Application for Enhanced Authority to Construct/Permit to Operate Modification for Landfill Expansion for Sycamore Landfill

Sycamore Landfill, Inc.
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Santee, California 92071
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SCS ENGINEERS

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1.0 INTRODUCTION

1.1 OVERVIEW

This document, prepared by SCS Engineers (SCS), on behalf of Sycamore Landfill, Inc. (SLI) provides information in support of an Enhanced Authority to Construct (ATC)/Permit to Operate (PTO) Modification for a landfill expansion at the Sycamore Landfill (Sycamore or Site) in San Diego, California. With the Enhanced ATC option, we understand that the Title V Permit would be modified with an Administrative Permit Amendment after the demonstration of compliance with the conditions of the Enhanced ATC.

This information is formatted in accordance with the San Diego County Air Pollution Control District (SDAPCD or District) ATC/PTO information requirements.

1.2 PROJECT LOCATION

Sycamore is located at 8514 Mast Boulevard in Santee. The location and a detailed map of the landfill are provided in Appendix A.

1.3 BACKGROUND INFORMATION

1.3.1 Applicant Name and Address

Sycamore Landfill, Inc.
8514 Mast Boulevard
Santee, CA 92071

1.3.2 Facility Address

Sycamore Landfill
8514 Mast Boulevard
Santee, CA 92071

1.3.3 Nature of Business

Municipal Solid Waste Landfill

1.3.4 Persons to Contact Regarding Application

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1.3.5 Type of Entitlement

Enhanced ATC

1.3.6 Operation Schedule

24 hours per day
7 days per week
52 weeks per year
With scheduled shutdown for control device maintenance

1.3.7 Status of Application

This is a modification application for a landfill expansion.

1.3.8 Facility Status

Existing

2.0 PROJECT DESCRIPTION

2.1 EXISTING OPERATION

Sycamore is located in Santee, California. The Site is owned and operated by SLI. The primary function of Sycamore is for the disposal of municipal solid waste (MSW). The landfill has been in operation since the early 1960s. The objective of the collection system at that time was to control the migration of combustible gases to off-site soils (California Code of Regulations [CCR] Title 27).

The SLI system consists of vertical and horizontal extraction wells used to collect the LFG, a plastic piping collection system used to convey the collected LFG, and a blower/flare stations (BFS) used to destruct the collected LFG. The BFS consists of a Perennial flare (No. 1) rated at 59 Million British Thermal Unit per hour (MMBtu/hr) and a John Zink flare (No. 2) rated at 54 MMBtu/hr.

All of the LFG that is not flared at SLI is sent to the third-party LFG-to-energy (LFGTE) facility, owned and operated by Opal Fuels (Opal), used to destruct the collected LFG and produce electricity. This LFGTE facility operates under separate air quality permits under Opal's name, and the LFGTE facility is not under common ownership or control with SLI.

In June 2024, SLI submitted an application for a new ultra-low emission (ULE) John Zink flare rated at 151.8 MMBtu/hr and issuance of the permit is pending SDAPCD review.

2.2 REASON FOR PERMITTING ACTION

SLI has proposed to modify the current permit for the landfill to reflect the approved expansion to the capacity of the landfill. The permitting action described herein is being proposed to reflect the emissions associated with the expanded landfill.

3.0 DESCRIPTION OF PROPOSED EXPANSION

3.1 PROPOSED LANDFILL EXPANSION

The current landfill was permitted to receive 40,200,000 cubic yards of MSW. The disposal operation could not exceed the maximum elevation of 883 feet (') above mean sea level (MSL) and maximum size of 520 acres. On July 20, 2015, SLI was granted an expansion to the permitted design capacity of the Site to 147,908,000 cubic yards with an estimated closure date of 2042. This also included modifications to the permitted area of the Site to 603 acres and maximum elevation of 1,050' MSL. The Solid Waste Facility Permit (SWFP) (No. 37-AA-0023) was issued after approvals from the City of San Diego Development Services Department and CalRecycle and can be found in Appendix B.

In May 2020, the landfill submitted an ATC application for a small expansion. In 2022, the SDAPCD issued the ATC which increased the permitted design capacity from 40,200,000 cubic yards of MSW to 43,655,000 cubic yards of MSW or 34,640,240 tons.

