# City of Palo Alto Landfill

## Title V Statement of Basis (SOB) for: Application # 26066 Minor Revision of Title V Operating Permit for Site # A2721

November 2015

*Introduction*

This is minor permit revision pursuant to Regulation 2, Rule 6, Section 215. This minor revision includes permit condition changes approved pursuant to New Source Review (NSR) Applications # 22543 and # 26538. The Statement of Basis/Evaluation Reports for these applications are attached.

In addition, the Applicant has requested that the District remove: S-5 Wood Grinder, A-5 Water Sprays, S-7 Trommel Screen, the exempt Portable Diesel Engines (S-6 and S-9), and any associated requirements, because this equipment has been permanently removed from the site.

The District is also proposing to delete a number of obsolete requirements including an obsolete permit shield. These requirements became obsolete when the landfill ceased accepting waste and cover materials in 2011.

*Section II*

Table II – A will be revised to delete sources S-5 and S-7 as they have been removed from service.

Table II – B will be revised to replace an old flare, A-3, with a new flare, A-10, as discussed in the attached Statement of Basis for Application # 22543.
Table II – B will be revised to remove A-5 as it has been removed from service.

Section II.C will be deleted as the facility will no longer have any exempt equipment in service at the facility.

*Section IV*

Table IV – A will be revised by replacing A-3 with A-10 throughout this table.
Table IV – A will be revised by removing an obsolete requirement: BAAQMD Regulation 8, Rule 2. This rule applied to the handling and use as cover material of VOC laden soil. Since waste acceptance at this landfill has ceased, cover material usage has also ceased and this rule is no longer applicable.
Table IV – A will be revised by removing obsolete requirements: BAAQMD Regulation 8, Rule 34, Section 116 (all subsections). These subsections only apply to active filling operations at a landfill. Since this landfill has ceased accepting waste, these sections are no longer applicable.
Table IV – A will be revised by adding applicable requirements for landfills that have collection system components that are operating less than continuously: BAAQMD Regulation 8, Rule 34, Sections 404 and 501.5. These sections apply to leachate collection system components that will be connected to the gas collection system as needed to prevent surface or component leaks.
Table IV – A will be revised to delete Parts 2 and 3 of Condition # 1028 as those previously applicable requirements expired on 8/1/11, as discussed in the attached Statement of Basis for Application # 26538.

Table IV – A will be revised by updating the basis of Condition # 1028, Part 6 pursuant to Application # 26538.
Table IV – A will be revised consistent with the revised NOx and CO limits for the A-10 flare in Condition # 1028, Parts 11 and 12.
Table IV – A: Condition # 1028, Part 13 will be deleted pursuant to Application # 22543.
Table IV – A: Condition # 1028, Part 19 will be added pursuant to Application # 26538.

Table IV – B will be deleted as S-5 and A-5 have been removed from service.

Table IV – C will be deleted as S-7 and A-5 have been removed from service.

*Section VI*

Condition # 1028 will be revised throughout (Parts 5, 8, 9, 10, 11, 12, 15, and 17) by replacing an old flare, A-3, with a new flare, A-10, as discussed in the attached Statement of Basis for Application # 22543.
Condition # 1028 Part 1 will be revised to remove waste acceptance limits that no longer apply to this inactive landfill, as discussed in the attached Statement of Basis for Application # 26538.
Condition # 1028 Parts 2 and 3 will be deleted because these requirements expired when the landfill ceased accepting waste.
Condition # 1028 Part # 6 will be revised to clarify applicable requirements for leachate collection wells, as discussed in the attached Statement of Basis for Application # 26538.
Condition # 1028 Part # 7 will be revised to authorize installation and decommissioning of gas collection wells and leachate collection system components, as discussed in the attached Statement of Basis for Application # 26538.
Condition # 1028 Part # 8 will be revised to reduce the daily and annual heat input limits for the enclosed flare because A-10 is smaller than the previous flare, A-3.
Condition # 1028 Part # 9 will be revised to change the required minimum operating temperature for the enclosed flare, based on the initial compliance test results for A-10.
Condition # 1028 Part # 11 will be revised to replace the NOx limit for A-3 (concentration basis) with the new NOx limit for A-10 (mass per heat input basis).
Condition # 1028 Part # 12 will be revised to replace the CO limit for A-3 (concentration basis) with the new CO limit for A-10 (mass per heat input basis).
Condition # 1028 Part # 13 will be deleted as discussed in the attached Statement of Basis for Application # 22543.
Condition # 1028 Part # 17(subparts a-c) will be deleted because these record keeping requirements are no longer necessary since waste acceptance has ceased. In addition, subpart g will be revised by replacing A-3 with A-10. Subpart I will be added to clarify the records that the site must keep to verify compliance with to the remaining cumulative decomposable material limit in Part 1.
Condition # 1028, Part 19 was added pursuant to Application # 26538 to describe applicable operating requirements and alternative wellhead limits for leachate collection system components that are connected to the gas collection system.

Condition # 20476 will be deleted as S-5 and A-5 have been removed from service.

Condition # 20478 will be deleted as S-7 and A-5 have been removed from service.

*Section VII*

Table VII – A will be revised by replacing A-3 with A-10.
Table VII – A will be revised by deleting obsolete citations (Regulation 8-2-301 and Regulation 8-34-116.2 and 3) that no longer apply because this site ceased accepting waste and cover material.

Table VII – A gas flow rate limits will be revised to clarify that that the specified leachate collection system components are allowed to operate on a less than continuous basis pursuant to Condition # 1028, Parts 6 and 19..
Table VII – A: Citation BAAQMD Condition # 1028 Part 8 will be revised to change the daily and annual heat input limits for the new flare.
Table VII – A: Citation BAAQMD Condition # 1028 Part 9 will be revised to change the minimum temperature required for the new flare.
Table VII – A: Citation BAAQMD Condition # 1028 Part 11 will be revised to change the NOx limit for the new flare.
Table VII – A: Citation BAAQMD Condition # 1028 Part 12 will be revised to change the CO limit for the new flare.
Table VII – A: Waste acceptance limits will be revised to reflect that waste acceptance has ceased.
Table VII – A: Citation BAAQMD Condition # 1028 Part 13 will be deleted as outlined in NSR Application # 22543.

Table VII – B will be deleted as S-5 and A-5 have been removed from service.

Table VII – C will be deleted as S-7 and A-5 have been removed from service.

*Section VIII*

Table VIII: Test methods for BAAQMD Regulation 8-2-301 and SIP 8-2-301 will be deleted as these parts are no longer applicable since cover materials placement has ceased.

Table VIII: Test methods for BAAQMD Condition # 1028 (Parts 2, 3, and 13) will be deleted as these parts are no longer applicable and are being deleted.

Table VIII: Test methods for BAAQMD Condition # 1028 Part 19 will be added. This part identifies methane and oxygen content measurements for leachate collection system components that are connected to the landfill gas collection system.

Table VIII: Test methods for BAAQMD Condition # 20476, Part 4 will be deleted as S-5 and A-5 have been removed from service.

Table VIII: Test methods for BAAQMD Condition # 20478, Part 4 will be deleted as S-7 and A-5 have been removed from service.

*Section IX*

The permit shield has been deleted as the permit shield only applied to the handling, disposal, or re-use of VOC laden soil, which the landfill no longer accepts, so the permit shield is no longer necessary.

*Section X*

All permit changes for this minor revision are described in Section X.

By: Stanley Tom November 9, 2015
Air Quality Engineer II

# Title V Minor Revision Statement of Basis: Permit to Operate Report and Revised Evaluation for a Smaller Replacement Flare

City of Palo Alto PLANT #2721
APPLICATION #22543

## BACKGROUND

The City of Palo Alto owns and operates a closed landfill (S-1) that is equipped with a landfill gas collection system. Collected landfill gas is currently either vented to an enclosed flare (A-3, 30 MM BTU/hour capacity) at Plant # A2721 or to sludge incinerators (S-1 and S-2) that are operated by the Palo Alto Regional Water Quality Control Plant #A0617.

Under Application # 22543, the City of Palo Alto applied for an Authority to Construct for a new smaller flare to replace A-3 and to better accommodate the expected lower gas collection rates for this landfill. In addition, the City requested a Change of Permit Conditions that would allow them to install and decommission a number landfill gas collection wells. In August 2011, the District issued the Change of Conditions for S-1 and the Authority to Construct for A-10, a 12 MM BTU/hour enclosed landfill gas flare that could handle up to 400 scfm of landfill gas. This A/C was renewed for an additional 2 years in August 2013.

Based on a re-evaluation of the projected gas generation rates for this landfill, the City of Palo Alto decided that an even smaller flare would betted meet their needs for this landfill. The City subsequently installed a 9 MM BTU/hour enclosed flare with a maximum capacity of 300 scfm of landfill gas. The City of Palo Alto is now requesting a Permit to Operate for this revised smaller flare.

The District reviewed the current and projected landfill gas flow rates for this facility. In 2010, the City reported that the landfill gas collection rate was 253 scfm. For 2012, which is the projected peak year for landfill gas generation, the landfill gas collection rate was 295 scfm. Therefore, this smaller flare should be adequate to handle all projected gas collection for this landfill. During the November 2013 source test, gas collection was maximized and was 224.7 scfm of landfill gas at 44.4% methane. This is equivalent to a heat input rate of about 6.1 MM BTU/hour (about 67% of the capacity for A-10).

Due to the smaller capacity for A-10, the emission calculations for Application # 22543 have changed. This Permit to Operate Report shows the changes to flare emissions and the cumulative emission increase for this application. Changes to the permit conditions for the S-1 Palo Alto Landfill are necessary to reflect the revised flare capacity and emission limits, the new minimum temperature limit for A-10 based on the temperature measured during the November 2013 source test, and the previously authorized well installations, which were missing from the current conditions. The flare changes will require modifications of the Data Form C and Data Form A for A-10. The new description for A-10 is:

**A-10** **Landfill Gas Flare**; Perennial Energy Model FL-60-25-E.; 9 MM BTU/hour; fired on propane (during start-up only) and landfill gas; abating S-1 Palo Alto Landfill Gas Collection System.

## EMISSIONS

Criteria Pollutants

Maximum daily and annual emission rates for the flare and the cumulative emission increases for this application are summarized in Table 1, followed by detailed emission calculations procedures for each criteria pollutant. All calculations are based on landfill gas firing. Emissions are reduced compared to the original proposed replacement flare.

