons/year of waste). The corresponding maximum cover material usage rates are 2484 tons/day and 775,077 tons/year. The maximum possible annual waste acceptance rate of 3.5 million tons is much higher than the predicted annual waste acceptance rate of 1.6 million tons/year (which was used for POC emission calculations). Thus, proposed the PM_{10} emissions determined for this application will likely be much higher than actual site emissions.

The vehicle trips for waste are consistent with the 3.5 million tons/year waste acceptance rate. In order to retain maximum flexibility in choosing cover materials for this site, Waste Management estimated the cover material truck trips based on a worst case throughput rate for each type of cover material that might be used: 70,700 tons/year of green waste delivered from off-site, 61,000 tons/year of processed green waste from off-site, 498,000 tons/year of soil from off-site, 278,000 tons/year of soil from on-site excavation, and 345,600 tons/year of non-green waste alternative daily cover material. Actual cover material throughput rates will be much lower than the combined total of the throughput rates listed above.

Waste Management is proposing to pave the main haul route from the current paved entrance road to the Fill Area 2 access point. Temporary roads within Fill Area 2 and roads traveled by soil scrapers to Fill Area 2 will be improved with gravel surfaces, dust suppressants and other measures to reduce PM emissions.

In addition to waste and cover material delivery, some of the on-site paved and unpaved roads are traveled by trucks and other mobile devices. For instance, bulldozers travel from the maintenance shed to the active face, trucks travel on-site to remove condensate or leachate, and miscellaneous employee vehicles transport workers to job sites. Some of these vehicle trips will be diverted from unpaved roads to paved roads to achieve additional PM emission reductions.

Toxic Air Contaminant Emissions:

A detailed discussion of the Toxic Air Contaminant (TAC) emissions from the proposed landfill is presented in the Health Risk Screening Analysis Report, which is attached as Appendix E. The emission rates for the most significant TACs are summarized in Appendix E, Tables 3a-c.

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

The operations and equipment described in this application were subject to an Environmental Impact Report (EIR) for which the County of Alameda was the lead agency. 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 have reviewed the certified final EIR and settlement agreement requirements and have determined that the proposed operations and equipment described in the application are expected to comply with all applicable District requirements. The District is proposing permit condition revisions that will ensure compliance with these applicable requirements. No additional air quality mitigation measures (beyond those required by the final EIR and settlement agreement) were deemed necessary. Therefore, this application has satisfied all requirements of Regulation 2-1-310. No further CEQA review is required.

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:

Best Available Control Technology:

As shown in Table 3, this application will result in 47.5 tons/year of POC emission increases and 1.0 tons/year of NPOC emission increases. These annual emission increases are equivalent to 260.4 pounds/day of POC increases and 5.3 pounds/day of NPOC increases. Since POC emission increases will exceed 10 pounds/day, this project triggers Best Available Control Technology (BACT) for POC emissions pursuant to Regulation 2-2-301.

BACT for POC emissions from a landfill includes the installation of a state-of-the-art landfill gas collection system that minimizes landfill surface emissions and a state-of-the-art landfill gas control system that destroys collected landfill gas to the maximum extent possibly for the particular device employed. The landfill gas collection and control systems must be operated continuously and must – as a minimum – satisfy all performance and operating requirements specified in BAAQMD Regulation 8, Rule 34 and the federal NSPS for MSW Landfills (40 CFR, Part 60, Subpart WWW). To satisfy BACT for this landfill, Fill Area 2 must be equipped with such state-of-the-art landfill gas collection and control systems. The District will evaluate the specific design criteria for the Fill Area 2 landfill gas collection and control systems when Waste Management submits the required Landfill Gas Collection and Control System Plan for this fill area, which is due 90 days prior to the date on which the collection and control system is required to begin operation (per Regulation 8-34-408.3) This plan will include criteria such as construction materials, types of gas collectors proposed, placement schedule for vertical wells and horizontal collectors, density, depth, and length of the wells and collectors, detailed descriptions of the daily and intermediate landfill caps, procedures for inspecting, maintaining and repairing the cap and the collectors, capacity of the gas mover system, landfill gas control strategies, start-up, shut-down, and malfunction plan updates, and applications for all new landfill gas control devices and any permit condition changes necessary to allow the site to begin collecting and burning gas from the new fill area. When this plan is submitted, the District will ensure that the collection and control systems designs achieve a BACT level of control for POC emissions.

For large active landfills, the operating requirements and other standards specified in BAAQMD Regulation 8-34 are at least as stringent as the Subpart WWW performance standards. Thus, compliance with Regulation 8, Rule 34 will assure compliance with Subpart WWW and with BACT for the landfill's fugitive POC emissions. The existing Altamont Landfill (Fill Area 1) is equipped with a continuously operating landfill gas collection system and multiple landfill gas control devices that have been generally operating in compliance with all applicable requirements of Regulation 8, Rule 34. Waste Management has quickly corrected the few isolated instances of non-compliance with the surface emission leak standard, component leak standard, down time restrictions, and key emission control system operating parameter limits. This good compliance

record is expected to continue as filling shifts from Fill Area 1 to Fill Area 2 and the gas collection and control systems for Fill Area 2 are installed. Therefore, the District expects that Waste Management will comply with BACT for landfill POC emissions.

As discussed in Section B, the proposed particulate emissions from the landfill and on-site roadways (after implementing the PM emission reduction measures required by the final EIR and settlement agreement) will not exceed the maximum potential PM emission levels for the current Fill Area 1 operations. Therefore, this application will not result in any PM emission increases. BACT is not required for the PM_{10} emissions from this landfill; however, Waste Management must demonstrate that actual PM_{10} emissions from their current and future landfill operations will not exceed the maximum potential PM_{10} emission level that was calculated in this application for Fill Area 1. Detailed record keeping and reporting procedures are included in the permit conditions to ensure that PM_{10} emissions will not increase above this maximum permitted level.

Offsets:

As discussed previously, this application only addresses fugitive landfill emissions. The residual and secondary emissions from new or modified landfill gas control devices and any potential offset requirements resulting from new or modified control devices burning gas from Fill Area 2 will be determined in the future applications for the specific control device proposed.

Since this application results in POC emission increases, and the facility emits more than 35 tons/year of POC emissions, this facility is required to provide POC emission reduction credits (ERCs) to offset the POC increases at a ratio of 1.15:1.0, pursuant to Regulation 2-2-302. With the limitations identified in the proposed permit condition revisions, this project will result in 47.516 tons/year of POC emission increases. The total POC offset requirement for this project is (47.516*1.15) = 54.643 tons/year.

As discussed in the emission calculations section of this report, the permitted fugitive POC emission rate from the landfill is highly dependent on the rate at which decomposable materials (wastes and decomposable cover materials) are placed in the landfill as well as the POC concentration in the landfill gas. The calculated POC increases for this project could change significantly if the annual decomposable material placement rate or the landfill gas POC concentration is lower or higher than anticipated. Due to these uncertainties, the District has agreed that Waste Management may provide the required ERCs for this project in increments (every two years). Prior to receiving an increase in the cumulative decomposable material placement limit for the landfill, Waste Management must surrender the required ERCs, in accordance with the schedule in Table 6 (see also Condition # 19235, Part 17).

In December 2008, Waste Management surrendered Banking Certificate # 995 for 12.087 tons/year of POC emission reduction credits and Banking Certificate # 1002 for 8.816

tons/year of POC emission reduction credits.[2] These 20.903 tons/year of POC credits are sufficient to offset the first increment of POC emission increases (11.114 tons/year of ERCs required to offset 9.664 tons/year of POC increases) and to allow the District to raise the cumulative decomposable material placement limit for S-2 to 48.337 million tons. For future offset increments, the amount of ERCs due will be based on the proposed increase in the cumulative decomposable material disposal limit for the next time period. For each increment, the District will review actual decomposable material placement rates, the actual average fill rate, the proposed fill rate, the proposed decomposable material limit, the actual average landfill gas NMOC concentration, and the proposed landfill gas NMOC concentration to determine if this project's POC increases and POC offset requirements need to be adjusted.

Table 6. Incremental POC Offset Schedule

ERC Due Date and Effective Date for New Limits	Amount of ERCs Due tons/year of POC	Fugitive Emission Limit tons/year of POC	Cumulative Decomposable Material Placement Limit million tons	Annual Decomposable Material Placement Limit tons/year	Landfill Gas Concentration Limit ppmv NMOC (rolling 3-year average, expressed as C_6 and corrected to 50% CH_4)
Surrendered by Waste Management	11.114	73.654	48.337	1,630,000	600
1/2/13	4.349	77.436	51.557	1,610,000	600
1/2/15	4.167	81.059	54.777	1,610,000	600
1/2/17	4.003	84.540	57.997	1,610,000	600
1/2/19	3.846	87.884	61.217	1,610,000	600
1/2/21	3.695	91.098	64.437	1,610,000	600
1/2/23	3.551	94.185	67.657	1,610,000	600
1/2/25	3.411	97.152	70.877	1,610,000	600
1/2/27	3.278	100.002	74.097	1,610,000	600
1/2/29	3.149	102.740	77.317	1,610,000	600
1/2/31	3.026	105.371	80.537	1,610,000	600
1/2/33	2.907	107.899	83.757	1,610,000	600
1/2/35	4.148	111.506	88.000	1,610,000	600

Regulation 2-2-303 offset requirements for PM_{10} and SO_2 emission increases only apply if the application results in emission increases for these pollutants. Since this application will not result in PM_{10} or SO_2 emission increases, PM_{10} and SO_2 offsets are not required.

[2] As of November 13, 2008, Waste Management holds a total of 40.423 tons/year of POC emission reduction credits in the following Banking Certificates: #995 for 12.087 TPY POC, #1002 for 8.816 TPY POC, #1003 for 6.153 TPY POC, #1004 for 1.000 TPY POC, #1005 for 12.367 TPY POC. Waste Management will need to purchase the additional required credits for this project as prior to the January 2025 due date in order to obtain the post-2025 increases in the decomposable material placement limit.

PSD:

Since landfill facilities are not one of 28 special PSD categories, landfill facilities are subject to a PSD major facility threshold of 250 tons/year for each regulated air pollutant (CO, NO_x, POC, SO_2, and PM_{10}). In addition, fugitive POC and PM_{10} emissions are excluded from this 250 ton/year major facility threshold.

The District conducted a detailed potential to emit evaluation for Site # A2066 during the evaluation of Application # 19206 for the proposed A-16 Landfill Gas Flare. Since the landfill gas combustion devices are limited to burning landfill gas collected from Fill Area 1 only, the facility wide potential to emit is currently limited by the projected landfill gas generation rates for Fill Area 1 rather than by the sum of the maximum permitted emission rates for each landfill gas control device, because there will be insufficient gas generated by Fill Area 1 to run all control devices simultaneously at their maximum permitted rates. The current facility wide potential to emit for each pollutant (excluding fugitive POC and excluding fugitive PM_{10}) is summarized below:

- 187 tons/year of CO
- 150 tons/year of NO_x
- 31 tons/year of POC
- 38 tons/year of SO_2
- 26 tons/year of PM_{10}

Application # 14814 will result in a total of 48 tons/year of POC increases. However, all of these POC increases are fugitive POC emissions. Therefore, this increase will not impact the POC potential to emit cited above (which excludes fugitive POC). While the proposed condition changes will allow an increase in the gas generation rate at the landfill, the control devices will continue to be limited to burning gas collected from Fill Area 1 only. Therefore, this application will not impact the feasible landfill gas combustion rates either. Consequently, the facility wide potential to emit remains unchanged from the current potential emission rates cited above.

When Waste Management submits the required permit application for the Fill Area 2 landfill gas collection and control systems, the site must undergo a new potential to emit evaluation, because these condition changes are expected to increase the overall maximum potential landfill gas combustion rates for this site. Since it is possible that such a permit condition change will result in more than 250 tons/year of potential CO emissions for this site (if all the permitted combustion devices are operating simultaneously and burning landfill gas at their maximum permitted throughput rates and emitting at their maximum permitted emission rates), Waste Management has submitted a request (Application # 18819) to limit the site-wide CO emissions to less than 250 tons/year to avoid triggering PSD. Pursuant to regulatory requirements, the District expects to cap the site-wide CO emissions at 225 tons/year. Source tests indicate that the actual CO emission rates from the flare and gas turbines are far below the maximum permitted emission rates. Therefore, it is likely that Waste Management will be able to comply with a site-wide CO cap of 225 tons/year, even at the higher landfill gas

combustion rates that will be necessary to control the additional levels of landfill gas that will be collected from Fill Area 2 in the future.

In summary, the facility wide potential to emit (excluding fugitive POC and fugitive PM_{10} emissions) for Site # A2066 is less than 250 tons/year for each pollutant. This application to increase material placement limits at the landfill will not result in any pollutants exceeding this PSD threshold. Therefore, this site is not a PSD facility, and none of the PSD modeling requirements apply to this application. Waste-Management has requested to establish a site-wide cap on CO emissions in order to ensure that PSD is not triggered in the future. This CO cap request will be evaluated and publically noticed separately from this current application.

Public Comment:

Since this facility is a major facility, and this application will result in more than 40 tons/year of POC emission increases, this application is considered a major modification pursuant to 2-2-221 and triggers the publication and public comment requirements of Regulation 2-2-405.

New Source Review for Toxic Air Contaminants:

The toxic air contaminant emissions associated with this project and the resulting health impacts are described in detail in the Health Risk Screening Analysis in Appendix E. The results of the HRSA are summarized below.

Table 7. Health Impacts for the Altamont Landfill Expansion Project

Health Impact Type	Receptor	Max. Project Impacts	Source Risk for S-2	Source Risk for A-15	Source Risk for A-16
Cancer Risk (in a million)	Resident	9.96	9.96	0.01	0.06
Cancer Risk (in a million)	Worker	3.60	3.60	0.01	0.13
Chronic HI	Resident	0.15	0.15	< 0.01	0.02
Chronic HI	Worker	0.06	0.06	< 0.01	0.06
Acute HI	Resident or Worker	0.90	0.90	< 0.01	0.01

Since the source risk for the S-2 Altamont Landfill will exceed a cancer risk of 1 in a million, Best Available Control Technology for Toxics (TBACT) is required for S-2 pursuant to Regulation 2-5-301. TBACT for a landfill is the same as the BACT requirements discussed above for POC emission increases. The District expects that Waste Management will satisfy TBACT by installing and properly operating state-of-the-

art landfill gas collection and control systems in Fill Area 2 and by maintaining state-of-the-art landfill gas collection and control systems in Fill Area 1.

The total project emission increases will result in a cancer risk of less than 10 in a million and a chronic hazard index (HI) of less than 1.0. The maximum acute HI is also less than 1.0 for emissions from the landfill and the flares, which are related devices. Therefore, this project will comply with the project risk limits in Regulation 2-5-302.

Regulation 2, Rule 6:

This facility is currently subject to the Operating Permit requirements of Title V of the federal Clean Air Act (40 CFR, Part 70) and BAAQMD Regulation 2, Rule 6, Major Facility Review (MFR), because it is a major facility for NO_x and CO emissions, which are each permitted to exceed 100 tons/year. This facility is also a designated facility, because it is subject to the control requirements of the Emission Guidelines for MSW Landfills (40 CFR, Part 60, Subpart Cc). Therefore, Waste Management's Altamont Landfill Facility (Site # A2066) is required to have an MFR permit pursuant to Regulations 2-6-301 and 2-6-304.

The MFR Permit for this facility was initially issued on December 1, 2003 and was last revised on October 9, 2008. Since this application will trigger the NSPS for MSW Landfills and will also result in more than 40 tons/year of POC increases, this project will require a significant revision of the MFR Permit. With this permit revision, POC and PM_{10} emissions will also permitted to exceed 100 tons/year each, but these emissions are primarily due to fugitive emissions that are exempt from the Title V applicability threshold. Since non-fugitive POC and PM_{10} emissions are each less than 100 tons/year, this facility will not be a Title V major facility for POC or PM_{10} emissions. This Title V permit revision will be handled pursuant to Application # 14816. All applicable sections of the NSPS for MSW Landfills will be added to the MFR permit and the Emission Guidelines for MSW Landfills will be removed from the permit. All permit condition changes noted below will also be incorporated into the Application # 14816 Significant Revision of the MFR Permit for Site # A2066.

Regulation 6, Rule 1:

Regulation 6-1-301 limits the visible emissions from each activity at the landfill, soil excavation areas, soil stockpiles, and on-site roadways to Ringelmann 1.0. In accordance with Regulation 6-1-401, the operator will be required to observe all roads and all loading, unloading, scraping, bulldozing, and compacting operations and to take whatever action is necessary to control emissions, if any visible emissions are identified.

Regulation 8, Rule 34:

The S-2 Altamont Landfill and gas collection systems are expected to comply with Regulation 8 Rule 34 Section 301 by:
(a) continuously operating the gas collection system and control devices,

(c) having no component leaks (exceeding 1000 ppmv) from the gas collection or control systems, and
(c) processing all collected gases in control devices (S-5, S-6, S-23, S-24, S-210, A-15, or A-16) achieving either 98% NMOC destruction efficiency or meeting the appropriate outlet NMOC concentration limit.

The S-2 Altamont Landfill (Fill Area 1 currently and Fill Area 2 after filling commences) is also subject to 8-34-303, which limits leaks on the surface of the landfill to less than 500 ppmv as methane. This facility is expected to continue to comply with this limit in the future.

For Fill Area 2, Regulation 8-34-304.3 is expected to result in the earliest trigger date for installing the landfill gas collection and control system in Fill Area 2. Regulation 8-34-304.3 requires that the gas collection system begin operation within 60 days of the date on which the total amount of decomposable materials placed in Fill Area 2 reaches 1 million tons. At the expected decomposable material fill rate of 1.61 million tons/year, Fill Area 2 will reach 1 million tons of decomposable materials after about 7 ½ months of operation. Therefore, the collection and control system for Fill Area 2 should begin operating no later than 9 ½ months after filling in Fill Area 2 commences.

The wells in the Fill Area 1 gas collection system are subject to the Regulation 8-34-305 Wellhead Standards, except where alternative wellhead standards have been approved in the permit conditions. The Fill Area 2 gas collection system will be subject to these same standards.

Waste Management has submitted the Amended Design Capacity Report required by Regulation 8-34-405.

In accordance with Regulation 8-34-408, a Collection and Control System Design Plan is required for Fill Area 2. Pursuant to 8-34-408.3, this plan is due 90 days prior to the date on which the gas collection system is required to begin operation. For Fill Area 2, the estimated plan due date is 6 ½ months after filling in Fill Area 2 commences.

Regulation 8, Rule 34, Sections 411, 412, 413, 414, 415, 416, 501, 503, 504, 505, 506, 507, 508, 509, and 510 are on-going administrative and monitoring requirements. Waste Management is expected to comply with these repairing, monitoring, testing, record keeping, and reporting requirements whenever necessary.

Federal Requirements:

EG: This facility is currently subject to the Emission Guidelines (EG) for Municipal Solid Waste Landfills (40 CFR, Part 60, Subpart Cc.) These requirements are implemented through Regulation 8 Rule 34. Compliance with Regulation 8, Rule 34 assures compliance with Subpart Cc. All applicable provisions are contained in the Title V permit for this facility. As discussed below, the Fill Area 2 Expansion Project will

trigger the NSPS requirements for the S-2 Altamont Landfill. Subpart WWW will replace Subpart Cc.

NSPS: As defined in 40 CFR Part 60.751, the Fill Area 2 expansion of the S-2 Altamont Landfill is a "modification" because it includes a horizontal expansion of the landfill that will increase the design capacity above the level the site was permitted for as of May 30, 1991. Upon commencement of construction of Fill Area 2, S-2 is subject to the 40 CFR, Part 60, Subpart WWW, New Source Performance Standards (NSPS) for Municipal Solid Waste (MSW) Landfills. A detailed description of all applicable NSPS requirements and the effective dates for these requirements will be included in the Title permit revision (Application # 14816). In accordance with 40 CFR Part 60.753(a)(1), the gas collection system for Fill Area 2 must be installed and operating by no later than 5 years after waste placement commences in this new active cell. However, Waste Management must comply with the District's more stringent due date for commencing gas collection in Fill Area 2 (Regulation 8-34-304.3). Compliance with Regulation 8, Rule 34 is expected to ensure compliance with all applicable provisions of Subpart WWW.

NESHAPS: This facility is subject to the 40 CFR, Part 63, Subpart A General Requirements and Subpart AAAA NESHAP requirement for MSW Landfills. This facility has the start-up, shut-down, malfunction plan required by Subpart AAAA, and it has been submitting the required semi-annual reports. The SSM Plan will need to be updated to include any new gas collection systems and any new control devices. The Title V permit contains a detailed list of all applicable provisions. This facility is expected to continue to comply with the requirements of 40 CFR, Part 63, Subparts A and AAAA.

Landfill Gas Collection and Control System Adequacy:

As required by BAAQMD Regulation 8, Rule 34 and the federal 40 CFR, Parts 60 and 63 provisions that are applicable to MSW Landfills, the S-2 Altamont Landfill (Fill Area 1) must be equipped with an active landfill gas collection system and numerous landfill gas control devices. A landfill gas collection system must be installed in Fill Area 2 shortly after waste placement commences pursuant to District requirements.

In accordance with 40 CFR Part 60.759(c), the gas mover equipment for each landfill gas control system should be designed to handle the maximum gas generation flow rate over the period of intended use (up to 15 years). As shown in Appendix C, the gas generation rate for Fill Area 1 is expected to peak in about 4 years. Therefore, the existing gas mover equipment for Fill Area 1 should be designed to handle this peak gas generation rate of 8618 scfm for Fill Area 1. Waste disposal in Fill Area 2 is expected to commence in 2013 with emissions beginning in 2014. The gas mover equipment for Fill Area 2 should be designed for to handle the gas that will be generated at Fill Area 2 through 2029. From Appendix C, the Fill Area 2 gas generation rate for 2029 is 5208 scfm.

This facility is equipped with several different types of landfill gas control equipment: gas turbines, internal combustion engines, and an enclosed flare. The total control system capacity is assumed to be the design capacity for the gas mover equipment. The capacities for each device and for the total current landfill gas control system are described in Table 8.

Table 8. Existing and Proposed Landfill Gas Control System Capacity

Existing Devices	Device Type	Maximum Capacity *		Annual Capacity *	
		MM BTU/hr	scfm of LFG	MM BTU/year	Avg. scfm
S-6	Gas Turbine	57.4	1925	838,480	3210
S-7	Gas Turbine	57.4	1925		
S-23	IC Engine	17.5	587	153,300	587
S-24	IC Engine	17.5	587	153,300	587
A-15	Enclosed Flare	70.98	2380	621,385	2379
Total for Existing LFG Control System		220.8	7404	1,766,465	6762
Proposed Devices	Device Type	Maximum Capacity *		Annual Capacity *	
		MM BTU/hr	scfm of LFG	MM BTU/year	Avg. scfm
S-210	LNG Plant	81.25	2725	547,500	2096
A-16	Enclosed Flare	132.00	4427	1,156,320	4427
Total for Existing and Proposed Control Systems		434.03	14555	3,470,285	13285

* For these calculations, landfill gas was assumed to have a heat capacity of 497 BTU/scf.

The annual average control capacity for the existing landfill gas control system is 6762 scfm of landfill gas. The existing control system capacity is about 78% of the maximum projected gas generation rate for Fill Area 1 (8618 scfm in year 2014). The existing control system capacity is sufficient for the maximum expected collection rate from Fill Area 1 (8618*0.75 = 6464 scfm), but it falls short of the gas mover capacity required pursuant to 40 CFR Part 60.759(c). After the installation of either the proposed LNG Plant or the proposed second flare, the control system for Fill Area 1 will have the capacity necessary to satisfy 40 CFR Part 60.759(c). The installation of both the LNG Plant and the second flare will provide sufficient control capacity for the projected maximum gas generation for Fill Areas 1 and 2 combined (12,926 scfm), but Waste Management is not proposing to use A-16 to control gas from Fill Area 2 at this time. The adequacy of the landfill gas collection and control systems for Fill Area 2 will be evaluated in detail when Waste Management submits the Landfill Gas Collection and Control System Plan for Fill Area 2.

Due to a level of uncertainty in the gas generation rate projections reported in Table 1, it is important to compare gas generation rate projections to actual site collection rates. The projected gas generation rate for 2007 is 7161 scfm of landfill gas at 50% methane (3580 scfm of methane). The actual gas collection rate reported by Waste Management was

4070 scfm of landfill (for the 12-month period ending 9/30/07). The average methane concentration in the landfill gas at this site is 52.2% CH_4 (2125 scfm of methane). Comparing the actual collected methane rate to the projected methane generation rate for 2007 indicates that Waste Management is collecting about 59% of the projected methane generation rate. Since excessive surface leaks have not been found at Fill Area 1, the existing gas collection system is adequate even though the collection rate is less than the expected gas capture efficiency of 75%.

D. PERMIT CONDITIONS

The District is proposing to modify Condition # 19235 with the revisions identified below by strike through and underline formatting. These revisions will authorize the disposal of waste in Fill Area 2, modify the design capacity and cumulative placement limits for the Altamont Landfill (for Fill Areas 1 and 2 combined), establish new POC and PM10 emission limits for S-2, and require new monitoring procedures, tests, records, and reports that will assure compliance with the new emission limits.

Condition # 19235
FOR: S-2 ALTAMONT LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM, A-15 LANDFILL GAS FLARE, AND A-16 LANDFILL GAS FLARE:

1. The S-2 Altamont Landfill (Fill Area 1) shall be equipped with a landfill gas collection system, which shall be operated continuously as defined in Regulation 8-34-219, unless the Permit Holder complies with all applicable provisions of Regulation 8, Rule 34, Section 113. Individual wells, collectors, and adjustment valves shall not be disconnected, removed, or completely closed, without prior written authorization from the District, unless the Permit Holder complies with all applicable provisions of Regulation 8, Rule 34, Sections 113, 116, 117, or with Part 1c below. The gas collection system shall also be operated in accordance with the wellhead requirements described in Part 1d. <u>The Regulation 8-34-408 Collection and Control System Design Plan for Fill Area 2 shall be submitted to the District in the form of a permit application for a Change of Conditions at least 30 days prior to the date on which Fill Area 2 is expected to reach 1 million tons of decomposable material in place.</u> (Basis: Regulations 8-34-301.1, 8-34-303, 8-34-304, 8-34-305, and 8-34-404)
   a. The Permit Holder has been issued a Permit to Operate for the landfill gas collection system components listed below as of July 1, 2008. Well and collector locations are as described in detail in Permit Application #16863.

i. The authorized number of landfill gas collection system components is the baseline count listed below plus any components installed and minus any components decommissioned pursuant to subpart 1b, as evidenced by start-up and decommissioning notification letters submitted to the District.
- 84 vertical wells
- 1 horizontal trench collector (shredded tires may be used as fill material)
- 1 leachate collection system clean-out riser

b. The Permit Holder has been issued an Authority to Construct to allow for the landfill gas collection system alterations described below pursuant to Permit Application # 16863. All collection system alterations shall comply with subparts 1b(i-vii) below.

i. The authorized collection system alterations are:
- Install up to 38 vertical wells
- Permanently decommission up to 19 vertical wells
- Install up to 25 horizontal trench collectors
- Permanently decommission up to 4 horizontal trench collectors
- Modify wellhead monitoring locations, as needed, provided that each landfill gas collection system component identified in Part 1a and each new collection system component installed per Part 1b is adequately represented by a wellhead monitoring location. The Permit Holder shall maintain documentation on site that identifies all landfill gas collection system components that are represented by each wellhead monitoring location.

ii. The Permit Holder shall apply for and receive an Authority to Construct before altering the landfill gas collection components described subpart 1a. Installing, altering, or permanently decommissioning a vertical well, horizontal collector, or other gas collection component is subject to the Authority to Construct requirement, unless this change constitutes a replacement as defined in subpart 1b(iii) below.

iii. Replacement of landfill gas collection system components with identical or functionally equivalent components will not be deemed an alteration and will not subject to the Authority to Construct requirement under the following circumstances. If a well or collector will be shut down and replaced by a new well or collector in essentially the same location as the old component and this decommission/installation will be accomplished in accordance with Regulations 8-34-117 and 8-34-118, then this activity shall be considered a component replacement that is not subject to the Authority to Construct requirement. For each individual well or collector replacement, this subpart authorizes a maximum vacuum disconnection time of five consecutive days for compliance with Regulation 8-34-117.5. The disconnected component and the new component shall not be counted toward the subpart 1b(i) limits; the numbers of replacement wells and replacement collectors are not limited. Alterations, repairs, or replacements of non-perforated piping sections (such as risers, laterals, or header pipes), piping connectors, or valves are not subject to the Authority to Construct requirement.

iv. At least three days prior to initiating operation of a well or collector installed pursuant to subpart 1b, the Permit Holder shall submit a start-up notice to the District that contains the component ID number for each new well or collector and the anticipated initial start-up date for each new component.

v. For each well or collector that is permanently decommissioned after [insert date of approval of this condition change], the Permit Holder shall submit a decommissioning notice to the District within no later than three working days after the component was disconnected from vacuum system. This decommissioning notice shall contain the component ID for each well or collector that was decommissioned, the date and time that each component was disconnected from the vacuum system, and the reason the component was decommissioned.

vi. Within six months of installing a new component or permanently decommissioning an existing component, the Permit Holder shall prepare an updated map of the landfill gas collection system that identifies the ID numbers and locations of all operable wells and collectors. On this map or in accompanying documentation, the Permit Holder shall summarize all component changes that were made since the last map was prepared. The previous collection system map, the updated collection system map, and the component change summary shall be provided to District staff upon request.

vii. If the Permit Holder has a net reduction (number of decommissioned components minus the number of installed components) of more than five components within a 120-day period, the Permit Holder shall submit a more comprehensive decommissioning notice to the District. In addition to the information required by subpart 1b(v), this comprehensive decommissioning notice shall include the maps and documentation required by subpart 1b(vi), shall identify all component changes that have occurred but that are not included on the most recently updated map, shall identify any components that are temporarily disconnected from vacuum pursuant to subpart 1c, shall provide estimated vacuum reconnection dates for these components, shall include a list of all well installations that are expected to occur within the next 120 days, and shall discuss the reasons why this reduction in gas collection components is not expected to result in surface emission leaks. Upon request, the Permit Holder shall provide wellhead monitoring data, surface leak monitoring data, records of repair attempts made to date, and other information to support the need for a net collection component reduction of more than five wells. The District may require additional surface monitoring to verify that this net component reduction is not causing landfill surface leaks. The District will notify the Permit Holder in writing of any additional surface monitoring that is required pursuant to this subpart.

c. The Permit Holder may temporarily disconnect individual wells or collectors from the vacuum system, provided that all requirements of this subpart are satisfied. (Basis: Regulation 8-34-404)

i. No more than five (5) landfill gas collection system components (wells or collectors) may be temporarily disconnected from the vacuum system at any one time pursuant to subpart 1c.

ii. For each individual well or collector that is disconnected from the vacuum system pursuant to subpart 1c, the total vacuum system disconnection time shall not exceed 120 days during any 12-month period.

iii. Collection system components that are disconnected from the vacuum system are not subject to wellhead limits (Regulation 8-34-305 or Part 1d, as applicable) or monthly wellhead monitoring requirements (Regulation 8-34-505) during this vacuum disconnection time.

iv. Wells or collectors that are temporarily disconnected from the vacuum system continue to be subject to the component leak limit (Regulation 8-34-301.2) and the quarterly leak testing requirement (Regulation 8-34-503) at all times. In addition, the Permit Holder shall conduct the following component leak monitoring at each component that has been disconnected from the vacuum system pursuant to subpart 1c: test for component leaks using the procedures identified in Regulation 8-34-602 within 10 calendar days of disconnection from vacuum and again within 1 month of disconnection from vacuum. If a component leak is detected at the well, the Permit Holder shall take all steps necessary to reduce the leak below the applicable limit, including reconnecting the well to the vacuum system, if no other corrective action measures are successful within the time frames allowed by Rule 34.

v. For each well disconnection event, the Permit Holder shall record each affected well ID number, all well disconnection dates and times, all well reconnection dates and times, all related monitoring dates and monitoring results in a District approved log. This log shall also include an explanation of why the temporary well shut down was necessary and shall describe all adjustments or repairs that were made in order to allow this well to operate continuously, to reduce leaks, or to achieve compliance with an applicable limit. All records shall be retained for a minimum of five years and shall be made available to District staff upon request.

d. Each landfill gas collection system component listed in Part 1a shall be operated in compliance with the wellhead limits of Regulation 8-34-305, unless an alternative wellhead limit has been approved for that component and the operator complies with all of the additional requirements identified in this subpart. Components that are subject to an alternative wellhead limit may still use the Regulation 8-34-414 repair schedule for operator discovered excesses of the alternative limit; however, invoking this repair schedule does replace the monitoring requirements described in Parts 1d(ii-viii). (Basis: Regulations 8-34-305 and 8-34-414)

i. For each of the wells identified in Part 1d(ii), the Regulation 8-34-305.2 wellhead temperature limit does not apply, and the landfill gas temperature at each wellhead shall not exceed 145 degrees F.

ii. The wells that are subject to the Part 1d(i) alternative wellhead temperature limit are:
#40, #401, #403, #443, #444, #456, #457, and #458.
If any other component has a wellhead temperature of 131 degrees F or higher, the operator may elect to add this component to the above list of alternative temperature limit wells by satisfying all of the following requirements:
- The wellhead temperature shall not exceed 145 degrees F.
- The carbon monoxide (CO) concentration in the wellhead gases shall not exceed 500 ppmv.
- Prior to adding a component to the list in this subpart, the operator shall monitor the gas in the component for CO concentration at least two times, with no more than 15 days between tests. CO monitoring shall continue on a monthly basis, or more frequently if required by subparts 1d(iv-vii), until the operator is allowed to discontinue CO monitoring per subpart 1d(vii).
- The operator shall comply with all applicable monitoring and record keeping requirements in subparts 1d(iii-viii).
- The component shall not exceed any wellhead limit other than temperature and shall have had no excesses of wellhead limits (other than temperature) during the 120 days prior to adding this component to the list in this subpart.