In December 2023, the landfill submitted an additional ATC application for a further small expansion, which would increase the permitted design capacity of the Site from 43,655,000 cubic yards or 34,640,240 tons to 55,350,369 cubic yards or 43,920,518 tons of MSW. Approval from the SDAPCD is pending.

SLI proposes to modify the existing permit to reflect the full expansion limits of 147,908,000 cubic yards. As such, SLI proposes to modify the existing PTO No. APCD2008-PTO-971111, Condition No. 36 to reflect the changes as follows:

*36. The active waste disposal operation shall not exceed the maximum elevation (~~883~~ **1,050** ft MSL) and size (~~520~~ **603** acres) limits specified in the Integrated Waste Management Board Permit Number 37-AA-0023. These limits are equivalent to a design capacity of approximately ~~43,655,000 cubic yards~~ **147,908,000** cubic yards or ~~34,640,240 ton~~* **117,364,998** *ton capacity. [NSR]*

4.0 EXISTING EMISSION SOURCES

The existing emission sources at Sycamore are summarized below:

- One (1) 59 MMBtu/hr enclosed LFG-fired flare
- One (1) 54 MMBtu/hr enclosed LFG-fired flare
- One (1) proposed 151.8 MMBtu/hr enclosed LFG-fired flare
- Landfill Surface
- Fugitive Dust from Daily Operations (Landfill Equipment)
- Fugitive Dust from Paved Roads
- Fugitive Dust from Unpaved Roads
- Stockpiles
- Material Handling (Earthmoving Activities)
- Material Handling (Earthmoving Travel)

A site map showing the existing emission sources at Sycamore can be found in Appendix A.

The actual baseline or pre-project actual emissions for the sources affected by the landfill expansion (i.e., landfill surface, fugitive dust from landfill equipment, paved and unpaved roads, stockpiles, and material handling) were calculated using the highest actual 2-year average emissions from the last five years (2019-2023). For the fugitive dust, the two-year average was from 2022-2023. For the fugitive LFG, it was from 2021-2022. There are no changes to the flares with the proposed expansion. Emission estimates for the current baseline emissions can be found in Appendix C.

5.0 EXPECTED EMISSIONS

5.1 CHEMICAL NATURE OF AIR POLLUTION EMISSIONS

LFG is the product of the natural decomposition of organic materials (e.g., food, yard waste, etc.) deposited in a landfill environment. At MSW landfill sites, LFG as generated typically contains about 50 percent methane and 45 percent carbon dioxide (CO_2) by volume. LFG is also comprised of residual amounts of nitrogen, oxygen and a number of trace constituents, including non-methane organic compounds (NMOCs), volatile organic compounds (VOCs), and some hazardous air pollutants (HAPs)/toxic air contaminants (TACs).

5.2 AIR POLLUTION EMISSIONS

As of the end of 2023, Sycamore's actual waste in place is about 30 percent of the proposed landfill capacity. Per SDAPCD Rule 20.1(d)(1)(C), if an emission unit's pre-project actual emissions are less than 80 percent of the emission unit's PTE, then the emission unit's pre-project PTE shall be the same as the unit's actual emissions. Since the landfill's pre-project actual waste in place is less than 80 percent, the landfill's pre-project emissions are less than 80 percent since waste disposal is directly tied to LFG generation and emissions. Therefore, for calculating emissions, the landfill's pre-project actual emissions will be used for baseline for the LFG surface emissions and dust sources.

Emissions of fugitive LFG from the landfill were updated based on the proposed landfill expansion. The proposed landfill expansion capacity is 147,908,000 cubic yards or 117,364,998 tons based on SLI estimate of 1,587 pounds per cubic yard. Actual tonnage disposed was updated through 2023, 2024 actual tonnage disposed through August 2024 and estimated for the rest of 2024, and estimated tonnage disposed for an annual 0.5 percent (%) increase was assumed from 2025-2082, using the California Air Resources Board's (CARB's) Intergovernmental Panel on Climate Change (IPCC)-based Model. Use of CARB's IPCC model is consistent with Sycamore's previously approved small expansion. The baseline or pre-project actual emissions were calculated using the highest actual 2-year average LFG recovery rate from the last five years, which was 2021 and 2022, and an 85% collection efficiency (consistent with the previously approved small expansion). In 2021-2022, Sycamore had an actual recovery of 3,317 standard cubic feet per minute (scfm) of LFG normalized to 50% methane, which back calculates to 3,903 scfm generation using 85% collection system efficiency.