Table 1. Summary of Criteria Pollutant Emissions from A-10

| | Emission Factor Pounds/MM BTU | Max Daily Emissions Pounds/Day | Max Annual Emissions Tons/Year | Application Cumulative Emission Increases Tons/Year |
|---|---|---|---|---|
| $NO_x$ | 0.0600 | 12.96 | 2.365 | 2.365 |
| CO | 0.2000 | 43.20 | 7.884 | 7.884 |
| $PM_{10}$ | 0.0171 | 3.69 | 0.674 | 0.674 |
| $SO_2$ | 0.5784 | 124.94 | 22.801 | 22.801 |
| POC | 0.0169 | 3.65 | 0.667 | 0.000 |
| NPOC | 0.0008 | 0.18 | 0.033 | 0.000 |

Cumulative Increase

The cumulative increases for all facilities in the District were reset in 1991, so the post 4/5/1991 increases are shown below as the current cumulative increase balance for this facility. The cumulative emission increases for this proposed project are included below.

Table 2. Summary of Plant-Wide Cumulative Emissions Increases for Plant # 2721

| Pollutant | Current Balance, tpy | Project Increases, tpy | Contemporaneous Reductions, tpy | Post-Project, tpy |
|---|---|---|---|---|
| **PM10** | 0.482 | 0.674 | -- | 1.156 |
| **POC** | 0.111 | 0.000 | -- | 0.111 |
| **NOx** | 0.000 | 2.365 | -- | 2.365 |
| **SO2** | 0.287 | 22.801 | -- | 23.088 |
| **CO** | 1.171 | 7.884 | -- | 9.055 |

Landfill Gas Assumptions for All Calculations:

25% Methane
75% Carbon Dioxide
Heat Content = 248.469 BTU/scf of LFG (at 70 F) = 0.25*(1013)*(459.67+60)/(459.67+70)
Flue Gas = 2.892344 $ft^3$ flue gas at 0% $O_2$/$ft^3$ LFG
LFG F Factor = 11,641 $ft^3$ flue gas at 0% $O_2$/MM BTU
Standard Molar Volume 386.765 $ft^3$/lbmol = 0.7302*(459.67+70)

$NO_x$ and CO Emissions:

This flare will generate secondary emissions of nitrogen oxides ($NO_x$) and carbon monoxide (CO). Since this device is new, the baseline emission rate for all secondary pollutants is 0. The maximum emission rate is also the cumulative emission increase for secondary pollutants.

The vendor stated that this flare will emit no more than 0.06 lbs $NO_x$/MM BTU and no more than 0.20 lbs CO/MM BTU over the expected operating ranges. The flare is assumed to operate continuously for 24 hours/day and 365 days/year.

(9.0 MM BTU/hr)*(0.06 lbs $NO_x$/MM BTU) = 0.54 lbs $NO_x$/hr
= 12.96 lbs $NO_x$/day
= 2.365 tons $NO_x$/year

(9.0 MM BTU/hr)*(0.20 lbs CO/MM BTU) = 1.8 lbs CO/hr
= 43.20 lbs CO/day
= 7.884 tons CO/year

$PM_{10}$ Emissions:

This flare will result in secondary particulate matter emissions ($PM_{10}$). As discussed above for secondary $NO_x$ and CO emissions, maximum permitted $PM_{10}$ emission rates will be equal to cumulative emission increases.

The vendor did not estimate particulate emission rates for the flare, but the District expects that flare $PM_{10}$ emissions will be no higher than the AP-42 emission factor of 17 pounds of PM per million scf of methane. For landfill gas at 25% methane this emission factor is equivalent to a $PM_{10}$ emission rate of 0.0171 lbs/MM BTU. Maximum $PM_{10}$ emissions are listed below.

(17 lbs $PM_{10}$/MM scf $CH_4$)*(0.25 MM scf $CH_4$/MM scf LFG)/(248.469 MM BTU/MM scf LFG)

= 0.0171 lbs $PM_{10}$/MM BTU

(9 MM BTU/hour)*(0.0171 lbs $PM_{10}$/MM BTU) = 0.154 lbs $PM_{10}$/hour
= 3.69 lbs $PM_{10}$/day
= 0.674 tons $PM_{10}$/year

$SO_2$ Emissions:

This flare will result in secondary sulfur dioxide ($SO_2$) emissions due to the combustion of sulfur compounds (primarily hydrogen sulfide) that are present in the landfill gas.

The sulfur dioxide ($SO_2$) emission factor for A-10 is based on the Regulation 9-1-302 limit on the outlet concentration of SO2 from any emission point ($\leq$ 300 ppm of $SO_2$, dry basis, at the as found oxygen concentration in the exhaust gas stream). The SO2 emission factor for A-10 is derived below.

For consistency with the current TRS limit in the Title V permit conditions, the assumed landfill gas methane content for this analysis is 25%, which results in the lowest possible landfill gas TRS content that will also meet the Regulation 9-1-302 limit.

(300 E-6 lb-mole S / 1.0 lb-mole flue gas) * (1.0 lb-mole $SO_2$ / 1.0 lb-mol S) *
(64.059 lbs $SO_2$ / 1.0 lb-mol $SO_2$) * (1.0 lb mole flue gas / 386.765 $ft^3$ flue gas) *
(11641 $ft^3$ flue gas/MM BTU) = 0.57842 lbs $SO_2$/MM BTU

(9 MM BTU/hour)*(0.57842 lbs $SO_2$/MM BTU) = 5.206 lbs $SO_2$/hour
= 124.94 lbs $SO_2$/day
= 22.801 tons $SO_2$/year

The $SO_2$ emission factor above is equivalent to an inlet TRS content in the landfill gas of: (0.57842 lbs $SO_2$/MM BTU) / (64.059 lbs $SO_2$/1.0 lb-mol $SO_2$) * (1.0 lb-mole $H_2S$/1.0 lb-mol $SO_2$) * (386.765 $ft^3$ $H_2S$/1.0 lb-mol $H_2S$) * (248.469 MM BTU/MM scf of LFG) = 868 ppmv of $H_2S$ in LFG Thus, the Part 14 limit of 860 ppmv of TRS in the landfill gas will ensure compliance with the Regulation 9-1-302 limit of 300 ppmv of $SO_2$ in the stack gas. During the November 2013 source test, Best Environmental measured 28.9 ppmv of TRS (expressed as $H_2S$) in the landfill gas at this site, which is less than 4% of the current limit. The equivalent SO2 emission rate was determined to be: 0.0101 lbs of $SO_2$/MM BTU.

POC and NPOC Emissions:

The precursor organic compound (POC) and non-precursor organic compound (NPOC) emission rates from the flare are actually residual emissions from the landfill (S-1) after control by the landfill gas collection system and flare. Since POC and NPOC emissions from the proposed flare will be no greater than the amounts allowed by the current control system, this application will not result in any cumulative emission increases of POC or NPOC emissions. POC and NPOC emission rates are discussed below for the purpose of developing databank emission factors.

The vendor stated that the flare will achieve a total non-methane organic compound (NMOC) destruction efficiency of at least 98% by weight.

Table 3. Summary of NMOC Data Measured During Recent Source Test

| Year | Inlet Methane | Inlet NMOC (ppmv as $CH_4$) | Outlet NMOC (ppmv as $CH_4$ @ 3% $O_2$) | NMOC Destruction Efficiency |
|---|---|---|---|---|
| Nov. 2013 | 44.40% | 493 | <2.3 | > 98% |

Regulation 8-34-301.3 limit allows 30 ppmv of NMOC (as methane) at 3% $O_2$ in the flare exhaust or a minimum of 98% NMOC destruction efficiency by weight. Since the inlet NMOC at this site is low, the outlet concentration limit results in higher emissions. Therefore, POC and NPOC emissions from A-10 will be based on the outlet concentration limit. The Regulation 8-34-301.3 outlet concentration limit is equivalent to an NMOC emission rate of 1.6912 E-2 lbs NMOC/MM BTU, as determined below.

(30 ppmv at 3% $O_2$)*(20.9-0)/(20.9-3) = 35.03 ppmv of $CH_4$ at 0% $O_2$
(35.03 $ft^3$ $CH_4$/1E6 $ft^3$ flue gas)*(11,641 $ft^3$ flue gas/MM BTU)/(386.765 $ft^3$ $CH_4$/1.0 lbmol CH4)*
(16.04 lbs $CH_4$/1.0 lbmol $CH_4$) = 1.6912 E-2 lbs NMOC/MM BTU

The NMOC in the outlet could be as much as 100% POC, but NPOCs are expected to make up no more than 5% of the total NMOC in the outlet.

(9 MM BTU/hr)*(1.6912E-2 lbs NMOC/MM BTU) = 0.152 lbs NMOC/hour

(0.13716 lbs NMOC/hr)*(1 lb POC/1 lb NMOC) = 0.152 lbs POC/hour
= 3.65 lbs POC/day
= 0.667 tons POC/year

(0.13716 lbs NMOC/hr)*(0.05 lbs NPOC/1 lb NMOC) = 0.008 lbs NPOC/hour
= 0.18 lbs NPOC/day
= 0.033 tons NPOC/year

Toxic Air Contaminants

Landfill gas contains numerous toxic air contaminants (TACs). Although burning the gas in a flare destroys most of the individual constituents, some residual TACs are emitted. In addition, the flare emits secondary TACs such as formaldehyde (due to the combustion of organic compounds) and acid gases (due to the combustion of chlorinated and fluorinated compounds).

In September 2008, a landfill gas analysis was conducted on gas collected from the City of Palo Alto Landfill. This data was used to determine the maximum expected TAC throughput to the proposed flare. The District assumed that A-10 would destroy at least 98% of each individual compound. Residual TAC emissions are summarized in Table 4. Toxic air contaminant emissions will be less than the rates listed in Table 4 based on the smaller capacity (300 scfm capacity) of the flare that was actually installed. For simplicity, the HRSA for A-10 was based on these original estimated emission rates. Detailed calculations are attached.