- Within 30 days of adding a component to the list in this subpart, the operator shall notify the District in writing that the operator is requesting to add the component to the Part 1d(ii) list of alternative temperature limit wells. This notification shall include the well ID number, a map of the collection system to identify the location of this well, and the dates and results of all monitoring conducted on the well to verify that the above requirements have been satisfied.
- If the Regulation 8-34-414 repair schedule has been invoked for the wellhead temperature excess, and the operator has met the requirements of Sections 414.1 and 414.2, then compliance with the requirements of this subpart shall be deemed an acceptable resolution of the wellhead temperature excess in lieu of the collection system expansion specified in Sections 414.3 and 414.4.

iii. The operator shall demonstrate compliance with the alternative wellhead temperature limit in Part 1d(i) by monitoring and recording the temperature of the landfill gas in each wellhead on a monthly basis, in accordance with Regulations 8-34-501.4, 8-34-501.9, and 8-34-505.

iv. If the temperature of the landfill gas in a wellhead exceeds 140 degrees F, the operator shall investigate the possibility of a subsurface fire at the wellhead by monitoring for CO concentration in the wellhead gases and by searching for smoke, smoldering odors, combustion residues, and other fire indicators in the wellhead and in the landfill area near this wellhead. Within 5 days of triggering a fire investigation, the operator shall measure the CO concentration in the landfill gas at the wellhead using a portable CO monitor or an EPA approved test method. CO monitoring shall continue according to the frequency specified in subparts 1d(v-vii).

v. If the CO concentration is greater than 500 ppmv, the operator shall immediately take all steps necessary to prevent or extinguish the subsurface fire, including disconnecting the well from the vacuum system if necessary. If the well is not disconnected from the vacuum system or upon reconnecting a well to the vacuum system, the operator shall monitor the well for CO concentration, wellhead temperature, and other fire indicators on at least a weekly basis until the CO concentration drops to 500 ppmv or less.

vi. If the CO concentration is less than or equal to 500 ppmv but greater than 100 ppmv, the operator shall monitor for CO concentration at least twice per month (not less than once every 15 days) until the CO concentration drops to 100 ppmv or less. Wellhead temperature and other fire indicators shall be evaluated at each of these semimonthly-monitoring events.

vii. If the CO concentration is less than or equal to 100 ppmv, the operator shall monitor for CO concentration on a monthly basis. CO monitoring may be discontinued if three consecutive CO measurements are 100 ppmv or less and the wellhead temperature during each of these three monitoring events is 140 degrees F or less. If a component has three or more CO measurements of 100 ppmv or less but the wellhead temperature was greater than 140 degrees F, the operator must receive written approval from the District before discontinuing the monthly CO monitoring at that component.

viii. The permit holder shall record the dates and results of all monitoring events required by this subpart in a District approved log. If Part 1d(v) applies, the operator shall also describe all actions taken to prevent or extinguish the fire.

2. All collected landfill gas from Fill Area 1 shall be vented to properly operating landfill gas control equipment as described below in Part 2a. Raw landfill gas shall not be vented to the atmosphere, except for unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair that is performed in compliance with Regulation 8, Rule 34, Sections 113, 116, 117, or 118 and for inadvertent component or surface leaks that do not exceed the limits specified in 8-34-301.2 or 8-34-303. (Basis: Regulations 8-34-301 and 8-34-303)

a. The Permit Holder may operate any combination of landfill gas control devices, including: A-15 Landfill Gas Flare, A-16 Landfill Gas Flare, S-6 Gas Turbine, S-7 Gas Turbine, S-23 Internal Combustion Engine, or S-24 Internal Combustion Engine; or may send landfill gas to other sources for additional processing and control; provided that a minimum of 71.47 MM BTU/hour of landfill gas, averaged over any rolling 24-hour period, is collected and controlled by the entire landfill gas control system. The following time periods shall be excluded from the calculation of this rolling 24-hour average landfill gas collection rate:

i. time periods when the gas collection system is not operating because the Permit Holder is conducting inspection or maintenance on the landfill gas collection or control system and is operating in compliance with all applicable requirements of Regulation 8-34-113, and

ii. time periods when the Permit Holder is attempting to prevent or extinguish a fire and is operating in compliance with all applicable requirements of Regulation 8-34-117, and

iii. time periods when the Permit Holder is conducting a source test to determine the appropriate target landfill gas collection rate pursuant to subpart c below, provided that the target landfill gas collection rate during this source test time period is not less than 99% of the limit stated above, and this source test time period does not last more than 120 consecutive hours, and no more than one source test time period exclusion is claimed per calendar year.

b. To demonstrate compliance with this part, the Permit Holder shall record, on a monthly basis, the total landfill gas collection rate for the entire control system averaged over each rolling 24-hour period during the previous month. In this record, the Permit Holder shall also identify the control devices that were operating, time periods that were excluded from the 24-hour average calculation pursuant to subpart a(i, ii, or iii), and the reason for this exclusion. The Permit Holder shall maintain all records necessary to calculate these rolling 24 hour average landfill gas collection rates including: heat input rates to each on-site control device; flow rate records and methane concentration data for landfill gas that was sent off-site; and start-up and shut down times for each control device. For exclusion time periods, the Permit Holder shall also maintain records of inspection, maintenance, fire prevention, or source test activities that occurred to verify the applicability of this exclusion. All records shall be retained on site or shall be made readily available to District staff upon request for a period of at least five years from the date on entry.

c. The target landfill gas collection rate shall be reevaluated at least once every two years in accordance with the following procedures. The Permit Holder may reevaluate the target landfill gas collection rate during any surface emission monitoring event, provided that the Permit Holder complies with subpart a(iii) above. Prior to and during any surface emission monitoring event that is conducted to reevaluate the target landfill gas collection rate limit, the Permit Holder shall:

i. maintain the total landfill gas collection at no less than 99% of the limit in subpart a and no more than 110% of the limit in subpart a, for at least 48 hours before initiating the surface emission monitoring event and during the surface emission monitoring event,
ii. record the date and time that the surface emission monitoring event was initiated and completed,
iii. conduct the surface emission monitoring event in accordance with Regulation 8-34-506,
iv. record the measured concentration and location of any landfill surface area that was found to have a surface leak above the Regulation 8-34-303 surface emission leak standard,
v. measure and record the landfill gas flow rate (in standard cubic feet) to each control device and off-site pipeline in accordance with Regulation 8-34-508,
vi. measure and record the methane concentration in the landfill gas that is delivered to each control device and off-site pipeline in accordance with Regulation 8-34-604,
vii. calculate and record the hourly heat input rate to each control device and off-site pipeline using a high heating value for methane of 997.7 MM BTU/scf of landfill gas at 68 degrees F and 1 atm for each hour of the surface emission monitoring event, and viii calculate and record the total landfill gas heat input rate during the monitoring event, the duration of the monitoring event (in hours), and the average hourly landfill gas heat input rate during the monitoring event.

The following procedures shall be used to determine if the subpart a target landfill gas collection rate limit should be decreased, increased, or remain the same. The target landfill gas collection rate shall be revised in accordance with the procedures identified in Regulations 2-6-414 or 2-6-415.

ix. If no surface emissions are detected during the surface emission monitoring event and the average hourly heat input rate measured during the event is greater than or equal to the target landfill gas collection rate limit in subpart a, then this limit should remain unchanged. No further action is required.

x. If no surface emissions are detected during the surface emission monitoring event and the average hourly heat input rate measured during the event is less than the target landfill gas collection rate limit in subpart a, then this limit may be decreased to the average hourly heat input limit measured during the surface emission monitoring event. The Permit Holder may submit permit applications to request that this limit be revised. The Permit Holder must obtain APCO approval before operating at the lower target landfill gas collection rate limit except as allowed under subpart a(iii).

xi. If surface emissions are detected during the surface emission monitoring event and the average hourly heat input rate measured during the event is less than the target landfill gas collection rate limit in subpart a, then this limit should not decreased, and the target landfill gas collection rate shall be reevaluated during the next scheduled quarterly surface emission monitoring event. If all surface leaks are corrected in accordance with Regulation 8-34-415, then no further action is required.

xii. If surface emissions are detected during a surface emission monitoring event and the average hourly heat input rate measured during the event is greater than the target landfill gas collection rate limit in subpart a, then the target landfill gas collection rate shall be reevaluated during the next scheduled quarterly surface emission monitoring event. If all surface leaks are corrected in accordance with Regulation 8-34-415, then no further action is required. If surface emissions are detected during two or more surface emission monitoring events during a year, then the target landfill gas collection rate limit should be increased to the higher of the two average hourly heat input rates measured during these monitoring events. Within 30 days of conducting the second surface emission monitoring event at which surface leaks are detected, the Permit Holder shall submit permit applications to request a revision of the target landfill gas collection rate.

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 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. 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)

7. Nitrogen oxide (NO_x) 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_x, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.06 pounds of NO_x (calculated as NO_2) per million BTU.
   b. For A-16, the exhaust concentration shall not exceed 45 ppmv of NO_x, corrected to 3% oxygen, dry basis, unless the permit holder can demonstrate that the emission rate does not exceed 0.06 pounds of NO_x (calculated as NO_2) 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.
   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.

   (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_{min}) shall be equal to the average combustion zone temperature determined during the most recent complying source test (T_{avg}) minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F:

    $T_{min} = T_{avg} - 50$, for $T_{avg} >= 1450$ degrees F
    $T_{min} = 1400$, for $T_{avg} < 1450$ degrees F

    (Basis: RACT, Offsets, Cumulative Increase, Toxic Risk Management Policy, and Regulation 8-34-301.3)

11. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 200 ppmv (dry) expressed as hydrogen sulfide (H_2S). In order to demonstrate compliance with this part, the Permit Holder shall measure the total sulfur content in collected landfill gas in accordance with the monitoring schedule identified in Condition # 18773, Part 10. The landfill gas sample shall be taken from the main landfill gas header. (Basis: Regulation 9-1-302 and Cumulative Increase)

*12. Prior to initiation of gas collection from Fill Area 2, t~~T~~he Permit Holder shall submit a permit application for a Change of Permit Conditions, if any site-specific landfill gas characterization test indicates that the landfill gas at this site contains any of the following compounds at a level greater than the concentration listed below. The Permit Application shall be submitted to the Engineering Division, within 45 days of receipt of test results indicating a concentration above the levels listed below. Upon initiation of landfill gas collection from Fill Area 2, the concentrations of toxic air contaminants in landfill gas collected from either fill area of the Altamont Landfill shall not exceed the concentrations listed below. An excess of a Part 12 TAC concentration limit shall not be deemed a violation of this part, if the Permit Holder complies with the requirements in Part 12a and demonstrates to the District's satisfaction that increasing the concentration level of a compound will satisfy either Part 12b or Part 12c.

    a. Within 45 days of receipt of test results indicating a concentration above the levels listed below, the Permit Holder shall submit a permit application to the Engineering Division of the District for a Change of Permit Conditions to increase the concentration level for that compound.

b. The Permit Holder shall demonstrate to the District's satisfaction that the requested higher concentration level for a compound will not result in an increase of the permitted emission level for that compound from the S-2 Altamont Landfill, as identified in the table below.

c. If the higher concentration level will result in an increase of the permitted emission level for one or more compounds, but this emission increase is accompanied by decreases in the permitted emission levels for one or more toxic air contaminants, the Permit Holder shall demonstrate to the District's satisfaction that the proposed emission changes will not result in a project risk that exceeds a limit in Regulation 2-5-302.

(Basis: Regulation 2-5-302)

Compound	Concentration in Collected LFG (ppbv)	Limit for Fugitive Emissions from S-2 pounds/year
Acrylonitrile	~~500~~300	70
Benzene	~~3300~~3,400	1,166
Benzylchloride	~~600~~500	278
Carbon Tetrachloride	100	68
Chloroform	100	52
1,4 Dichlorobenzene	~~1100~~2,600	1,678
Ethyl Benzene	30,000	13,987
~~Ethylene Dibromide~~	~~300~~	
Ethylene Dichloride	~~250~~200	87
Ethylidene Dichloride	~~1200~~1,400	608
Isopropyl Alcohol	200,000	54,782
Methyl Alcohol	600,000	84,427
Methylene Chloride	~~2500~~12,000	4,476
Methyl Ethyl Ketone	200,000	63,331
Perchloroethylene	~~2400~~7,300	5,316
1,1,2,2 Tetrachloroethane	~~550~~400	295
Toluene	200,000	80,925
Trichloroethylene	~~1400~~1,600	923
Vinyl Chloride	1100	302
Xylenes	90,000	41,960

13. In order to demonstrate compliance with Regulation 8, Rule 34, Sections 301.3 and 412 and Parts 7 through 12 above, the Permit Holder shall ensure that a District approved source test is conducted annually on the A-15 and A-16 Landfill Gas Flares. The annual source tests shall be conducted while the flare is operating at or near maximum operating rates and for each of the following operating conditions: (a) while the flare is burning landfill gas without any condensate injection, (b) while the flare is burning landfill gas and condensate is being injected into the flare at or near the maximum injection rate, and (c) while the A-16 flare is controlling emissions from the S-210 LNG Plant. Each source test shall determine the following:
    a. landfill gas flow rate to the flare (dry basis);
    b. concentrations (dry basis) of carbon dioxide (CO_2), nitrogen (N_2), oxygen (O_2), total hydrocarbons (THC), methane (CH_4), and total non-methane organic compounds (NMOC) in the landfill gas;
    c. stack gas flow rate from the flare (dry basis);
    d. concentrations (dry basis) of NO_x, CO, NMOC, and O_2 in the flare stack gas;
    e. NMOC destruction efficiency achieved by the flare; and
    f. average combustion zone temperature of the flare during the test period.

    The first annual source test for the A-16 Landfill Gas Flare shall be conducted within 120 days of the initial start up date forA-16. Testing of A-16 while condensate is being injected or while A-16 is controlling emissions from the S-210 LNG Plant is not required until the first annual source test that is scheduled to occur after the date that these operating scenarios commence. Subsequent annual source tests shall be conducted no later than 12 months after the previous source test. Testing while condensate is being injected is not required, if condensate was not injected into the flare during any of the 12 consecutive months prior to the source test date. The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and the Source Test Section within 60 days of the test date. (Basis: RACT, Offsets, Cumulative Increase, and Regulations 2-5-302, 8-34-301.3 and 8-34-412)

14. The Permit Holder shall conduct a characterization of the landfill gas concurrent with the annual source test required by Part 13 above. The landfill gas sample shall be drawn from the main landfill gas header.

a. In addition to the compounds listed in Part 13b, the landfill gas shall be analyzed for the organic compounds listed below, except that acrylonitrile testing shall be conducted once every four years instead of annually. All concentrations shall be reported on a dry basis. The test report shall be submitted to the Compliance and Enforcement Division and the Source Test Section within 60 days of the test date. (Basis: ~~Toxic Risk Management Policy~~AB-2588 Air Toxics Hot Spots Act, Cumulative Increase, and Regulations 2-5-501 and 8-34-412)

Organic Compounds
acrylonitrile
benzene
benzyl chloride
carbon tetrachloride
~~chlorobenzene~~
~~chlorodifluoromethane~~
~~chloroethane~~
chloroform
~~1,1 dichloroethane~~
~~1,1 dichlorethene~~
~~1,2 dichloroethane~~
1,4 dichlorobenzene
~~dichlorodifluoromethane~~
~~dichlorofluoromethane~~
ethylbenzene
~~ethylene dibromide~~
~~fluorotrichloromethane~~
~~hexane~~
ethylene dichloride (1,2 dichloroethane)
ethylidene dichloride (1,1 dichloroethane)
isopropyl alcohol
methyl alcohol
methylene chloride
methyl ethyl ketone
perchloroethylene
1,1,2,2 tetrachloroethane
toluene
~~1,1,1 trichloroethane~~
trichloroethylene
vinyl chloride
xylenes

b. The Permit Holder shall demonstrate compliance with the landfill gas NMOC concentration limit in part 17a by measuring the NMOC concentration in landfill gas collected from the S-2 Altamont Landfill at least twice during each calendar year. One of the two required annual tests shall be conducted concurrent with subpart a above. For each consecutive three-year period, the sample collection dates for the second annual sample shall be varied to ensure that at least one sample is collected during each quarter of a year (one sample shall be collected during January-March, one during April-June, one during July-September, and one during October-December). Analytical results from District approved source tests that were conducted for other purposes may be used to satisfy the requirements of this part provided the sample was tested for both total NMOC concentration and methane concentration using APCO approved test methods. The measured NMOC concentration shall be corrected to 50% methane using the following equation: corrected NMOC concentration = 0.5 * measured NMOC concentration / measured methane concentration. For each landfill gas NMOC concentration test, the Permit Holder shall maintain records of the sample date, the measured NMOC concentration, the measured methane concentration, and the corrected NMOC concentration. The Permit Holder shall determine and record the average of the corrected NMOC concentration for each calendar quarter (if multiple tests are available for any one particular quarter) and the rolling three-year average of these quarterly average NMOC concentrations. All records shall be maintained on site or shall be made readily available to District staff upon request for at least 5 years from the date of entry.

15. In order to demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved logbook. All records shall be maintained on site or shall be made readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirements contained in any applicable rules or regulations. (Basis: Offsets, Cumulative Increase, 2-6-501, 8-34-301, and 8-34-501)
    a. For the Landfill Gas Flares (A-15 and A-16), record the date and time for each start-up and shut-down of a flare and the reason for each shut-down.
    b. Summarize the operating hours for each Landfill Gas Flare (A-15 and A-16), on a daily basis.

c. Calculate and record, on a monthly basis, the maximum daily and total monthly heat input to each Landfill Gas Flare (A-15 and A-16) based on operating hours for the flare, the landfill gas flow rate recorded pursuant to Part 6, the average methane concentration in the landfill gas as determined by the most recent source test, and a high heating value for methane of 997.7 BTU/ft^3 of landfill gas at 68 degrees F and 1 atmosphere.

d. Record the total amount of condensate (gallons per day) injected into each Landfill Gas Flare (A-15 and A-16) for each day that condensate is injected into a flare, and summarize these records on a monthly basis.

e. Maintain records of all test dates and test results performed to maintain compliance with Parts 12 and 13 or with any applicable rule or regulation.

16. Any emission reductions that may occur due to the shut-down or modification of S-23 IC Engine or S-24 IC Engine cannot be banked or used to generate contemporaneous on site emission reduction credits for other projects. All such emission reductions shall be use to reimburse the District Small Facility Banking Account (SFBA) for the emission reduction credits provided from the SFBA to offset NOx and POC emission increases from this equipment. Furthermore, the Permit Holder shall use any NOx or POC emission reduction credits generated at any of the Permit Holder's facilities, which are located within the District, to reimburse the SFBA for all emission reduction credits provided from the SFBA on behalf of the Permit Holder, before any of these credits could become eligible for banking. (Basis: Regulation 2-4-303.5)

17. ~~[Reserved]~~This part becomes effective upon the date of the District's approval of a Change of Conditions for the Fill Area 2 Expansion of the S-2 Altamont Landfill. In order to assure compliance with District offsetting requirements for precursor organic compound (POC) emission increases at the S-2 Altamont Landfill, the Permit Holder shall submit the required amount of District approved POC emission reduction credits (ERC) in accordance with the schedule identified in Part 17a and shall comply with all associated limits, monitoring, record keeping, and reporting requirements in Parts 17a. The fugitive POC emissions, the associated amount of ERC credits due, and other related limits shall be reviewed and, if necessary, modified, in accordance with the procedures specified in Part 17b. (Basis: Regulation 2-2-302)

a. The Permit Holder shall comply with all requirements and limits identified in the table below, unless the Permit Holder has submitted, in accordance with the provisions of Part 17b, a permit application to request a modification of a specific ERC amount or due date or a specific limit. This permit application submittal will temporarily suspend the specific ERC requirement or limit from the date of the application submittal until the District makes a final decision on the change request. The permit application submittal does not suspend any monitoring, record keeping, or reporting requirements in this subpart.

i. By no later than the due date specified in column 1 of the table, the Permit Holder shall surrender the total amount of POC ERCs indicated in column 2 of the table. These ERCs shall be in the form of District approved banking certificates for POC emission reduction credits. The banking certificate submittal shall be addressed to the attention of the Director of the Engineering Division, BAAQMD, 939 Ellis Street, San Francisco, CA 94109.

ii. The limits identified in columns 3 through 6 of the table apply to the S-2 Altamont Landfill (Fill Areas 1 and 2 combined). These limits become effective upon the date identified in column 1 and remain in effect until the Permit Holder has surrendered the amount of ERCs required for the subsequent set of limits, unless the limit has been temporarily suspended as specified in Part 17a.

iii. The Permit Holder shall demonstrate compliance with the fugitive POC emission limits in column 3 of the table by complying with: the limits in columns 4, 5, and 6, the record keeping requirements in Part 22i, the monitoring requirements in Part 14b, and the fugitive POC emissions reassessment requirements of Part 17b.

iv. For the purposes of the decomposable material placement limits in columns 4 and 5, decomposable materials are as defined in Part 22i. The Permit Holder shall demonstrate compliance with the cumulative decomposable placement limit in column 4 using the record keeping and reporting procedures in Part 22. The annual decomposable material placement limit in column 5 applies to each calendar year. The Permit Holder shall demonstrate compliance with these limits using the record keeping and reporting procedures in Part 22. Prior to exceeding a cumulative or annual decomposable material placement limit, the Permit Holder shall either surrender the amount of ERCs required for the next subsequent set of limits or submit a permit application to request a change of conditions. Each permit application

submittal shall include a reassessment of the fugitive POC emissions conducted in accordance with Parts 17b(ii-iv).

v. The landfill gas NMOC concentration limit applies on a rolling three-year average basis. The Permit Holder shall demonstrate compliance with this limit using the monitoring and record keeping requirements in Part 14b. If testing indicates that the three-year average NMOC concentration in landfill gas collected S-2 has or will exceed the limit in column 6, the Permit Holder shall submit a permit application to request an increase of this NMOC concentration limit, within 45 days of recording the exceedance. The permit application submittal shall include a reassessment of the fugitive POC emissions conducted in accordance with Parts 17b(ii-iv).

ERC Due Date and Effective Date for New Limits	Amount of ERCs Due tons/year of POC	Fugitive Emission Limit tons/year of POC	Cumulative Decomposable Material Placement Limit million tons	Annual Decomposable Material Placement Limit tons/year	Landfill Gas Concentration Limit ppmv NMOC (rolling 3-year average, expressed as C_6 and corrected to 50% CH_4)
*	11.114	73.654	48.337	1,630,000	600
1/2/13	4.349	77.436	51.557	1,610,000	600
1/2/15	4.167	81.059	54.777	1,610,000	600
1/2/17	4.003	84.540	57.997	1,610,000	600
1/2/19	3.846	87.884	61.217	1,610,000	600
1/2/21	3.695	91.098	64.437	1,610,000	600
1/2/23	3.551	94.185	67.657	1,610,000	600
1/2/25	3.411	97.152	70.877	1,610,000	600
1/2/27	3.278	100.002	74.097	1,610,000	600
1/2/29	3.149	102.740	77.317	1,610,000	600
1/2/31	3.026	105.371	80.537	1,610,000	600
1/2/33	2.907	107.899	83.757	1,610,000	600
1/2/35	4.148	111.506	88.000	1,610,000	600

* These limits and all subsequent limits are effective upon commencement of waste disposal in Fill Area 2.

b. The Permit Holder shall conduct a fugitive POC emissions reassessment for the S-2 Altamont Landfill in accordance with the schedule and procedures identified below.

i. A reassessment of the annual fugitive POC emission rate from the S-2 Altamont Landfill (Fill Areas 1 and 2 combined) shall be submitted to the District each year by no later than July 1st. The first reassessment is due the first July 1st after waste placement in Fill Area 2 commences. The reassessment shall be addressed to the attention of the District permit engineer assigned to this site, Engineering Division, BAAQMD, 939 Ellis St., San Francisco, CA 94109.

ii. The fugitive POC emissions reassessment shall use the EPA LANDGEM program to determine the projected amount of landfill gas (scfm) and NMOC (tons/year) that will be generated by S-2 (Fill Areas 1 and 2 combined) for each year from 1980 through at least 2080. The Permit Holder shall use the following LANDGEM User Input Data: methane generation rate (k) = 0.02 $year^{-1}$, potential methane generation capacity (L_0) = 100 m^3/Mg, methane content = 50%. The Permit Holder shall use the best available data for the amount of decomposable materials placed in the landfill from 1980 through 2008. For calendar year 2009 and later, the Permit Holder shall use the annual decomposable material placement data recorded pursuant to Part 22. For the user-specified NMOC concentration in LANDGEM, the Permit Holder shall use the most recent three-year average NMOC concentration data (ppmv of NMOC expressed as hexane and corrected to 50% methane) recorded pursuant to Part 14b.

iii. Each reassessment report shall include the fugitive POC emission rate determined for the current calendar year and for each subsequent year through the projected peak landfill gas generation year. Fugitive POC emissions shall be determined using the following equation:

$POC_{fugitive} = NMOC_{generated} * 0.25 * 0.98$

where: $POC_{fugitive}$ is the projected amount of fugitive POC emissions (tons/year) for a particular calendar year

$NMOC_{generated}$ is the projected amount of NMOC generated (tons/year) as determined by LANDGEM using the User-Input Data discussed above.

0.25 is the assumed fugitive emission fraction (75% captured and 25% fugitive) for the total NMOC generated

0.98 is the assumed POC fraction (by weight) of the total NMOC emission rate

iv. The current and projected annual fugitive POC emission rates determined per Part 17b(iii) shall be compared to the fugitive POC emission limits in the table in Part 17a. If the projected peak fugitive POC emission rate for the landfill is less than the maximum POC emissions limit in the table, the Permit Holder may, at his or her discretion, request that the District modify the Part 17a table limits and ERC submittal requirements based on the updated fugitive POC emissions calculations. This condition change request shall be submitted in the form of a District permit application, and the District will handle the request as an administrative permit condition change. If the peak fugitive POC emissions for S-2 are projected to exceed the maximum fugitive POC emission limit of 111.506 tons/year, the Permit Holder must submit a permit application to request an increase of this limit by no later than October 1st of the year in which the fugitive POC emissions reassessment was due. In this latter case, the permit application cannot be handled administratively, but the District will review the circumstances leading to the need to increase the maximum fugitive POC emissions for the landfill to determine if the change constitutes an alteration or a modification of S-2.

18. The Permit Holder shall comply with the following waste acceptance and disposal limits and shall obtain the appropriate New Source Review permit, if one of the following limits is exceeded:
    a. Total waste accepted and placed at the landfill shall not exceed 11,150 tons in any day (except during temporary emergency situations approved by the Local Enforcement Agency). (Basis: Regulation 2-1-301)
    b. The amount of non-hazardous sludge accepted and placed at the landfill shall not exceed 5,000 tons in any day. (Basis: Regulation 2-1-301)
    c. The maximum design capacity of the landfill (total volume of solid waste placed in the landfill where solid waste has the same meaning as the definition in 40 CFR Part 60.751) shall not exceed ~~58,900,000~~ 124,400,000 cubic yards. (Basis: Regulation 2-1-301)
    d. The total cumulative amount of all waste placed in Fill Area 1 of the landfill shall not exceed 47,100,000 tons. Exceedance of the cumulative tonnage limit is not a violation of the permit and does not trigger the requirement to obtain a New Source review permit, if the operator can, within 30 days of the date of discovery of the exceedance, provide documentation to the District demonstrating, in accordance with BAAQMD Regulation 2-1-234.3, that the limit should be higher. (Basis: Regulation 2-1-234.3)

19. This part applies to any activities associated with or related to the S-2 Altamont Landfill that generate particulate matter emissions including, but not limited to: waste and cover material delivery, placement, and compaction; on-site excavation of cover soil; and vehicle and mobile equipment travel on paved and unpaved roads within the property boundaries of Site # A2066.

    a. For current landfill operations associated with or supporting waste disposal in Fill Area 1, ~~W~~water and/or dust suppressants shall be applied to all unpaved roadways and active soil removal and fill areas associated with this landfill as necessary to prevent visible particulate emissions that persist for more than 3 minutes in any hour. Paved roadways at the facility shall be kept sufficiently clear of dirt and debris as necessary to prevent persistent visible particulate emissions from vehicle traffic or wind. This subpart shall remain in effect until waste disposal in Fill Area 1 ceases. (Basis: Regulations 2-1-403, 6-1-301, and 6-1-305)

    b. Effective upon commencement of waste disposal in Fill Area 2, the Permit Holder shall comply with the following particulate emission limits:

        i. Total particulate emissions from the S-2 Altamont Landfill and the associated waste and cover material excavation, delivery, placement, and compaction operations shall not exceed 387.5 tons of PM10 during any calendar year. (Basis: Regulation 2-1-301)

        ii. Each particulate emitting operation associated with S-2 shall be abated to the extent necessary to ensure compliance with the Ringelmann No. 1 limitation in Regulation 6-1-301. (Basis: Regulation 6-1-301)

    c. Effective upon commencement of waste disposal in Fill Area 2, the main haul route for Fill Area 2, from the entrance gate off of Altamont Pass Road to the edge of the Fill Area 2 disposal area shall be paved with asphaltic concrete or other similar material. For these paved road segments, the Permit Holder shall employ all paved road dust control measures necessary to maintain compliance with the PM10 emission limits in subpart b. Paved road dust control measures may include: use of truck wash stations, sweeping, vacuuming, and water flushing to maintain an average paved road surface silt loading of 2.0 g/m^2 or less. If the average paved road surface silt loading is determined to be greater than 2.0 g/m^2, the Permit Holder shall limit the types and numbers of vehicles traveling on this paved road to ensure that the subpart b PM10 emission limits are not exceeded. (Basis: Regulation 2-1-403)

d. Effective upon commencement of waste disposal in Fill Area 2, any temporary roads used for delivering soil from on-site cover soil excavation areas to Fill Area 2 and any temporary roads within Fill Areas 2 used for waste or cover material delivery shall be paved with gravel or other aggregate based materials. For these gravel road segments, the Permit Holder shall employ all gravel road dust control measures necessary to maintain compliance with the PM10 emission limits in subpart b. Gravel road dust control measures may include: application of dust suppressants at least once per month and use of frequent water spraying during dry periods. If the average gravel road surface material silt content is greater than 6.4%, the Permit Holder shall limit the types and numbers of vehicles traveling on these gravel roads to ensure that the subpart b PM10 emission limits are not exceeded. (Basis: Regulation 2-1-403)

e. Effective upon commencement of waste disposal in Fill Area 2, the Permit Holder shall apply dust suppressants and water sprays to unpaved roads at a sufficient rate and frequency to ensure compliance with the subpart b PM10 emission limits. (Basis: Regulation 2-1-403)

f. Effective upon commencement of waste disposal in Fill Area 2, the Permit Holder shall use water sprays and dust suppressants at the active face and at soil stockpiles at the rate and frequency necessary to ensure compliance with the subpart b PM10 emission limits and to prevent wind erosion from these areas. (Basis: Regulation 2-1-403)

g. Inactive landfill surfaces shall be re-vegetated as soon as possible. If necessary, dust suppressants or water sprays shall be used on any inactive landfill surfaces without vegetation at the rate and frequency necessary to prevent wind erosion. (Basis: Regulation 2-1-403)

h. If the dust control measures in Part 19(c-g) are not sufficient to maintain compliance with the PM10 emission limits in Part 19(b), the Permit Holder shall employ any other measures deemed necessary by the APCO. Such additional control measures may include: increasing frequency of road sweeping, vacuuming, water flushing, dust suppressant applications, or water spray applications; using additional truck wash stations; and paving additional road segments, parking areas, or equipment staging areas with asphaltic concrete, gravel, or other appropriate materials. (Basis: Regulation 2-1-403)

i. In order to demonstrate compliance with the PM10 emission limit in Part 19(b)(i), the Permit Holder shall calculate and record the PM10 emission rate for the S-2 Altamont Landfill on an annual basis using APCO approved emission calculation methods. The Permit Holder shall obtain APCO approval for these calculation methods prior to commencing waste disposal at Fill Area 2. The PM10 calculation procedures shall be based on EPA's most recent AP-42 procedures and site-specific data collected pursuant to subparts j and k below. (Basis: Regulation 2-1-403)

j. Within six months of commencing waste disposal at Fill Area 2, and at least once every five years thereafter, the Permit Holder shall determine, using APCO approved procedures, the average paved road surface silt loading (g/m^2) for the main haul route to Fill Area 2, the average surface material silt content (%) for Fill Area 2 gravel road segments, the average surface material silt content for Fill Area 2 unpaved road segments, and the actual length of each road segment. (Basis: Regulation 2-1-403)

k. Upon commencing waste disposal in Fill Area 2, the Permit Holder shall maintain the following records in a District approved log:

   i. Maintain a description of the vehicle fleet traveling on each road segment within this site (types of vehicles, empty weights, loaded weights, and types of materials carried by the vehicles). For each calendar year, estimate the average vehicle fleet weight and the annual vehicle fleet trips for each road segment.

   ii For each calendar year, estimate the amount of each type of cover material used at Fill Area 2, the total amount of all cover materials used at Fill Area 2, and the amount of soil excavated for cover material from on-site locations.

   iii. Maintain a description of the types of off-road mobile equipment used at the active face (bulldozers, compactors, etc.) and the numbers of each type of equipment that are employed during an operating day. For each calendar year, estimate the annual operating hours at the active face for each type of equipment.

iv. Maintain a dust control plan that identifies the anticipated locations for dust suppressant and water spray applications, the types of dust suppressants that may be used, the application rates for each type of dust suppressant and for the water sprays, the anticipated application frequency for each type of dust suppressant and for the water sprays, a description of all paved road cleaning procedures (sweeping, vacuuming, water flushing), the anticipated frequency for all paved road cleaning procedures, the locations of truck wash stations, and truck wash station operating procedures.

v. For each calendar year, maintain sufficient records to demonstrate, to the APCO's satisfaction, that the dust control plan was properly implemented including any supporting documentation, such as rain fall data for each day of the year. For unpaved roads, these records should include the dates that dust suppressants were applied, the dates that water sprays were applied, and the frequency of water spray reapplications on these dates. On operating days when water sprays are not employed on unpaved road, the records shall include the reason why water sprays were not employed. For paved roads, these records should include the dates that the paved roads were cleaned and a description of the cleaning procedures used. For truck wash stations, maintain records of operating days. For areas other than roads, the records should include dates of dust suppressant application and frequency of water spray applications.

vi. All records shall be maintained on site or shall be made readily available to District staff upon request for at least 5 years from the date of entry.