SLI estimated the future generation rate for the expansion (2082) using the same process as SDAPCD in the last approved small expansion. The proposed future recovery rate for the maximum or last year of the requested expansion (2082) was based upon the percent increase of estimated recovery using the CARB model, consistent with SDAPCD's process previously. In 2021-2022, Sycamore had an actual recovery of 3,317 scfm of LFG. From the baseline 2021 to 2082, the IPCC model estimated a 55.53% increase in expected gas recovery. Therefore, in 2082, we have estimated approximately 5,159 scfm recovered, which back calculates to 6,069 scfm generation

using 85% collection system efficiency. The NMOC concentration was taken from Sycamore's previously approved small expansion where the SDAPCD based the concentration on the sum of all non-exempt compound concentrations. A copy of the IPCC model results can be found in Appendix D. Table C-3 in Appendix C provides estimates of the baseline PTE pollutant emissions that may be expected from the current permitted landfill capacity. Table E-1 in Appendix E provides PTE estimates of the proposed expansion through 2082.

The HAP/TAC emissions were estimated using site-specific concentrations based on November 2019 LFG sampling and/or October 2015 LFG sampling, consistent with the concentrations used by the SDAPCD in the previously approved small expansion. Laboratory analyses can be found in Appendix F.

5.2.1 Criteria Pollutants

Criteria pollutant emissions from the landfill expansion will be fugitive VOCs generated that are not captured by the GCCS and combusted. Criteria pollutants from the future proposed landfill equipment, unpaved and paved roads, stockpiles, and material handling can be found in Appendix E. As part of this expansion request, Sycamore also proposes that in the future, the facility receive credit for watering paved roads. Sycamore waters paved roadways every four hours, which is consistent with the current unpaved roadways watering schedule. However, SDAPCD currently does not allow a control efficiency to be utilized for paved roadways because the current PTO does not include conditions for watering for paved roadways, even though watering occurs. As such, this application represents a request to add PTO conditions for paved roadways to allow a control efficiency for future emission estimates which aligns with the current PTO conditions for watering unpaved roads. Emission estimates for the proposed future paved roadways can be found in Appendix E.

5.2.2 Toxic Emissions

Toxic pollutant emissions from the proposed landfill expansion will include toxic air contaminants (TACs) identified in Section 5.2. These emissions will consist of undestroyed toxic VOCs. Tables C-2 through C-4 in Appendix C provides emission estimates of the current permitted flares. Table E-1 in Appendix E attached provides fugitive toxic emissions from the proposed landfill expansion LFG.

5.3 TOTAL PRE-PROJECT ACTUAL EMISSIONS

The methods previously described in the section were used to estimate the actual emissions from 2019 to 2023, resulting from all applicable processes at Sycamore (including both fugitive and non-fugitive emissions). The emissions are summarized below and in Table 8 attached. The emissions changes are summarized in Table 9 attached.

Table 1. Summary of Pre-Project Actual Facility-Wide Emissions

Pollutant	Pre-Project Actual Emissions (lb/day)	Pre-Project Actual Emissions (tpy)
NOx	246.6	45.0
CO	737.0	134.5
SOx	309.2	56.4
NMOC	480.1	87.6
VOC	439.0	80.1
PM_{10}	1,290.7	204.6
$PM_{2.5}$	372.1	61.3
Total HAPs	29.2	5.3

*Includes fugitives

5.4 TOTAL POTENTIAL TO EMIT

The methods previously described in the section were used to estimate the PTE resulting from all applicable processes at Sycamore (including both fugitive and non-fugitive emissions). Note that the combustion sources (i.e. flares) do not change with this expansion application. The emissions are summarized below and in Table 8 attached. The emissions changes are summarized in Table 9 attached.

Table 2. Summary of Proposed Facility-Wide Emissions

Pollutant	Proposed PTE (lb/day)	Proposed PTE (tpy)
NOx	246.6	45.0
CO	737.0	134.5
SOx	309.2	56.4
NMOC	590.8	107.8
VOC	549.6	100.3
PM_{10}	1,044.4	187.9
$PM_{2.5}$	247.1	44.7
Total HAPs	43.7	8.0

*Includes fugitives

6.0 REGULATORY ANALYSIS

Since the proposed project will have emissions of VOC, PM_{10}, and $PM_{2.5}$, it will be subject to the SCAPCD's New Source Review (NSR) for criteria pollutants under Regulation II and will be described in Section 6.3.