Table 4. Residual TAC Emissions from A-10 @ 400 scfm of LFG Throughput

| | Emitted LFG | Max. Emissions | | Risk Screen Trigger Level | |
|---|---|---|---|---|---|
| Compounds Detected in City of Palo Alto LFG | lbs/M scf | lbs/hour | lbs/year | Acute lbs/hour | Chronic lbs/yr |
| Acrylonitrile (353) | 2.744E-07 | 7.099E-06 | 6.219E-02 | None | 3.80E-01 |
| Benzene (41) | 8.887E-07 | 2.299E-05 | 2.014E-01 | 2.9 | 3.80E+00 |
| Carbon Disulfide | 9.842E-08 | 2.546E-06 | 2.231E-02 | 1.40E+01 | 3.10E+04 |
| Carbon Tetrachloride (60) | 1.989E-07 | 5.145E-06 | 4.507E-02 | 4.2 | 2.50E+00 |
| Chlorobenzene | 5.646E-07 | 1.461E-05 | 1.280E-01 | None | 3.90E+04 |
| Chloroform (390) | 1.543E-07 | 3.993E-06 | 3.498E-02 | 3.30E-01 | 2.00E+01 |
| 1,1 DCA | 1.279E-07 | 3.310E-06 | 2.900E-02 | None | 6.60E+01 |
| 1,2 DCA | 1.279E-07 | 3.310E-06 | 2.900E-02 | None | None |
| 1,1 DCE | 1.253E-07 | 3.242E-06 | 2.840E-02 | None | 2.70E+03 |
| 1,4 Dichlorobenzene | 9.122E-07 | 2.360E-05 | 2.067E-01 | None | 9.50E+00 |
| Ethyl Benzene | 7.137E-06 | 1.846E-04 | 1.617E+00 | None | 4.30E+01 |
| Ethyl Chloride (chloroethane) | 8.341E-08 | 2.158E-06 | 1.890E-02 | None | 1.20E+06 |
| Ethylene Dibromide (420) | 2.429E-07 | 6.284E-06 | 5.504E-02 | None | 1.50E+00 |
| Ethylene Dichloride (107) 1,2 DCA | 1.279E-07 | 3.310E-06 | 2.900E-02 | None | 5.30E+00 |
| Hexane | 2.095E-06 | 5.419E-05 | 4.747E-01 | None | 2.70E+05 |
| Hydrogen Sulfide (acute) (5020) | 2.291E-03 | 5.927E-02 | 5.192E+02 | 9.30E-02 | |
| TRS Hydrogen Sulfide (annual average) | 2.291E-03 | 5.927E-02 | 5.192E+02 | | 3.90E+02 |
| Methylene Chloride (396) | 1.845E-07 | 4.773E-06 | 4.181E-02 | 31 | 1.10E+02 |

| | | | | | |
|---|---|---|---|---|---|
| MEK | 3.505E-06 | 9.069E-05 | 7.944E-01 | 2.90E+01 | None |
| MTBE | 1.140E-07 | 2.948E-06 | 2.583E-02 | None | 2.10E+02 |
| Perchloroethylene (210) | 4.888E-07 | 1.265E-05 | 1.108E-01 | 4.40E+01 | 1.80E+01 |
| 1,1,2,2 Tetrachloroethane | 2.170E-07 | 5.614E-06 | 4.918E-02 | None | 1.90E+00 |
| Toluene | 6.671E-06 | 1.726E-04 | 1.512E+00 | 8.20E+01 | 1.20E+04 |
| Trichloroethylene (295) | 2.310E-07 | 5.977E-06 | 5.236E-02 | None | 5.40E+01 |
| 1,1,1 TCA | 1.725E-07 | 4.462E-06 | 3.909E-02 | 1.50E+02 | 3.90E+04 |
| 1,1,2 TCA | 1.725E-07 | 4.462E-06 | 3.909E-02 | None | 6.60E+00 |
| Vinyl Chloride (518) | 8.080E-08 | 2.090E-06 | 1.831E-02 | 4.00E+02 | 1.40E+00 |
| Xylene | 1.114E-05 | 2.883E-04 | 2.526E+00 | 4.90E+01 | 2.70E+04 |
| IPA | 2.611E-06 | 6.755E-05 | 5.918E-01 | 7.10E+00 | 2.70E+05 |

Secondary TAC emissions are summarized in Table 5. Secondary formaldehyde emissions are calculated using a CATEF emission factor of 0.18 pounds of formaldehyde per million scf of landfill gas burned. This factor was established for landfill gas turbines based on source test data. There is a CATEF factor for formaldehyde emissions from landfill gas flares, but this factor included detection limits that result in an unrealistically high formaldehyde emission factor. Therefore, the District assumes the formaldehyde factor for landfill gas turbines is applicable to well operated enclosed landfill gas flares. Secondary acid gas emissions are calculated using the total concentration on chlorine compounds that were measured during the September 2008 source test. Total chlorinated compounds were reported as 3.19 ppm. The District assumes that all chlorine is converted to hydrogen chloride (HCl) and that all fluorine is converted to hydrogen fluoride (HF). The facility wants to keep its permit limit of 104 ppm of chlorinated solvents. Therefore, this value was used rather than the landfill gas value from source test. As with the residual TAC emissions, the District used these original estimated emission rates in the HRSA, but the District expects that secondary emissions from A-10 will be much lower.

Table 5. Secondary TAC Emissions from A-10 @ 400 scfm of LFG Throughput

| Secondary TACs | Emitted | Max. Emissions | | Risk Screen Trigger Levels | |
|---|---|---|---|---|---|
| | lbs/M scf | lbs/hour | lbs/year | lbs/hour | lbs/year |
| Formaldehyde | 1.800 E-4 | 4.657E-3 | 40.80 | 1.2 E-1 | 18 |
| Hydrogen Chloride | 9.804E-03 | 2.537E-1 | 2222.08 | 4.6 E+0 | 350 |
| Hydrogen Fluoride | 2.690E-03 | 6.959E-2 | 609.63 | 5.3 E-1 | 540 |

## STATEMENT OF COMPLIANCE

Regulation 2, Rule 1 (CEQA and Public Notice Requirements)

This project involves the installation of abatement equipment (A-10 Landfill Gas Flare) that is necessary to ensure continued compliance with Regulation 8, Rule 34 and that is required pursuant to a District Abatement Order. This project is a replacement of an existing flare (A-3, 30 MM BTU/hour) with a much smaller flare (A-10, 9 MM BTU/hour). The abatement efficiency for A-10 is at least as high has the old flare. Secondary criteria and TAC emissions for the new flare will be less than the current permitted emissions for the old flare. Secondary flare emissions are

subject to RACT instead of BACT and are expected to meet RACT requirements. The flare emissions do not trigger TBACT and are expected to comply with the District's project risk limit based on an HRSA. The City of Palo Alto has determined and provided a letter dated April 15, 2011 stating this project is exempt from CEQA review per section 15303. After reviewing, the District concludes that there is no possibility that this project will have any significant adverse impacts on the environment. Consequently, this project is categorically exempt from CEQA review pursuant to Regulation 2-1-312.2 and 2-1-312.9, and 312.11.

This application also included a change of permit conditions at S-1 that involve the addition of 27 vertical wells, which is part of the overall emission control system for this landfill. These alterations and permit condition revisions will not allow any expansion of any operations beyond the currently permitted maximum operating rates and will not result in any significant emission increases at this facility. There is no possibility that the proposed permit condition revisions or collection system modifications could have any significant impact on the environment. Therefore, this proposed change of permit condition is categorically exempt from CEQA review pursuant to Regulation 2-1-312.12. No further CEQA review is required.

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

Regulation 2, Rule 2 (NSR)

This project involves the replacement of a flare with a smaller flare. Since the proposed flare will have at least as high as a control efficiency for organic compounds as the old flare and will have a lower landfill gas throughput rate, the project will not result in any POC or NPOC emission increase above the maximum permitted levels for the S-1 Palo Alto Landfill with Gas Collection System (after control by a flare).

Secondary criteria pollutant emissions ($NO_x$, CO, and $SO_2$) are subject to NSR. Per Regulation 2, Rule 2, Section 112, BACT review does not apply to emissions of secondary pollutants that are the direct result of operation of an abatement device that complies with the BACT or BARCT requirements for the control of another pollutant. Since the proposed flare meets the BARCT requirements of Regulation 8-34-301.3 for control of organic compounds, BACT does not apply to the secondary pollutants from this flare. However, Regulation 2, Rule 2, Section 112 does require secondary pollutants meet the Reasonably Available Control Technology Requirements (RACT). RACT for enclosed landfill gas flares includes compliance with emission limits of 0.06 lbs NOx/MM BTU and 0.20 lbs CO/MM BTU. The proposed flare, A-10, will meet these RACT limits for secondary NOx and CO emissions.

RACT for $SO_2$: The District determined that landfill gas sulfur treatment systems do not constitute a "reasonably" available control measure for closed landfills. Instead, RACT for $SO_2$ emissions from landfill gas combustion operations was determined to be compliance with reasonable landfill gas sulfur content limits. Initially, the Regulation 9-1-302 limit was used to establish a reasonable peak landfill gas sulfur content limit of 1300 ppmv as $H_2S$ for landfill gas containing 45% methane. Due to declining methane contents at this site, the District re-evaluated the appropriate TRS limit for methane concentrations as low as 25% (see Statement of Basis Report for the 2012 Title V renewal permit). The District has now determined that a landfill gas sulfur content limit of 860 ppmv of TRS, expressed as H2S, will ensure compliance with the 9-1-302 outlet SO2 concentration limit, even at low landfill gas methane content levels. This is the new RACT sulfur content level for this facility. The facility is currently meeting this new sulfur content limit with a high margin of compliance.

Since this project involves installation of abatement equipment that is necessary to meet BARCT requirements (specifically Regulation 8, Rule 34) and this project does not involve any modifications to the landfill, this project qualifies for the California Health and Safety Code exemption from offset requirements: H&SC § 42301.2, which states:

> 42301.2. A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled.

The proposed landfill gas flare is an abatement device as defined in Regulation 1-240, which is being installed to meet the control requirements in Regulation 8, Rule 34. There is no modification proposed to the landfill itself, so there is no increase in the capacity of the 'unit being controlled.' Therefore, the site will not be required to provide or reimburse the District for any the emission offsets (if they would otherwise be required) for secondary pollutant emissions from A-10.

Regulation 2-2-302 requires offsets for NOx and POC emission increases if facility wide emissions will exceed 10 tons/year. The required offsets may be provide from the District's small facility banking account if site-wide emissions are less than 35 tons/year of NOx and POC. For the City of Palo Alto, the site-wide NOx and POC emissions fall between 10 and 35 tons/year. Therefore, emission increases must be offset but qualify for the District's small facility banking account. As noted previously, this application has no POC increases and the NOx emission increases also qualify for the H&S Code 42301.2 offset exemption for abatement equipment.