(Basis: Regulation 2-1-403)

20. This Part applies to the acceptance, handling, storage, and on-site reuse of VOC-laden soil. VOC-laden soil is any soil that contains volatile organic compounds, as defined in Regulation 8-40-213, other than contaminated soil. As defined in Regulation 8-40-205, contaminated soil contains more than 50 ppmw of VOC or has a surface concentration greater than 50 ppmv of VOC as C1, and contaminated soil is subject to Part 21 below instead of this part. Materials containing only non-volatile hydrocarbons and materials meeting the requirements of Regulation 8-40-113 are not subject to this part. For each lot of VOC-laden soil accepted at this site, the Permit Holder shall comply with the limits and monitoring procedures identified in either subpart a or subpart b below to demonstrate compliance with the total carbon limits in Regulation 8-2-301. (Basis: Regulation 8-2-301)

    a. Unless the Permit Holder demonstrates compliance with Regulation 8-2-301 in accordance with subpart b below, the Permit Holder shall limit the quantity of VOC laden soil handled per day such that no more than 15 pounds of total carbon could be emitted to the atmosphere per day. In order to demonstrate compliance with this subpart, the Permit Holder shall maintain the following records in a District approved log for all VOC-laden soil accepted at the landfill.

        i. Record on a daily basis the amount of VOC laden soil accepted for each truckload or each soil lot, as appropriate. This amount (in units of pounds per day) is Q in the equation in subpart a(iii) below.

        ii. Record on a daily basis the VOC content for each truckload or each soil lot, as appropriate. This VOC Content (C in the equation below) should be expressed as parts per million by weight as total carbon (or C1).

        iii. Calculate and record on a daily basis the VOC Emission Rate (E) using the following equation: $E = Q * C / 1E6$

        This equation may be applied to each truckload or to each soil lot received per day depending on the amount of soil that is represented by the VOC Content data. If the equation is applied to multiple loads per day, the VOC Emission Rate shall be totaled for all loads received each day.

        iv. Summarize all daily emission rates on a monthly and calendar year basis.

        v. All records shall be maintained on site or shall be made readily available to District staff upon request for at least 5 years from the date of entry.

b. Unless the Permit Holder demonstrates compliance with Regulation 8-2-301 in accordance with subpart a above, the Permit Holder shall screen each lot of VOC laden soil accepted per day for VOC surface emissions to show that each lot of VOC laden soil is not contaminated soil.
   i. The Permit Holder shall use the testing procedures outlined in Regulation 8-40-604.
   ii. The screening test shall be representative of the entire lot of VOC-laden soil. The soil surface shall be disturbed prior to screening to ensure that the screening is representative of the entire load.
   iii. The Permit Holder shall maintain records of all testing conducted to satisfy this subpart and shall record the amount of VOC-laden soil accepted and the highest surface concentration measured pursuant to this subpart. These records shall be maintained for each truckload or each soil lot accepted, as appropriate, provided that the records are made or summarized on at least a daily basis.
   iv. Summarize the daily soil acceptance rates and the weighted average of the surface concentration records on a monthly basis and for each calendar year.
   v. All records shall be maintained on site or shall be made readily available to District staff upon request for at least 5 years from the date of entry.

21. This part applies to any on-site activities involving contaminated soil as defined in Regulation 8-40-205. Unless stated otherwise, all terms, standards, or procedures described in this part have the same meaning as the terms, standards, and procedures described in Regulation 8, Rule 40. (Basis: Regulation 2-1-301, 2-1-403, 8-40-301, 8-40-304 and 8-40-305)
   a. The procedures listed below in subparts b-l do not apply if the following criteria are satisfied. However, the record keeping requirements in subpart m below are applicable.
      i. The Permit Holder has appropriate documentation demonstrating that either the organic content of the soil or the organic concentration above the soil is below the "contaminated" level (as defined in Regulations 8-40-205, 207, and 211). The handling of soil containing in concentrations below the "contaminated" level is subject to Part 20 above.
      ii. The Permit Holder has no documentation to prove that soil is not contaminated, but source of the soil is known and there is no reason to suspect that the soil might contain organic compounds.

b. The Permit Holder shall provide notification to the Compliance and Enforcement Division of the Permit Holder's intention to accept contaminated soil at the facility at least 24 hours in advance of receiving the contaminated soil. The Permit Holder shall provide an estimate of the amount of contaminated soil to be received, the degree of contamination (range and average VOC Content), and the type or source of contamination.

c. Any soil received at the facility that is known or suspected to contain volatile organic compounds (VOCs) shall be handled as if the soil were contaminated, unless the Permit Holder receives test results proving that the soil is not contaminated. To prove that the soil is not contaminated, the Permit Holder shall collect soil samples in accordance with Regulation 8-40-601 within 24 hours of receipt of the soil by the facility. The organic content of the collected soil samples shall be determined in accordance with Regulation 8-40-602.

   i. If these test results indicate that the soil is still contaminated or if the soil was not sampled within 24 hours of receipt by the facility, the Permit Holder must continue to handle the soil in accordance with the procedures subparts d-l below, until the soil has been placed in a final disposal location and adequately covered. Storing soil in a temporary stockpile or pit is not considered treatment. Co-mingling, blending, or mixing of soil lots is not considered treatment.

   ii. If these test results indicate that the soil - as received at the facility - has an organic content of 50 ppmw or less, then the soil may be considered to be not contaminated and need not be handled in accordance with the procedures listed in subparts d-l below, but shall be handled in accordance with Part 20 above.

d. Any contaminated soil received at the facility shall be clearly identified as contaminated soil, shall be handled in accordance with subparts e-l below, and shall be segregated from non-contaminated soil. Contaminated soil lots may not be co-mingled, blended, or otherwise mixed with non-contaminated soil lots prior to treatment, reuse, or disposal. Mixing soil lots in an attempt to reduce the overall concentration of the contaminated soil or to circumvent any requirements or limits is strictly prohibited.

e. On-site handling of contaminated soil shall be limited to no more than 2 on-site transfers per soil lot. For instance, unloading soil from off-site transport vehicles into a temporary storage pile is considered one transfer. Moving soil from a temporary storage to a staging area is considered one transfer. Moving soil from a temporary storage pile to a final disposal site is one transfer. Moving soil from a staging area to a final disposal site is one transfer. Therefore, unloading soil from off-site transport into a temporary storage pile and then moving the soil from that temporary storage pile to the final disposal site is allowed. Unloading soil from off-site transport into a staging area and then moving the soil from that staging area to the final disposal site is allowed. However, unloading soil from off-site transport to a temporary storage pile, moving this soil to a staging area, and then moving the soil again to a final disposal site is 3 on-site transfers and is not allowed.

f. Contaminated soil shall either be deposited in a final disposal site or transported off-site for treatment:
   a. within 90 days, if the soil contains less than 500 ppmw of VOC, or
   b. within 45 days, if the soil contains 500 ppmw of VOC or more.

g. The total amount of contaminated soil disposed of at this site shall not exceed 6000 tons per day. (Basis: Regulation 2-1-301)

h. All active storage piles shall meet the requirements of Regulation 8-40-304 by using water sprays, vapor suppressants or approved coverings to minimize emissions. The exposed surface area of any active storage pile (including the active face at a landfill) shall be limited to 6000 ft2. The types of storage piles that may become subject to these provisions include (but are not limited to) truck unloading areas, staging areas, temporary stockpiles, soil on conveyors, bulldozers or trucks, the active face of a landfill, or other permanent storage pile at the final disposal location.

i. All inactive storage piles shall meet the requirements of Regulation 8-40-305 including the requirement to cover contaminated soil during periods of inactivity longer than one hour. The types of storage piles that may become subject to these provisions include (but are not limited to) soil on trucks or other on-site equipment, staging areas, temporary stockpiles, and the permanent storage pile at the final disposal location. District approved coverings for inactive storage piles include continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) or encapsulating vapor suppressants (with re-treatment as necessary to prevent emissions).

j. The Permit Holder must:
   i. Keep contaminated soil covered with continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) whenever soil is to be stored in temporary stockpiles or during on-site transport in trucks. Soil in trucks shall not be left uncovered for more than 1 hour.
   ii. Establish a tipping area for contaminated soils near the active face that is isolated from the tipping area for other wastes.
   iii. Spray contaminated soil with water or vapor suppressant immediately after dumping the soil from a truck at the tipping area.
   iv. Ensure that all contaminated soil is transferred from the tipping area to the active face immediately after spraying with water or vapor suppressant.
   v. Ensure that contaminated soil in the tipping area is not disturbed by subsequent trucks. Trucks shall not drive over contaminated soil in the tipping area or track contaminated soil out of the tipping area on their wheels.
   vi. Spray contaminated soil on the active face with water or vapor suppressant (to keep the soil visibly moist) until the soil can be covered with an approved covering.
   vii. Limit the area of exposed soil on the active face to no more than 6000 ft2.
   viii. Ensure that contaminated soil spread on the active face is completely covered on all sides with one of the following approved coverings: at least 6 inches of clean compacted soil, at least 12 inches of compacted garbage, or at least 12 inches of compacted green waste.
   ix. Ensure that covering of soil on the active face is completed within one hour of the time that the soil was first dumped from a truck at the tipping area.

k. Contaminated soil shall not be used as daily, intermediate, or final cover material for landfill waste operations unless the requirements of Regulation 8, Rule 40, Sections 116 or 117 have been satisfied.

l. Contaminated soil is considered to be a decomposable solid waste pursuant to Regulation 8, Rule 34. All contaminated soil disposed of at a site shall be included in any calculations of the amount of decomposable waste in place for annual reporting requirements or for purposes of 8-34-111 or 8-34-304.

m. The Permit Holder shall keep the following records for each lot of soil received, in order to demonstrate on-going compliance with the applicable provisions of Regulation 8, Rule 40 and this part.

i. For all soil received by the facility (including soil with no known contamination), record the arrival date at the facility, the soil lot number, the amount of soil in the lot, the organic content or organic concentration of the lot (if known), the type of contamination (if any), and keep copies of any test data or other information that documents whether the soil is contaminated (as defined in 8-40-205) or not contaminated, with what, and by how much.

ii. If the soil is tested for organic content after receipt by the facility, a report with the sampling date, test results, and the date results were received.

iii. For all on-site handling of contaminated soil, use a checklist or other approved method to demonstrate that appropriate procedures were followed during all on-site handling activities. One checklist shall be completed for each day and for each soil lot (if multiple lots are handled per day).

iv. For soil aerated in accordance with 8-40-116 or 117 record the soil lot number, the amount of soil in the lot, the organic content, the final placement date, the final placement location, and describe how the soil was handled or used on-site.

v. For final disposal at a landfill, record on a daily basis the soil lot number, the amount of soil placed in the landfill, the disposal date, and the disposal location.

vi. Summarize the total amount of contaminated soil disposed of at this site on a monthly and calendar year basis to demonstrate compliance with subpart g.

All records shall be retained for at least 5 years from the date of entry and shall be made available for District inspection upon request.

22. To demonstrate compliance with Parts ~~18~~17-21 and Regulation 8-34-304, the Permit Holder shall maintain the following records in a District approved logbook. All records shall be maintained on site or shall be made readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirements contained in any applicable rules or regulations. (Basis: Regulations 2-1-301, 2-6-501, 6-301, 6-305, 8-2-301, 8-40-301, 8-34-304, and 8-34-501)

a. Record the total amount of municipal solid waste received at S-2 on a daily basis. Summarize the daily waste acceptance records for each calendar month.

b. For each area or cell that is not controlled by a landfill gas collection system, maintain a record of the date that waste was initially placed in the area or cell. Record the cumulative amount of waste placed in each uncontrolled area or cell on a monthly basis.

c. If the Permit Holder plans to exclude an uncontrolled area or cell from the collection system requirement, the Permit Holder shall also record the types and amounts of all non-decomposable waste placed in the area and the percentage (if any) of decomposable waste placed in the area.

d. Record the initial operation date for each new landfill gas well and collector.

e. Maintain an accurate map of the landfill that indicates the locations of all refuse boundaries and the locations of all wells and collectors (using unique identifiers) that are required to be operating continuously pursuant to Part 1a. Any areas containing only non-decomposable waste shall be clearly identified. This map shall be updated at least once a year to indicate changes in refuse boundaries and to include any newly installed wells and collectors.

f. Record of the dates, locations, and frequency per day of all watering activities on unpaved roads or active soil or fill areas. Record the dates, locations, and type of any dust suppressant applications. Record the dates and description of all paved road-cleaning activities. All records shall be summarized on monthly basis.

g. Record the date on which waste placement in Fill Area 2 commences.

h. Record the date on which waste placement in Fill Area 1 ceases.

i. Effective upon commencement of waste disposal in Fill Area 2, the Permit Holder shall demonstrate compliance with the cumulative and annual average decomposable material placement limits in Part 17a by maintaining the following records in a District approved log. For the purposes of Part 17 and this subpart, decomposable materials shall include all wastes disposed of in either fill area of the landfill other than quantities of inert (non-decomposable) wastes recorded pursuant to subpart c, all daily cover materials that are decomposable, any decomposable materials that are used in the construction of the intermediate cover for an area unless the decomposable materials were placed on the uppermost surface and were being used for the purpose of erosion control or revegetation of the intermediate landfill surface.

    i. Maintain quarterly estimates of the total amount of all decomposable materials used for either daily or intermediate cover at each fill area of the landfill and summarize these estimates for each calendar year.

ii. Using the waste acceptance records required by Part 22a-c and the decomposable cover material estimates required above, summarize the total amount (in tons) of decomposable materials placed in the landfill for each calendar year. If Fill Area 1 and Fill Area 2 are both accepting waste during a year, maintain separate calendar year totals for each fill area as well as the total calendar year decomposable material placement amount for the entire landfill. Clearly identify the type and amount of any inert or non-decomposable wastes that are being excluded from these annual totals.

iii. Determine and record the cumulative amount (in tons) of decomposable materials placed in the S-2 Altamont Landfill as of December 31st for each calendar year. Prior to commencement of waste disposal in Fill Area 2, the best available decomposable material placement data shall be used to determine the cumulative amount of decomposable materials placed in Fill Area 1 of S-2.

iv. The cumulative amount of decomposable materials recorded pursuant to Part 22i(iii) shall be reported to the District pursuant to the annual information update request for this facility under S-2, source code: G7145580.

23. The annual report required by BAAQMD Regulation 8-34-411 shall be submitted in two semi-annual increments. The reporting period for the first increment of the Regulation 8-34-411 annual report that is submitted subsequent to the issuance of the MFR Permit for this site shall be from December 1, 2003 through April 30, 2004. This first increment report shall be submitted by May 31, 2004. The reporting periods and report submittal due dates for all subsequent increments of the Regulation 8-34-411 report shall be synchronized with the reporting periods and report submittal due dates for the semi-annual MFR Permit monitoring reports that are required by Section I.F of the MFR Permit for this site. A single report may be submitted to satisfy the requirements of Section I.F, Regulation 8-34-411, and 40 CFR Part 63.1980(a), provided that all items required by each applicable reporting requirement are included in the single report. (Basis: Regulation 8-34-411 and 40 CFR Part 63.1980(a))

E. 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 to issue a Change of Conditions for:

S-2 Altamont Landfill: Authorize and Incorporate the Fill Area 2 Expansion

By: Carol S. Allen Date
Senior Air Quality Engineer

APPENDIX A

CURRENT EQUIPMENT LIST

FOR SITE # A2066

Current Equipment List for Site # A2066

Source #	Source Description	*
S-2	Altamont Landfill with Landfill Gas Collection System	
S-6	Gas Turbine	
S-7	Gas Turbine	
S-12	Knockout Vessel, V-101	Exempt
S-19	Transfer Tank with Siphon Pump	
S-20	Treated Effluent Storage Tank	Exempt
S-23	Internal Combustion Engine	
S-24	Internal Combustion Engine	
S-28	Condensate Storage Tank	Exempt
S-29	Green Waste Stockpiles	
S-30	Portable Green Waste Grinding Operation	Exempt
S-31	PERP Diesel Engine for Green Waste Grinder	Exempt
S-99	Non-Retail Gasoline Dispensing Facility G # 7123	
S-130	Equalization Tank, storage and neutralization of wastewater	Exempt
S-140	SBR 1, aerated biological reactor	
S-141	SBR 2, aerated biological reactor	
S-180	Sludge Thickening	Exempt
S-193	Diesel Engine (for fire pump at Gas Plant)	
S-196	Diesel Engine (for emergency standby generator at Scale House)	
S-197	Diesel Engine (for portable generator at Break Trailer)	
S-198	Diesel Engine (for vacuum truck pump)	
S-199	Emergency Standby Diesel Genset (Flare Station)	
S-200	Emergency Standby Diesel Genset Set (WWTP)	
S-201	Emergency Standby Diesel Genset (Maintenance Shop)	

Abatement Device #	Abatement Device Description
A-6	Fogging System for S-6 Gas Turbine
A-7	Fogging System for S-7 Gas Turbine
A-15	Landfill Gas Flare
A-130	Carbon Adsorption System

* Sources identified as “Exempt” are exempt from District permitting requirements.

Proposed Equipment at Site # A2066 (Approved For Construction)

Source #	Source Description	*
S-210	Liquefied Natural Gas Plant	
S-211	LNG Storage Tank	Exempt
S-212	LNG Storage Tank	Exempt
S-213	LNG Storage Tank	Exempt
A-16	Landfill Gas Flare	

Proposed Equipment at Site # A2066 (Undergoing District Evaluation)

Source #	Source Description	*
S-206	Portable Diesel Fired Engine for Tipper # 83	
S-207	Portable Diesel Fired Engine for Tipper # 93	
S-208	Portable Diesel Fired Engine for Tipper # 70	
S-209	Portable Diesel Fired Engine for Tipper # 71	
S-214	Portable Diesel Fired Engine for an Air Compressor	
S-215	Portable Diesel Fired Engine for an Emergency Generator	

APPENDIX B

DECOMPOSABLE MATERIAL PLACEMENT DATA

FOR S-2 ALTAMONT LANDFILL

Decomposable Material Placement History For Fill Area 1

	Amount of Decomposable Wastes Placed in S-2	Amount of Decomposable Cover Materials Placed in S-2	Total Amount of Decomposable Materials Placed in S-2	Cumulative Total of All Decomposable Materials in S-2	Total Amount of Decomposable Materials Placed in S-2	Cumulative Total of All Decomposable Materials in S-2
Year	tons/year	tons/year	tons/year	tons-in-place	Mg/year	Mg-in-place
1980	49,500		49,500	49,500	44,906	44,906
1981	614,600		614,600	664,100	557,556	602,461
1982	683,400		683,400	1,347,500	619,970	1,222,431
1983	807,400		807,400	2,154,900	732,461	1,954,892
1984	1,352,000		1,352,000	3,506,900	1,226,514	3,181,406
1985	1,415,000		1,415,000	4,921,900	1,283,666	4,465,073
1986	1,517,000		1,517,000	6,438,900	1,376,199	5,841,272
1987	1,591,000		1,591,000	8,029,900	1,443,331	7,284,603
1988	1,585,000		1,585,000	9,614,900	1,437,888	8,722,491
1989	1,707,000		1,707,000	11,321,900	1,548,564	10,271,055
1990	1,961,000		1,961,000	13,282,900	1,778,989	12,050,044
1991	1,810,000		1,810,000	15,092,900	1,642,004	13,692,049
1992	1,668,078		1,668,078	16,760,978	1,513,255	15,205,303
1993	1,526,390		1,526,390	18,287,368	1,384,718	16,590,021
1994	1,502,203		1,502,203	19,789,571	1,362,776	17,952,797
1995	1,563,486		1,563,486	21,353,057	1,418,371	19,371,167
1996	1,472,987		1,472,987	22,826,044	1,336,271	20,707,439
1997	1,509,626		1,509,626	24,335,670	1,369,510	22,076,948
1998	1,534,539		1,534,539	25,870,209	1,392,110	23,469,059
1999	1,463,998		1,463,998	27,334,207	1,328,117	24,797,175
2000	1,496,182	10,515	1,506,697	28,840,904	1,366,853	26,164,028
2001	1,453,330	51,275	1,504,605	30,345,509	1,364,955	27,528,983
2002	1,339,641	75,235	1,414,876	31,760,385	1,283,554	28,812,537
2003	1,284,321	122,415	1,406,736	33,167,121	1,276,169	30,088,706
2004	1,290,315	111,755	1,402,070	34,569,191	1,271,937	31,360,643
2005	1,302,603	38,815	1,341,418	35,910,609	1,216,914	32,577,556
2006	1,303,241	34,015	1,337,256	37,247,865	1,213,138	33,790,695
2007	1,282,894	40,970	1,323,864	38,571,729	1,200,989	34,991,684

Decomposable Material Placement Projections For Fill Areas 1 and 2

	Amount of Decomposable Wastes Placed in S-2	Amount of Decomposable Cover Materials Placed in S-2	Total Amount of Decomposable Materials Placed in S-2	Cumulative Total of All Decomposable Materials in S-2	Total Amount of Decomposable Materials Placed in S-2	Cumulative Total of All Decomposable Materials in S-2
Year	tons/year	tons/year	tons/year	tons-in-place	Mg/year	Mg-in-place
2008	1,600,000	40,005	1,640,005	40,211,734	1,487,788	36,479,472
2009	1,600,000	35,000	1,635,000	41,846,734	1,483,247	37,962,719
2010	1,600,000	30,000	1,630,000	43,476,734	1,478,711	39,441,430
2011	1,600,000	25,000	1,625,000	45,101,734	1,474,175	40,915,605
2012	1,600,000	20,000	1,620,000	46,721,734	1,469,639	42,385,244
2013	1,600,000	15,000	1,615,000	48,336,734	1,465,103	43,850,348
2014	1,600,000	10,000	1,610,000	49,946,734	1,460,567	45,310,915
2015	1,600,000	10,000	1,610,000	51,556,734	1,460,567	46,771,483
2016	1,600,000	10,000	1,610,000	53,166,734	1,460,567	48,232,050
2017	1,600,000	10,000	1,610,000	54,776,734	1,460,567	49,692,617
2018	1,600,000	10,000	1,610,000	56,386,734	1,460,567	51,153,185
2019	1,600,000	10,000	1,610,000	57,996,734	1,460,567	52,613,752
2020	1,600,000	10,000	1,610,000	59,606,734	1,460,567	54,074,320
2021	1,600,000	10,000	1,610,000	61,216,734	1,460,567	55,534,887
2022	1,600,000	10,000	1,610,000	62,826,734	1,460,567	56,995,455
2023	1,600,000	10,000	1,610,000	64,436,734	1,460,567	58,456,022
2024	1,600,000	10,000	1,610,000	66,046,734	1,460,567	59,916,589
2025	1,600,000	10,000	1,610,000	67,656,734	1,460,567	61,377,157
2026	1,600,000	10,000	1,610,000	69,266,734	1,460,567	62,837,724
2027	1,600,000	10,000	1,610,000	70,876,734	1,460,567	64,298,292
2028	1,600,000	10,000	1,610,000	72,486,734	1,460,567	65,758,859
2029	1,600,000	10,000	1,610,000	74,096,734	1,460,567	67,219,427
2030	1,600,000	10,000	1,610,000	75,706,734	1,460,567	68,679,994
2031	1,600,000	10,000	1,610,000	77,316,734	1,460,567	70,140,561
2032	1,600,000	10,000	1,610,000	78,926,734	1,460,567	71,601,129
2033	1,600,000	10,000	1,610,000	80,536,734	1,460,567	73,061,696
2034	1,600,000	10,000	1,610,000	82,146,734	1,460,567	74,522,264
2035	1,600,000	10,000	1,610,000	83,756,734	1,460,567	75,982,831
2036	1,600,000	10,000	1,610,000	85,366,734	1,460,567	77,443,399
2037	1,600,000	10,000	1,610,000	86,976,734	1,460,567	78,903,966
2038	1,023,266	10,000	1,023,266	88,000,000	928,291	79,832,257

APPENDIX C

LANDGEM RESULTS

FOR S-2 ALTAMONT LANDFILL

LandGEM Input Parameters for Fill Area 1

LANDFILL CHARACTERISTICS		
Landfill Open Year	**1980**	
Landfill Closure Year (with 80-year limit)	**2013**	
Actual Closure Year (without limit)	***2013***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**47,750,000** *short tons*	
MODEL PARAMETERS		
Methane Generation Rate, k	**0.020**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**548**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

LandGEM Results for Fill Area 1

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
1980	49,500	0	0	0.000
1981	614,600	49,500	12	0.385
1982	683,400	664,100	161	5.164
1983	807,400	1,347,500	323	10.383
1984	1,352,000	2,154,900	512	16.464
1985	1,415,000	3,506,900	829	26.666
1986	1,517,000	4,921,900	1155	37.157
1987	1,591,000	6,438,900	1500	48.234
1988	1,585,000	8,029,900	1855	59.668
1989	1,707,000	9,614,900	2202	70.828
1990	1,961,000	11,321,900	2572	82.718
1991	1,810,000	13,282,900	2996	96.350
1992	1,668,078	15,092,900	3375	108.537
1993	1,526,390	16,760,978	3712	119.376
1994	1,502,203	18,287,368	4008	128.898
1995	1,563,486	19,789,571	4293	138.044
1996	1,472,987	21,353,057	4586	147.485
1997	1,509,626	22,826,044	4852	156.034
1998	1,534,539	24,335,670	5122	164.700
1999	1,463,998	25,870,209	5392	173.388
2000	1,506,697	27,334,207	5639	181.355
2001	1,504,605	28,840,904	5893	189.496
2002	1,414,876	30,345,509	6140	197.460
2003	1,406,736	31,760,385	6361	204.567
2004	1,402,070	33,167,121	6576	211.471
2005	1,341,418	34,569,191	6785	218.201
2006	1,337,256	35,910,609	6976	224.326
2007	1,323,864	37,247,865	7161	230.297
2008	1,640,005	38,571,729	7340	236.046
2009	1,635,000	40,211,734	7592	244.142

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2010	1,630,000	41,846,734	7837	252.039
2011	1,625,000	43,476,734	8077	259.741
2012	1,620,000	45,101,734	8310	267.252
2013	1,028,266	46,721,734	8538	274.575
2014	0	47,750,000	8618	277.145
2015	0	47,750,000	8447	271.657
2016	0	47,750,000	8280	266.278
2017	0	47,750,000	8116	261.005
2018	0	47,750,000	7956	255.837
2019	0	47,750,000	7798	250.771
2020	0	47,750,000	7644	245.805
2021	0	47,750,000	7492	240.938
2022	0	47,750,000	7344	236.167
2023	0	47,750,000	7198	231.491
2024	0	47,750,000	7056	226.907
2025	0	47,750,000	6916	222.414
2026	0	47,750,000	6779	218.010
2027	0	47,750,000	6645	213.693
2028	0	47,750,000	6513	209.461
2029	0	47,750,000	6384	205.314
2030	0	47,750,000	6258	201.248
2031	0	47,750,000	6134	197.263
2032	0	47,750,000	6013	193.357
2033	0	47,750,000	5894	189.529
2034	0	47,750,000	5777	185.776
2035	0	47,750,000	5663	182.097
2036	0	47,750,000	5550	178.491
2037	0	47,750,000	5440	174.957
2038	0	47,750,000	5333	171.493
2039	0	47,750,000	5227	168.097
2040	0	47,750,000	5124	164.768
2041	0	47,750,000	5022	161.506
2042	0	47,750,000	4923	158.308
2043	0	47,750,000	4825	155.173
2044	0	47,750,000	4730	152.100
2045	0	47,750,000	4636	149.088
2046	0	47,750,000	4544	146.136
2047	0	47,750,000	4454	143.243
2048	0	47,750,000	4366	140.406
2049	0	47,750,000	4280	137.626
2050	0	47,750,000	4195	134.901
2051	0	47,750,000	4112	132.230
2052	0	47,750,000	4030	129.611
2053	0	47,750,000	3951	127.045
2054	0	47,750,000	3872	124.529
2055	0	47,750,000	3796	122.063
2056	0	47,750,000	3721	119.646
2057	0	47,750,000	3647	117.277
2058	0	47,750,000	3575	114.955

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2059	0	47,750,000	3504	112.679
2060	0	47,750,000	3434	110.447
2061	0	47,750,000	3366	108.260
2062	0	47,750,000	3300	106.117
2063	0	47,750,000	3234	104.015
2064	0	47,750,000	3170	101.956
2065	0	47,750,000	3108	99.937
2066	0	47,750,000	3046	97.958
2067	0	47,750,000	2986	96.018
2068	0	47,750,000	2927	94.117
2069	0	47,750,000	2869	92.253
2070	0	47,750,000	2812	90.427
2071	0	47,750,000	2756	88.636
2072	0	47,750,000	2702	86.881
2073	0	47,750,000	2648	85.161
2074	0	47,750,000	2596	83.474
2075	0	47,750,000	2544	81.821
2076	0	47,750,000	2494	80.201
2077	0	47,750,000	2445	78.613
2078	0	47,750,000	2396	77.057
2079	0	47,750,000	2349	75.531
2080	0	47,750,000	2302	74.035
2081	0	47,750,000	2257	72.569
2082	0	47,750,000	2212	71.132
2083	0	47,750,000	2168	69.724
2084	0	47,750,000	2125	68.343
2085	0	47,750,000	2083	66.990
2086	0	47,750,000	2042	65.663
2087	0	47,750,000	2001	64.363
2088	0	47,750,000	1962	63.089
2089	0	47,750,000	1923	61.839
2090	0	47,750,000	1885	60.615
2091	0	47,750,000	1848	59.415
2092	0	47,750,000	1811	58.238
2093	0	47,750,000	1775	57.085
2094	0	47,750,000	1740	55.955
2095	0	47,750,000	1706	54.847
2096	0	47,750,000	1672	53.761
2097	0	47,750,000	1639	52.696
2098	0	47,750,000	1606	51.653
2099	0	47,750,000	1574	50.630
2100	0	47,750,000	1543	49.627
2101	0	47,750,000	1513	48.645
2102	0	47,750,000	1483	47.681
2103	0	47,750,000	1453	46.737
2104	0	47,750,000	1425	45.812
2105	0	47,750,000	1396	44.905
2106	0	47,750,000	1369	44.015
2107	0	47,750,000	1342	43.144