In accordance with Regulation 2-2-303, SO2 and PM10 offsets are only required for major facilities that emit more than 100 tons/year of these pollutants. This site will not emit more than 100 tons/year of PM10 or SO2, therefore; offsets are not required for these pollutants.

Since facility wide emissions of all pollutants are less than 100 tons/year, this site is not a major facility for the purposes of PSD or Title V. Sections 2-2-304-309 do not apply.

**Regulation 2, Rule 5 (Toxic NSR)**

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants. All TAC emissions from new and modified sources are subject to risk assessment review, if emissions of any individual TAC exceed either the acute or chronic emission thresholds defined in Table 2-5-1.

The proposed flare was to be installed in a new location, and a risk screening analysis was required. For the initially proposed A-10 flare, the maximum health impacts were determined to be 0.01 in a million cancer risk, 0.008 chronic HI, and 0.02 acute HI. The ISCST model was run again based on the revised parameters for the smaller 9 MM BTU/hr flare that was actually installed (exhaust temperature, stack diameter, stack exhaust height, exhaust flow rate) and the same emission rates. The maximum ground level concentrations were less than those for the initial flare assessment. Thus, the health impacts for the 9 MM BTU/hr flare will be less than those listed above. A revised spreadsheet for the 9 MM BTU/hr flare is attached.

District Regulations

**Regulation 6, "Particulate Matter and Visible Emissions"**

The new landfill gas flare will be subject to the Ringelmann 1 limit and visible emissions prohibition in Sections 301 and 305. Visible particulate emissions are normally not associated with combustion of gaseous fuels, such as natural gas and landfill gas, so compliance with these sections is expected. The flare is also subject to the Section 310 filterable particulate emissions limit of 0.15 grains per dry standard cubic foot of exhaust volume. EPA's AP-42 emission factor for landfill gas combustion in a flare (0.0171 lbs PM10/MMBtu) is equivalent to 0.012 grains/dscf at 0% oxygen. Therefore, the proposed flare is expected to comply with Section 310.

**Regulation 8, Rule 34, "Organic Compounds - Solid Waste Disposal Sites"**

This section requires the flare to meet a non-methane organic compound (NMOC) destruction efficiency of at least 98% by weight or meeting an outlet NMOC concentration of less than 30 ppmv, dry as methane, corrected to 3% oxygen. The flare is expected to comply with these limits, which will be included in the permit conditions and enforced through a minimum temperature limit. The facility is also in compliance with landfill surface requirements.

**Regulation 9, Rule 1, "Inorganic Gaseous Pollutants – Sulfur Dioxide"**
The new flare will be subject to Regulation 9, Rule 1, Section 9-1-301 and Section 9-1-302. Section 9-1-302 limits sulfur dioxide emissions to no more than 300 ppmv in the exhaust.

Compliance with the $SO_2$ concentration limit for the existing flare is currently established through a surrogate limit of 860 ppmv of total reduced sulfur (TRS) content in the landfill gas. Assuming all of the sulfur is converted to $SO_2$ upon combustion, this level of sulfur will result in the following outlet $SO_2$ concentration:

(860 $ft^3$ $H_2S$/1 MM $ft^3$ LFG)*(1 $ft^3$ $SO_2$/1 $ft^3$ $H_2S$)/(2.892344 MM $ft^3$ flue gas at 0% $O_2$/1 MM $ft^3$ LFG) = 297 ppmv of $SO_2$, corrected to 0% $O_2$

This outlet concentration is less than the Regulation 9-1-302 limit. Any excess oxygen in the flue gas will further reduce this outlet $SO_2$ concentration. Therefore, compliance with the TRS content limit of 860 ppmv ensures compliance with the limit in Section 9-1-302.

Compliance with the 300 ppmv $SO_2$ exhaust limit Section 9-1-301 is expected to ensure compliance with the ground level concentration limits in Section 9-1-301 of: 0.5 ppm continuously for 3 minutes, 0.25 ppm averaged over 60 minutes, and 0.05 ppm averaged over 24 hours.

The November 2013 analysis of the landfill gas at this site measured only 29 ppmv of TRS, which is less than 4% of the limit.

**Regulation 9, Rule 2, "Inorganic Gaseous Pollutants – Hydrogen Sulfide"**
The ground level concentration limit on hydrogen sulfide in Section 9-2-301 is 0.06 ppm averaged over 3 minutes or 0.03 ppm averaged over 60 minutes. Hydrogen sulfide is generally identified by its characteristic rotten egg small and can be detected by its odor at concentrations as low as 0.0005 ppmv. Therefore, H2S emissions are usually detected by smell well before the concentrations approach the limits in Section 9-2-301. Hydrogen sulfide complaints are rarely received in association with Bay Area landfills, therefore area monitoring to demonstrate compliance with this rule has not been required.

**40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS):**
**Subpart A, Standards of Performance for New Stationary Sources – General Provisions**
**Subpart Cc, Standards of Performance for New Stationary Sources – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills**

40 CFR Part 60, Subpart Cc, Emission Guidelines (EG) for Municipal Solid Waste (MSW) Landfills applies to MSW landfills that have had no design capacity modification since May 30, 1991, but that have accepted waste since November 8, 1987. This facility began accepting waste in 1954, stopped accepting waste in 2011, and is currently subject to the EG requirements. The District's Regulation 8, Rule 34 has been approved in the state plan for implementation of the EG requirements. Therefore, the facility is currently subject to the EG, which is enforced through compliance with District Regulation 8, Rule 34. See the discussion of Rule 8-34 requirements above.

**Subpart A, Standards of Performance for New Stationary Sources – General Provisions**
**Subpart WWW, Standards of Performance for New Stationary Sources –Municipal Solid Waste Landfills**

Subpart WWW applies to municipal solid waste landfills that commenced construction, reconstruction, or modification or began accepting waste on or after May 30, 1991. For the purposes of Subpart WWW, modification is defined as

> *"an increase in the permitted volume design capacity of the landfill by either horizontal or vertical expansion based on its permitted design capacity as of May 30, 1991. Modification does not occur until the owner or operator commences construction on the horizontal or vertical expansion."*

The proposed replacement of the landfill gas flare, and additional wells will not affect the permitted design capacity of the landfill, therefore this site will not become subject to Subpart WWW due to the these changes.

**40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs):**
**Subpart M, National Emission Standard for Asbestos**

Subpart M applies to a number of asbestos related operations and handling activities, including active waste disposal sites that receive asbestos-containing waste material from sources subject to §61.149 (asbestos mills), 61.150 (manufacturing, fabricating, demolition, renovation, and spraying operations, and/or 61.155 (operations that convert asbestos-containing material into asbestos-free material). Asbestos-containing waste material is defined to include filters from control devices, friable asbestos waste, and bags or other packaging contaminated with commercial asbestos. This site accepted only non-friable asbestos and is therefore not subject to Subpart M.

**40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories/Maximum Achievable Control Technology (MACT) Standards:**
**Subpart A, National Emission Standards for Hazardous Air Pollutants – General Provisions**
**Subpart AAAA, National Emission Standards for Hazardous Air Pollutants – Municipal Solid Waste Landfills**

Subpart AAAA applies to municipal solid waste landfills that have accepted waste since November 8, 1987 or have additional capacity to accept waste and that meets any of the following:

- The landfill is a major source as defined in 40 CFR Part 63.2 of Subpart A (has the potential to emit, considering controls, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants);
- The landfill is co-located with a major source as defined in 40 CFR Part 63.2 of Subpart A; or

- The landfill is area source with a design capacity of 2.5 million megagrams and 2.5 million cubic meters or more and which has estimated uncontrolled non-methane organic compound emissions of 50 megagrams or more, as calculated according to Part 60, Subpart WWW.

This site meets the third criteria and is therefore subject to this regulation. This regulation requires subject landfills to meet the requirements of 40 CFR Part 60, Subpart Cc or WWW (addressed above). In addition, subject facilities are required to develop, maintain, and comply with a written startup, shutdown, and malfunction (SSM) plan per §63.1960 and Subpart A of this part. §63.1980 of the rule also requires semiannual submittal of the reports required by 40 CFR 60.757(f) (instead of annually). Table 1 requires compliance with certain sections of 40 CFR Part 63, Subpart A which are mirrored in 40 CFR Part 60, Subpart A and the following sections of 40 CFR Part 63, Subpart A:

- §63.5(b), Requirements for existing, newly constructed, and reconstructed sources: This application does not constitute reconstruction of the affected source.
- §63.6(e), Operation and maintenance requirements: This section requires operation of the affected source in a manner consistent with safety and good control practices for minimizing emissions, including during any periods of startup, shutdown, or malfunction. The facility is expected to continue to comply with these requirements.
- §63.10(b)(2)(i) – (v), General recordkeeping requirements: This section requires maintenance of records pertaining to startup, shutdown, and malfunction of the source, as well as maintenance on control and monitoring equipment. This must include all information necessary to demonstrate compliance with the SSM plan and documentation of actions taken that are different from the procedures in the SSM plan. The facility is expected to continue to comply with these requirements.
- §63.10(d)(5), General reporting requirements: Periodic reports of actions taken in compliance with the SSM plan must be reported if there was an exceedance of an emission limit. These reports must be submitted semiannually. If there was an exceedance of an emission limit and the actions taken are inconsistent with the SSM plan, an immediate report is required. The report must include a summary of the actions taken, must be reported within 2 working days, and a summary must follow within 7 working days after the event ends. The facility is expected to continue to comply with these requirements.

**40 CFR Part 70, State Operating Permit Programs (Title V):**
This facility is a designated facility, as it is currently subject to the requirements of 40 CFR Part 70. As a designated facility, this facility is subject to the requirements of 40 CFR Part 70. The requirements of this program have been codified in District Regulation 2, Rule 6. See discussion of Rule 2-6 above.

**PERMIT CONDITIONS**

The S-1 Palo Alto Landfill with gas collection System is currently subject to Condition # 1028. Permit condition revisions are necessary to remove the old flare (A-3) and also include the increases in vertical well installation allowances for the Phase IIC area of the landfill. The District is proposing to add the new flare (A-10) and the associated RACT, 8-34, and initial source test requirements and to clarify continuous operation and monitoring requirements for the current and proposed emission control systems. The necessary permit condition revisions are shown below in strikeout and underline format.

**Condition # 1028**
**For: S-1 PALO ALTO LANDFILL WITH GAS COLLECTION SYSTEM AND A-~~3~~ 10 LANDFILL GAS FLARE**

1. 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 400 tons in any day prior to August 1, 2011. Effective August 1, 2011, this landfill is inactive and shall not accept any waste for disposal and shall not place any waste or other decomposable materials in the landfill. (Basis: Regulation 2-1-301)
   b. The total cumulative amount of all decomposable materials placed in the landfill shall not exceed 5,830,000 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)
   c. The maximum design capacity of the landfill (total volume of all wastes and cover materials placed in the landfill, excluding final cover) shall not exceed 7,759,000 cubic yards. (Basis: Regulation 2-1-301)

2. Effective August 1, 2011, this part does not apply because this site is no longer accepting any waste or cover materials for disposal or placement in the landfill. The following text applies to activities that occurred prior to August 1, 2011. This facility is not subject to Regulation 8, Rule 40 because the landfill does not accept contaminated soil (soil containing more than 50 ppmw of volatile organic compounds, VOCs). The following types of materials may be accepted:
   a. Materials for which 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 Regulation 8, Rule 40, Sections 205, 207, and 211).
   b. Materials for which the Permit Holder lacks 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.

   c. Materials which the Permit Holder plans to test in order to determine the VOC contamination level in the soil, provided that the material is sampled within 24 hours of receipt by this site and is handled as if the soil were contaminated until the Permit Holder receives the test results. The Permit Holder shall collect soil samples in accordance with Regulation 8-40-601. The organic

content of the collected soil samples shall be determined in accordance with Regulation 8-40-602.

i. If the test results indicate that the soil is 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 Regulation 8, Rule 40, until the soil has been removed from this site or has completed treatment. 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 the test results indicate that the soil, as received at this site, has an organic content of 50 ppmw or less, then the soil need not be handled in accordance with Regulation 8, Rule 40 any longer.

(Basis: Regulation 8-40-301)

3. Effective August 1, 2011, this part does not apply because this site is no longer accepting any waste or cover materials for disposal or placement in the landfill. The following text applies to activities that occurred prior to August 1, 2011. VOC laden soil is any material that contains volatile organic compounds, as defined in Regulation 8-40-213, at a concentration of 50 ppm by weight or less. Soil containing more than 50 ppmw of VOC is considered to be "contaminated soil" and is subject to Part 2 instead of this part. Materials containing only non-volatile hydrocarbons and meeting the requirements of Regulation 8-40-113 are not subject to this part. The Permit Holder shall demonstrate compliance with Regulation 8-2-301 by randomly screening each lot of VOC laden soil for VOC surface emissions (in such a manner as to be representative of the entire lot and using the testing procedures outlined in Regulation 8-40-604) to show that each lot of VOC laden soil is not contaminated soil and could therefore not result in emissions in excess of 300 ppmv of total carbon. Soil presumed to be VOC laden soil that is found to have a surface VOC concentration greater than 50 ppmv shall be considered contaminated soil and will be subject to the requirements of Part 2 of these conditions. In order to demonstrate compliance with this condition, the Permit Holder shall maintain the following records in a District approved log.

a. Record a lot number for each shipment of VOC laden soil.

b. Record the soil delivery date, the testing date for the VOC surface emissions screening test, the name and affiliation of the person conducting the screening test, and the results of the screening test for each lot of VOC laden soil accepted at the site.

c. Maintain certifications that the Regulation 8-40-604 procedures were followed for each screening test.

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: Regulations 8-2-301, 8-40-205, and 8-40-604)

4. 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 longer than 3 minutes in any hour. Paved roadways at the facility shall be kept sufficiently clear of dirt and debris as necessary to prevent visible particulate emissions (that persist for longer than 3 minutes in any hour) from vehicle traffic.
(Basis: Regulations 2-1-403, 6-1-301, and 6-1-305)

5. All collected landfill gas shall be vented to the properly operating Landfill Gas Flare (A-~~3~~10) or the sludge incinerators (S-1 and S-2) as supplemental fuel at site#A617 Palo Alto Regional Water Quality Control Plant. If the sludge incinerators at site #A617 are not operating, all collected landfill gas shall be vented to the A-~~3~~ 10 Landfill Gas Flare. Any amount of collected landfill gas that exceeds the capacity of the operating sludge incinerators at Site #A617 shall be vented to the flare. Raw landfill shall not be vented to the atmosphere, except for unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair (which 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: Regulation 8-34-301)

6. The landfill gas collection system described in Part 7a shall be operated continuously, as defined in Regulation 8-34-219. Wells and adjustment valves shall not be shut off, disconnected, or removed from operation without written authorization from the District, unless the Permit Holder complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118. (Basis: Regulation 8-34-301.1)

7. The Permit Holder shall apply for and receive a Change of Conditions before altering the landfill gas collection system described in Parts 7a-b below. Increasing or decreasing the number of wells or collectors, changing the length of collectors, or changing locations of wells or collectors are all considered to be alterations that are subject to this requirement.
   a. The Permit Holder has been issued a ~~Permit to Operate~~ Change of Condition for the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in Permit Application #~~2230~~22543 June 7,

2011.

| | Required Components |
|---|---|
| Total Number of Vertical Wells: | 92 |

b. The Permit is authorized to make the landfill gas collection system alterations described below:
i. install up to 17 vertical wells in the Phase IIC area
ii. install up to 10 additional vertical wells in the landfill as need

Wells installed pursuant to this subpart shall be added to or removed from subpart a in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415.
(Basis: Regulations 2-1-301, 8-34-301.1, 8-34-304, 8-34-305)

8. The Heat Input to the A-~~3~~10 Landfill Gas Flare shall not exceed ~~720~~216 million BTU per day and shall not exceed ~~262,800~~78,840 million BTU per year. In order to demonstrate compliance with this part, the Permit Holder shall calculate and record, on a monthly basis, the maximum daily and total monthly heat input to the flare based on: (a) the landfill gas flow rate recorded pursuant to Regulation 8-34-508 and 8-34-501.10, (b) the average methane concentration in the landfill gas measured in most recent source test, and (c) a high heating value for methane of 1013 BTU per cubic foot at 60 degrees F. (Basis: Regulation 2-1-301)

9. The combustion zone temperature of the A-~~3~~10 Landfill Gas Flare shall be maintained at a minimum of ~~1420~~1457 degrees Fahrenheit, averaged over any 3-hour period. 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 Regulation 2-6-414 or 2-6-415, based on the following criteria. The minimum combustion zone temperature for the flare shall be equal to the average combustion zone temperature measured during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature shall not be less than 1400 degrees F. (Basis: Regulations 2-5-301 and 8-34-301.3)

10. The A-~~3~~ 10 Landfill Gas Flare shall be equipped with both local and remote alarm systems. (Basis: Regulation 8-34-301)

11. Nitrogen oxide ($NO_x$) emissions from the A-~~3~~ 10 Landfill Gas Flare shall not exceed ~~32 ppmv of $NO_x$, corrected to 15% oxygen, dry basis~~ 0.06 lbs/MM BTU ~~of NOx~~ (calculated as NO2). (Basis: Cumulative Increase)

12. Carbon monoxide (CO) emissions from the A-~~3~~ 10 Landfill Gas Flare shall not exceed ~~208 ppmv of CO, corrected to 15% oxygen, dry basis~~ 0.20 lbs/MMBTU ~~of CO~~. (Basis: Cumulative Increase)

*13. Deleted March 5, 2014.

14. Total reduced sulfur compounds in the collected landfill gas shall be monitored as a surrogate for monitoring sulfur dioxide in control system's exhaust. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 860 ppmv (dry) expressed as hydrogen sulfide. In order to demonstrate compliance with this part, the Permit Holder shall test collected landfill gas on an annual basis. The landfill gas sample shall be taken from the main landfill gas header. The Permit Holder shall either test the gas for total reduced sulfur compounds (carbon disulfide, carbonyl sulfide, dimethyl sulfide, hydrogen sulfide, ethyl mercaptan, and methyl mercaptan) using District approved methods (MOP, Volume III, Methods 5, 25, or 44) or test the gas for hydrogen sulfide using a draeger tube and following the manufacturer's recommended procedures for using the draeger tube and interpreting the results. If the draeger tube method is used, the measured hydrogen sulfide concentration shall be multiplied by 1.2 to obtain the total reduced sulfur concentration. (Basis: Regulation 9-1-302)

15. To demonstrate compliance with Parts 8-12 above and Regulation 8, Rule 34, Sections 301.3 and 412, the Permit Holder shall ensure that a District approved source test is conducted annually on the Landfill Gas Flare (A-3). As a minimum, the annual 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 ($O_2$), 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, $CH_4$, NMOC, and $O_2$ in the flare stack gas;
    e. the NMOC and methane destruction efficiencies achieved by the flare; and
    f. the average combustion zone temperature in the flare during the test period.

    Each annual source test shall be conducted no later than 12 months after the previous annual source test. 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 45 days of the test date.
    (Basis: Cumulative Increase and Regulations 2-5-302, 8-34-301.3, and 8-34-412)

16. To demonstrate compliance with Part 13 above and Regulation 8-34-412, the Permit Holder shall conduct a characterization of the landfill gas concurrent with the annual source test required by Part 15 above. The landfill gas sample shall be drawn from the main landfill gas header. In addition to the compounds listed in part 15b, the landfill gas shall be analyzed for the organic compounds listed below. 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 45 days of the test date. (Basis: Regulations 2-5-302 and 8-34-412)

| Organic Compounds | Organic Compounds |
|---|---|
| acrylonitrile | hexane |
| benzene | isopropyl alcohol |
| carbon tetrachloride | methyl ethyl ketone |
| chlorobenzene | methylene chloride |
| chloroethane | perchloroethylene |
| chloroform | toluene |
| 1,1 dichloroethane | 1,1,1 trichloroethane |
| 1,1 dichlorethene | 1,1,2,2 tetrachloroethane |
| 1,2 dichloroethane | trichloroethylene |
| 1,4 dichlorobenzene | vinyl chloride |
| ethyl benzene | xylenes |
| ethylene dibromide | |

17. To demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved logbook.
    a. Record the total amount of municipal solid waste received at S-1 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 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. The Permit Holder may use District approved checklists that describe the standard dust mitigation measures employed at this site in lieu of these daily records, provided that the checklists are completed on a daily basis and any deviations from standard procedures are described. All records shall be summarized on monthly basis.