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2108	0	47,750,000	1315	42.290
2109	0	47,750,000	1289	41.452
2110	0	47,750,000	1263	40.631
2111	0	47,750,000	1238	39.827
2112	0	47,750,000	1214	39.038
2113	0	47,750,000	1190	38.265
2114	0	47,750,000	1166	37.507
2115	0	47,750,000	1143	36.765
2116	0	47,750,000	1121	36.037
2117	0	47,750,000	1098	35.323
2118	0	47,750,000	1077	34.624
2119	0	47,750,000	1055	33.938
2120	0	47,750,000	1034	33.266

LandGEM Input Parameters for Fill Area 2

LANDFILL CHARACTERISTICS		
Landfill Open Year	**2013**	
Landfill Closure Year (with 80-year limit)	**2038**	
Actual Closure Year (without limit)	***2038***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**40,250,000**	*short tons*
MODEL PARAMETERS		
Methane Generation Rate, k	**0.020**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**600**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

LandGEM Results for Fill Area 2

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2013	586,734	0	0	0.000
2014	1,610,000	586,734	142	5.002
2015	1,610,000	2,196,734	529	18.630
2016	1,610,000	3,806,734	908	31.987
2017	1,610,000	5,416,734	1280	45.081
2018	1,610,000	7,026,734	1645	57.914
2019	1,610,000	8,636,734	2002	70.494
2020	1,610,000	10,246,734	2352	82.825
2021	1,610,000	11,856,734	2696	94.911
2022	1,610,000	13,466,734	3032	106.758
2023	1,610,000	15,076,734	3362	118.371
2024	1,610,000	16,686,734	3685	129.754
2025	1,610,000	18,296,734	4002	140.911
2026	1,610,000	19,906,734	4313	151.847
2027	1,610,000	21,516,734	4617	162.567
2028	1,610,000	23,126,734	4916	173.074
2029	1,610,000	24,736,734	5208	183.374
2030	1,610,000	26,346,734	5495	193.469
2031	1,610,000	27,956,734	5776	203.365
2032	1,610,000	29,566,734	6051	213.064
2033	1,610,000	31,176,734	6321	222.572
2034	1,610,000	32,786,734	6586	231.891
2035	1,610,000	34,396,734	6845	241.026
2036	1,610,000	36,006,734	7100	249.980
2037	1,610,000	37,616,734	7349	258.756
2038	1,023,266	39,226,734	7593	267.359
2039	0	40,250,000	7691	270.789
2040	0	40,250,000	7538	265.427
2041	0	40,250,000	7389	260.171
2042	0	40,250,000	7243	255.020

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2043	0	40,250,000	7099	249.970
2044	0	40,250,000	6959	245.020
2045	0	40,250,000	6821	240.169
2046	0	40,250,000	6686	235.413
2047	0	40,250,000	6554	230.751
2048	0	40,250,000	6424	226.182
2049	0	40,250,000	6297	221.704
2050	0	40,250,000	6172	217.313
2051	0	40,250,000	6050	213.010
2052	0	40,250,000	5930	208.793
2053	0	40,250,000	5813	204.658
2054	0	40,250,000	5697	200.606
2055	0	40,250,000	5585	196.633
2056	0	40,250,000	5474	192.740
2057	0	40,250,000	5366	188.923
2058	0	40,250,000	5259	185.182
2059	0	40,250,000	5155	181.515
2060	0	40,250,000	5053	177.921
2061	0	40,250,000	4953	174.398
2062	0	40,250,000	4855	170.945
2063	0	40,250,000	4759	167.560
2064	0	40,250,000	4665	164.242
2065	0	40,250,000	4572	160.990
2066	0	40,250,000	4482	157.802
2067	0	40,250,000	4393	154.677
2068	0	40,250,000	4306	151.614
2069	0	40,250,000	4221	148.612
2070	0	40,250,000	4137	145.670
2071	0	40,250,000	4055	142.785
2072	0	40,250,000	3975	139.958
2073	0	40,250,000	3896	137.186
2074	0	40,250,000	3819	134.470
2075	0	40,250,000	3752	131.807
2076	0	40,250,000	3678	129.197
2077	0	40,250,000	3605	126.639
2078	0	40,250,000	3534	124.131
2079	0	40,250,000	3464	121.673
2080	0	40,250,000	3395	119.264
2081	0	40,250,000	3328	116.903
2082	0	40,250,000	3262	114.588
2083	0	40,250,000	3197	112.319
2084	0	40,250,000	3134	110.095
2085	0	40,250,000	3072	107.915
2086	0	40,250,000	3011	105.778
2087	0	40,250,000	2952	103.683
2088	0	40,250,000	2893	101.630
2089	0	40,250,000	2836	99.618
2090	0	40,250,000	2780	97.645
2091	0	40,250,000	2725	95.712

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2092	0	40,250,000	2671	93.817
2093	0	40,250,000	2618	91.959
2094	0	40,250,000	2566	90.138
2095	0	40,250,000	2515	88.353
2096	0	40,250,000	2465	86.604
2097	0	40,250,000	2417	84.889
2098	0	40,250,000	2369	83.208
2099	0	40,250,000	2322	81.560
2100	0	40,250,000	2276	79.945
2101	0	40,250,000	2231	78.362
2102	0	40,250,000	2187	76.810
2103	0	40,250,000	2143	75.290
2104	0	40,250,000	2101	73.799
2105	0	40,250,000	2059	72.337
2106	0	40,250,000	2018	70.905
2107	0	40,250,000	1978	69.501
2108	0	40,250,000	1939	68.125
2109	0	40,250,000	1901	66.776
2110	0	40,250,000	1863	65.454
2111	0	40,250,000	1826	64.157
2112	0	40,250,000	1790	62.887
2113	0	40,250,000	1755	61.642
2114	0	40,250,000	1720	60.421
2115	0	40,250,000	1686	59.225
2116	0	40,250,000	1653	58.052
2117	0	40,250,000	1620	56.903
2118	0	40,250,000	1588	55.776
2119	0	40,250,000	1556	54.671
2120	0	40,250,000	1526	53.589
2121	0	40,250,000	1495	52.528
2122	0	40,250,000	1466	51.488
2123	0	40,250,000	1437	50.468
2124	0	40,250,000	1408	49.469
2125	0	40,250,000	1380	48.489
2126	0	40,250,000	1353	47.529
2127	0	40,250,000	1326	46.588
2128	0	40,250,000	1300	45.665
2129	0	40,250,000	1274	44.761
2130	0	40,250,000	1249	43.875
2131	0	40,250,000	1224	43.006
2132	0	40,250,000	1200	42.154
2133	0	40,250,000	1176	41.320
2134	0	40,250,000	1153	40.502
2135	0	40,250,000	1130	39.700
2136	0	40,250,000	1108	38.913
2137	0	40,250,000	1086	38.143
2138	0	40,250,000	1064	37.388
2139	0	40,250,000	1043	36.647
2140	0	40,250,000	1023	35.922

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2141	0	40,250,000	1002	35.210
2142	0	40,250,000	982	34.513
2143	0	40,250,000	963	33.830
2144	0	40,250,000	944	33.160
2145	0	40,250,000	925	32.503
2146	0	40,250,000	907	31.860
2147	0	40,250,000	889	31.229
2148	0	40,250,000	871	30.610
2149	0	40,250,000	854	30.004
2150	0	40,250,000	837	29.410
2151	0	40,250,000	821	28.828
2152	0	40,250,000	804	28.257
2153	0	40,250,000	788	27.697

LandGEM Input Parameters for Fill Areas 1 and 2 Combined

LANDFILL CHARACTERISTICS		
Landfill Open Year	**1980**	
Landfill Closure Year (with 80-year limit)	**2038**	
Actual Closure Year (without limit)	***2038***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**88,000,000**	*short tons*
MODEL PARAMETERS		
Methane Generation Rate, k	**0.020**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**600**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

LandGEM Results for Fill Areas 1 and 2 Combined

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
1980	49,500	0	0	0.000
1981	614,600	49,500	12	0.422
1982	683,400	664,100	161	5.654
1983	807,400	1,347,500	323	11.368
1984	1,352,000	2,154,900	512	18.027
1985	1,415,000	3,506,900	829	29.197
1986	1,517,000	4,921,900	1155	40.683
1987	1,591,000	6,438,900	1500	52.811
1988	1,585,000	8,029,900	1855	65.329
1989	1,707,000	9,614,900	2202	77.549
1990	1,961,000	11,321,900	2572	90.567
1991	1,810,000	13,282,900	2996	105.493
1992	1,668,078	15,092,900	3375	118.836
1993	1,526,390	16,760,978	3712	130.704
1994	1,502,203	18,287,368	4008	141.130
1995	1,563,486	19,789,571	4293	151.143
1996	1,472,987	21,353,057	4586	161.480
1997	1,509,626	22,826,044	4852	170.841
1998	1,534,539	24,335,670	5122	180.328
1999	1,463,998	25,870,209	5392	189.841
2000	1,506,697	27,334,207	5639	198.563
2001	1,504,605	28,840,904	5893	207.477
2002	1,414,876	30,345,509	6140	216.197
2003	1,406,736	31,760,385	6361	223.979
2004	1,402,070	33,167,121	6576	231.537
2005	1,341,418	34,569,191	6785	238.906
2006	1,337,256	35,910,609	6976	245.612
2007	1,323,864	37,247,865	7161	252.150
2008	1,640,005	38,571,729	7340	258.444
2009	1,635,000	40,211,734	7592	267.309
2010	1,630,000	41,846,734	7837	275.956
2011	1,625,000	43,476,734	8077	284.388

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2012	1,620,000	45,101,734	8310	292.611
2013	1,615,000	46,721,734	8538	300.629
2014	1,610,000	48,336,734	8760	308.445
2015	1,610,000	49,946,734	8977	316.064
2016	1,610,000	51,556,734	9189	323.532
2017	1,610,000	53,166,734	9397	330.852
2018	1,610,000	54,776,734	9600	338.028
2019	1,610,000	56,386,734	9800	345.061
2020	1,610,000	57,996,734	9996	351.955
2021	1,610,000	59,606,734	10188	358.712
2022	1,610,000	61,216,734	10376	365.335
2023	1,610,000	62,826,734	10560	371.828
2024	1,610,000	64,436,734	10741	378.192
2025	1,610,000	66,046,734	10918	384.430
2026	1,610,000	67,656,734	11092	390.544
2027	1,610,000	69,266,734	11262	396.537
2028	1,610,000	70,876,734	11429	402.412
2029	1,610,000	72,486,734	11592	408.170
2030	1,610,000	74,096,734	11753	413.814
2031	1,610,000	75,706,734	11910	419.346
2032	1,610,000	77,316,734	12064	424.769
2033	1,610,000	78,926,734	12215	430.085
2034	1,610,000	80,536,734	12363	435.295
2035	1,610,000	82,146,734	12508	440.402
2036	1,610,000	83,756,734	12650	445.408
2037	1,610,000	85,366,734	12789	450.315
2038	1,023,266	86,976,734	12926	455.125
2039	0	88,000,000	12918	454.837
2040	0	88,000,000	12662	445.830
2041	0	88,000,000	12411	437.002
2042	0	88,000,000	12166	428.349
2043	0	88,000,000	11925	419.867
2044	0	88,000,000	11689	411.553
2045	0	88,000,000	11457	403.404
2046	0	88,000,000	11230	395.416
2047	0	88,000,000	11008	387.586
2048	0	88,000,000	10790	379.912
2049	0	88,000,000	10576	372.389
2050	0	88,000,000	10367	365.015
2051	0	88,000,000	10162	357.787
2052	0	88,000,000	9960	350.703
2053	0	88,000,000	9763	343.758
2054	0	88,000,000	9570	336.951
2055	0	88,000,000	9380	330.279
2056	0	88,000,000	9195	323.739
2057	0	88,000,000	9012	317.329
2058	0	88,000,000	8834	311.045
2059	0	88,000,000	8659	304.886
2060	0	88,000,000	8488	298.849
2061	0	88,000,000	8320	292.931
2062	0	88,000,000	8155	287.131

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2063	0	88,000,000	7993	281.445
2064	0	88,000,000	7835	275.872
2065	0	88,000,000	7680	270.410
2066	0	88,000,000	7528	265.055
2067	0	88,000,000	7379	259.807
2068	0	88,000,000	7233	254.662
2069	0	88,000,000	7089	249.620
2070	0	88,000,000	6949	244.677
2071	0	88,000,000	6811	239.832
2072	0	88,000,000	6677	235.083
2073	0	88,000,000	6544	230.428
2074	0	88,000,000	6415	225.865
2075	0	88,000,000	6288	221.393
2076	0	88,000,000	6163	217.009
2077	0	88,000,000	6041	212.712
2078	0	88,000,000	5922	208.500
2079	0	88,000,000	5804	204.371
2080	0	88,000,000	5689	200.325
2081	0	88,000,000	5577	196.358
2082	0	88,000,000	5466	192.470
2083	0	88,000,000	5358	188.659
2084	0	88,000,000	5252	184.923
2085	0	88,000,000	5148	181.261
2086	0	88,000,000	5046	177.672
2087	0	88,000,000	4946	174.154
2088	0	88,000,000	4848	170.705
2089	0	88,000,000	4752	167.325
2090	0	88,000,000	4658	164.012
2091	0	88,000,000	4566	160.764
2092	0	88,000,000	4475	157.581
2093	0	88,000,000	4387	154.461
2094	0	88,000,000	4300	151.402
2095	0	88,000,000	4215	148.404
2096	0	88,000,000	4131	145.465
2097	0	88,000,000	4050	142.585
2098	0	88,000,000	3969	139.762
2099	0	88,000,000	3891	136.994
2100	0	88,000,000	3814	134.282
2101	0	88,000,000	3738	131.623
2102	0	88,000,000	3664	129.016
2103	0	88,000,000	3592	126.462
2104	0	88,000,000	3521	123.957
2105	0	88,000,000	3451	121.503
2106	0	88,000,000	3382	119.097
2107	0	88,000,000	3316	116.739
2108	0	88,000,000	3250	114.427
2109	0	88,000,000	3186	112.161
2110	0	88,000,000	3122	109.940
2111	0	88,000,000	3061	107.763
2112	0	88,000,000	3000	105.630
2113	0	88,000,000	2941	103.538

Year	Decomposable Materials Accepted *Tons/Year*	Cumulative Decomposable Materials *Tons-in-Place*	Landfill Gas Generated *ft^3/min*	NMOC Generated *Tons/Year*
2114	0	88,000,000	2882	101.488
2115	0	88,000,000	2825	99.478
2116	0	88,000,000	2769	97.508
2117	0	88,000,000	2715	95.578
2118	0	88,000,000	2661	93.685
2119	0	88,000,000	2608	91.830
2120	0	88,000,000	2556	90.012

APPENDIX D

PARTICULATE EMISSION CALCULATIONS

FOR S-2 ALTAMONT LANDFILL

Plant # 2066, Waste Management of Alameda County, Altamont Landfill and Resource Recovery Facility

Application # 14814, Fill Area 2 Expansion at the S-2 Altamont Landfill

Particulate Emissions Summary for S-2 Altamont Landfill

Description of Activity	Fill Area 2 Proposed PM10 Tons/Year	Fill Area 1 Maximum PTE PM10 Tons/Year	Fill Area 1 Baseline Average PM10 Tons/Year
Vehicle and Mobile Equipment Travel on Paved and Unpaved Roads, including: main haul roads, perimeter roads, on-site cover soil delivery routes, and temporary fill area access routes	360.344	379.882	302.838
On-Site Cover Soil Excavation	4.031	2.755	2.020
Waste & Cover Material Delivery, Placement, and Compaction	6.018	4.882	4.807
Total Particulate Emissions from S-2	**370.393**	**387.519**	**309.665**

Proposed Fill Area 2: Maximum Potential Vehicle Traffic Emissions

									Control Factors								
					WM Tables			Fill Area 2	Emission Factors		4%	75%	Fill Area 2		Emissions for Fill Area 2 Roads		
Description of Proposed Roads for Fill Area 2 (Post 2010)	Road #	Paved or Unpaved ?	One-Way Distance (feet)	Round Trip Distance (miles)	Round Trip Distance (miles)	Paved Road Surface Silt Loading (g/m^2)	Unpaved Surface Material Silt Content (%)	Average Vehicle Fleet Weight (tons)	Un-controlled Paved	Un-controlled Unpaved	Post-Control Paved	Post-Control Unpaved	Fleet Trips / Year	VMT	Post-Control Paved	Post-Control Unpaved	PM10 tons/yr
Site Entrance Off Altamont Pass Rd. to Maintenance Bldg Area	P-1	paved	3875	1.47	5.3	2.0		25.75	0.402		0.386		213091	312776	120602		60.301
Maintenance Bldg Area to Scale House and Truck Wash Area	P-2	paved	2125	0.80		2.0		25.24	0.390		0.374		219811	176931	66227		33.113
Scale House/Truck Wash Area to "Y" Split	P-3	paved	3250	1.23		2.0		25.24	0.390		0.374		219811	270601	101288		50.644
"Y" Spit North Along Loop Road to Fill Area 2 NW Edge	P-4	paved	5125	1.94		2.0		25.22	0.389		0.374		219753	426604	159430		79.715
Average Temporary Road Distance within Fill Area 2	P-5	unpaved	3875	1.47	1.48		6.4	28.65		2.352		0.588	229881	337420		198372	99.186
From Soil Stockpiles to Fill Area 2 Edge (Average)	P-6	unpaved	2750	1.04	1.04		6.4	65.65		3.415		0.854	16848	17550		14985	7.493
"Y" Split South to Fill Area 1 Edge	P-7	paved	250	0.09		2.0		25.68	0.400		0.384		7014	664	255		0.128
Fill Area 1 Edge to Green Waste Processing Area	P-8	unpaved	375	0.14			25.2	25.68		7.686		1.922	7014	996		1914	0.957
Perimeter Road from Maintenance Bldg E/N to FA 2 NW Entrance	P-9	unpaved	9250	3.50	3.5		25.2	17.19		6.416		1.604	9280	32515		52153	26.077
From FA 2 Staging Area to Active Face (Average)	P-10	unpaved	2125	0.80	0.8		6.4	13.86		1.696		0.424	16000	12879		5461	2.731
Total from All Fill Area 2 Roads																	**360.344**

Description of Vehicle Fleet for Proposed Fill Area 2 Operations		Empty Wt tons	Avg Load Wt tons	Loaded Wt tons	Avg Trip Wt tons/trip	Proposed Round Trips Per Year trips/day	days/yr	trips/year
Delivery Trucks for Waste from Off-Site		15.0	22.0	37.0	26.0	507	312	158184
Delivery Trucks for Cover Soil from Off-Site		15.8	21.0	36.8	26.3	76	312	23712
Delivery Trucks for ADC Other Than Green Waste from Off-Site		16.6	14.0	30.6	23.6	204	121	24684
Delivery Trucks for Processed Green Waste from Off-Site		14.6	20.5	35.1	24.9	35	85	2975
Delivery Trucks for Unprocessed Green Waste from Off-Site		16.5	20.0	36.5	26.5	16	221	3536
On-Site Transport Trucks for Cover Soil		57.4	16.5	73.9	65.7	54	312	16848
On-Site Transport Trucks for Processed Green Waste		14.6	20.5	35.1	24.9	47	74	3478
On-Site Pickup Trucks (Fleet A diverted to paved rds)		2.0	1.0	3.0	2.5	16	320	5120
On-Site Pickup Trucks (Fleet B remaining on unpvd perimeter)		2.0	1.0	3.0	2.5	14	320	4480
On-Site Mobile Equipment (Fleet A diverted to paved rds)		30.9	0.0	30.9	30.9	5	320	1600
On-Site Mobile Equipment (Fleet B remaining on unpvd rds)		30.9	0.0	30.9	30.9	15	320	4800

EPA AP-42 Chapter 13.2.1 Paved Roads (November 2006)

Equation (1): $E = [k * (sL/2)^{0.65} * (W/3)^{1.5}] - C$	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1 (uncontrolled emission factor)
k = Particle Size Multiplier (lbs PM10 / VMT)	0.016 from Table 13.2-1.1
sL = Road Surface Silt Loading (g/m^2)	as identified above for each road segment (baseline, pre-truck wash, and post-truck wash)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment
C = Emission Factor for Bake and Tire Wear	0.0005 from Table 13.2-1.2

EPA AP-42 Chapter 13.2.2 Unpaved Roads (November 2006)

Equation (1a): $E = k * (s/12)^a * (W/3)^b$	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1a (uncontrolled emission factor)
k = Particle Size Empirical Constant (lbs PM10 / VMT)	1.5 from Table 13.2-2.2 for Equation 1a and PM10
a = Empirical Constant	0.9 from Table 13.2-2.2 for Equation 1a and PM10
b = Empirical Constant	0.45 from Table 13.2-2.2 for Equation 1a and PM10
s = Surface Material Silt Content (%)	as identified above for each road segment (Fill Area 1 unimproved, Fill Area 2 improved)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment

Weighted Average Vehicle Fleet Weight Per Road Segment for Proposed Roads

	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
	4112784	4112784	4112784	4112784	4112784	0	0	0	0	0
	623626	623626	623626	623626	623626	0	0	0	0	0
	582542	582542	582542	582542	582542	0	0	0	0	0
	73929	73929	73929	73929	73929	0	0	0	0	0
	93704	93704	93704	0	0	0	93704	93704	0	0
	0	0	0	0	1106071	1106071	0	0	0	0
	0	0	0	86428	86428	0	86428	86428	0	0
	0	12800	12800	12800	0	0	0	0	0	12800
	0	0	0	0	0	0	0	0	11200	11200
	0	49440	49440	49440	0	0	0	0	0	49440
	0	0	0	0	0	0	0	0	148320	148320
tons/yr	5486585	5548825	5548825	5541549	6585380	1106071	180132	180132	159520	221760
trips/yr	213091	219811	219811	219753	229881	16848	7014	7014	9280	16000
tons/trip	25.75	25.24	25.24	25.22	28.65	65.65	25.68	25.68	17.19	13.86

Fill Area 1: Maximum Potential Vehicle Traffic Emissions During Maximum Waste Acceptance Years

Description of Fill Area 1 Roads for Max. Potential to Emit Case	Road #	Paved or Unpaved ?	District Estimates from Maps: One-Way Distance (feet)	District Estimates from Maps: Round Trip Distance (miles)	WM Tables: Round Trip Distance (miles)	Paved Road Surface Silt Loading (g/m^2)	Unpaved Surface Material Silt Content (%)	Max PTE: PM10 Tons/Year
Site Entrance Off Altamont Pass Rd. to Scale House Area	B-1	paved	6500	2.46	3.54	7.4		138.971
Scale House Area to "Y" Split	B-2	paved	2625	0.99		7.4		56.123
"Y" Split South to Fill Area 1 Edge	B-3	paved	250	0.09		7.4		5.345
Fill Area 1 Edge to Green Waste Processing Area	B-4	unpaved	375	0.14	missing		25.2	0.000
Average Temporary Road Distance within Fill Area 1	B-5	unpaved	2375	0.90	0.92		25.2	123.314
From Soil Stockpiles to Fill Area 1 Edge (Average)	B-6	unpaved	1125	0.43	1.04		25.2	7.192
Perimeter Road from Maintenance Bldg east then north to "Y" Rd	B-7	unpaved	8500	3.22	3.42		25.2	48.936
Total PTE from All Fill Area 1 Roads (based on max waste throughput reported for Fill Area 1 and associated cover material trips determined from observed cover/waste ratios)								**379.882**

Description of Vehicle Fleet for Max PTE Fill Area 1 Operations		Empty Wt (tons)	Avg Load Wt (tons)	Loaded Wt (tons)	Avg Trip Wt (tons/trip)	Actual Number of Round Trips Per Year: 2004	2005	2006	Max PTE based on 1.9E tons/yr of waste in 92-98 (no ADC)
Delivery Trucks for Waste from Off-Site		15.0	22.0	37.0	26.0	60060	60496	64023	86364
Delivery Trucks for Cover Soil from Off-Site		15.8	21.0	36.8	26.3	20557	18027	24408	36190
Delivery Trucks for ADC Other Than Green Waste from Off-Site		16.6	14.0	30.6	23.6	11112	9919	7419	0
Delivery Trucks for Processed Green Waste from Off-Site		14.6	20.5	35.1	24.9	2681	214	813	0
Delivery Trucks for Unprocessed Green Waste from Off-Site		16.5	20.0	36.5	26.5	2841	1721	1473	0
On-Site Transport Trucks for Cover Soil		57.4	16.5	73.9	65.7	8443	6248	10638	11515
On-Site Transport Trucks for Processed Green Waste		14.6	20.5	35.1	24.9	2771	1679	1437	0
On-Site Pickup Trucks		2.0	1.0	3.0	2.5	9600	9600	9600	9600
On-Site Mobile Equipment (dozers, scrapers, compactors, etc.)		30.9	0.0	30.9	30.9	9600	9600	9600	9600
					total cover materials vs waste	63.4%	49.5%	59.5%	50%
					off-site soil	51.5%	57.4%	61.2%	80%
					on-site soil	16.6%	15.6%	20.9%	20%
					ADC	31.9%	26.9%	17.9%	

	Dust Controls Include: natural mitigation (rain) for paved roads & water-ing of unpaved roads		Control Factors: 59 Days With >/= 0.01 in. rain	Watering of Unpaved Roads					
at Max Waste	Emission Factors		4%	75%	For Max. PTE Case		Max. Potential to Emit for Fill Area 1		
Average Vehicle Fleet Weight (tons)	Un-controlled Paved	Un-controlled Unpaved	Post-Control Paved	Post-Control Unpaved	Fleet Trips / Year	VMT	Post-Control Paved	Post-Control Unpaved	PM10 tons/yr
26.09	0.960		0.921		122554	301743	277943		138.971
26.09	0.960		0.921		122554	121858	112246		56.123
26.09	0.960		0.921		122554	11606	10690		5.345
0.00		0.000		0.000	0	0		0	0.000
29.49		8.179		2.045	134069	120612		246629	123.314
65.65		11.726		2.931	11515	4907		14385	7.192
16.70		6.333		1.583	19200	61818		97873	48.936
									379.882

Weighted Average Vehicle Fleet Weight Per Road Segment

	B-1	B-2	B-3	B-4	B-5	B-6	B-7
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
	2245455	2245455	2245455	0	2245455	0	0
	951810	951810	951810	0	951810	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	755970	755970	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	24000
	0	0	0	0	0	0	296640
tons/yr	3197264	3197264	3197264	0	3953234	755970	320640
trips/yr	122554	122554	122554	0	134069	11515	19200
tons/trip	26.09	26.09	26.09	0.00	29.49	65.65	16.70

EPA AP-42 Chapter 13.2.1 Paved Roads (November 2006)

Equation (1): E = [k * (sL/2)^0.65 * (W/3)^1.5] - C	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1
k = Particle Size Multiplier (lbs PM10 / VMT)	0.016 from Table 13.2-1.1
sL = Road Surface Silt Loading (g/m^2)	as identified above for each road segment (baseline, pre-truck wash, and post-truck wash)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment
C = Emission Factor for Bake and Tire Wear	0.00047 from Table 13.2-1.2

EPA AP-42 Chapter 13.2.2 Unpaved Roads (November 2006)

Equation (1a): E = k * (s/12)^a * (W/3)^b	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1a
k = Particle Size Empirical Constant (lbs PM10 / VMT)	1.5 from Table 13.2-2.2 for Equation 1a and PM10
a = Empirical Constant	0.9 from Table 13.2-2.2 for Equation 1a and PM10
b = Empirical Constant	0.45 from Table 13.2-2.2 for Equation 1a and PM10
s = Surface Material Silt Content (%)	as identified above for each road segment (Fill Area 1 unimproved, Fill Area 2 improved)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment

Fill Area 1: Baseline Vehicle Traffic Emissions Due to Actual Vehicle Travel During 2004 through 2006

			District Estimates from Maps		WM Tables			2004-2006
Description of Baseline Fill Area 1 Roads	Road #	Paved or Unpaved ?	One-Way Distance (feet)	Round Trip Distance (miles)	Round Trip Distance (miles)	Paved Road Surface Silt Loading (g/m^2)	Unpaved Surface Material Silt Content (%)	Actual Average PM10 Emissions tons/year
Site Entrance Off Altamont Pass Rd. to Scale House Area	B-1	paved	6500	2.46	3.54	7.4		106.368
Scale House Area to "Y" Split	B-2	paved	2625	0.99		7.4		42.956
"Y" Split South to Fill Area 1 Edge	B-3	paved	250	0.09		7.4		4.091
Fill Area 1 Edge to Green Waste Processing Area	B-4	unpaved	375	0.14	missing		25.2	0.542
Average Temporary Road Distance within Fill Area 1	B-5	unpaved	2375	0.90	0.92		25.2	94.670
From Soil Stockpiles to Fill Area 1 Edge (Average)	B-6	unpaved	1125	0.43	1.04		25.2	5.273
Perimeter Road from Maintenance Bldg east then north to "Y" Rd	B-7	unpaved	8500	3.22	3.42		25.2	48.936
Baseline Actual Average Emissions from All Fill Area 1 Roads (based on 2004-2006 actual vehicle trips for waste and cover materials)								**302.838**

Description of Vehicle Fleet for Baseline Fill Area 1 Operations		Empty Wt	Avg Load Wt	Loaded Wt	Avg Trip Wt	Baseline Number of Round Trips Per Year		
		tons	tons	tons	tons/trip	2004	2005	2006
Delivery Trucks for Waste from Off-Site		15.0	22.0	37.0	26.0	60060	60496	64023
Delivery Trucks for Cover Soil from Off-Site		15.8	21.0	36.8	26.3	20557	18027	24408
Delivery Trucks for ADC Other Than Green Waste from Off-Site		16.6	14.0	30.6	23.6	11112	9919	7419
Delivery Trucks for Processed Green Waste from Off-Site		14.6	20.5	35.1	24.9	2681	214	813
Delivery Trucks for Unprocessed Green Waste from Off-Site		16.5	20.0	36.5	26.5	2841	1721	1473
On-Site Transport Trucks for Cover Soil		57.4	16.5	73.9	65.7	8443	6248	10638
On-Site Transport Trucks for Processed Green Waste		14.6	20.5	35.1	24.9	2771	1679	1437
On-Site Pickup Trucks		2.0	1.0	3.0	2.5	9600	9600	9600
On-Site Mobile Equipment (dozers, scrapers, compactors, etc.)		30.9	0.0	30.9	30.9	9600	9600	9600

EPA AP-42 Chapter 13.2.1 Paved Roads (November 2006)

Equation (1): $E = [k * (sL/2)^{0.65} * (W/3)^{1.5}] - C$	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1
k = Particle Size Multiplier (lbs PM10 / VMT)	0.016 from Table 13.2-1.1
sL = Road Surface Silt Loading (g/m^2)	as identified above for each road segment (baseline, pre-truck wash, and post-truck wash)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment
C = Emission Factor for Bake and Tire Wear	0.00047 from Table 13.2-1.2

EPA AP-42 Chapter 13.2.2 Unpaved Roads (November 2006)

Equation (1a): $E = k * (s/12)^a * (W/3)^b$	
E = Emission Factor (lbs PM10 / VMT)	as calculated per Equation 1a
k = Particle Size Empirical Constant (lbs PM10 / VMT)	1.5 from Table 13.2-2.2 for Equation 1a and PM10
a = Empirical Constant	0.9 from Table 13.2-2.2 for Equation 1a and PM10
b = Empirical Constant	0.45 from Table 13.2-2.2 for Equation 1a and PM10
s = Surface Material Silt Content (%)	as identified above for each road segment (Fill Area 1 unimproved, Fill Area 2 improved)
W = Mean Vehicle Fleet Weight (tons)	as calculated above for each road segment