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

f. 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 7a. 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.

g. Calculate and record the heat input to A-~~3~~10, pursuant to Part 8.

h. Maintain records of all test dates and test results performed to maintain compliance Parts 14-16 above or to maintain compliance with any applicable rule or regulation

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: Cumulative Increase and Regulations 2-1-301, 2-5-501, 2-6-501, 6-1-301, 6-1-305, 8-2-301, 8-34-301, 8-34-304, and 8-34-501)

18. The annual report required by BAAQMD Regulation 8-34-411 shall be submitted in two semi-annual increments. The reporting periods and report submittal due dates for all 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))

## RECOMMENDATION

Archive all records and delete all permit conditions associated with the A-3 Landfill Gas Flare.

Issue a Permit to Operate for the following abatement device:

**A-10** **Landfill Gas Flare**; Perennial Energy Model FL-60-25-E.; 9 MM BTU/hour; fired on propane (during start-up only) and landfill gas; abating S-1 Palo Alto Landfill Gas Collection System.

Issue a Change of Permit Conditions for the following equipment:

**S-1** **Palo Alto Landfill with Gas Collection System**; increase vertical well installation

By: Irma Salinas
Senior Air Quality Engineer

# Title V Minor Revision Statement of Basis: Permit to Operate

Connection of Leachate Collection and Recovery System (LCRS) to the Gas Collection and Control System (GCCS) known as S-1
City of Palo Alto PLANT #2721
APPLICATION #26538

## BACKGROUND

The facility is requesting that the components of the LCRS be allowed to connect to the GCCS so that fugitive emissions from the LCRS will be minimized. The City of Palo Alto is proposing to allow up to 24 leachate collection wells to be connected to the GCCS. The City is assuring that they will comply with the requirements of Regulation 8-34 in that testing of the wellhead for temperature, pressure and gas concentrations will be performed. In addition, the City of Palo Alto is requesting that a change of condition to allow up to 20 vertical LGF collection wells be allowed to be decommissioned and not replaced if it is determined that wells are not productive and it would serve no purpose to install new wells in that general area.

S-1 Palo Alto Landfill Gas Collection System and LCRS abated by A-10 Landfill Gas Flare; Perennial Energy Model FL-60-25-E.; 9 MM BTU/hour;

## EMISSIONS

Landfills are sources of air emissions, including particulate matter from the handling of waste, excavation and compaction activities, as well as vehicular traffic across paved and unpaved roads. Landfill gas control equipment, as well as delivery vehicles and onsite mobile construction equipment, also generate combustion emissions from the combustion of fuel. The decomposition of waste in the landfill generates emissions of methane and volatile organic compounds, which is emitted in the form of fugitive leaks from uncollected landfill gas or as the small fraction of organic compounds which are uncombusted at the landfill gas abatement device. All of these types of emissions are related to the permitted capacity of the landfill.

The City of Palo Alto landfill has ceased accepting degradable waste in August 2011, so the emissions that occur due to active placement of waste no longer exist at this site. However, emissions from landfill continue due to degradation of the existing waste in place. Intermittent connection of the leachate collection and recovery system (LCRS) to the gas collection and control system (GCCS) will not result in additional gas generation or any change in the landfill gas production rate.

The landfill gas that can accumulate in the leachate collection system does not represent new emissions – these emissions are generated from the existing waste in place. The occasional venting of the collected landfill gas from the leachate collection system to the gas collection system is therefore not an emission increase, but simply disposition of emissions from an already permitted source. Since the proposed periodic connection of the leachate collection system to the gas collection system does not represent an emission increase, this action is therefore not a "modification" of the landfill source as defined in Regulation 1-217:

> *"Any physical change in existing plant or change in the method of operation which results or may result in either an increase in emission of any air pollutant subject to District control, or the emission of any such air pollutant not previously emitted. …"*

## CUMULATIVE INCREASE

There is no change in emissions associated with the request to periodically connect the leachate collection system to the gas collection system, therefore there will be no change to the cumulative emission increases for this facility as a result of this application.

## COMPLIANCE DETERMINATION

**Regulation 1, "General Provisions and Definitions"**
Regulation 2, Rule 1, "Permits – General Requirements" - Public Notice Requirements
Regulation 2, Rule 2, "Permits – New Source Review" - Best Available Control Technology (BACT) Requirements, Emission Offsets and Prevention of Significant Deterioration (PSD)
Regulation 2, Rule 5, "Permits – New Source Review of Toxic Air Contaminants" - Health Risk Assessment Requirements
**Regulation 6, Rule 1, "Particulate Matter – General Requirements"**
**Regulation 9, Rule 2, "Inorganic Gaseous Pollutants – Hydrogen Sulfide"**

As there is no increase in emissions associated with the proposed operation of the leachate collection system, continued compliance with the emission limits in Regulation 1 (public nuisance), Regulation 6, Rule 1 (particulate and visible emissions), and Regulation 9, Rule 2 (hydrogen sulfide) is expected. In addition, the public notification requirements of Regulation 2, Rule 1, Section 412, the BACT, PSD, and emission offset requirements in Regulation 2, Rule 2, as well as the health risk assessment requirements in Regulation 2, Rule 5 are requirements that are triggered based on emission increases and therefore also do not apply.

California Environmental Quality Act (CEQA) Requirements, Regulation 2, Rule 1
The proposed change of conditions for the leachate collection and recovery system (LCRS) does not involve an increase in emissions. Therefore, this request is exempt from CEQA review by the express terms of CEQA and District Regulation 2-1-312.1.

**Major Facility Review, Regulation 2, Rule 6**
The Title V federal permitting requirements of 40 CFR Part 70 have been codified and are enforced through District Regulation 2, Rule 6. This facility is a designated facility and is therefore subject to Title V and Regulation 2, Rule 6. As a designated facility, this facility was required to obtain a Title V Federal Operating Permit. The Title V permit for this facility was recently renewed in June 2012. The proposed change of conditions for the leachate cleanout risers qualifies as a minor revision to the Title V permit, which will be processed under Application #26066.

**Regulation 3, Fees**
The facility has paid the application fees billed under Invoice 3KU40.

**Regulation 8, Rule 34, "Organic Compounds – Solid Waste Disposal Sites"**
Regulation 8, Rule 34 contains operational requirements that apply to the landfill gas collection system, as well as requirements that apply to the landfill operation and the landfill gas emission control system.

Section 8-34-301.1 requires the landfill gas collection system to be operated continuously, unless the requirements of Section 8-34-404 are met. Also, Section 8-34-305 defines the landfill gas collection wellhead standards: negative pressure (8-34-305.1), temperature < 55 $^{o}$C (8-34-305.2), and either $N_2$ < 20% or $O_2$ < 5% (8-34-305.3 or 305.4), which apply unless alternate operating limits have been approved. The District policy on how these standards apply to the leachate collection system has changed – the LCRS are being held to the same standard as the gas collection system and wellhead standards, unless separate provisions have been made. The facility has applied for less than continuous operation for the leachate collection recovery system (LCRS) and it will be granted.

The leachate collection system, as well as the rest of the landfill, is subject to the landfill surface leak requirements in Section 8-34-303, limiting surface leaks to no more than 500 ppmv, as methane above background, unless the repair schedule of Section 8-34-415 has been met. Quarterly monitoring is required per Section 8-34-506, and records of this monitoring and repair procedures must be maintained per Section 8-34-501.6. Since this landfill is closed, if no surface leaks in excess of 500 ppmv are detected in 3 consecutive quarters, the

monitoring frequency is extended to annual monitoring per Section 8-34-506.3. Any monitored surface leak exceedance increases the monitoring frequency back to quarterly monitoring.

The Applicant is expected to continue to comply with these applicable requirements, and the permit conditions will be revised to continue allowance of less than continuous operation and connection of the LCRS to the gas collection as necessary to comply with the surface leak limitations.

**California Health and Safety Code Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change,**
**Article 4, Regulations to Achieve Greenhouse Gas Emission Reductions, Subarticle 6, Methane Emissions from Municipal Solid Waste Landfills, Sections 95460-95476**

This state regulation was adopted to reduce methane emissions from municipal solid waste landfills and applies to all MSW landfills that received waste after January 1, 1977. Waste was accepted at the City of Palo Alto Landfill after this date, so the landfill is subject to this regulation.

Section 95464 specifies requirements for the gas collection and control system. Section 95464(b)(1)(A) requires continuous operation of the gas collection and control system. Section 95464(b)(1)(B) requires the control system be operated such that there are no landfill gas leaks that exceed 500 ppmv, measured as methane, at any component containing landfill gas under positive pressure. Section 95464(b)(2) and (3) specify control efficiencies, and Section 95464(b)(4) specifies source test requirements for control devices. Section 95464(c) specifies that each wellhead must be operated under vacuum (negative pressure), except for well raising, repairs, decommissioned wells, or use of a geomembrane/synthetic cover. Section 95469(b)(3) requires quarterly leak monitoring to demonstrate compliance with this limit and repair within 10 days.

Section 95465(a) specifies a landfill surface leak limit of 500 ppmv, determined by instantaneous surface emissions monitoring, and an average methane concentration limit of 25 ppmv, as determined by integrated surface emissions monitoring, except at the working face of the landfill or areas where cover material has been removed for installing, expanding, replacing, or repairing landfill gas, leachate, or gas condensate collection and removal system components (Section 95466). Section 95469(a) requires quarterly instantaneous and integrated surface monitoring, as well as the records required to demonstrate compliance with this limit. For closed landfills, Section 95469(a)(1)(C) allows monitoring frequency to extend to annual monitoring if no exceedances are documented in 4 consecutive quarters. This monitoring reverts to quarterly if any exceedance is measured. The monitoring procedures are specified in Section 95471(c).

Section 95470(a) specifies the recordkeeping requirements, and Section 95470(b)(3) and (4) specify the annual reporting requirements. Test methods and procedures are contained in Section 95471.

Although the LCRS were never intended to be part of the landfill gas collection system, they can be considered "wellheads" and subject to Section 95464(c) due to the periodic connection to the gas collection system. Section 95468 allows the operator to request alternatives to the compliance measures, monitoring, test methods and procedures in Sections 95464, 95469, and 95471. Section 95468(a)(1) specifically cites activities such as semi-continuous operation of gas collection system due to insufficient gas flows, which applies to the LCRS when disconnected from vacuum when insufficient gas is available to justify the need to collect gas. The Compliance and Enforcement Division is handling implementation of the state rule, and has indicated that this alternative compliance operation should be pursued to ensure that there is no violation of this rule. The Applicant has been advised to seek approval of alternative compliance provisions from the Compliance and Enforcement Division.

**40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS):**

**Subpart A, Standards of Performance for New Stationary Sources – General Provisions**

**Subpart Cc, Standards of Performance for New Stationary Sources – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills**

40 CFR Part 60, Subpart Cc, Emission Guidelines (EG) for Municipal Solid Waste (MSW) Landfills applies to MSW landfills that have had no design capacity modification since May 30, 1991, but that have accepted waste since November 8, 1987. This facility began accepting waste in 1954, stopped accepting waste in 2011, and is currently subject to the EG requirements. The District's Regulation 8, Rule 34 has been approved in the state plan for implementation of the EG requirements. Therefore, the facility is currently subject to the EG, which is enforced through compliance with District Regulation 8, Rule 34. See the discussion of Rule 8-34 requirements above.

**Subpart A, Standards of Performance for New Stationary Sources – General Provisions**

**Subpart WWW, Standards of Performance for New Stationary Sources – Municipal Solid Waste Landfills**

Subpart WWW applies to municipal solid waste landfills that commenced construction, reconstruction, or modification or began accepting waste on or after May 30, 1991. For the purposes of Subpart WWW, modification is defined as

> *"an increase in the permitted volume design capacity of the landfill by either horizontal or vertical expansion based on its permitted design capacity as of May 30, 1991. Modification does not occur until the owner or operator commences construction on the horizontal or vertical expansion."*

The proposed connection of the LGCS will not affect the permitted design capacity of the landfill, therefore this site will not become subject to Subpart WWW due to the these changes.

Section 60.753 specifies the operating standards for collection and control systems. Section 60.753(b) requires operation of the collection system with negative pressure at each wellhead. Section 60.753(c) requires operation of each interior wellhead in the collection system at a gas temperature less than 55 degrees C, and a nitrogen level less than 20% or oxygen level less than 5%, and allows the operator to establish a higher operating temperature, nitrogen, or oxygen limits for particular wells. 60.753(d) requires operation of the collection system so that surface leaks do not exceed 500 ppm above background at the landfill surface.

Section 60.755(c) requires quarterly surface monitoring. Section 60.756(f) allows closed landfills to perform surface monitoring annually if no exceedances are found in 3 consecutive quarters, which reverts back to quarterly with any monitored exceedance. Sections 60.757 and 768 specify the reporting and recordkeeping requirements. Section 60.755 specifies compliance provisions and 60.759 contains the requirements for active collection systems.

There is no definition of wellhead under this regulation to distinguish between landfill gas collection wells and leachate collection system components. However, Section 60.759(a) specifies that active collection wells, horizontal collection, and other extraction devices shall be sited at sufficiently density throughout gas-producing areas in a manner certified to achieve comprehensive control of surface gas emissions, and that the design should consider refuse and cover properties, gas system expandability, leachate and condensate management, air intrusion control, among others. This section also requires that the density of the gas collection devices address landfill gas migration issues and augmentation of the collection system through use of active or passive systems at the landfill perimeter or exterior.

The regulation acknowledges that leachate management should be considered in the design of the gas collection system to sufficiently control surface gas emissions. Since the LCRS were never intended to be part of the landfill gas collection system, they are not necessary elements of the gas extraction system. Connection to the gas collection system is necessary to prevent surface leaks and gas migration issues, if the LCRS are located at the perimeter of the landfill,

as required by the regulation. However, the regulation does not specify that LCRs are considered part of the gas collection system when not connected to vacuum. Therefore, the District has determined that these components are subject to wellheads standards under this regulation only when connected to the gas collection system.

**40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs):**

**Subpart M, National Emission Standard for Asbestos**

Subpart M applies to a number of asbestos related operations and handling activities, including active waste disposal sites that receive asbestos-containing waste material from sources subject to §61.149 (asbestos mills), 61.150 (manufacturing, fabricating, demolition, renovation, and spraying operations, and/or 61.155 (operations that convert asbestos-containing material into asbestos-free material). Asbestos-containing waste material is defined to include filters from control devices, friable asbestos waste, and bags or other packaging contaminated with commercial asbestos. This site accepted only non-friable asbestos and is therefore not subject to Subpart M.

**40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories/Maximum Achievable Control Technology (MACT) Standards:**

**Subpart A, National Emission Standards for Hazardous Air Pollutants – General Provisions**

**Subpart AAAA, National Emission Standards for Hazardous Air Pollutants – Municipal Solid Waste Landfills**

40 CFR Part 63, Subpart AAAA applies to existing and new municipal solid waste landfills that have accepted waste since November 8, 1987 or have additional capacity to accept waste and that meets any of the following:

- The landfill is a major source as defined in 40 CFR Part 63.2 of Subpart A (has the potential to emit, considering controls, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants);
- The landfill is co-located with a major source as defined in 40 CFR Part 63.2 of Subpart A; or
- The landfill is area source with a design capacity of 2.5 million megagrams and 2.5 million cubic meters or more and which has estimated uncontrolled non-methane organic compound emissions of 50 megagrams or more, as calculated according to Part 60, Subpart WWW.

This rule requires compliance with the NSPS, Subpart WWW or Subpart Cc and compliance with Section 63.1960 through 63.1985 and the specified general provisions. Section 63.1960 requires compliance demonstrations through

performance testing, monitoring, or other credible evidence as required by the NSPS or implementing District regulation, as well as development of a startup, shutdown, and malfunction (SSM) plan in accordance with Section 63.6(e)(3). Section 63.1980(a) requires submittal of a compliance report every 6 months, rather than just annually.

The following sections of the general provisions also apply to the landfills subject to this subpart: Sections 63.1(a), (b), and (e); 63.2; 63.4; 63.5(b); 63.6(e) operation, maintenance, and SSM plan requirements and (f) compliance with non-opacity standards; 63.10(b)(2)(i)-(b)(2)(v) SSM recordkeeping requirements and (d)(5) SSM reports; 63.12(a); 63.15.

Periodic connection of the leachate collection system to the gas collection system as proposed under this application will not affect the facility's requirement to develop and implement as SSM plan under this rule.

### 40 CFR Part 70, State Operating Permit Programs (Title V):

This facility is a designated facility, as it is currently subject to the requirements of 40 CFR Part 70. As a designated facility, this facility is subject to the requirements of 40 CFR Part 70. The requirements of this program have been codified in District Regulation 2, Rule 6. See discussion of Rule 2-6 above.

## PERMIT CONDITIONS

Parts 1,6, 7,11,12,15,16,17 and 19 of Condition #1028 will be revised as indicated below to allow intermittent connection of the leachate components to the gas collection system:

**Condition # 1028**
**For: S-1 PALO ALTO LANDFILL WITH GAS COLLECTION SYSTEM AND A-10 LANDFILL GAS FLARE**

1. ~~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 400 tons in any day prior to August 1, 2011. Effective August 1, 2011, this landfill is inactive and shall not accept any waste for disposal and shall not place any waste or other decomposable materials in the landfill. (Basis: Regulation 2-1-301)~~
   b. ~~The total cumulative amount of all decomposable materials placed in the landfill shall not exceed 5,830,000 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)~~

~~c. The maximum design capacity of the landfill (total volume of all wastes and cover materials placed in the landfill, excluding final cover) shall not exceed 7,759,000 cubic yards.~~ The cumulative amount of all decomposable materials placed in the landfill shall not exceed 5,830,000 tons. Effective August 1, 2011, no waste shall be disposed of in the landfill. Modified October 21, 2014. (Basis: Regulation 2-1-301, Cumulative Increase) ~~(Basis: Regulation 2-1-301)~~

2. ~~Effective August 1, 2011, this part does not apply because this site is no longer accepting any waste or cover materials for disposal or placement in the landfill. The following text applies to activities that occurred prior to August 1, 2011. This facility is not subject to Regulation 8, Rule 40 because the landfill does not accept contaminated soil (soil containing more than 50 ppmw of volatile organic compounds, VOCs). The following types of materials may be accepted:~~

~~a. Materials for which 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 Regulation 8, Rule 40, Sections 205, 207, and 211).~~

~~b. Materials for which the Permit Holder lacks 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.~~

~~c. Materials which the Permit Holder plans to test in order to determine the VOC contamination level in the soil, provided that the material is sampled within 24 hours of receipt by this site and is handled as if the soil were contaminated until the Permit Holder receives the test results. The Permit Holder shall collect soil samples in accordance with Regulation 8-40-601. The organic content of the collected soil samples shall be determined in accordance with Regulation 8-40-602.~~

~~i. If the test results indicate that the soil is 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 Regulation 8, Rule 40, until the soil has been removed from this site or has completed treatment. 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 the test results indicate that the soil, as received at this site, has an organic content of 50 ppmw or less, then the soil need not be handled in accordance with Regulation 8, Rule 40 any longer.~~

~~(Basis: Regulation 8-40-301)~~Deleted October 21, 2014

3. ~~Effective August 1, 2011, this part does not apply because this site is no longer accepting any waste or cover materials for disposal or placement in the landfill. The following text applies to activities that occurred prior to August 1, 2011. VOC laden soil is any material that contains volatile organic compounds, as defined in Regulation 8-40-213, at a concentration of 50 ppm by weight or less. Soil containing more than 50 ppmw of VOC is considered to be "contaminated soil" and is subject to Part 2 instead of this part. Materials containing only non-volatile hydrocarbons and meeting the requirements of Regulation 8-40-113 are not subject to this part. The Permit Holder shall demonstrate compliance with Regulation 8-2-301 by randomly screening each lot of VOC laden soil for VOC surface emissions (in such a manner as to be representative of the entire lot and using the testing procedures outlined in Regulation 8-40-604) to show that each lot of VOC laden soil is not contaminated soil and could therefore not result in emissions in excess of 300 ppmv of total carbon. Soil presumed to be VOC laden soil that is found to have a surface VOC concentration greater than 50 ppmv shall be considered contaminated soil and will be subject to the requirements of Part 2 of these conditions. In order to demonstrate compliance with this condition, the Permit Holder shall maintain the following records in a District approved log.~~