	Dust Controls Include: natural mitigation (rain) for paved roads & watering of unpaved roads		Control Factors: 59 Days With >/= 0.01 in. rain	Watering of Unpaved Roads					
2004	Emission Factors		4%	75%	Actual 2004		2004 Actual Emissions		
Vehicle Fleet Weight (tons)	Uncontrolled Paved	Uncontrolled Unpaved	Post-Control Paved	Post-Control Unpaved	Fleet Trips / Year	VMT	Post-Control Paved	Post-Control Unpaved	PM10 tons/yr
25.77	0.942		0.904		97251	239444	216554		108.277
25.77	0.942		0.904		97251	96698	87454		43.727
25.77	0.942		0.904		97251	9209	8329		4.164
25.69		7.687		1.922	5612	797		1532	0.766
28.92		8.108		2.027	105624	95022		192601	96.301
65.65		11.726		2.931	8443	3598		10547	5.273
16.70		6.333		1.583	19200	61818		97873	48.936
									307.445

2004 Weighted Average Vehicle Fleet Weight Per Road Segment

	B-1	B-2	B-3	B-4	B-5	B-6	B-7
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
	1561560	1561560	1561560	0	1561560	0	0
	540649	540649	540649	0	540649	0	0
	262243	262243	262243	0	262243	0	0
	66623	66623	66623	0	66623	0	0
	75287	75287	75287	75287	0	0	0
	0	0	0	0	554283	554283	0
	0	0	0	68866	68866	0	0
	0	0	0	0	0	0	24000
	0	0	0	0	0	0	296640
tons/yr	2506362	2506362	2506362	144153	3054224	554283	320640
trips/yr	97251	97251	97251	5612	105624	8443	19200
tons/trip	25.77	25.77	25.77	25.69	28.92	65.65	16.70

	Dust Controls Include: natural mitigation (rain) for paved roads & watering of unpaved roads		Control Factors: 59 Days With >/= 0.01 in. rain	Watering of Unpaved Roads					
2005	Emission Factors		4%	75%	Actual 2005		2005 Actual Emissions		
Vehicle Fleet Weight (tons)	Un-controlled Paved	Un-controlled Unpaved	Post-Control Paved	Post-Control Unpaved	Fleet Trips / Year	VMT	Post-Control Paved	Post-Control Unpaved	PM10 tons/yr
25.80	0.944		0.906		90377	222519	201612		100.806
25.80	0.944		0.906		90377	89863	81420		40.710
25.80	0.944		0.906		90377	8558	7754		3.877
25.69		7.687		1.922	3400	483		928	0.464
28.35		8.036		2.009	96583	86888		174561	87.281
65.65		11.726		2.931	6248	2663		7805	3.902
16.70		6.333		1.583	19200	61818		97873	48.936
									285.977

2005 Weighted Average Vehicle Fleet Weight Per Road Segment

	B-1	B-2	B-3	B-4	B-5	B-6	B-7
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
	1572896	1572896	1572896	0	1572896	0	0
	474110	474110	474110	0	474110	0	0
	234088	234088	234088	0	234088	0	0
	5318	5318	5318	0	5318	0	0
	45607	45607	45607	45607	0	0	0
	0	0	0	0	410181	410181	0
	0	0	0	41731	41731	0	0
	0	0	0	0	0	0	24000
	0	0	0	0	0	0	296640
tons/yr	2332019	2332019	2332019	87338	2738325	410181	320640
trips/yr	90377	90377	90377	3400	96583	6248	19200
tons/trip	25.80	25.80	25.80	25.69	28.35	65.65	16.70

	Dust Controls Include: natural mitigation (rain) for paved roads & water-ing of unpaved roads		Control Factors: 59 Days With >/= 0.01 in. rain	Watering of Unpaved Roads					
2006	Emission Factors		4%	75%	Actual 2006		2006 Actual Emissions		
Vehicle Fleet Weight (tons)	Un-controlled Paved	Un-controlled Unpaved	Post-Control Paved	Post-Control Unpaved	Fleet Trips / Year	VMT	Post-Control Paved	Post-Control Unpaved	PM10 tons/yr
25.89	0.949		0.911		98136	241623	220041		110.021
25.89	0.949		0.911		98136	97578	88863		44.431
25.89	0.949		0.911		98136	9293	8463		4.232
25.69		7.687		1.922	2910	413		794	0.397
29.76		8.213		2.053	108738	97823		200860	100.430
65.65		11.726		2.931	10638	4533		13289	6.644
16.70		6.333		1.583	19200	61818		97873	48.936
									315.092

2006 Weighted Average Vehicle Fleet Weight Per Road Segment

	B-1	B-2	B-3	B-4	B-5	B-6	B-7
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
	1664598	1664598	1664598	0	1664598	0	0
	641930	641930	641930	0	641930	0	0
	175088	175088	175088	0	175088	0	0
	20203	20203	20203	0	20203	0	0
	39035	39035	39035	39035	0	0	0
	0	0	0	0	698385	698385	0
	0	0	0	35714	35714	0	0
	0	0	0	0	0	0	24000
	0	0	0	0	0	0	296640
tons/yr	2540854	2540854	2540854	74748	3235918	698385	320640
trips/yr	98136	98136	98136	2910	108738	10638	19200
tons/trip	25.89	25.89	25.89	25.69	29.76	65.65	16.70

Particulate Emissions Due to Waste and Cover Material Delivery, Placement, and Compaction

	Basis for Emission Factor	TSP Emission Factor		Worst Case PM10 Emission Factor		Average PM10 Emission Factor		Equipment	Hours/Day per Machine at Max Throughput	Max Throughput tons/day	Emission Factor, PM10 lbs/ton	tons/year	Fill Area 2 Max PM10 tons/year
Waste Tipping	1			1.37E-03	lbs/ton	1.68E-04	lbs/ton			11150	1.68E-04	3478800	0.293
Waste Bulldozing	2					1.09E+00	lbs/hour	2	10	11150	1.95E-03	3478800	3.389
Waste Compacting	3	1.20E-02	lbs/ton	6.00E-03	lbs/ton	1.09E+00	lbs/hour	1	10	11150	9.74E-04	3478800	1.694
Cover Soil Unloading	4 / 1	4.00E-02	lbs/ton	1.37E-03	lbs/ton	1.49E-04	lbs/ton			2484	1.49E-04	775077	0.058
Cover Soil Bulldozing	2					6.25E-01	lbs/hour	2	2	2484	1.01E-03	775077	0.390
Cover Soil Compacting	3	1.20E-02	lbs/ton	6.00E-03	lbs/ton	6.25E-01	lbs/hour	1	2	2484	5.03E-04	775077	0.195
Total													6.018

1. AP-42 Chapter 13.2.4, page 13.2.4-3, Equation 1: E (lbs/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4 , where k=0.74 for TSP and k=0.35 for PM10.
   For waste, the moisture content of miscellaneous fill material is 11% (from Table 13.2.4-1), but the equation only retains the quality rating of A if M is 0.25-4.8%.
   Similarly for cover materials (soil is assumed to worst case), the average moisture content is 12%. Silt contents for cover and fill materials (9 and 12, respectively)
   are within the appropriate range for equation 1. The mean wind speed at the site is 7.8 mph (worst case wind speed for the equation is 15 mph).
2. AP-42 Chapter 11.9, Table 11.9-1 for bulldozing overburden, PM10 Emissions (E) in pounds/hour are = 0.75*1.0*(s^1.5)/(M^1.4).
   For waste, silt(s)=12% and moisture(M)=11%, which are within appropriate ranges for this equation. For cover materals, silt=9% and M=12%. See 1. for waste and cover data.
3. The worst case factor is from AP-42 Chapter 11.9, Table 11.9-4: the overburden replacement factor: 0.012 lbs TSP/ton (assumed PM10 = 50% of TSP). However, AP-42
   Chapter 13.2.3-1 (Table 13.2.3-1) states that the dozer equation in Note 2 above should be used for compacting emissions.
   The average PM10 factor uses these dozer equations and estimated compactor equipment operating time.
4. AP-42 Chapter 11.9, Table 11.9-4: Emission Factors for Topsoil Removal by Scrapers.

Particulate Emissions Due to On-Site Cover Soil Excavation

	Basis for Emission Factor	TSP Emission Factor		PM10 Emission Factor	
Cover Soil Scraping	(5)	5.80E-02	lbs/ton	2.90E-02	lbs/ton

	Emission Factor	Soil Throughput			Soil Throughput	PM10 Emissions	PM10 Emissions
	Pounds PM_{10} / Ton Soil	Basis	Tons/Day	Basis	Tons/Year	Pounds/Day	Tons/Year
Fill Area 2: Proposed Max	0.029	(6)	1115	(7)	277992	32.34	4.031
Fill Area 1: Actual Max	0.029	(8)	609	(8)	190000	17.66	2.755
Fill Area 1: Baseline Average	0.029	(9)	447	(9)	139313	12.95	2.020

(5) AP-42 Chapter 11.9, Table 11.9-4: Used Emission Factor for Topsoil Removal by Scrapers: 0.058 pounds of TSP/ton of soil. PM10 emissions are assumed to be 50% of these TSP emissions.

(6) Fill Area 2: The proposed maximum daily amount of soil supplied by the scrapers is estimated to be 20% of the maximum cover required (5575 tons/day of cover material), which is 50% of the maximum waste delivery rate (11,150 tons/day of waste). Applicant estimated the maximum soil from scrapers to be 892 tons/day, which is 8% of the maximum daily waste throughput rate.

(7) Fill Area 2: The proposed maximum annual amount of soil supplied by the scrapers is the same as the max throughput rate identified for the road emission calculations: 54 trips/day at 16.5 tons/trip for 312 days/yr = 277,992 tons/year. The applicant estimated a soil throughput for scapers of 278,304 tons/year, which is 8% of maximum annual waste acceptance rate (3,478,800 tons/year of waste). Difference is due to rounding applicant's average scraper trips per day (54.06) to an integer number (56 trips/day) for road emission calculations.

(8) Fill Area 1: The maximum scraper throughput is estimated to be 20% of the cover requirement. The cover requirement is estimated to be 50% of the maximum waste throughput, which was 1.9E6 tons/year in the 1990s. Therefore, maximum cover required is 950,000 tons/year and the scrapers are assumed to have supplied 190,000 tons/year of this soil. The daily throughput is based on this annual rate and 312 days/year of operation.

(9) Fill Area 1: The baseline average scraper throughput is the average throughput for 2004-2006 as reported by SCS Engineers (on-site cover soil usage): 447 tons/day and 139,313 tons/yr for 2004; 330 tons/day and 103,099 tons/yr for 2005; and 563 tons/day and 175,527 tons/yr for 2006.

	Fill Area 1 Max. PM10 Emission Factor		Fill Area 1 Max Throughput		Fill Area 1 Max PM10 tons/year	Fill Area 1 Baseline PM10 Emission Factor		Fill Area 1 Max Throughput		Fill Area 1 Max PM10 tons/year
Waste Tipping	1.68E-04	lbs/ton	1900000	tons/yr	0.160	1.68E-04	lbs/ton	1334383	tons/yr	0.112
Waste Bulldozing	1.09E+00	lbs/hour	4992	hours/yr	2.711	1.09E+00	lbs/hour	4992	hours/yr	2.711
Waste Compacting	1.09E+00	lbs/hour	2496	hours/yr	1.355	1.09E+00	lbs/hour	2496	hours/yr	1.355
Cover Soil Unloading	1.49E-04	lbs/ton	950000	tons/yr	0.071	1.49E-04	lbs/ton	580257	tons/yr	0.043
Cover Soil Bulldozing	6.25E-01	lbs/hour	1248	hours/yr	0.390	6.25E-01	lbs/hour	1248	hours/yr	0.390
Cover Soil Compacting	6.25E-01	lbs/hour	624	hours/yr	0.195	6.25E-01	lbs/hour	624	hours/yr	0.195
Total					4.882					4.807

Maximum Potential Wind Erosion at Altamont Landfill

Basis: AP-42 Chapter 13.2.5.1

$P = 58 * (u^* - u_t^*)^2 + 25 * (u^* - u_t^*)$
$P = 0$ for $u^* \leq u_t^*$

The threshold fiction velocity (u_t^*) of compacted waste or cover material at the active landfill face or of loose cover soil stored in stockpiles is expected to be no less than the threshold friction velocity of 1.02 m/s for overburden at a coal mine, found in Table 13.2.5-2.

The friction velocity (u^*) is: $u^* = 0.053 * u_{10}^+$ in m/s.

For 2007 at KCALICER6 weather station, the highest wind speed gust was 34.0 miles/hour (15.2 m/s). This speed is assumed to be measured at 10 m such that $u_{10}^+ = 15.2$ m/s, and $u^* = 0.053*15.2 = 0.806$ m/s.

Since u^* (0.8 m/s) is less than u_t^* (1.02 m/s), the wind erosion potential (P) is 0 at the active face.
Wind speeds would need to exceed 43 mph in order for P to be greater than 0 (for $u_t^* = 1.02$).

APPENDIX E

HEALTH RISK ASSESSMENT

FOR THE ALTAMONT LANDFILL EXPANSION

INTEROFFICE MEMORANDUM

February 25, 2009

TO: Scott B. Lutz **Via:** Daphne Y. Chong

FROM: Carol Allen

SUBJECT: **Results of a Revised Health Risk Screening Analysis for: Waste Management of Alameda County (Livermore, CA), Plant #2066, Application #14814: Fill Area 2 Expansion Project**

The District completed a health risk screening analysis (HRSA) for the Altamont Landfill Expansion Project (Application # 14814) in January 2008 and revised this analysis in May 2008. Due to project modifications proposed by the applicant, receptor changes identified by the District, and health effects value changes recently implemented by the District, the District has determined that a third revision of the HRSA for the Altamont Landfill Fill Area 2 Expansion Project is necessary. The revised project description and other changes from the previous HRSA are described below, followed by the revised HRSA results and the detailed HRSA report.

Revised Project Description

This application includes a modification of the S-2 Altamont Landfill. The S-2 Altamont Landfill was an existing permitted source prior to January 1, 1987. Therefore, this project evaluates the chronic health impacts resulting from the emission increases that occur at each operation in this project. However, acute impacts are evaluated based on the total proposed emissions from each operation in this project.

Currently, landfill gas collected from Fill Area 1 is abated by one or more of the five permitted landfill gas control system devices: A-15 Landfill Gas Flare, S-6 Gas Turbine, S-7 Gas Turbine, S-23 IC Engine, and S-24 IC Engine. The S-6 and S-7 turbines and the S-23 and S-24 engines have been operating at close to maximum operating levels using landfill gas collected from the currently permitted Fill Area 1, while the A-15 flare has been operating at a low percentage of its capacity. A second flare (A-16 Landfill Gas Flare) and a landfill gas processing operation (S-210 LNG Plant) were issued Authorities to Construct in February 2009. The landfill gas combustion devices emit residual toxic air contaminants due to incomplete combustion of the TACs in the collected landfill gas and also emit secondary TACs – such as formaldehyde and acid gases – due to combustion reactions. The S-210 LNG Plant will have negligible fugitive TAC emissions. Waste gas streams and condensate from S-210 will be abated by A-16, but the maximum permitted emissions from A-16 will be no greater than when A-16 is fired on landfill gas alone.

Since S-6, S-7, S-23, and S-24 are separate sources from the landfill, and these sources were last modified more than two years ago, the TAC emissions from these turbines and engines are not considered part of this current landfill expansion project. However, the existing A-15 Landfill Gas Flare and proposed A-16 Landfill Gas Flare are integral elements of the S-2 Altamont Landfill Source, and they will be either the primary or back-up control devices for landfill gas collected from the new fill area. Therefore, the emissions from these flares are considered to be related to this landfill expansion project for the purpose of this HRSA. Since both flares were

initially permitted after January 1, 1987, the maximum permitted residual and secondary TAC emissions from these flares will all be included as part of this project.

Summary of Changes From Previous HRSA

This revised HRSA for Application # 14184 will use the same modeling procedures and assumptions as the May 2008 HRSA that was conducted for this application. This revised HRSA will include the following changes:

- The baseline waste placement history for the existing landfill has been updated pursuant to Waste Management's December 2008 report.
- The baseline and projected waste placement rates for the proposed landfill (including both Fill Areas 1 and 2) have been updated.
- The proposed TAC concentration limits for several compounds (benzene, perchloroethylene, vinyl chloride, and others) have been increased.
- The new A-16 Flare has been included as part of this project.
- The on-site worker receptors at the LNG Plant location have been removed.
- A grid of residential receptors - located west of the Waste Management's Maintenance Building and north of Altamont Pass Road - has been removed.
- The health effects value for several compounds have been updated for consistency with OEHHA's most recent approved values.

In December 2008, Waste Management submitted revised waste placement history data that resulted in lower baseline and proposed landfill gas generation rates for the S-2 Altamont Landfill. In addition, Waste Management requested that the District consider raising the proposed landfill gas concentration limits for several TACs that were close to the maximum measured concentrations for this site. The net result of these waste placement history and TAC concentration limit changes is higher TAC emission increases for this project compared to the project evaluated in May 2008. The ISCST3 input parameters for S-2 and A-15 have been updated accordingly.

In February 2009, the District permitted a new landfill gas flare (A-16) that will control landfill gas collected from S-2 and a new liquefied natural gas plant (S-210). The A-16 Flare is considered to be an integral part of the landfill; therefore, the emissions from A-16 will be included as part of this project. The A-16 TAC emission rates have been updated from Application # 19206 based on the proposed inlet TAC concentration limits identified in this landfill expansion project application.

The proposed S-210 LNG Plant replaces a similar operation (permitted but never built) that was to be owned and operated by CryoEnergy International. In the May 2008 HRSA, the location of the CryoEnergy International LNG Plant (on-site near the existing S-23 and S-24 IC Engines) was considered to be an off-site worker location for Plant # 2066. Since this CryoEnergy International LNG Plant will not be built, and Waste Management will hold the permit for new LNG Plant, this location is no longer considered to be an off-site worker location for Plant # 2066. A grid of 28 worker receptors – previously located near the IC engines – has been removed from the worker receptor list for this site.

In the May 2008 HRSA, the District identified an off-site location approximately 750-1050 meters west of the Administration Building as a potential residential receptor location (represented by a square grid of 49 receptors spaced 50 meters apart.) Based on updated aerial maps of this area, the District has determined that there are no receptors in this previously identified residential receptor area. There is a building located about 450 meter west of the Administration Building (618074 m E and 4178735 m N, NAD 83); however, this building is a long abandoned farm building that cannot support a resident. The area surrounding this

abandoned building is zoned for agricultural use. Since this area is not expected to ever have any residential receptors, the receptor grid described above has been removed from the residential receptor list for this site.

The District has recently begun using an updated set of OEHHA health effects values in HRSAs for new source review. The updated OEHHA health effects values have been incorporated in the ISCST3 input factor calculations for this HRSA revision. The updated health effects values include a new cancer potency factor for ethyl benzene that OEHHA adopted in November 2007 and the removal of chronic inhalation RELs for the following compounds: benzyl chloride, chlorodifluoromethane, chlorofluorocarbons, methyl ethyl ketone, vinyl chloride, and hydrogen bromide.

Health Impacts Summary

The results of this revised HRSA are summarized in Table 1. As shown below, the maximum health impacts due to all emission increases resulting from the Fill Area 2 Expansion Project are: an increased cancer risk of 9.96 in a million and an increase in the chronic non-cancer hazard index (chronic HI) of 0.15. These health impacts constitute both the source risk for S-2 and the total project risk. For the flares, the maximum impacts are an increased cancer risk of 0.13 in a million and a chronic HI of 0.06.

While the chronic impacts discussed above are determined based on emission increases for the project, acute impacts are determined based on the proposed maximum hourly emission rates from each source in the project. The maximum acute non-cancer hazard index (acute HI) for this project is 0.90.

Since the source risk for S-2 will exceed a cancer risk of 1.0 in one million, Best Available Control Technology for Toxics (TBACT) is required for the S-2 Altamont Landfill pursuant to Regulation 2-5-301. TBACT is not triggered for chronic non-cancer impacts from S-2, because the chronic HI for S-2 is less than 0.2. The impacts from each flare are less than these TBACT trigger levels. Compliance with TBACT requirements for S-2 will be discussed in detail in the engineering evaluation for Application # 14814.

In accordance with Regulation 2-5-302, the project risk levels of: 9.96 in one million cancer risk, 0.15 chronic HI, and 0.90 acute HI are acceptable, provided that the S-2 Altamont Landfill meets the District's TBACT requirements for cancer risk resulting from landfill emissions.

Table 1. Health Impacts for the Altamont Landfill Expansion Project

Health Impact Type	Receptor	Max. Impacts for Total Project (S-2 Increases, A-15, and A-16)	Max. Impacts for S-2 Due to Emission Increases	Max. Impacts for Flares	
				A-15	A-16
Cancer Risk	Resident	9.96	9.96	0.014	0.058
Cancer Risk	Worker	3.60	3.60	0.011	0.133
Chronic HI	Resident	0.15	0.15	0.005	0.021
Chronic HI	Worker	0.06	0.06	0.005	0.056
Acute HI *	Off-Site	0.90	0.90	0.003	0.036
Acute HI *	On-Site	0.71	0.71	0.001	0.007

* Acute impacts were evaluated for the total proposed emissions from S-2 rather than just the emission increases.

Project Emissions

Maximum proposed fugitive emissions for the S-2 Altamont Landfill are determined using proposed concentration limits for the toxic air contaminants (TACs) that are commonly found in Altamont's landfill gas, projected landfill gas generation rates that are estimated using EPA's LANDGEM model with standard inputs for the variables, and an assumed minimum landfill gas collection system capture efficiency of 75%. Baseline fugitive emissions from S-2 are determined for the currently permitted Fill Area 1 using the average landfill gas generation rate for 2005 through 2007 and the average measured concentrations of toxic air contaminants in this site's landfill gas during 2005 through 2007. Current concentration limits, baseline average concentrations, and proposed concentration limits for TACs detected in Altamont's landfill gas are compared in Table 2.

Table 2. Current, Baseline, and Proposed Landfill Gas Concentration Levels for TACs

TACs Detected in Landfill Gas Collected from Altamont Landfill	Current LFG Concentration Limit	Baseline Average Concentrations	Proposed Concentration Limits for Modified Landfill
	PPBV	PPBV	PPBV
Acrylonitrile	500	ND	300
Benzene	3300	1285	3400
Benzylchloride	600	ND	500
Carbon Tetrachloride		ND	100
Chlorobenzene		112	2000
Chloroethane		25	1000
Chloroform		ND	100
1,4 Dichlorobenzene	1100	1550	2600
Ethyl Benzene		9690	30000
Ethylene Dibromide	300	ND	No Limit
Ethylene Dichloride	250	ND	200
Ethylidene Dichloride	1200	153	1400
Hexane		993	4000
Hydrogen Sulfide		139604	200000
Isopropyl Alcohol		63413	200000
Methyl Alcohol		147894	600000
Methyl Ethyl Ketone		47164	200000
Methylene Chloride	2500	3603	12000
Perchloroethylene	2400	2034	7300
1,1,2,2 Tetrachloroethane		ND	400
Styrene		3705	7000
Toluene		52618	200000
1,1,1 Trichloroethane		ND	100
Trichloroethylene		382	1600
Vinyl Chloride	1100	183	1100
Vinylidene Chloride		ND	200
Xylenes (o, m, & p)		25787	90000

For each source in the project (S-2 Altamont Landfill, A-15 Flare, and A-16 Flare), the District determined three sets of emission rates, which are then used to determine input factors for three types of health impacts: acute non-cancer impacts, chronic non-cancer impacts, and cancer risk impacts. The calculation procedures for each type of health impact are explained below.

Acute impacts are based on the maximum hourly emission rates from each source in a project. For the landfill, the maximum hourly emission rates were determined using the projected peak landfill gas generation rate for Fill Areas 1 and 2 combined (12,926 scfm of LFG), a 25% fugitive emission rate, and the proposed landfill gas TAC concentrations in Table 2. For the flares, the maximum hourly emission rates were based on the maximum permitted heat input rate to each flare (70.98 MM BTU/hour for A-15 and 132 MM BTU/hour for A-16), the proposed TAC concentrations in Table 2, and 98% destruction efficiency for each TAC. Hourly emissions of secondary TACs (formaldehyde and acid gases: HCl, HF, and HBr) from the flares were determined using the District's standard formaldehyde emission factor for flares and the maximum expected inlet ion concentrations of: 110 ppmv for chloride and 15 ppmv for fluoride. Maximum hourly emissions for each source are presented in Table 3a.

Table 3a. Maximum Hourly Emissions Used for Acute Non-Cancer Health Impacts

Toxic Air Contaminants	Proposed Emissions from S-2 (Fill Areas 1 and 2 Combined) Pounds/Hour	Proposed Emissions from A-15 Pounds/Hour	Proposed Emissions from A-16 Pounds/Hour
Benzene	1.33E-01	1.96E-03	3.65E-03
Benzyl Chloride	3.17E-02	4.67E-04	8.69E-04
Carbon Tetrachloride	7.71E-03	1.14E-04	2.11E-04
Chloroform	5.98E-03	8.82E-05	1.64E-04
Hydrogen Sulfide	3.42E+00	5.03E-02	9.36E-02
Isopropyl Alcohol	6.03E+00	8.88E-02	1.65E-01
Methyl Alcohol	9.64E+00	1.42E-01	2.64E-01
Methyl Ethyl Ketone	7.23E+00	1.07E-01	1.98E-01
Methylene Chloride	5.11E-01	7.53E-03	1.40E-02
Perchloroethylene	6.07E-01	8.94E-03	1.66E-02
Styrene	3.65E-01	5.38E-03	1.00E-02
Toluene	9.24E+00	1.36E-01	2.53E-01
1,1,1 Trichloroethane	6.69E-03	9.85E-05	1.83E-04
Vinyl Chloride	3.45E-02	5.08E-04	9.44E-04
Xylenes (o, m, & p)	4.79E+00	7.06E-02	1.31E-01
Formaldehyde		2.57E-02	4.78E-02
Hydrogen Chloride		1.48E+00	2.75E+00
Hydrogen Fluoride		1.11E-01	2.061E-01

Chronic non-cancer impacts are based on the maximum annual emission increases (maximum proposed annual emissions minus baseline annual emissions) for each source in a project. For the landfill, the maximum proposed annual emissions are the same as the maximum hourly emissions determined above for acute impacts multiplied by the maximum possible operating rates (24 hours/day and 365 days/year). Baseline emissions for the landfill are the average of the annual emissions for 2005, 2006, and 2007. Annual emissions for each of these three years are based on the projected landfill gas generation for that year, 25% fugitive emissions, and the baseline average TAC concentrations in Table 2. Maximum annual TAC emission increases for S-2 are shown in Table 3b.

Since both of the flares were initially permitted after 1987, the baseline emissions for these flares are 0 pounds per year for each TAC. Since both flares are permitted to operate continuously, the maximum annual TAC emission increases for each flare are the same as the maximum hourly emissions determined above for acute impacts multiplied by the maximum possible operating rates (24 hours/day and 365 days/year). Maximum annual TAC emissions for A-16 and A-16 are shown in Table 3b.

Table 3b. Maximum Annual Emissions Used for Chronic Non-Cancer Health Impacts

Toxic Air Contaminants	Proposed Emission Increases from S-2 Pounds/Year	Proposed Emissions from A-15 Pounds/Year	Proposed Emissions from A-16 Pounds/Year
Acrylonitrile	6.99E+01	1.03E+00	1.92E+00
Benzene	9.28E+02	1.72E+01	3.20E+01
Carbon Tetrachloride	6.76E+01	9.95E-01	1.85E+00
Chlorobenzene	9.59E+02	1.46E+01	2.71E+01
Chloroethane	2.80E+02	4.17E+00	7.76E+00
Chloroform	5.24E+01	7.72E-01	1.44E+00
1,4 Dichlorobenzene	1.14E+03	2.47E+01	4.60E+01
Ethyl Benzene	1.15E+04	2.06E+02	3.83E+02
Ethylene Dichloride	8.69E+01	1.28E+00	2.38E+00
Hexane	1.31E+03	2.23E+01	4.15E+01
Hydrogen Sulfide	1.87E+04	4.41E+02	8.20E+02
Isopropyl Alcohol	4.38E+04	7.78E+02	1.45E+03
Methyl Alcohol	7.32E+04	1.24E+03	2.31E+03
Methylene Chloride	3.75E+03	6.59E+01	1.23E+02
Perchloroethylene	4.52E+03	7.83E+01	1.46E+02
Styrene	2.29E+03	4.72E+01	8.77E+01
Toluene	6.94E+04	1.19E+03	2.22E+03
1,1,1 Trichloroethane	5.86E+01	8.63E-01	1.61E+00
Trichloroethylene	8.04E+02	1.36E+01	2.53E+01
Vinylidene Chloride	8.51E+01	1.25E+00	2.33E+00
Xylenes (o, m, & p)	3.55E+04	6.18E+02	1.15E+03
Formaldehyde		7.83E+01	4.19E+02
Hydrogen Chloride		5.24E+02	2.41E+04
Hydrogen Fluoride		1.30E+04	1.81E+03

For cancer risk impacts, the District takes into consideration the variable annual gas generation rate profile for landfills and the cancer risk evaluation procedures, which estimate risk over a lifetime (70 years) of exposure. Instead of calculating cancerous compound emissions based on the peak gas generation rate (which will occur during one year only throughput the lifetime of the landfill), the District determines a 70-year average of the projected gas generation rates for each year that the landfill has emissions. The peak of these 70-year average landfill gas generation rates is used to determine a maximum 70-year average emission rate for the proposed landfill. Baseline 70-year average emissions are determined in a similar fashion. The difference between these proposed and baseline TAC emission rates is equal to the 70-year average emission increases for S-2. Since the flares are permitted to operate continuously, the cancer risk for the flares will be evaluated based on the maximum permitted annual emission rates for the flares (the same as the annual emission rates for chronic non-cancer impacts). The emission increases used for determining cancer risk impacts are summarized in Table 3c.

Table 3c. Maximum Annual Emissions Used for Cancer Risk Health Impacts

Toxic Air Contaminants	Proposed 70-Year Average Emission Increases from S-2 Pounds/Year	Proposed Emissions from A-15 Pounds/Year	Proposed Emissions from A-16 Pounds/Year
Acrylonitrile	5.24E+01	1.03E+00	1.92E+00
Benzene	8.29E+02	1.72E+01	3.20E+01
Benzyl Chloride	2.08E+02	4.10E+00	7.62E+00
Carbon Tetrachloride	5.07E+01	9.95E-01	1.85E+00
Chloroform	3.93E+01	7.72E-01	1.44E+00
1,4 Dichlorobenzene	1.16E+03	2.47E+01	4.60E+01
Ethyl Benzene	1.00E+04	2.06E+02	3.83E+02
Ethylene Dichloride	6.52E+01	1.28E+00	2.38E+00
Ethylidene Dichloride	4.49E+02	8.96E+00	1.67E+01
Methylene Chloride	3.22E+03	6.59E+01	1.23E+02
Perchloroethylene	3.83E+03	7.83E+01	1.46E+02
1,1,2,2 Tetrachloroethane	2.21E+02	4.34E+00	8.08E+00
Trichloroethylene	6.70E+02	1.36E+01	2.53E+01
Vinyl Chloride	2.21E+02	4.45E+00	8.27E+00
Formaldehyde		7.83E+01	4.19E+02

Input Factors for Air Dispersion Model

The emission rates in Tables 3a-c were modified using the corresponding health impact calculation procedures to generate input factors for the air dispersion modeling program. When these input factors are used for the source emission rates (g/s for A-15 and A-16 or g/s-m^2 for S-2), the results reported by the model will show the health impact for each case being evaluated. The input factor calculation procedures are discussed below for each type of health impact. Detailed calculations are presented in the attached spreadsheets. The input factors are summarized in Table 4.

Table 4. Summary of ISCST3 Input Factors

Adjusted Emission Rate Input Factors	S-2 Altamont Landfill	A-15 Flare	A-16 Flare
Acute Non-Cancer (Resident & Worker Impacts)	5.6911 E-9	3.3926 E-4	6.3091 E-4
Chronic Non-Cancer (Resident Impacts)	1.7322 E-9	2.2663 E-3	4.2145 E-3
Chronic Non-Cancer (Worker Impacts)	4.0417 E-10	5.2879 E-4	9.8338 E-4
Cancer Risk (Resident Impacts)	1.1549 E-7	6.3920 E-3	1.1887 E-2
Cancer Risk (Worker Impacts)	2.2792 E-8	1.2615 E-3	2.3459 E-3

Acute Input Factor:
For acute non-cancer impacts, the averaging time for the dispersion model concentration result (maximum 1 hour average) is the same as the evaluation period (1 hour average) for the acute REL. Therefore, no conversion factors are necessary for concentration averaging time. Since the exposure period (1 hour) for both worker and residential receptors is the same as the source operating time (1 hour), no exposure adjustment factors are necessary.