~~a. Record a lot number for each shipment of VOC laden soil.~~

~~b. Record the soil delivery date, the testing date for the VOC surface emissions screening test, the name and affiliation of the person conducting the screening test, and the results of the screening test for each lot of VOC laden soil accepted at the site.~~

~~c. Maintain certifications that the Regulation 8-40-604 procedures were followed for each screening test.~~

~~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: Regulations 8-2-301, 8-40-205, and 8-40-604)~~Deleted Oct 21, 2014

4. 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 longer than 3 minutes in any hour. Paved roadways at the facility shall be kept

sufficiently clear of dirt and debris as necessary to prevent visible particulate emissions (that persist for longer than 3 minutes in any hour) from vehicle traffic.
(Basis: Regulations 2-1-403, 6-1-301, and 6-1-305)

6. All collected landfill gas shall be vented to the properly operating Landfill Gas Flare (A-10) or the sludge incinerators (S-1 and S-2) as supplemental fuel at site#A617 Palo Alto Regional Water Quality Control Plant. If the sludge incinerators at site #A617 are not operating, all collected landfill gas shall be vented to the A-10 Landfill Gas Flare. Any amount of collected landfill gas that exceeds the capacity of the operating sludge incinerators at Site #A617 shall be vented to the flare. Raw landfill shall not be vented to the atmosphere, except for unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair (which 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: Regulation 8-34-301)

6. The landfill gas collection system described in Part 7a shall be operated continuously, as defined in Regulation 8-34-219. Wells and adjustment valves shall not be shut off, disconnected, or removed from operation without written authorization from the District, unless the Permit Holder complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118. The landfill gas collection system described in Part 7b.(iii) is not required to be operated continuously and is subject to the alternative wellhead standards described in Part 19, as allowed under Regulation 8-34-305. The CCR, Title 17, Section 95464(c) Wellhead Gauge Pressure Requirement continues to apply to these components. (Basis: Regulation 8-34-301.1 and 8-34-305, CA H&S Code, Title 17, Division 3, Chapter 10, Article 4, Subarticle 6, 40 CFR Part 60.753)

7. The Permit Holder shall apply for and receive a Change of Conditions before altering the landfill gas collection system described in Parts 7a-b below. Increasing or decreasing the number of wells or collectors, changing the length of collectors, or changing locations of wells or collectors are all considered to be alterations that are subject to this requirement.
   a. The Permit Holder has been issued a Change of Condition for the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in Permit Application #22543 June 7, 2011 and A/N 26538 for the

LCRS.

| | Required Components |
|---|---|
| Total Number of Vertical Wells: | 92 |
| Total Number of Leachate Collection Wells | 0 |
| Total Number of Decommission Wells | 0 |

b. The Permit is authorized to make the landfill gas collection system and leachate collection recovery system component alterations described below:
i. install up to 17 vertical wells in the Phase IIC area
ii. install up to 10 additional vertical wells in the landfill as need
iii. connect up to 24 leachate cleanout risers/collection wells to the landfill gas collection system
iv. allow the decommissioning of 20 vertical wells in the landfill gas collection system if wells are unproductive, and provided compliance with surface emission standards is maintained.

Wells installed pursuant to this subpart shall be added to or removed from subpart a in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415.

(Basis: Regulations 2-1-301, 8-34-301.1, 8-34-304, 8-34-305)

8. The Heat Input to the A-10 Landfill Gas Flare shall not exceed 216 million BTU per day and shall not exceed 78,840 million BTU per year. In order to demonstrate compliance with this part, the Permit Holder shall calculate and record, on a monthly basis, the maximum daily and total monthly heat input to the flare based on: (a) the landfill gas flow rate recorded pursuant to Regulation 8-34-508 and 8-34-501.10, (b) the average methane concentration in the landfill gas measured in most recent source test, and (c) a high heating value for methane of 1013 BTU per cubic foot at 60 degrees F. (Basis: Regulation 2-1-301)

9. The combustion zone temperature of the A-10 Landfill Gas Flare shall be maintained at a minimum of 1457 degrees Fahrenheit, averaged over any 3-hour period. 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 Regulation 2-6-414 or 2-6-415, based on the following criteria. The minimum combustion zone temperature for the flare shall be equal to the average combustion zone temperature measured during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature shall not be less than 1400 degrees F. (Basis: Regulations 2-5-301 and 8-34-301.3)

10. The A-10 Landfill Gas Flare shall be equipped with both local and remote alarm systems. (Basis: Regulation 8-34-301)

11. Nitrogen oxide ($NO_x$) emissions from the A-10 Landfill Gas Flare shall not exceed 0.06 lbs/MMBTU of NOx. (Basis: Cumulative Increase)

12. Carbon monoxide (CO) emissions from the A-10 Landfill Gas Flare shall not exceed 0.20 lbs/MMBTU of CO.
(Basis: Cumulative Increase)

*13. Deleted March 5, 2014.

14. Total reduced sulfur compounds in the collected landfill gas shall be monitored as a surrogate for monitoring sulfur dioxide in control system's exhaust. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 860 ppmv (dry) expressed as hydrogen sulfide. In order to demonstrate compliance with this part, the Permit Holder shall test collected landfill gas on an annual basis. The landfill gas sample shall be taken from the main landfill gas header. The Permit Holder shall either test the gas for total reduced sulfur compounds (carbon disulfide, carbonyl sulfide, dimethyl sulfide, hydrogen sulfide, ethyl mercaptan, and methyl mercaptan) using District approved methods (MOP, Volume III, Methods 5, 25, or 44) or test the gas for hydrogen sulfide using a draeger tube and following the manufacturer's recommended procedures for using the draeger tube and interpreting the results. If the draeger tube method is used, the measured hydrogen sulfide concentration shall be multiplied by 1.2 to obtain the total reduced sulfur concentration. (Basis: Regulation 9-1-302)

15. To demonstrate compliance with Parts 8-12 above and Regulation 8, Rule 34, Sections 301.3 and 412, the Permit Holder shall ensure that a District approved source test is conducted annually on the Landfill Gas Flare (A-~~3~~10). As a minimum, the annual 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 ($O_2$), 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, $CH_4$, NMOC, and $O_2$ in the flare stack gas;
    e. the NMOC and methane destruction efficiencies achieved by the flare; and
    f. the average combustion zone temperature in the flare during the

test period.

Each annual source test shall be conducted no later than 12 months after the previous annual source test. 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 45 days of the test date.

(Basis: Cumulative Increase and Regulations 2-5-302, 8-34-301.3, and 8-34-412)

16. To demonstrate compliance with ~~Part 13 above and~~ Regulation 8-34-412, the Permit Holder shall conduct a characterization of the landfill gas concurrent with the annual source test required by Part 15 above. The landfill gas sample shall be drawn from the main landfill gas header. In addition to the compounds listed in part 15b, the landfill gas shall be analyzed for the organic compounds listed below. 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 45 days of the test date. (Basis: Regulations 2-5-302 and 8-34-412)

| Organic Compounds | Organic Compounds |
|---|---|
| acrylonitrile | hexane |
| benzene | isopropyl alcohol |
| carbon tetrachloride | methyl ethyl ketone |
| chlorobenzene | methylene chloride |
| chloroethane | perchloroethylene |
| chloroform | toluene |
| 1,1 dichloroethane | 1,1,1 trichloroethane |
| 1,1 dichlorethene | 1,1,2,2 tetrachloroethane |
| 1,2 dichloroethane | trichloroethylene |
| 1,4 dichlorobenzene | vinyl chloride |
| ethyl benzene | xylenes |
| ethylene dibromide | |

17. To demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved logbook.
    a. ~~Record the total amount of municipal solid waste received at S-1 on a daily basis. Summarize the daily waste acceptance records for each calendar month.~~Deleted October 21, 2014
    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.~~ Deleted September 24, 2014

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.~~ Deleted October 21, 2014

d. 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. The Permit Holder may use District approved checklists that describe the standard dust mitigation measures employed at this site in lieu of these daily records, provided that the checklists are completed on a daily basis and any deviations from standard procedures are described. All records shall be summarized on monthly basis.

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

f. 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 7a. 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.

g. Calculate and record the heat input to A-10, pursuant to Part 8.

h. Maintain records of all test dates and test results performed to maintain compliance Parts 14-16 above or to maintain compliance with any applicable rule or regulation.

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: Cumulative Increase and Regulations 2-1-301, 2-5-501, 2-6-501, 6-1-301, 6-1-305, 8-2-301, 8-34-301, 8-34-304, and 8-34-501)

18. The annual report required by BAAQMD Regulation 8-34-411 shall be submitted in two semi-annual increments. The reporting periods and report submittal due dates for all 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))

19. The leachate collection system shall be connected to the vacuum system as needed to prevent violation of applicable surface and component leak limits, and the operating requirements listed below shall replace the operating requirements identified in Regulation 8-34-301.1, 8-34-305.3, and 8-34-305.4 for the leachate collection risers (LCRs). All LCRs remain subject to the landfill gas temperature limit in Regulation 8-34-305.2.
    a. The Regulation 8-34-305.3 and 8-34-305.4, the nitrogen and oxygen content limits, shall not apply, provided that each LCRS is operated at an oxygen concentration not to exceed 15% by volume. Regulation 8-34-414 and subpart 19(b) below may be used in conjunction with this alternative wellhead limit.
    b. The component may be disconnected from the vacuum system if compliance with Part 19(a) requires turning off the vacuum to a LCR or if the temperature > 131 degreesF. The component shall be connected to vacuum if any pressure is detected.
    c. The owner/operator shall monitor and record the gauge pressure, oxygen content, methane content, and temperature at each LCR on a monthly basis regardless of whether the component is connected to vacuum or not.

All records to demonstrate compliance with Part 19 and all applicable sections of BAAQMD Regulation 8, Rule 34 shall be recorded in a District-approved log and made available to District staff upon request for at least 5 years from date of entry. (basis: Regulations 8-34-305, 8-34-404, 8-34-414, 8-34-501.4, 8-34-501.9, Regulation 2-6-501, 40 CFR Part 60.755(a) and 60.759, CCR, Title 17, Section 95468(a)(1))

## RECOMMENDATION

Issue a Permit to Operate for the change in condition and the inclusion of leachate wells to the landfill gas collection system

**S-1 Palo Alto Landfill with Gas Collection System**: add a maximum of 24 leachate wells

Signed By Irma Salinas, November 24, 2014

By: Irma Salinas
Senior Air Quality Engineer