The acute input factor for each set of hourly emission rates in Table 3a was determined using the following equations:

Acute Input Factor for Flares (adjusted g/s) = Σ Acute Weighted Emission Rate, g/s

Acute Input Factor for Fugitive Landfill Emissions (adjusted g/s-m^2) =
Σ Acute Weighted Emission Rate, g/s / Landfill Surface Area, m^2

The Σ acute weighted emission rate is the sum of the individual acute weighted emission rates for all individual compounds that have an acute REL. The acute weighted emission rate for each compound is determined from the Table 3a hourly emission rate for that compound as follows:

Acute Weighted Emission Rate, g/s = (Emission Rate, pounds/hour)/(Acute REL)*
(453.59237 grams/pound)/(3600 seconds/hour)

Since the landfill is an area source, all landfill emission rates must be entered in the air dispersion model as an emission rate flux per unit of surface area (g/s-m^2). This flux was determined by dividing the sum of the acute weighted emission rates by the corresponding surface area (1,881,300 m^2 for the proposed total landfill).

Chronic Input Factor:
For chronic non-cancer impacts, a factor of 0.1 is included with the input factor calculations to convert the model result's 1-hr average concentration to an annual average concentration. The following exposure adjustment factors (EAF) are also required for chronic non-cancer health impact calculations concerning these continuously operating sources:

Resident (exposure vs. operating time):
(24 hrs/day / 24 hrs/day)*(7 days/wk / 7 days/wk)*(50 weeks/yr / 52 weeks/yr) = 0.9615
Worker (exposure vs. operating time):
(8 hrs/day / 24 hrs/day)*(5 days/wk / 7 days/wk)*(49 weeks/yr / 52 weeks/yr) = 0.2244

The chronic input factor for each set of annual emission rates in Table 3b was determined using the following equations:

Chronic Input Factor for Flares, Impacts to Residents (adjusted g/s)
= (0.1)*(0.9615)*(Σ Chronic Weighted Emission Rate, g/s)
Chronic Input Factor for Flares, Impacts to Workers (adjusted g/s)
= (0.1)*(0.2244)*(Σ Chronic Weighted Emission Rate, g/s)

Chronic Input Factor for Fugitive Landfill Emissions, Impacts to Residents (adjusted g/s-m^2)
= (0.1)*(0.9615)*(Σ Chronic Weighted Emission Rate, g/s)/(Landfill Surface Area, m^2)
Chronic Input Factor for Fugitive Landfill Emissions, Impacts to Workers (adjusted g/s-m^2)
= (0.1)*(0.2244)*(Σ Chronic Weighted Emission Rate, g/s)/(Landfill Surface Area, m^2)

The Σ Chronic Weighted Emission Rate is the sum of the individual chronic weighted emission rates for all individual compounds that have a chronic REL. The chronic weighted emission rate for each compound is determined from the Table 3b annual emission rate for that compound as follows:

Chronic Weighted Emission Rate, g/s = (Emission Rate, pounds/year)/(Chronic REL)* (453.59237 grams/pound)/(365 days/year)/(24 hours/day)/(3600 seconds/hour)

As discussed above for the acute input factor, the chronic weighted emission rate is divided by the surface area of the landfill to obtain the emission rate flux (g/s-m^2) that is required for the air dispersion model area source input for the landfill.

Cancer Risk Input Factor:
For cancer risk impacts, the health impact calculations are based on cancer potency factors for individual compounds with units of $(mg/kg\text{-}day)^{-1}$. The calculations include receptor breathing rates (L/kg-day), a factor of 1E-6 (mg-m^3/μg-L) to convert the dispersion model air concentration results (μg/m^3) to the dosage units of mg/L, and lifetime exposure adjustment factors for different receptor types. A factor of 0.1 converts dispersion model concentration results from a 1-hour average to an annual average concentration. A factor of 1E6 is also included so that the dispersion model results will report the health impact as risk per million.

Resident:
(302 L/kg-day)*(1E-6 mg-m^3/μg-L)*(24 hrs/day / 24 hrs/day)*(7 days/wk / 7 days/wk)*(50 wks/yr / 52 wks/yr)*(70 yrs / 70 yrs)*(0.1 μg/m^3 – ann avg / μg/m^3 1-hr avg)*(1E6 risk per million)
= (3.02E-4)*(1)*(1)*(0.9615)*(1)*(1E5) = 29.04 mg/kg-day
Worker:
(447 L/kg-day)*(1E-6 mg-m^3/μg-L)*(8 hrs/day / 24 hrs/day)*(5 days/wk / 7 days/wk)*(49 wks/yr / 52 wks/yr)*(40 yrs / 70 yrs) *(0.1 μg/m^3 – ann avg / μg/m^3 1-hr avg)*(1E6 risk per million)
= (4.47E-4)*(0.3333)*(0.7143)*(0.9423)*(0.5714)*(1E5) = 5.73 mg/kg-day

The cancer risk input factor for each set of annual emission rates in Table 3c was determined using the following equations:

Cancer Risk Input Factor for Flares, Impacts to Residents (adjusted g/s)
= (29.04)*(Σ Cancer Risk Weighted Emission Rate)
Cancer Risk Input Factor for Flares, Impacts to Workers (adjusted g/s)
= (5.73)*(Σ Cancer Risk Weighted Emission Rate)

Cancer Risk Input Factor for Fugitive Landfill Emissions, Residents (adjusted g/s-m^2)
= (29.04)*(Σ Cancer Risk Weighted Emission Rate)/(Landfill Surface Area)
Cancer Risk Input Factor for Fugitive Landfill Emissions, Workers (adjusted g/s-m^2)
= (5.73)*(Σ Cancer Risk Weighted Emission Rate)/(Landfill Surface Area)

The Σ cancer risk weighted emission rate is the sum of the individual cancer risk weighted emission rates for all individual compounds that have a cancer potency factor. The cancer risk weighted emission rate for each compound is determined from the Table 3c annual emission rate for that compound as follows:

Cancer Risk Weighted Emission Rate, g/s per mg/kg-day =
(Emission Rate, pounds/year)*(Cancer Potency Factor, $(mg/kg\text{-}day)^{-1}$)*
(453.59237 grams/pound)/(365 days/year)/(24 hours/day)/(3600 seconds/hour)

As discussed above for the acute and chronic input factors, modeling the landfill area source requires the input factor be expressed as an emission rate flux ($g/s\text{-}m^2$). Consequently, the cancer risk weighted emission rates for S-2 are divided by the landfill surface area.

Modeling Procedures

The ISCST3 air dispersion computer model was used to estimate 1-hour average ambient air concentrations. The only appropriate meteorological data set for this site is SCREEN3. The model was run with SCREEN3 for all cases except one. To evaluate acute impacts to workers (other than Waste Management employees) that may be present on Waste Management's property (at the windmills, for example), SCREEN3-daytime was used, because these on-site non-Waste Management workers will only be on-site during day time hours. However, acute impacts were higher for off-site receptors. Emission rate scalars were not used. The model was run with the following terrain data: Altamont, Byron Hot Springs, Clifton Court Forebay, and Midway. Model runs were made with rural dispersion coefficients. Urban dispersion coefficients are not appropriate for this location.

Health Impacts

Estimates of residential risk assume potential exposure to annual average TAC concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for off-site workers (and on-site non Waste Management employees) assume potential exposure occurs 8 hours per day, 245 day per year, for 40 years. Risk estimates for students were not determined, because this site is not located within 1000 feet of a school. The estimated health risks for this project and for each source in this project are presented in Table 1 and in the attached spreadsheets.

Summary of ISCST3 Input Factors

	Fill Area 1	Fill Area 2	Total Proposed	Total Increases	Total Avg. Cncn.	A-15 Flare	A-16 Flare	S-6 or S-7 Turbine	S-23 or S-24 Engine
Acute Emissions (Resident & Worker Impacts)	4.2507E-09	6.6571E-09	5.6911E-09	Not Applicable		3.3926E-04	6.3091E-04	2.4437E-04	3.7865E-04
Chronic Emissions (Resident Impacts)	1.8115E-09	3.0674E-09	2.6223E-09	1.7322E-09		2.2663E-03	4.2145E-03	6.9409E-04	5.2745E-04
Chronic Emissions (Worker Impacts)	4.2268E-10	7.1574E-10	6.1186E-10	4.0417E-10		5.2879E-04	9.8338E-04	1.6195E-04	1.2307E-04
Cancer Emissions (Resident Impacts)	8.1927E-09	1.9970E-09	1.1951E-07	1.1549E-07	3.1503E-08	6.3920E-03	1.1887E-02	4.3098E-03	1.1657E-02
Cancer Emissions (Worker Impacts)	1.6168E-09	3.9412E-10	2.3586E-08	2.2792E-08	6.2172E-09	1.2615E-03	2.3459E-03	8.5055E-04	2.3006E-03

HRSA Results for Proposed Altamont Landfill Expansion

			Project Risks		Source Risks for this Project				Potential Max Risk in Future	
Health Impact Type	Receptor	Meteorological Data Set	Project Risk (due to increases at S-2 plus A-15 & A-16)	Proposed Total S-2 Plus A-15 and A-16 Flares	S-2 Total Proposed	S-2 Emission Increases	A-15	A-16	At Proposed Total Emissions from S-2 (after 2038)	Proposed Total: S-2, S-5, S-6, S-23, S-24, A-15, and A-16
Acute HI (Off-Site)	Resident or Worker	SCREEN3	NA	0.90	0.90	NA	0.003	0.036	0.90	0.90
Acute HI (On-Site)	Worker	SCREEN3daytime	NA	0.71	0.71	NA	0.001	0.007	0.71	0.71
Chronic HI	Resident	SCREEN3	0.15	NA	NA	0.15	0.005	0.021	0.23	0.23
Chronic HI	Worker	SCREEN3	0.06	NA	NA	0.06	0.005	0.056	0.10	0.11
Cancer Risk	Resident	SCREEN3	9.96	NA	NA	9.96	0.014	0.058	10.31	10.31
Cancer Risk	Worker	SCREEN3	3.60	NA	NA	3.60	0.011	0.133	3.72	3.72

TAC Limits for Altamont Landfill Gas	Current LFG Concentration Limit	Baseline Average (ND=0)	Overall Average (ND=0)	Maximum Detected	Concentration Limit for Proposed Landfill
	PPBV	PPBV	PPBV	PPBV	PPBV
Acrylonitrile	500	0	275	275	300
Benzene	3300	1285	1540	2884	3400
Benzylchloride	600	0	209	364	500
Carbon Tetrachloride		0	18	18	100
Chlorobenzene		112	314	903	2000
Chlorodifluoromethane		385	744	1567	3000
Chloroethane		25	149	270	1000
Chlorofluorocarbons (other than CHClF2&TCA)		2075	2709	4682	6000
Chloroform		0	15	15	100
1,4 Dichlorobenzene	1100	1550	908	2193	2600
Ethyl Benzene		9690	9655	26876	30000
Ethylene Dibromide	300	0	0	0	0
Ethylene Dichloride	250	0	120	138	200
Ethylidene Dichloride	1200	153	513	1158	1400
Hexane		993	1339	2395	4000
Hydrogen Sulfide *	150000	139604	143341	192402	200000
Isopropyl Alcohol		63413	63048	113267	200000
Methyl Alcohol		147894	147894	341667	600000
Methyl Ethyl Ketone		47164	46266	93700	200000
Methylene Chloride	2500	3603	2688	10254	12000
Methyl tert-Butyl Ether		0	0	0	0
Perchloroethylene	2400	2034	1569	6316	7300
1,1,2,2 Tetrachloroethane		0	338	338	400
Styrene		3705	2721	4044	7000
Toluene		52618	49856	134800	200000
1,1,1 Trichloroethane		0	33	50	100
Trichloroethylene		382	583	1352	1600
Vinyl Chloride	1100	183	439	896	1100
Vinylidene Chloride		0	83	83	200
Xylenes (o, m, & p)		25787	26126	71015	90000

OEHHA Health Effects Values			BAAQMD Regulation 2-5		
Acute REL $\mu g/m^3$	Chronic REL $\mu g/m^3$	Chronic CPF $(mg/kg\text{-}day)^{-1}$	Risk Screen Trigger Levels Acute Pounds/Hour	Risk Screen trigger Levels Chronic Pounds/Year	Molecular Weight Lbs/Lb-mol
NA	5.0E+00	1.0E+00	NA	6.4E-01	53.06
1.3E+03	6.0E+01	1.0E-01	2.9E+00	6.4E+00	78.11
2.4E+02	NCR	1.7E-01	5.3E-01	3.8E+00	126.58
1.9E+03	4.0E+01	1.5E-01	4.2E+00	4.3E+00	153.82
NA	1.0E+03	NC	NA	3.9E+04	112.56
NA	NCR	NC	NA	1.9E+06	86.47
NA	3.0E+04	NC	NA	1.2E+06	64.51
NA	NCR	NC	NA	2.7E+04	122.50
1.5E+02	3.0E+02	1.9E-02	3.3E-01	3.4E+01	119.38
NA	8.0E+02	4.0E-02	NA	1.6E+01	147.00
NA	2.0E+03	8.7E-03	NA	7.7E+04	106.17
NA	8.0E-01	2.5E-01	NA	2.6E+00	187.86
NA	4.0E+02	7.2E-02	NA	8.9E+00	98.96
NA	NCR	5.7E-03	NA	1.1E+02	98.96
NA	7.0E+03	NC	NA	2.7E+05	86.18
4.2E+01	1.0E+01	NC	9.3E-02	3.9E+02	34.08
3.2E+03	7.0E+03	NC	7.1E+00	2.7E+05	60.10
2.8E+04	4.0E+03	NC	6.2E+01	1.5E+05	32.04
1.3E+04	NCR	NC	2.9E+01	3.9E+04	72.11
1.4E+04	4.0E+02	3.5E-03	3.1E+01	1.8E+02	84.93
NA	8.0E+03	1.8E-03	NA	3.6E+02	88.15
2.0E+04	3.5E+01	2.1E-02	4.4E+01	3.0E+01	165.83
NA	NCR	2.0E-01	NA	3.2E+02	167.85
2.1E+04	9.0E+02	NC	4.6E+01	3.5E+04	104.15
3.7E+04	3.0E+02	NC	8.2E+01	1.2E+04	92.14
6.8E+04	1.0E+03	NC	1.5E+02	3.9E+04	133.40
NA	6.0E+02	7.0E-03	NA	9.1E+01	131.39
1.8E+05	NCR	2.7E-01	4.0E+02	2.4E+00	62.50
NA	7.0E+01	NC	NA	2.7E+03	96.94
2.2E+04	7.0E+02	NC	4.9E+01	2.7E+04	106.17

Determination of Acute (Non-Cancer) Emission Rates

Toxic Air Contaminants	Molecular Weight	Baseline FA 1 Average Concentration	Baseline Acute Generation Rate for FA 1	Collection System Efficiency	Baseline Acute FA 1 Emissions	Proposed Concentration Levels	Proposed Acute Generation Rate	Collection System Efficiency	Proposed Acute Emissions for Fill Areas 1&2	Acute Emissions for Comparison	Trigger Level for Acute HRSA	Emissions > Trigger ?
	Lbs/Lb-mol	PPBV	CFM		Pounds/Hour	PPBV	CFM		Pounds/Hour	Pounds/Hour	Pounds/Hour	
Acrylonitrile	53.063	0	6974	75%	0.00E+00	300	12926	75%	7.98E-03	7.98E-03	NA	NA
Benzene	78.112	1285	6974	75%	2.72E-02	3400	12926	75%	1.33E-01	1.33E-01	2.9E+00	no
Benzylchloride	126.583	0	6974	75%	0.00E+00	500	12926	75%	3.17E-02	3.17E-02	5.3E-01	no
Carbon Tetrachloride	153.822	0	6974	75%	0.00E+00	100	12926	75%	7.71E-03	7.71E-03	4.2E+00	no
Chlorobenzene	112.557	112	6974	75%	3.41E-03	2000	12926	75%	1.13E-01	1.13E-01	NA	NA
Chlorodifluoromethane	86.468	385	6974	75%	9.01E-03	3000	12926	75%	1.30E-01	1.30E-01	NA	NA
Chloroethane	64.514	25	6974	75%	4.32E-04	1000	12926	75%	3.23E-02	3.23E-02	NA	NA
Chlorofluorocarbons	122.500	2075	6974	75%	6.87E-02	6000	12926	75%	3.68E-01	3.68E-01	NA	no
Chloroform	119.377	0	6974	75%	0.00E+00	100	12926	75%	5.98E-03	5.98E-03	3.3E-01	no
1,4 Dichlorobenzene	147.001	1550	6974	75%	6.16E-02	2600	12926	75%	1.92E-01	1.92E-01	NA	NA
Ethyl Benzene	106.165	9690	6974	75%	2.78E-01	30000	12926	75%	1.60E+00	1.60E+00	NA	NA
Ethylene Dibromide	187.861	0	6974	75%	0.00E+00	0	12926	75%	0.00E+00	0.00E+00	NA	NA
Ethylene Dichloride	98.959	0	6974	75%	0.00E+00	200	12926	75%	9.92E-03	9.92E-03	NA	NA
Ethylidene Dichloride	98.959	153	6974	75%	4.11E-03	1400	12926	75%	6.95E-02	6.95E-02	NA	NA
Hexane	86.175	993	6974	75%	2.31E-02	4000	12926	75%	1.73E-01	1.73E-01	NA	NA
Hydrogen Sulfide	34.082	139604	6974	75%	1.29E+00	200000	12926	75%	3.42E+00	3.42E+00	9.3E-02	YES
Isopropyl Alcohol	60.095	63413	6974	75%	1.03E+00	200000	12926	75%	6.03E+00	6.03E+00	7.1E+00	no
Methyl Alcohol	32.042	147894	6974	75%	1.28E+00	600000	12926	75%	9.64E+00	9.64E+00	6.2E+01	no
Methyl Ethyl Ketone	72.106	47164	6974	75%	9.20E-01	200000	12926	75%	7.23E+00	7.23E+00	2.9E+01	no
Methylene Chloride	84.932	3603	6974	75%	8.28E-02	12000	12926	75%	5.11E-01	5.11E-01	3.1E+01	no
Methyl tert-Butyl Ether	88.148	0	6974	75%	0.00E+00	0	12926	75%	0.00E+00	0.00E+00	NA	NA
Perchloroethylene	165.832	2034	6974	75%	9.12E-02	7300	12926	75%	6.07E-01	6.07E-01	4.4E+01	no
1,1,2,2 Tetrachloroethane	167.848	0	6974	75%	0.00E+00	400	12926	75%	3.37E-02	3.37E-02	NA	NA
Styrene	104.149	3705	6974	75%	1.04E-01	7000	12926	75%	3.65E-01	3.65E-01	4.6E+01	no
Toluene	92.138	52618	6974	75%	1.31E+00	200000	12926	75%	9.24E+00	9.24E+00	8.2E+01	no
1,1,1 Trichloroethane	133.403	0	6974	75%	0.00E+00	100	12926	75%	6.69E-03	6.69E-03	1.5E+02	no
Trichloroethylene	131.387	382	6974	75%	1.36E-02	1600	12926	75%	1.05E-01	1.05E-01	NA	NA
Vinyl Chloride	62.498	183	6974	75%	3.10E-03	1100	12926	75%	3.45E-02	3.45E-02	4.0E+02	no
Vinylidene Chloride	96.943	0	6974	75%	0.00E+00	200	12926	75%	9.72E-03	9.72E-03	NA	NA
Xylenes (o, m, & p)	106.165	25787	6974	75%	7.40E-01	90000	12926	75%	4.79E+00	4.79E+00	4.9E+01	no

Proposed Concentration Levels	Proposed Acute Generation Rate (FA 2)	Collection System Efficiency	Proposed Acute Emissions for Fill Area 2
PPBV	CFM		Pounds/Hour
300	7691	75%	4.75E-03
3400	7691	75%	7.92E-02
500	7691	75%	1.89E-02
100	7691	75%	4.59E-03
2000	7691	75%	6.71E-02
3000	7691	75%	7.74E-02
1000	7691	75%	1.92E-02
6000	7691	75%	2.19E-01
100	7691	75%	3.56E-03
2600	7691	75%	1.14E-01
30000	7691	75%	9.50E-01
0	7691	75%	0.00E+00
200	7691	75%	5.90E-03
1400	7691	75%	4.13E-02
4000	7691	75%	1.03E-01
200000	7691	75%	2.03E+00
200000	7691	75%	3.58E+00
600000	7691	75%	5.73E+00
200000	7691	75%	4.30E+00
12000	7691	75%	3.04E-01
0	7691	75%	0.00E+00
7300	7691	75%	3.61E-01
400	7691	75%	2.00E-02
7000	7691	75%	2.17E-01
200000	7691	75%	5.50E+00
100	7691	75%	3.98E-03
1600	7691	75%	6.27E-02
1100	7691	75%	2.05E-02
200	7691	75%	5.78E-03
90000	7691	75%	2.85E+00

Determination of Chronic (Non-Cancer) Emission Rates

Toxic Air Contaminants	Molecular Weight	Baseline FA 1 Average Concentration	Baseline Chronic Generation Rate for FA 1	Collection System Efficiency	Baseline Chronic FA 1 Emissions	Proposed Concentration Levels	Proposed Chronic Generation Rate	Collection System Efficiency	Proposed Chronic Emissions for Fil Areas 1&2	Chronic Emission Increases for Expansion	Trigger Level for Chronic HRSA	Emissions > Trigger ?
	Lbs/Lb-mol	PPBV	Ft^3/Year		Pounds/Year	PPBV	Ft^3/Year		Pounds/Year	Pounds/Year	Pounds/Year	
Acrylonitrile	53.063	0	3665572697	75%	0.00E+00	300	6793931054	75%	6.99E+01	6.99E+01	6.4E-01	YES
Benzene	78.112	1285	3665572697	75%	2.38E+02	3400	6793931054	75%	1.17E+03	9.28E+02	6.4E+00	YES
Benzylchloride	126.583	0	3665572697	75%	0.00E+00	500	6793931054	75%	2.78E+02	2.78E+02	3.8E+00	YES
Carbon Tetrachloride	153.822	0	3665572697	75%	0.00E+00	100	6793931054	75%	6.76E+01	6.76E+01	4.3E+00	YES
Chlorobenzene	112.557	112	3665572697	75%	2.99E+01	2000	6793931054	75%	9.89E+02	9.59E+02	3.9E+04	no
Chlorodifluoromethane	86.468	385	3665572697	75%	7.90E+01	3000	6793931054	75%	1.14E+03	1.06E+03	1.9E+06	no
Chloroethane	64.514	25	3665572697	75%	3.78E+00	1000	6793931054	75%	2.83E+02	2.80E+02	1.2E+06	no
Chlorofluorocarbons	122.500	2075	3665572697	75%	6.02E+02	6000	6793931054	75%	3.23E+03	2.63E+03	2.7E+04	no
Chloroform	119.377	0	3665572697	75%	0.00E+00	100	6793931054	75%	5.24E+01	5.24E+01	3.4E+01	YES
1,4 Dichlorobenzene	147.001	1550	3665572697	75%	5.40E+02	2600	6793931054	75%	1.68E+03	1.14E+03	1.6E+01	YES
Ethyl Benzene	106.165	9690	3665572697	75%	2.44E+03	30000	6793931054	75%	1.40E+04	1.15E+04	7.7E+04	no
Ethylene Dibromide	187.861	0	3665572697	75%	0.00E+00	0	6793931054	75%	0.00E+00	0.00E+00	2.6E+00	no
Ethylene Dichloride	98.959	0	3665572697	75%	0.00E+00	200	6793931054	75%	8.69E+01	8.69E+01	8.9E+00	YES
Ethylidene Dichloride	98.959	153	3665572697	75%	3.60E+01	1400	6793931054	75%	6.08E+02	5.72E+02	1.1E+02	YES
Hexane	86.175	993	3665572697	75%	2.03E+02	4000	6793931054	75%	1.51E+03	1.31E+03	2.7E+05	no
Hydrogen Sulfide	34.082	139604	3665572697	75%	1.13E+04	200000	6793931054	75%	2.99E+04	1.87E+04	3.9E+02	YES
Isopropyl Alcohol	60.095	63413	3665572697	75%	9.03E+03	200000	6793931054	75%	5.28E+04	4.38E+04	2.7E+05	no
Methyl Alcohol	32.042	147894	3665572697	75%	1.12E+04	600000	6793931054	75%	8.44E+04	7.32E+04	1.5E+05	no
Methyl Ethyl Ketone	72.106	47164	3665572697	75%	8.06E+03	200000	6793931054	75%	6.33E+04	5.53E+04	3.9E+04	YES
Methylene Chloride	84.932	3603	3665572697	75%	7.25E+02	12000	6793931054	75%	4.48E+03	3.75E+03	1.8E+02	YES
Methyl tert-Butyl Ether	88.148	0	3665572697	75%	0.00E+00	0	6793931054	75%	0.00E+00	0.00E+00	3.6E+02	no
Perchloroethylene	165.832	2034	3665572697	75%	7.99E+02	7300	6793931054	75%	5.32E+03	4.52E+03	3.0E+01	YES
1,1,2,2 Tetrachloroethane	167.848	0	3665572697	75%	0.00E+00	400	6793931054	75%	2.95E+02	2.95E+02	3.2E+02	no
Styrene	104.149	3705	3665572697	75%	9.14E+02	7000	6793931054	75%	3.20E+03	2.29E+03	3.5E+04	no
Toluene	92.138	52618	3665572697	75%	1.15E+04	200000	6793931054	75%	8.09E+04	6.94E+04	1.2E+04	YES
1,1,1 Trichloroethane	133.403	0	3665572697	75%	0.00E+00	100	6793931054	75%	5.86E+01	5.86E+01	3.9E+04	no
Trichloroethylene	131.387	382	3665572697	75%	1.19E+02	1600	6793931054	75%	9.23E+02	8.04E+02	9.1E+01	YES
Vinyl Chloride	62.498	183	3665572697	75%	2.72E+01	1100	6793931054	75%	3.02E+02	2.75E+02	2.4E+00	YES
Vinylidene Chloride	96.943	0	3665572697	75%	0.00E+00	200	6793931054	75%	8.51E+01	8.51E+01	2.7E+03	no
Xylenes (o, m, & p)	106.165	25787	3665572697	75%	6.49E+03	90000	6793931054	75%	4.20E+04	3.55E+04	2.7E+04	YES
										3.29E+05		

Proposed Concentration Levels	Fill Area 2 Only - Chronic Generation Rate	Collection System Efficiency	Proposed Chronic Emissions for Fill Area 2
PPBV	Ft^3/Year		Pounds/Year
300	4042240883	75%	4.16E+01
3400	4042240883	75%	6.94E+02
500	4042240883	75%	1.65E+02
100	4042240883	75%	4.02E+01
2000	4042240883	75%	5.88E+02
3000	4042240883	75%	6.78E+02
1000	4042240883	75%	1.69E+02
6000	4042240883	75%	1.92E+03
100	4042240883	75%	3.12E+01
2600	4042240883	75%	9.99E+02
30000	4042240883	75%	8.32E+03
0	4042240883	75%	0.00E+00
200	4042240883	75%	5.17E+01
1400	4042240883	75%	3.62E+02
4000	4042240883	75%	9.01E+02
200000	4042240883	75%	1.78E+04
200000	4042240883	75%	3.14E+04
600000	4042240883	75%	5.02E+04
200000	4042240883	75%	3.77E+04
12000	4042240883	75%	2.66E+03
0	4042240883	75%	0.00E+00
7300	4042240883	75%	3.16E+03
400	4042240883	75%	1.75E+02
7000	4042240883	75%	1.90E+03
200000	4042240883	75%	4.81E+04
100	4042240883	75%	3.49E+01
1600	4042240883	75%	5.49E+02
1100	4042240883	75%	1.80E+02
200	4042240883	75%	5.07E+01
90000	4042240883	75%	2.50E+04

Determination of 70-Year Average Chronic Emission Rates (for Cancer Risk Calculations Only):

Toxic Air Contaminants	Molecular Weight	Baseline FA 1 Average Concentration	Baseline 70-Yr Avg Generation Rate for FA 1	Collection System Efficiency	Baseline 70-Yr Avg FA 1 Emissions	Proposed Concentration Levels	Proposed Total 70-Yr Avg Generation Rate	Collection System Efficiency	Proposed 70-Yr Avg Emissions	70-Yr Avg Emission Increases	Trigger Level for Chronic HRSA	Emissions > Trigger ?
	Lbs/Lb-mol	PPBV	Ft^3/Year		Pounds/Year	PPBV	Ft^3/Year		Pounds/Year	Pounds/Year	Pounds/Year	
Acrylonitrile	53.063	0	704979097	75%	0.00E+00	300	5095788705	75%	5.24E+01	5.24E+01	6.4E-01	YES
Benzene	78.112	1285	704979097	75%	4.57E+01	3400	5095788705	75%	8.75E+02	8.29E+02	6.4E+00	YES
Benzylchloride	126.583	0	704979097	75%	0.00E+00	500	5095788705	75%	2.08E+02	2.08E+02	3.8E+00	YES
Carbon Tetrachloride	153.822	0	704979097	75%	0.00E+00	100	5095788705	75%	5.07E+01	5.07E+01	4.3E+00	YES
Chlorobenzene	112.557	112	704979097	75%	5.74E+00	2000	5095788705	75%	7.41E+02	7.36E+02	3.9E+04	no
Chlorodifluoromethane	86.468	385	704979097	75%	1.52E+01	3000	5095788705	75%	8.54E+02	8.39E+02	1.9E+06	no
Chloroethane	64.514	25	704979097	75%	7.27E-01	1000	5095788705	75%	2.12E+02	2.12E+02	1.2E+06	no
Chlorofluorocarbons	122.500	2075	704979097	75%	1.16E+02	6000	5095788705	75%	2.42E+03	2.31E+03	2.7E+04	no
Chloroform	119.377	0	704979097	75%	0.00E+00	100	5095788705	75%	3.93E+01	3.93E+01	3.4E+01	YES
1,4 Dichlorobenzene	147.001	1550	704979097	75%	1.04E+02	2600	5095788705	75%	1.26E+03	1.16E+03	1.6E+01	YES
Ethyl Benzene	106.165	9690	704979097	75%	4.69E+02	30000	5095788705	75%	1.05E+04	1.00E+04	7.7E+04	no
Ethylene Dibromide	187.861	0	704979097	75%	0.00E+00	0	5095788705	75%	0.00E+00	0.00E+00	2.6E+00	no
Ethylene Dichloride	98.959	0	704979097	75%	0.00E+00	200	5095788705	75%	6.52E+01	6.52E+01	8.9E+00	YES
Ethylidene Dichloride	98.959	153	704979097	75%	6.92E+00	1400	5095788705	75%	4.56E+02	4.49E+02	1.1E+02	YES
Hexane	86.175	993	704979097	75%	3.90E+01	4000	5095788705	75%	1.14E+03	1.10E+03	2.7E+05	no
Hydrogen Sulfide *	34.082	139604	704979097	75%	2.17E+03	200000	5095788705	75%	2.25E+04	2.03E+04	3.9E+02	YES
Isopropyl Alcohol	60.095	63413	704979097	75%	1.74E+03	200000	5095788705	75%	3.96E+04	3.79E+04	2.7E+05	no
Methyl Alcohol	32.042	147894	704979097	75%	2.16E+03	600000	5095788705	75%	6.33E+04	6.12E+04	1.5E+05	no
Methyl Ethyl Ketone	72.106	47164	704979097	75%	1.55E+03	200000	5095788705	75%	4.75E+04	4.60E+04	3.9E+04	YES
Methylene Chloride	84.932	3603	704979097	75%	1.39E+02	12000	5095788705	75%	3.36E+03	3.22E+03	1.8E+02	YES
Methyl tert-Butyl Ether	88.148	0	704979097	75%	0.00E+00	0	5095788705	75%	0.00E+00	0.00E+00	3.6E+02	no
Perchloroethylene	165.832	2034	704979097	75%	1.54E+02	7300	5095788705	75%	3.99E+03	3.83E+03	3.0E+01	YES
1,1,2,2 Tetrachloroethane	167.848	0	704979097	75%	0.00E+00	400	5095788705	75%	2.21E+02	2.21E+02	3.2E+02	no
Styrene	104.149	3705	704979097	75%	1.76E+02	7000	5095788705	75%	2.40E+03	2.23E+03	3.5E+04	no
Toluene	92.138	52618	704979097	75%	2.21E+03	200000	5095788705	75%	6.07E+04	5.85E+04	1.2E+04	YES
1,1,1 Trichloroethane	133.403	0	704979097	75%	0.00E+00	100	5095788705	75%	4.39E+01	4.39E+01	3.9E+04	no
Trichloroethylene	131.387	382	704979097	75%	2.29E+01	1600	5095788705	75%	6.92E+02	6.70E+02	9.1E+01	YES
Vinyl Chloride	62.498	183	704979097	75%	5.23E+00	1100	5095788705	75%	2.26E+02	2.21E+02	2.4E+00	YES
Vinylidene Chloride	96.943	0	704979097	75%	0.00E+00	200	5095788705	75%	6.39E+01	6.39E+01	2.7E+03	no
Xylenes (o, m, & p)	106.165	25787	704979097	75%	1.25E+03	90000	5095788705	75%	3.15E+04	3.02E+04	2.7E+04	YES

Current Average Concentration Levels	Fill Area 1 Maximum 70-Yr Avg Generation Rate	Collection System Efficiency	Average Emissions at Max Gen Rate (AB 2588)
PPBV	Ft^3/Year		Pounds/Year
275	3027076224	75%	2.85E+01
1540	3027076224	75%	2.35E+02
209	3027076224	75%	5.18E+01
18	3027076224	75%	5.46E+00
314	3027076224	75%	6.91E+01
744	3027076224	75%	1.26E+02
149	3027076224	75%	1.88E+01
2709	3027076224	75%	6.49E+02
15	3027076224	75%	3.44E+00
908	3027076224	75%	2.61E+02
9655	3027076224	75%	2.01E+03
0	3027076224	75%	0.00E+00
120	3027076224	75%	2.32E+01
513	3027076224	75%	9.94E+01
1339	3027076224	75%	2.26E+02
143341	3027076224	75%	9.56E+03
63048	3027076224	75%	7.41E+03
147894	3027076224	75%	9.27E+03
46266	3027076224	75%	6.53E+03
2688	3027076224	75%	4.47E+02
0	3027076224	75%	0.00E+00
1569	3027076224	75%	5.09E+02
338	3027076224	75%	1.11E+02
2721	3027076224	75%	5.54E+02
49856	3027076224	75%	8.99E+03
33	3027076224	75%	8.57E+00
583	3027076224	75%	1.50E+02
439	3027076224	75%	5.37E+01
83	3027076224	75%	1.57E+01
26126	3027076224	75%	5.43E+03

Proposed Concentration Levels	70-Yr Avg Generation Rate for Fill Area 2 Alone	Collection System Efficiency	Proposed 70-Yr Avg Emissions from Fill Area 2 Alone
PPBV	Ft^3/Year		Pounds/Year
300	43309866	75%	4.46E-01
3400	43309866	75%	7.43E+00
500	43309866	75%	1.77E+00
100	43309866	75%	4.31E-01
2000	43309866	75%	6.30E+00
3000	43309866	75%	7.26E+00
1000	43309866	75%	1.81E+00
6000	43309866	75%	2.06E+01
100	43309866	75%	3.34E-01
2600	43309866	75%	1.07E+01
30000	43309866	75%	8.92E+01
0	43309866	75%	0.00E+00
200	43309866	75%	5.54E-01
1400	43309866	75%	3.88E+00
4000	43309866	75%	9.65E+00
200000	43309866	75%	1.91E+02
200000	43309866	75%	3.36E+02
600000	43309866	75%	5.38E+02
200000	43309866	75%	4.04E+02
12000	43309866	75%	2.85E+01
0	43309866	75%	0.00E+00
7300	43309866	75%	3.39E+01
400	43309866	75%	1.88E+00
7000	43309866	75%	2.04E+01
200000	43309866	75%	5.16E+02
100	43309866	75%	3.73E-01
1600	43309866	75%	5.89E+00
1100	43309866	75%	1.92E+00
200	43309866	75%	5.43E-01
90000	43309866	75%	2.67E+02

Weighted Acute Non-Carcinogenic Emissions and Pre-Processed ISCST3 Input Factors

Toxic Air Contaminants	Acute REL	Fill Area 1 Baseline Acute Emissions	Fill Area 1 Weighted Average Acute Emissions *	Fill Area 2 Only Acute Emissions	Fill Area 2 Weighted Average Acute Emissions *	Fill Areas 1 & 2 Combined Acute Emissions	Fill Areas 1 & 2 Weighted Average Acute Emissions *		
	µg/m³	Pounds/Hour	Pounds/Hour	Pounds/Hour	Pounds/Hour	Pounds/Hour	Pounds/Hour		
Acrylonitrile	NA	0.00E+00	NA	4.75E-03	NA	7.98E-03	NA		
Benzene	1.3E+03	2.72E-02	2.09E-05	7.92E-02	6.09E-05	1.33E-01	1.02E-04		0.12%
Benzylchloride	2.4E+02	0.00E+00	0.00E+00	1.89E-02	7.87E-05	3.17E-02	1.32E-04		0.16%
Carbon Tetrachloride	1.9E+03	0.00E+00	0.00E+00	4.59E-03	2.41E-06	7.71E-03	4.06E-06		0.00%
Chlorobenzene	NA	3.41E-03	NA	6.71E-02	NA	1.13E-01	NA		
Chlorodifluoromethane	NA	9.01E-03	NA	7.74E-02	NA	1.30E-01	NA		
Chloroethane	NA	4.32E-04	NA	1.92E-02	NA	3.23E-02	NA		
Chlorofluorocarbons	NA	6.87E-02	NA	2.19E-01	NA	3.68E-01	NA		
Chloroform	1.5E+02	0.00E+00	0.00E+00	3.56E-03	2.37E-05	5.98E-03	3.99E-05		0.05%
1,4 Dichlorobenzene	NA	6.16E-02	NA	1.14E-01	NA	1.92E-01	NA		
Ethyl Benzene	NA	2.78E-01	NA	9.50E-01	NA	1.60E+00	NA		
Ethylene Dibromide	NA	0.00E+00	NA	0.00E+00	NA	0.00E+00	NA		
Ethylene Dichloride	NA	0.00E+00	NA	5.90E-03	NA	9.92E-03	NA		
Ethylidene Dichloride	NA	4.11E-03	NA	4.13E-02	NA	6.95E-02	NA		
Hexane	NA	2.31E-02	NA	1.03E-01	NA	1.73E-01	NA		
Hydrogen Sulfide	4.2E+01	1.29E+00	3.06E-02	2.03E+00	4.84E-02	3.42E+00	8.14E-02	first	95.75%
Isopropyl Alcohol	3.2E+03	1.03E+00	3.22E-04	3.58E+00	1.12E-03	6.03E+00	1.88E-03	second	2.22%
Methyl Alcohol	2.8E+04	1.28E+00	4.58E-05	5.73E+00	2.05E-04	9.64E+00	3.44E-04	fourth	0.41%
Methyl Ethyl Ketone	1.3E+04	9.20E-01	7.08E-05	4.30E+00	3.31E-04	7.23E+00	5.56E-04	third	0.65%
Methylene Chloride	1.4E+04	8.28E-02	5.91E-06	3.04E-01	2.17E-05	5.11E-01	3.65E-05		0.04%
Methyl tert-Butyl Ether	NA	0.00E+00	NA	0.00E+00	NA	0.00E+00	NA		
Perchloroethylene	2.0E+04	9.12E-02	4.56E-06	3.61E-01	1.81E-05	6.07E-01	3.03E-05		0.04%
1,1,2,2 Tetrachloroethane	NA	0.00E+00	NA	2.00E-02	NA	3.37E-02	NA		
Styrene	2.1E+04	1.04E-01	4.97E-06	2.17E-01	1.04E-05	3.65E-01	1.74E-05		0.02%
Toluene	3.7E+04	1.31E+00	3.54E-05	5.50E+00	1.49E-04	9.24E+00	2.50E-04	fifth	0.29%
1,1,1 Trichloroethane	6.8E+04	0.00E+00	0.00E+00	3.98E-03	5.85E-08	6.69E-03	9.83E-08		0.00%
Trichloroethylene	NA	1.36E-02	NA	6.27E-02	NA	1.05E-01	NA		
Vinyl Chloride	1.8E+05	3.10E-03	1.72E-08	2.05E-02	1.14E-07	3.45E-02	1.91E-07		0.00%
Vinylidene Chloride	NA	0.00E+00	NA	5.78E-03	NA	9.72E-03	NA		
Xylenes (o, m, & p)	2.2E+04	7.40E-01	3.37E-05	2.85E+00	1.30E-04	4.79E+00	2.18E-04		0.26%

* Weighted Average Acute Emissions = Acute Emissions / Acute REL

	Fill Area 1		Fill Area 2		Total Landfill	
Sum of Weighted Average Acute (non-cancer) Emission Rates	3.1185E-02	lbs/hour	5.0558E-02	lbs/hour	8.4974E-02	lbs/hour
Sum of Weighted Average Acute (non-cancer) Emission Rates	3.9292E-03	g/s	6.3702E-03	g/s	1.0707E-02	g/s
Applicable Surface Area for each Fill Area	924385	m^2	956901	m^2	1881287	m^2
Acute REL Weighted Emission Rate Flux from Area Sources	4.2507E-09	g/s-m^2	6.6571E-09	g/s-m^2	5.6911E-09	g/s-m^2

the ISCST3 Input Factor for Acute Impacts = Acute REL Weighted Emission Rate Flux (for both residents and workers).

Weighted Chronic Non-Carcinogenic Emissions and Pre-Processed ISCST3 Input Factors

Toxic Air Contaminants	Chronic REL	Fill Area 1 Baseline Chronic Emissions	Fill Area 1 Weighted Average Chronic Emissions *	Fill Area 2 Only Chronic Emissions	Fill Area 2 Weighted Average Chronic Emissions *	Fill Areas 1 & 2 Combined Chronic Emissions	Fill Areas 1 & 2 Weighted Average Chronic Emissions *		
	µg/m^3	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year		
Acrylonitrile	5.0E+00	0.00E+00	0.00E+00	4.16E+01	8.32E+00	6.99E+01	1.40E+01		0.39%
Benzene	6.0E+01	2.38E+02	3.96E+00	6.94E+02	1.16E+01	1.17E+03	1.94E+01		0.54%
Benzylchloride	NCR	0.00E+00	NCR	1.65E+02	NCR	2.78E+02	NCR		
Carbon Tetrachloride	4.0E+01	0.00E+00	0.00E+00	4.02E+01	1.00E+00	6.76E+01	1.69E+00		0.05%
Chlorobenzene	1.0E+03	2.99E+01	2.99E-02	5.88E+02	5.88E-01	9.89E+02	9.89E-01		0.03%
Chlorodifluoromethane	NCR	7.90E+01	NCR	6.78E+02	NCR	1.14E+03	NCR		
Chlorofluorocarbons	NCR	3.78E+00	NCR	1.69E+02	NCR	2.83E+02	NCR		
Chloroethane	3.0E+04	3.78E+00	1.26E-04	1.92E+03	6.40E-02	2.83E+02	9.44E-03		0.00%
Chloroform	3.0E+02	0.00E+00	0.00E+00	3.12E+01	1.04E-01	5.24E+01	1.75E-01		0.00%
1,4 Dichlorobenzene	8.0E+02	5.40E+02	6.75E-01	9.99E+02	1.25E+00	1.68E+03	2.10E+00		0.06%
Ethyl Benzene	2.0E+03	2.44E+03	1.22E+00	8.32E+03	4.16E+00	1.40E+04	6.99E+00		0.20%
Ethylene Dibromide	8.0E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00%
Ethylene Dichloride	4.0E+02	0.00E+00	0.00E+00	5.17E+01	1.29E-01	8.69E+01	2.17E-01		0.01%
Ethylidene Dichloride	NCR	3.60E+01	NCR	3.62E+02	NCR	6.08E+02	NCR		
Hexane	7.0E+03	2.03E+02	2.90E-02	9.01E+02	1.29E-01	1.51E+03	2.16E-01		0.01%
Hydrogen Sulfide	1.0E+01	1.13E+04	1.13E+03	1.78E+04	1.78E+03	2.99E+04	2.99E+03	first	83.92%
Isopropyl Alcohol	7.0E+03	9.03E+03	1.29E+00	3.14E+04	4.49E+00	5.28E+04	7.54E+00		0.21%
Methyl Alcohol	4.0E+03	1.12E+04	2.81E+00	5.02E+04	1.26E+01	8.44E+04	2.11E+01	fifth	0.59%
Methyl Ethyl Ketone	NCR	8.06E+03	NCR	3.77E+04	NCR	6.33E+04	NCR		
Methylene Chloride	4.0E+02	7.25E+02	1.81E+00	2.66E+03	6.66E+00	4.48E+03	1.12E+01		0.31%
Methyl tert-Butyl Ether	8.0E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00%
Perchloroethylene	3.5E+01	7.99E+02	2.28E+01	3.16E+03	9.04E+01	5.32E+03	1.52E+02	third	4.26%
1,1,2,2 Tetrachloroethane	NCR	0.00E+00	NCR	1.75E+02	NCR	2.95E+02	NCR		
Styrene	9.0E+02	9.14E+02	1.02E+00	1.90E+03	2.12E+00	3.20E+03	3.56E+00		0.10%
Toluene	3.0E+02	1.15E+04	3.83E+01	4.81E+04	1.60E+02	8.09E+04	2.70E+02	second	7.56%
1,1,1 Trichloroethane	1.0E+03	0.00E+00	0.00E+00	3.49E+01	3.49E-02	5.86E+01	5.86E-02		0.00%
Trichloroethylene	6.0E+02	1.19E+02	1.98E-01	5.49E+02	9.15E-01	9.23E+02	1.54E+00		0.04%
Vinyl Chloride	NCR	2.72E+01	NCR	1.80E+02	NCR	3.02E+02	NCR		
Vinylidene Chloride	7.0E+01	0.00E+00	0.00E+00	5.07E+01	7.24E-01	8.51E+01	1.22E+00		0.03%
Xylenes (o, m, & p)	7.0E+02	6.49E+03	9.27E+00	2.50E+04	3.57E+01	4.20E+04	5.99E+01	fourth	1.68%

* Weighted Average Chronic Emissions = Chronic Emissions / Chronic REL

	Fill Area 1		Fill Area 2		Total Landfill	
Sum of Weighted Average Chronic Non-Cancer Emission Rates	1.2108E+03	lbs/year	2.1224E+03	lbs/year	3.5670E+03	lbs/year
Sum of Weighted Average Chronic Non-Cancer Emission Rates	1.7415E-02	g/s	3.0527E-02	g/s	5.1306E-02	g/s
Applicable Surface Area for each Fill Area	924385	m^2	956901	m^2	1881287	m^2
Chronic REL Weighted Emission Rate Flux from Area Sources	1.8839E-08	g/s-m^2	3.1901E-08	g/s-m^2	2.7272E-08	g/s-m^2

Chronic Exposure Adjustment Factor for Residents and a Continuously Emitting Source = (24/24) * (7/7) * (50/52) = 0.9615
Chronic Exposure Adjustment Factor for Workers and a Continuously Emitting Source = (8/24) * (5/7) * (49/52) = 0.2244
SCREEN3 Conversion Factor (to convert the hourly concentration results from ISCST3 to annual avg. concentrations) = 0.1000

Chronic Non-Cancer ISCST3 Input Factors = Chronic REL Weighted Emission Rate Flux * Exposure Adjustment Factors * Screen3 Conversion Factor

	Fill Area 1		Fill Area 2		Total Landfill	
Chronic NC Input Factors for Residents	1.8115E-09	g/s-m^2	3.0674E-09	g/s-m^2	2.6223E-09	g/s-m^2
Chronic NC Input Factors for Workers	4.2268E-10	g/s-m^2	7.1574E-10	g/s-m^2	6.1186E-10	g/s-m^2

Weighted Chronic Non-Carcinogenic Emissions and Pre-Processed ISCST3 Input Factors

Toxic Air Contaminants	Emission Increases	Wgtd Avg. Increases
	Pounds/Year	Pounds/Year
Acylonitrile	6.99E+01	1.40E+01
Benzene	9.28E+02	1.55E+01
Benzylchloride	2.78E+02	NCR
Carbon Tetrachloride	6.76E+01	1.69E+00
Chlorobenzene	9.59E+02	9.59E-01
Chlorodifluoromethane	1.06E+03	NCR
Chlorofluorocarbons	2.80E+02	NCR
Chloroethane	2.80E+02	9.32E-03
Chloroform	5.24E+01	1.75E-01
1,4 Dichlorobenzene	1.14E+03	1.42E+00
Ethyl Benzene	1.15E+04	5.77E+00
Ethylene Dibromide	0.00E+00	0.00E+00
Ethylene Dichloride	8.69E+01	2.17E-01
Ethylidene Dichloride	5.72E+02	NCR
Hexane	1.31E+03	1.87E-01
Hydrogen Sulfide	1.87E+04	1.87E+03
Isopropyl Alcohol	4.38E+04	6.25E+00
Methyl Alcohol	7.32E+04	1.83E+01
Methyl Ethyl Ketone	5.53E+04	NCR
Methylene Chloride	3.75E+03	9.38E+00
Methyl tert-Butyl Ether	0.00E+00	0.00E+00
Perchloroethylene	4.52E+03	1.29E+02
1,1,2,2 Tetrachloroethane	2.95E+02	NCR
Styrene	2.29E+03	2.54E+00
Toluene	6.94E+04	2.31E+02
1,1,1 Trichloroethane	5.86E+01	5.86E-02
Trichloroethylene	8.04E+02	1.34E+00
Vinyl Chloride	2.75E+02	NCR
Vinylidene Chloride	8.51E+01	1.22E+00
Xylenes (o, m, & p)	3.55E+04	5.07E+01

Increases	
2.3562E+03	lbs/year
3.3891E-02	g/s
1881287	m^2
1.8015E-08	g/s-m^2

Increases	
1.7322E-09	g/s-m^2
4.0417E-10	g/s-m^2

Weighted Carcinogenic Emissions and Pre-Processed ISCST3 Input Factors

Toxic Air Contaminants	Cancer Potency Factors	Fill Area 1 Baseline 70-Year Avg. Emissions	Fill Area 1 Weighted Avg. of 70-Yr Avg. Emissions	Fill Area 2 Only 70-Yr Average Emissions	Fill Area 2 Weighted Avg. of 70-Yr Avg. Emissions	Fill Areas 1 & 2 Combined 70-Yr Avg. Emissions	Fill Areas 1 & 2 Weighted Avg. of 70-Yr Avg. Emissions		
	$(mg/kg\text{-}day)^{-1}$	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year		
Acrylonitrile	1.0E+00	0.00E+00	0.00E+00	4.46E-01	4.46E-01	5.24E+01	5.24E+01	fifth	9.74%
Benzene	1.0E-01	4.57E+01	4.57E+00	7.43E+00	7.43E-01	8.75E+02	8.75E+01	second	16.25%
Benzylchloride	1.7E-01	0.00E+00	0.00E+00	1.77E+00	3.01E-01	2.08E+02	3.54E+01	eighth	6.58%
Carbon Tetrachloride	1.5E-01	0.00E+00	0.00E+00	4.31E-01	6.46E-02	5.07E+01	7.60E+00	tenth	1.41%
Chlorobenzene	NC	5.74E+00	NC	6.30E+00	NC	7.41E+02	NC		
Chlorodifluoromethane	NC	1.52E+01	NC	7.26E+00	NC	8.54E+02	NC		
Chloroethane	NC	7.27E-01	NC	1.81E+00	NC	2.12E+02	NC		
Chlorofluorocarbons	NC	1.16E+02	NC	2.06E+01	NC	2.42E+03	NC		
Chloroform	1.9E-02	0.00E+00	0.00E+00	3.34E-01	6.35E-03	3.93E+01	7.47E-01		0.14%
1,4 Dichlorobenzene	4.0E-02	1.04E+02	4.15E+00	1.07E+01	4.28E-01	1.26E+03	5.04E+01	sixth	9.35%
Ethyl Benzene	8.7E-03	4.69E+02	4.08E+00	8.92E+01	7.76E-01	1.05E+04	9.13E+01	first	16.95%
Ethylene Dibromide	2.5E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00%
Ethylene Dichloride	7.2E-02	0.00E+00	0.00E+00	5.54E-01	3.99E-02	6.52E+01	4.69E+00		0.87%
Ethylidene Dichloride	5.7E-03	6.92E+00	3.94E-02	3.88E+00	2.21E-02	4.56E+02	2.60E+00		0.48%
Hexane	NC	3.90E+01	NC	9.65E+00	NC	1.14E+03	NC		
Hydrogen Sulfide	NC	2.17E+03	NC	1.91E+02	NC	2.25E+04	NC		
Isopropyl Alcohol	NC	1.74E+03	NC	3.36E+02	NC	3.96E+04	NC		
Methyl Alcohol	NC	2.16E+03	NC	5.38E+02	NC	6.33E+04	NC		
Methyl Ethyl Ketone	NC	1.55E+03	NC	4.04E+02	NC	4.75E+04	NC		
Methylene Chloride	3.5E-03	1.39E+02	4.88E-01	2.85E+01	9.99E-02	3.36E+03	1.17E+01	nineth	2.18%
Methyl tert-Butyl Ether	1.8E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00%
Perchloroethylene	2.1E-02	1.54E+02	3.23E+00	3.39E+01	7.12E-01	3.99E+03	8.37E+01	third	15.56%
1,1,2,2 Tetrachloroethane	2.0E-01	0.00E+00	0.00E+00	1.88E+00	3.76E-01	2.21E+02	4.42E+01	seventh	8.22%
Styrene	NC	1.76E+02	NC	2.04E+01	NC	2.40E+03	NC		
Toluene	NC	2.21E+03	NC	5.16E+02	NC	6.07E+04	NC		
1,1,1 Trichloroethane	NC	0.00E+00	NC	3.73E-01	NC	4.39E+01	NC		
Trichloroethylene	7.0E-03	2.29E+01	1.60E-01	5.89E+00	4.12E-02	6.92E+02	4.85E+00		0.90%
Vinyl Chloride	2.7E-01	5.23E+00	1.41E+00	1.92E+00	5.20E-01	2.26E+02	6.11E+01	fourth	11.36%
Vinylidene Chloride	NC	0.00E+00	NC	5.43E-01	NC	6.39E+01	NC		
Xylenes (o, m, & p)	NC	1.25E+03	NC	2.67E+02	NC	3.15E+04	NC		

* Weighted Average Cancer Emissions = 70-Yr Avg Emissions * Cancer Potency Factor

	Fill Area 1		Fill Area 2		Total Landfill	
Sum of Weighted Average of the 70-Yr Avg Emission Rates	1.8132E+01	lbs/year	4.5753E+00	lbs/year	5.3832E+02	lbs/year
Sum of Weighted Average of the 70-Yr Avg Emission Rates	2.6080E-04	g/s	6.5808E-05	g/s	7.7429E-03	g/s
Applicable Surface Area for each Fill Area	924385	m^2	956901	m^2	1881287	m^2
Cancer Potency Weighted Emission Rate Flux from Area Sources	2.8213E-10	$g/s\text{-}m^2$	6.8772E-11	$g/s\text{-}m^2$	4.1157E-09	$g/s\text{-}m^2$

Cancer Risk ISCST3 Input Factors = Cancer Potency Weighted Average Emission Rate Flux * Breathing Rate (L/kg-day) * Conversion Factor (1E-6 mg-m3 / ug-L) * Exposure Adjustment Factors * Screen3 Conversion Factor (0.1) * 1E6 risk/million

	BR (L/kg-day)	Unit Conversion	EAF	Screen3 Conver. (hourly - annual)	To show Risk per Million	Total Adjustments
Resident	302	1.0E-06	0.962	0.1	1.0E+06	2.9038E+01
Worker	447	1.0E-06	0.128	0.1	1.0E+06	5.7308E+00

Cancer Risk ISCST3 Input Factors = Cancer Potency Weighted Average Emission Rate Flux * Total Adjustments

	Fill Area 1		Fill Area 2		Total Landfill	
Cancer Risk Input Factors for Residents	8.1927E-09	$g/s\text{-}m^2$	1.9970E-09	$g/s\text{-}m^2$	1.1951E-07	$g/s\text{-}m^2$
Cancer Risk Input Factors for Workers	1.6168E-09	$g/s\text{-}m^2$	3.9412E-10	$g/s\text{-}m^2$	2.3586E-08	$g/s\text{-}m^2$

Weighted Carcinogenic Emissions for ISCST3 Model Input, continued

Toxic Air Contaminants	Emission Increases	Wgtd Avg. Increases	Avg Emis. at Max Gen Rate	Wgtd Avg. of Max. Avg. Emissions
	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year
Acylonitrile	5.24E+01	5.24E+01	2.85E+01	2.85E+01
Benzene	8.29E+02	8.29E+01	2.35E+02	2.35E+01
Benzylchloride	2.08E+02	3.54E+01	5.18E+01	8.81E+00
Carbon Tetrachloride	5.07E+01	7.60E+00	5.46E+00	8.19E-01
Chlorobenzene	7.36E+02		6.91E+01	
Chlorodifluoromethane	8.39E+02		1.26E+02	
Chloroethane	2.12E+02		1.88E+01	
Chlorofluorocarbons	2.31E+03			
Chloroform	3.93E+01	7.47E-01	3.44E+00	6.53E-02
1,4 Dichlorobenzene	1.16E+03	4.62E+01	2.61E+02	1.04E+01
Ethyl Benzene	1.00E+04	8.72E+01	2.01E+03	1.74E+01
Ethylene Dibromide	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylene Dichloride	6.52E+01	4.69E+00	2.32E+01	1.67E+00
Ethylidene Dichloride	4.49E+02	2.56E+00	9.94E+01	5.67E-01
Hexane	1.10E+03		2.26E+02	
Hydrogen Sulfide	2.03E+04		9.56E+03	
Isopropyl Alcohol	3.79E+04		7.41E+03	
Methyl Alcohol	6.12E+04			
Methyl Ethyl Ketone	4.60E+04		6.53E+03	
Methylene Chloride	3.22E+03	1.13E+01	4.47E+02	1.56E+00
Methyl tert-Butyl Ether	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene	3.83E+03	8.05E+01	5.09E+02	1.07E+01
1,1,2,2 Tetrachloroethane	2.21E+02	4.42E+01	1.11E+02	2.22E+01
Styrene	2.23E+03		5.54E+02	
Toluene	5.85E+04		8.99E+03	
1,1,1 Trichloroethane	4.39E+01		8.57E+00	
Trichloroethylene	6.70E+02	4.69E+00	1.50E+02	1.05E+00
Vinyl Chloride	2.21E+02	5.97E+01	5.37E+01	1.45E+01
Vinylidene Chloride	6.39E+01		1.57E+01	
Xylenes (o, m, & p)	3.02E+04		5.43E+03	

Increases		AB 2588	
5.2019E+02	lbs/year	1.4190E+02	lbs/year
7.4821E-03	g/s	2.0410E-03	g/s
1881287	m^2	1881287	m^2
3.9771E-09	g/s-m^2	1.0849E-09	g/s-m^2
		26.4%	of S-2 total max

Increases		AB 2588	
1.1549E-07	g/s-m^2	3.1503E-08	g/s-m^2
2.2792E-08	g/s-m^2	6.2172E-09	g/s-m^2

A-15 Landfill Gas Flare

	MM BTU	scf	scfm	M scf/Year			
Maximum Hourly Capacity	70.98	142833	2381		Methane HC	993.887	BTU/scf
Max. Permitted Annual Throughput	621785	1251218961		1251219	LFG_HC	496.943	BTU/scf

TACs in Altamont LFG	Concentration Levels for Proposed Landfill	Molecular Weight	Uncontrolled Emission Factor	Minimum Control Efficiency for TACs	Maximum Acute Emissions	Maximum Chronic Emissions	Acute REL	Chronic REL	Chronic CPF	Acute Non Cancer Weighted Emissions	Chronic Non-Cancer Resident Wtd. Emissions	Chronic Non-Cancer Worker Wtd. Emissions	Cancer Risk Resident Weighted Emissions	Cancer Risk Worker Weighted Emissions
	PPBV	lbs/lb-mol	pounds/scf		lbs/hour	lbs/year	µg/m^3	µg/m^3	(mg/kg-day)$^{-1}$	grams/second	grams/second	grams/second	grams/second	grams/second
Acrylonitrile	300	53.063	4.1159E-08	98.0%	1.18E-04	1.03E+00	NA	5.0E+00	1.0E+00	NA	2.85E-07	6.65E-08	4.30E-04	8.49E-05
Benzene	3400	78.112	6.8667E-07	98.0%	1.96E-03	1.72E+01	1.3E+03	6.0E+01	1.0E-01	1.90E-07	3.96E-07	9.24E-08	7.18E-04	1.42E-04
Benzylchloride	500	126.583	1.6364E-07	98.0%	4.67E-04	4.10E+00	2.4E+02	NCR	1.7E-01	2.45E-07	NCR	NCR	2.91E-04	5.74E-05
Carbon Tetrachloride	100	153.822	3.9771E-08	98.0%	1.14E-04	9.95E-01	1.9E+03	4.0E+01	1.5E-01	7.53E-09	3.44E-08	8.03E-09	6.24E-05	1.23E-05
Chlorobenzene	2000	112.557	5.8204E-07	98.0%	1.66E-03	1.46E+01	NA	1.0E+03	NC	NA	2.01E-08	4.70E-09	NC	NC
Chlorodifluoromethane	3000	86.468	6.7070E-07	98.0%	1.92E-03	1.68E+01	NA	NCR	NC	NA	NA	NCR	NC	NC
Chloroethane	1000	64.514	1.6680E-07	98.0%	4.77E-04	4.17E+00	NA	3.0E+04	NC	NA	1.92E-10	4.49E-11	NC	NC
Cluorofluorocarbons	6000	122.500	1.9004E-06	98.0%	5.43E-03	4.76E+01	NA	NCR	NC	NA	NCR	NCR	NC	NC
Chloroform	100	119.377	3.0865E-08	98.0%	8.82E-05	7.72E-01	1.5E+02	3.0E+02	1.9E-02	7.41E-08	3.56E-09	8.31E-10	6.13E-06	1.21E-06
1,4 Dichlorobenzene	2600	147.001	9.8821E-07	98.0%	2.82E-03	2.47E+01	NA	8.0E+02	4.0E-02	NA	4.28E-08	9.98E-09	4.13E-04	8.15E-05
Ethyl Benzene	30000	106.165	8.2348E-06	98.0%	2.35E-02	2.06E+02	NA	2.0E+03	8.7E-03	NA	1.42E-07	3.32E-08	7.49E-04	1.48E-04
Ethylene Dibromide	0	187.861	0.0000E+00	98.0%	0.00E+00	0.00E+00	NA	8.0E-01	2.5E-01	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylene Dichloride	200	98.959	5.1172E-08	98.0%	1.46E-04	1.28E+00	NA	4.0E+02	7.2E-02	NA	4.43E-09	1.03E-09	3.85E-05	7.60E-06
Ethylidene Dichloride	1400	98.959	3.5821E-07	98.0%	1.02E-03	8.96E+00	NA	NCR	5.7E-03	NA	NCR	NCR	2.13E-05	4.21E-06
Hexane	4000	86.175	8.9124E-07	98.0%	2.55E-03	2.23E+01	NA	7.0E+03	NC	NA	4.41E-09	1.03E-09	NC	NC
Hydrogen Sulfide	200000	34.082	1.7624E-05	98.0%	5.03E-02	4.41E+02	4.2E+01	1.0E+01	NC	1.51E-04	6.10E-05	1.42E-05	NC	NC
Isopropyl Alcohol	200000	60.095	3.1076E-05	98.0%	8.88E-02	7.78E+02	3.2E+03	7.0E+03	NC	3.50E-06	1.54E-07	3.58E-08	NC	NC
Methyl Alcohol	600000	32.042	4.9707E-05	98.0%	1.42E-01	1.24E+03	2.8E+04	4.0E+03	NC	6.39E-07	4.30E-07	1.00E-07	NC	NC
Methyl Ethyl Ketone	200000	72.106	3.7267E-05	98.0%	1.07E-01	9.33E+02	1.3E+04	NCR	NC	1.03E-06	NCR	NCR	NC	NC
Methylene Chloride	12000	84.932	2.6351E-06	98.0%	7.53E-03	6.59E+01	1.4E+04	4.0E+02	3.5E-03	6.77E-08	2.28E-07	5.32E-08	9.64E-05	1.90E-05
Methyl tert-Butyl Ether	0	88.148	0.0000E+00	98.0%	0.00E+00	0.00E+00	NA	8.0E+03	1.8E-03	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene	7300	165.832	3.1300E-06	98.0%	8.94E-03	7.83E+01	2.0E+04	3.5E+01	2.1E-02	5.63E-08	3.10E-06	7.22E-07	6.87E-04	1.36E-04
1,1,2,2 Tetrachloroethane	400	167.848	1.7359E-07	98.0%	4.96E-04	4.34E+00	NA	NCR	2.0E-01	NA	NCR	NCR	3.63E-04	7.16E-05
Styrene	7000	104.149	1.8850E-06	98.0%	5.38E-03	4.72E+01	2.1E+04	9.0E+02	NC	3.23E-08	7.25E-08	1.69E-08	NC	NC
Toluene	200000	92.138	4.7646E-05	98.0%	1.36E-01	1.19E+03	3.7E+04	3.0E+02	NC	4.63E-07	5.50E-06	1.28E-06	NC	NC
1,1,1 Trichloroethane	100	133.403	3.4492E-08	98.0%	9.85E-05	8.63E-01	6.8E+04	1.0E+03	NC	1.83E-10	1.19E-09	2.79E-10	NC	NC
Trichloroethylene	1600	131.387	5.4353E-07	98.0%	1.55E-03	1.36E+01	NA	6.0E+02	7.0E-03	NA	3.14E-08	7.32E-09	3.98E-05	7.85E-06
Vinyl Chloride	1100	62.498	1.7775E-07	98.0%	5.08E-04	4.45E+00	1.8E+05	NCR	2.7E-01	3.55E-10	NCR	NCR	5.02E-04	9.90E-05
Vinylidene Chloride	200	96.943	5.0130E-08	98.0%	1.43E-04	1.25E+00	NA	7.0E+01	NC	NA	2.48E-08	5.78E-09	NC	NC
Xylenes (o, m, & p)	90000	106.165	2.4705E-05	98.0%	7.06E-02	6.18E+02	2.2E+04	7.0E+02	NC	4.04E-07	1.22E-06	2.85E-07	NC	NC
							Acute REL	Chronic REL	Chronic CPF	Wtd. Acute	ChronicNC Res.	ChronicNC Wrk	Cancer Res.	Cancer Wrk.
Secondary TACs	PPBV	lbs/lb-mol	pounds/scf		lbs/hour	lbs/year	µg/m^3	µg/m^3	(mg/kg-day)$^{-1}$	grams/second	grams/second	grams/second	grams/second	grams/second
Formaldehyde			1.8000E-07	0.0%	2.57E-02	2.25E+02	9.4E+01	3.0E+00	2.1E-02	3.45E-05	1.04E-04	2.42E-05	1.98E-03	3.90E-04
Hydrogen Bromide	2000	80.912	4.1840E-07	0.0%	5.98E-02	5.24E+02	NA	NCR	NC	NA	NCR	NCR	NC	NC
Hydrogen Chloride	110000	36.461	1.0370E-05	0.0%	1.48E+00	1.30E+04	2.1E+03	9.0E+00	NC	8.89E-05	1.99E-03	4.65E-04	NC	NC
Hydrogen Fluoride	15000	20.006	7.7591E-07	0.0%	1.11E-01	9.71E+02	2.4E+02	1.4E+01	NC	5.82E-05	9.59E-05	2.24E-05	NC	NC

Total of Weighted Emissions for A-15 LFG Flare

Acute Non Cancer Weighted Emissions	Chronic Non-Cancer Resident Wtd. Emissions	Chronic Non-Cancer Worker Wtd. Emissions	Cancer Risk Resident Weighted Emissions	Cancer Risk Worker Weighted Emissions
3.3926E-04	2.2663E-03	5.2879E-04	6.3920E-03	1.2615E-03

A-16 Landfill Gas Flare

	MM BTU	scf	scfm	M scf/Year
Maximum Hourly Capacity	132	265624	4427	
Max. Permitted Annual Throughput	1156320	2326864606		2326865

TACs in Altamont LFG	Concentration Levels for Proposed Landfill	Molecular Weight	Uncontrolled Emission Factor	Minimum Control Efficiency for TACs	Maximum Acute Emissions	Maximum Chronic Emissions	Acute REL	Chronic REL	Chronic CPF	Acute Non Cancer Weighted Emissions	Chronic Non-Cancer Resident Wtd. Emissions	Chronic Non-Cancer Worker Wtd. Emissions	Cancer Risk Resident Weighted Emissions	Cancer Risk Worker Weighted Emissions
	PPBV	lbs/lb-mol	pounds/scf		lbs/hour	lbs/year	$\mu g/m^3$	$\mu g/m^3$	$(mg/kg\text{-}day)^{-1}$	grams/second	grams/second	grams/second	grams/second	grams/second
Acrylonitrile	300	53.063	4.1159E-08	98.0%	2.19E-04	1.92E+00	NA	5.0E+00	1.0E+00	NA	5.30E-07	1.24E-07	8.00E-04	1.58E-04
Benzene	3400	78.112	6.8667E-07	98.0%	3.65E-03	3.20E+01	1.3E+03	6.0E+01	1.0E-01	3.54E-07	7.37E-07	1.72E-07	1.33E-03	2.63E-04
Benzylchloride	500	126.583	1.6364E-07	98.0%	8.69E-04	7.62E+00	2.4E+02	NCR	1.7E-01	4.56E-07	NCR	NCR	5.41E-04	1.07E-04
Carbon Tetrachloride	100	153.822	3.9771E-08	98.0%	2.11E-04	1.85E+00	1.9E+03	4.0E+01	1.5E-01	1.40E-08	6.40E-08	1.49E-08	1.16E-04	2.29E-05
Chlorobenzene	2000	112.557	5.8204E-07	98.0%	3.09E-03	2.71E+01	NA	1.0E+03	NC	NA	3.75E-08	8.74E-09	NC	NC
Chlorodifluoromethane	3000	86.468	6.7070E-07	98.0%	3.56E-03	3.12E+01	NA	NCR	NC	NA	NCR	NCR	NC	NC
Chloroethane	1000	64.514	1.6680E-07	98.0%	8.86E-04	7.76E+00	NA	3.0E+04	NC	NA	3.58E-10	8.35E-11	NC	NC
Cluorofluorocarbons	6000	122.500	1.9004E-06	98.0%	1.01E-02	8.84E+01	NA	NCR	NC	NA	NCR	NCR	NC	NC
Chloroform	100	119.377	3.0865E-08	98.0%	1.64E-04	1.44E+00	1.5E+02	3.0E+02	1.9E-02	1.38E-07	6.62E-09	1.55E-09	1.14E-05	2.25E-06
1,4 Dichlorobenzene	2600	147.001	9.8821E-07	98.0%	5.25E-03	4.60E+01	NA	8.0E+02	4.0E-02	NA	7.95E-08	1.86E-08	7.68E-04	1.52E-04
Ethyl Benzene	30000	106.165	8.2348E-06	98.0%	4.37E-02	3.83E+02	NA	2.0E+03	8.7E-03	NA	2.65E-07	6.18E-08	1.39E-03	2.75E-04
Ethylene Dibromide	0	187.861	0.0000E+00	98.0%	0.00E+00	0.00E+00	NA	8.0E-01	2.5E-01	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylene Dichloride	200	98.959	5.1172E-08	98.0%	2.72E-04	2.38E+00	NA	4.0E+02	7.2E-02	NA	8.23E-09	1.92E-09	7.16E-05	1.41E-05
Ethylidene Dichloride	1400	98.959	3.5821E-07	98.0%	1.90E-03	1.67E+01	NA	NCR	5.7E-03	NA	NCR	NCR	3.97E-05	7.83E-06
Hexane	4000	86.175	8.9124E-07	98.0%	4.73E-03	4.15E+01	NA	7.0E+03	NC	NA	8.19E-09	1.91E-09	NC	NC
Hydrogen Sulfide	200000	34.082	1.7624E-05	98.0%	9.36E-02	8.20E+02	4.2E+01	1.0E+01	NC	2.81E-04	1.13E-04	2.65E-05	NC	NC
Isopropyl Alcohol	200000	60.095	3.1076E-05	98.0%	1.65E-01	1.45E+03	3.2E+03	7.0E+03	NC	6.50E-06	2.86E-07	6.67E-08	NC	NC
Methyl Alcohol	600000	32.042	4.9707E-05	98.0%	2.64E-01	2.31E+03	2.8E+04	4.0E+03	NC	1.19E-06	8.00E-07	1.87E-07	NC	NC
Methyl Ethyl Ketone	200000	72.106	3.7287E-05	98.0%	1.98E-01	1.74E+03	1.3E+04	NCR	NC	1.92E-06	NCR	NCR	NC	NC
Methylene Chloride	12000	84.932	2.6351E-06	98.0%	1.40E-02	1.23E+02	1.4E+04	4.0E+02	3.5E-03	1.26E-07	4.24E-07	9.89E-08	1.79E-04	3.54E-05
Methyl tert-Butyl Ether	0	88.148	0.0000E+00	98.0%	0.00E+00	0.00E+00	NA	8.0E+03	1.8E-03	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene	7300	165.832	3.1300E-06	98.0%	1.66E-02	1.46E+02	2.0E+04	3.5E+01	2.1E-02	1.05E-07	5.76E-06	1.34E-06	1.28E-03	2.52E-04
1,1,2,2 Tetrachloroethane	400	167.848	1.7359E-07	98.0%	9.22E-04	8.08E+00	NA	NCR	2.0E-01	NA	NCR	NCR	6.75E-04	1.33E-04
Styrene	7000	104.149	1.8850E-06	98.0%	1.00E-02	8.77E+01	2.1E+04	9.0E+02	NC	6.01E-08	1.35E-07	3.15E-08	NC	NC
Toluene	200000	92.138	4.7646E-05	98.0%	2.53E-01	2.22E+03	3.7E+04	3.0E+02	NC	8.62E-07	1.02E-05	2.39E-06	NC	NC
1,1,1 Trichloroethane	100	133.403	3.4492E-08	98.0%	1.83E-04	1.61E+00	6.8E+04	1.0E+03	NC	3.40E-10	2.22E-09	5.18E-10	NC	NC
Trichloroethylene	1600	131.387	5.4353E-07	98.0%	2.89E-03	2.53E+01	NA	6.0E+02	7.0E-03	NA	5.83E-08	1.36E-08	7.40E-05	1.46E-05
Vinyl Chloride	1100	62.498	1.7775E-07	98.0%	9.44E-04	8.27E+00	1.8E+05	NCR	2.7E-01	6.61E-10	NCR	NCR	9.33E-04	1.84E-04
Vinylidene Chloride	200	96.943	5.0130E-08	98.0%	2.66E-04	2.33E+00	NA	7.0E+01	NC	NA	4.61E-08	1.08E-08	NC	NC
Xylenes (o, m, & p)	90000	106.165	2.4705E-05	98.0%	1.31E-01	1.15E+03	2.2E+04	7.0E+02	NC	7.52E-07	2.27E-06	5.30E-07	NC	NC
							Acute REL	Chronic REL	Chronic CPF	Wtd. Acute	ChronicNC Res.	ChronicNC Wrk	Cancer Res.	Cancer Wrk.
Secondary TACs	PPBV	lbs/lb-mol	pounds/scf		lbs/hour	lbs/year	$\mu g/m^3$	$\mu g/m^3$	$(mg/kg\text{-}day)^{-1}$	grams/second	grams/second	grams/second	grams/second	grams/second
Formaldehyde			1.8000E-07	0.0%	4.78E-02	4.19E+02	9.4E+01	3.0E+00	2.1E-02	6.41E-05	1.93E-04	4.51E-05	3.67E-03	7.25E-04
Hydrogen Bromide	2000	80.912	4.1840E-07	0.0%	1.11E-01	9.74E+02	NA	NCR	NC	NA	NCR	NCR	NC	NC
Hydrogen Chloride	110000	36.461	1.0370E-05	0.0%	2.75E+00	2.41E+04	2.1E+03	9.0E+00	NC	1.65E-04	3.71E-03	8.65E-04	NC	NC
Hydrogen Fluoride	15000	20.006	7.7591E-07	0.0%	2.061E-01	1.81E+03	2.4E+02	1.4E+01	NC	1.08E-04	1.78E-04	4.16E-05	NC	NC

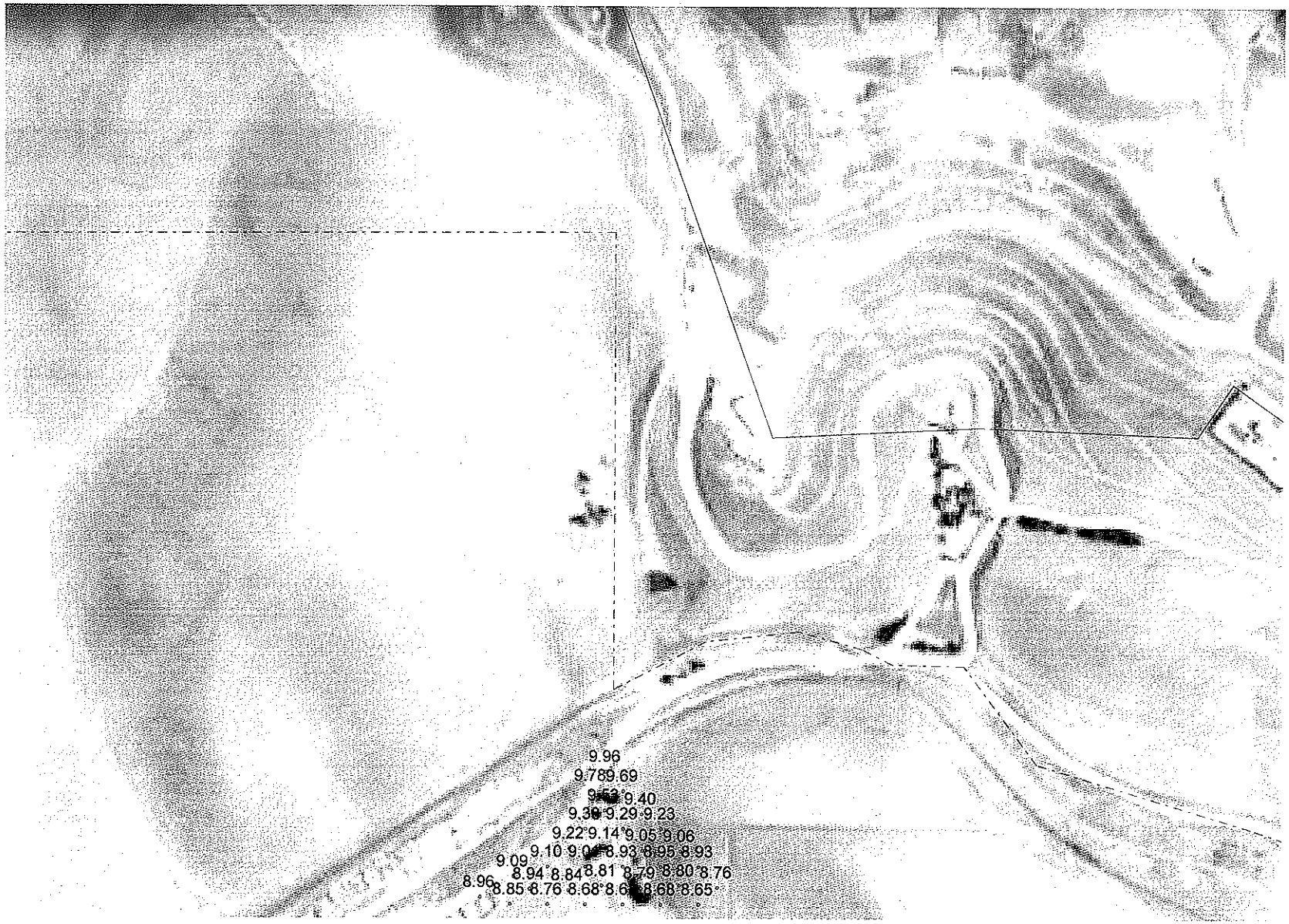
Total of Weighted Emissions for A-16 LFG Flare

Acute Non Cancer Weighted Emissions	Chronic Non-Cancer Resident Wtd. Emissions	Chronic Non-Cancer Worker Wtd. Emissions	Cancer Risk Resident Weighted Emissions	Cancer Risk Worker Weighted Emissions
6.3091E-04	4.2145E-03	9.8338E-04	1.1887E-02	2.3459E-03

Project Cancer Risk for Residential Receptors

Application 14814 Altamont Landfill Expansion

C:\Work Files\Toxics\RiskScreens\Altamont\App14814\Feb09Revision\total_resident_99_OTHER.GRF



Scale: 1" = 195.9 Meters

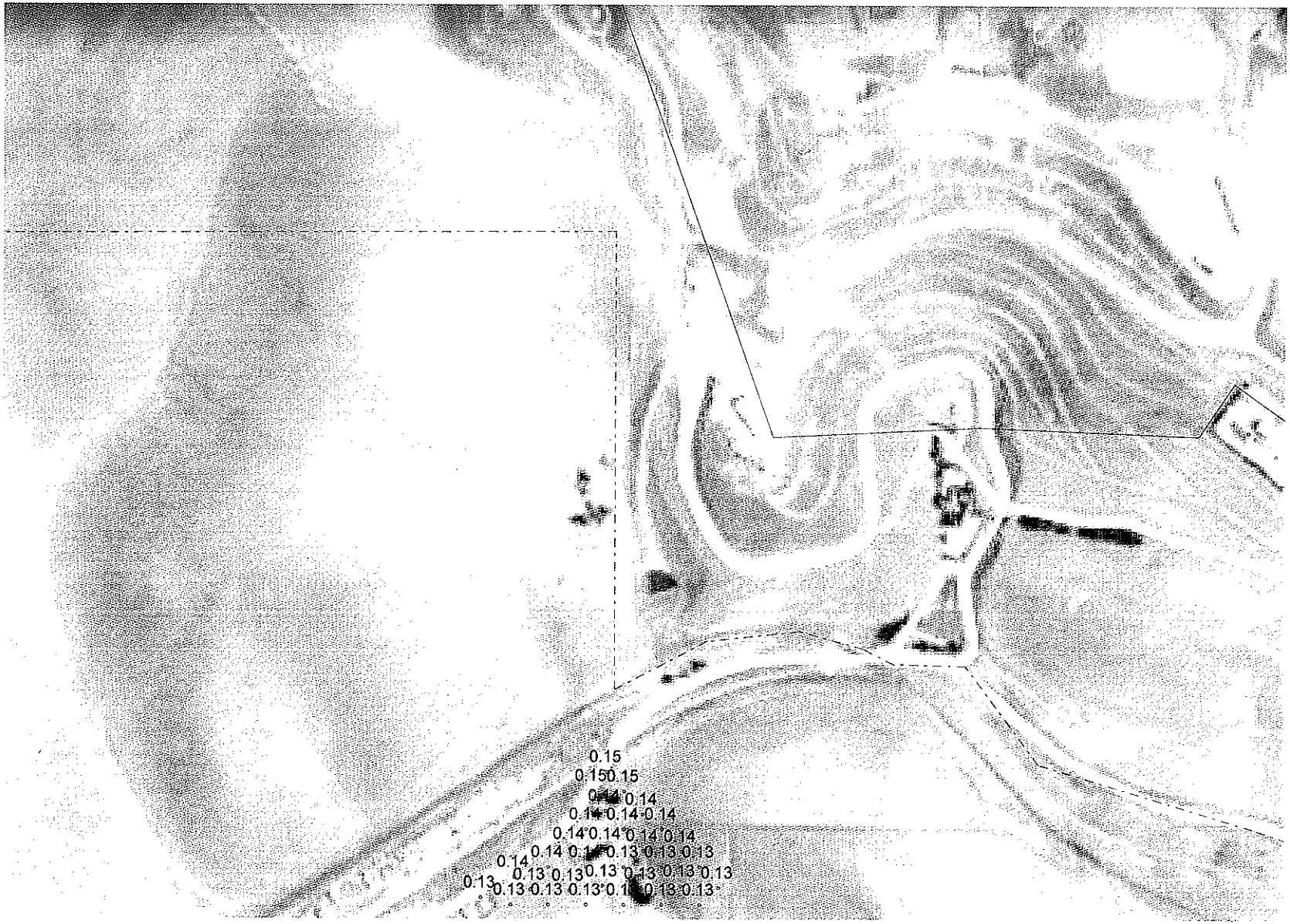
HIGH 1ST HIGH 1-HR VALUES FOR GROUP: CAN_PRJ

Max = 9.95845 (618182.1, 4178222)

Project Chronic Hazard Index for Residential Receptors

Application 14814 Altamont Landfill Expansion

C:\Work Files\Toxics\RiskScreens\Altamont\App14814\Feb09Revision\total_resident_99_OTHER.GRF



Scale: 1" = 195.9 Meters

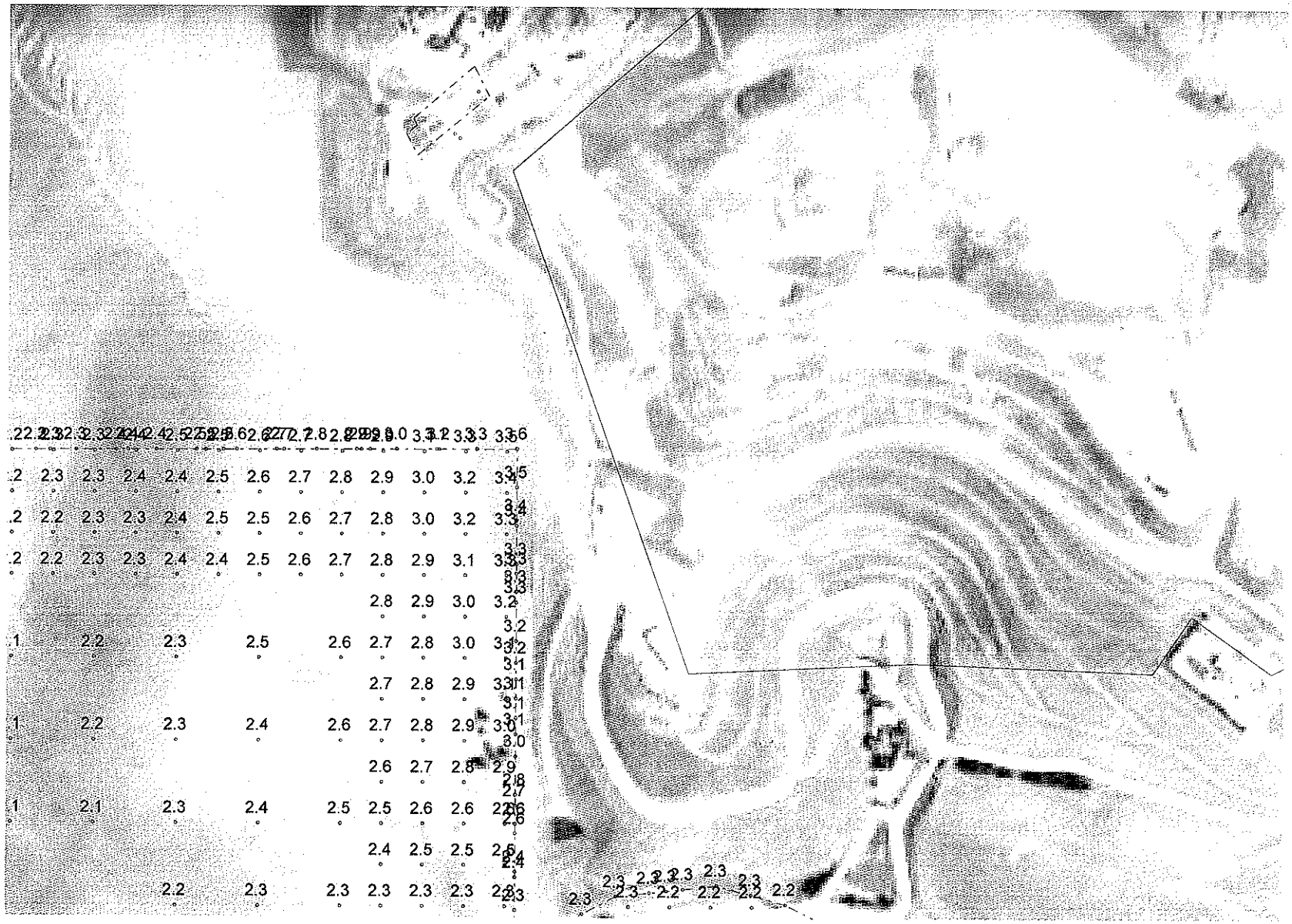
HIGH 1ST HIGH 1-HR VALUES FOR GROUP: CHI_PRJ

Max = 0.14936 (618182.1, 4178222)

Project Cancer Risk for Residential Receptors

Application 14814 Altamont Landfill Expansion

C:\Work Files\Toxics\RiskScreens\Altamont\App14814\Feb09Revision\total_worker_99_OTHER.GRF



Scale: 1" = 178.8 Meters

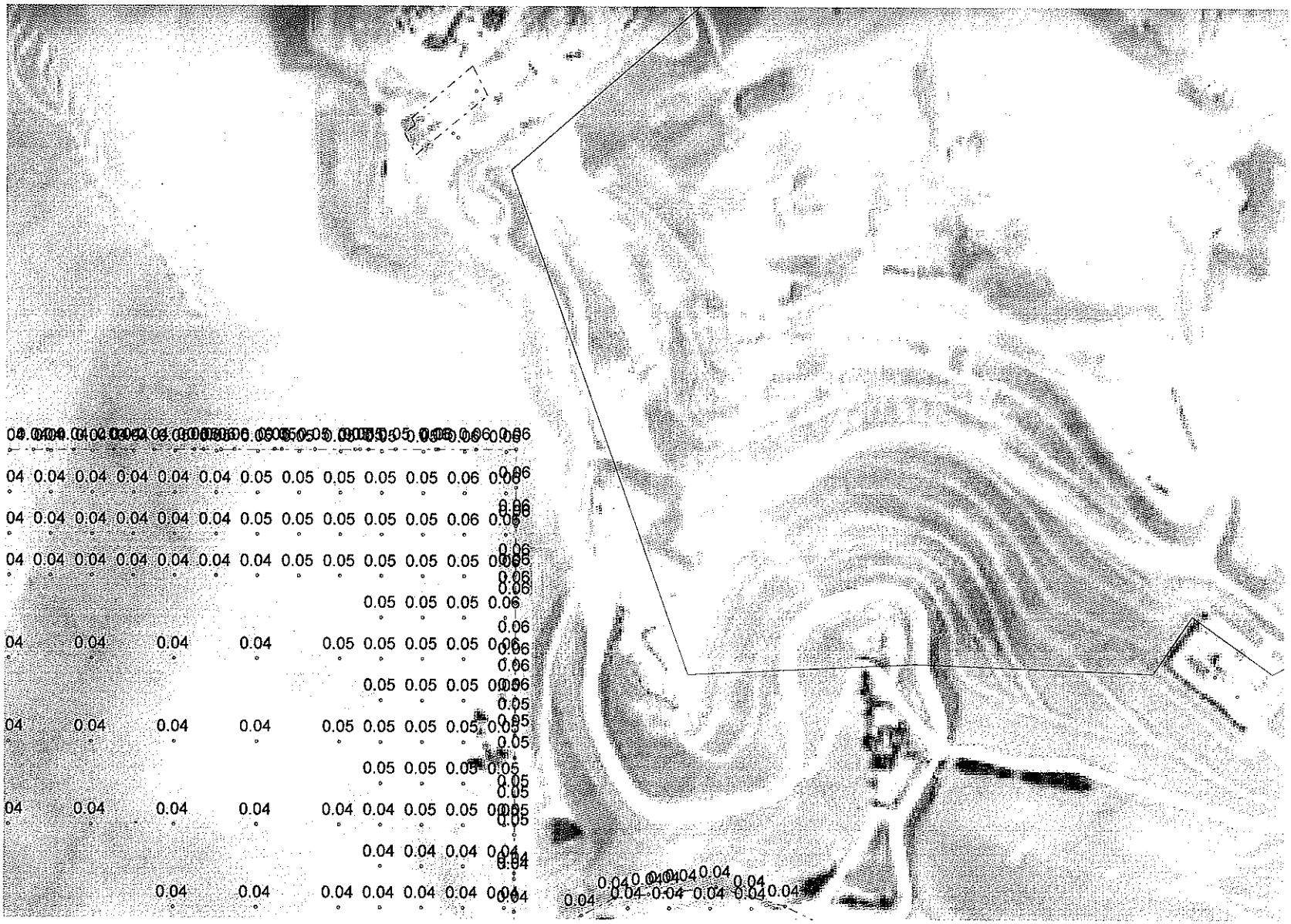
HIGH 1ST HIGH 1-HR VALUES FOR GROUP: PRJ_CNCR

Max = 3.59563 (618191.9, 4178935)

Project Chronic Hazard Index for Worker Receptors

Application 14814 Altamont Landfill Expansion

C:\Work Files\Toxics\RiskScreens\Altamont\App14814\Feb09Revision\total_worker_99_OTHER.GRF



Scale: 1" = 178.8 Meters

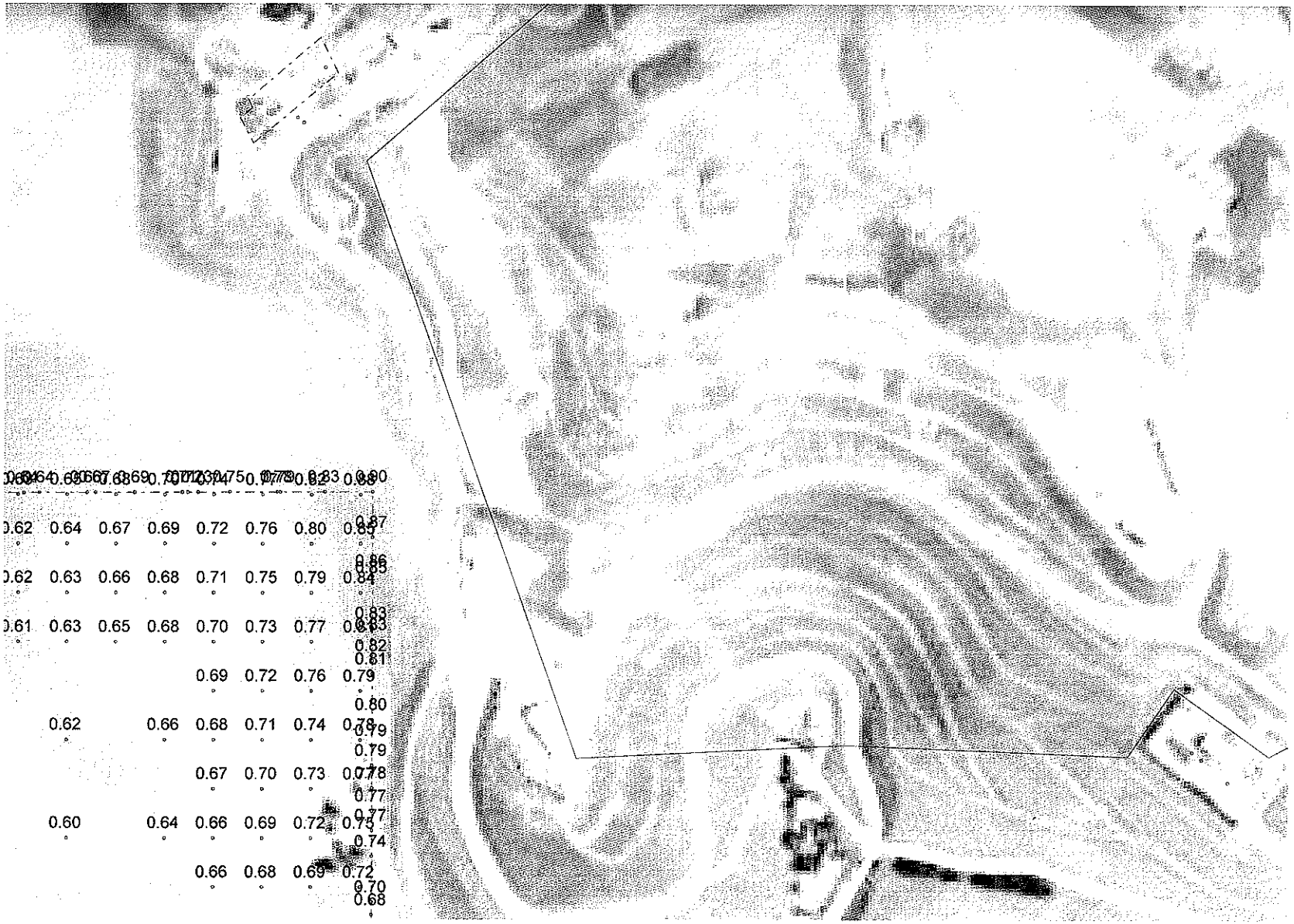
HIGH 1ST HIGH 1-HR VALUES FOR GROUP: PRJ_CHRN

Max = 0.06376 (618191.9, 4178935)

Maximum Acute Hazard Index

Application 14814 Altamont Landfill Expansion

C:\Work Files\Toxics\RiskScreens\Altamont\App14814\Feb09Revision\acute_offsite_99_OTHER.GRF



Scale: 1" = 151.5 Meters

HIGH 1ST HIGH 1-HR VALUES FOR GROUP: PROJECT

Max = 0.89782 (618191.9, 4178935)