Per the estimated emissions, VOCs have PTE greater than 50 tons per year (tpy), and PM_{10} and CO have PTE greater than 100 tpy, including fugitive emissions, therefore the facility is a current District major polluting source under Rule 20.1. There are no pollutants with a PTE greater than the federal major source thresholds (excluding fugitive emissions); therefore, the facility is not a current federal major source. There are no pollutants with a PTE greater than 250 tpy (excluding fugitives); therefore, the facility is not a federal major source and subject to the Prevention of Significant Deterioration (PSD) requirements under Rule 20.3.

6.1 PROHIBITORY RULES

6.1.1 Rule 50 (Visible Emissions)---

No visible emissions are expected from the proposed landfill expansion with proper operation of the LFG collection and control equipment.

6.1.2 Rule 51 (Nuisance)---

No nuisance complaints are expected with proper operation of the landfill.

6.1.3 Rule 52 (Particulate Matter)---

Particulate matter emissions from the facility are not expected to exceed 0.10 grain per dry standard cubic foot of gas.

6.1.4 Rule 53 (Specific Air Contaminants)---

SOx emissions and combustion particulates from the facility will not exceed the threshold concentrations set forth in Rule 53.

6.1.5 Rule 54 (Dust and Fumes)---

No significant fugitive dust emissions are anticipated from the proposed expansion activities which would cause a violation of the Table in Rule 54.

6.1.6 Rule 55 (Fugitive Dust Control)---

The facility will implement best management practices to limit fugitive dust from the landfill expansion activities to meet the standards in Rule 55.

6.1.7 Rule 62 (Sulfur Content of Fuels)---

No exceedances of the ground level concentration or general emission limit for sulfur are expected. Sycamore is currently in compliance with Rule 62 and the landfill expansion is not expected to change the sulfur content of fuels.

6.2 SOURCE SPECIFIC REQUIREMENTS

6.2.1 Rule 59 (Control of Waste Disposal Site Emissions)

Rule 59 specifies the requirements for waste disposal sites with the potential to emit gaseous reactive organic compounds, odors, and/or toxic air contaminants. Sycamore currently complies with the requirements of Rule 59.

6.2.2 Rule 59.1 (Municipal Solid Waste Landfills)

Rule 59.1 does not apply to any new MSW landfill subject to the requirements of the New Source Performance Standards (NSPS) Subpart WWW. Since Sycamore is currently subject to NSPS Subpart XXX, which replaced the outdated NSPS Subpart WWW, Rule 59.1 does not apply.

6.2.3 Rule 1200 (New Source Review for Toxic Air Contaminants)

Rule 1200 specifies that any emission unit, which may increase emissions of one or more TACs, is subject to a screening risk assessment. The screening risk assessment will be performed by SCAPCD.

6.2.4 Other Regulatory Requirements

The landfill is subject to 40 CFR Part 60 Subpart XXX (New Source Performance Standards (NSPS)) and will continue to meet the requirements of the NSPS. The landfill is also subject to 40 CFR 63 Subpart AAAA (National Emission Standards for Hazardous Air Pollutants (NESHAP)) and will continue to meet the requirements of the NESHAP.

The landfill is subject to Article 4, Subarticle 6, Sections 95460 to 95476 of Title 17 of the California Code of Regulations (AB 32 LMR). The proposed landfill expansion will continue to meet the requirements of the LMR.

The Landfill is exempted from the requirements of Compliance Assurance Monitoring (CAM) based on 40 CFR 64.2(b)(i), which states that the requirements of this part shall not apply to emission limitations or standard proposed by the Administrators after November 15, 1990 pursuant to section 111 or 112 of the Clean Air Act. Section 111 includes the NSPS for MSW landfills and flares to which the site is subject, the reason the flares were installed and the additional previously proposed ULE flare will provide more control, and which was promulgated on March 12, 1996 (after November 1990).

6.3 REGULATION II – NEW SOURCE REVIEW

Since the system will have emissions of criteria pollutants, it will be subject to the SCAPCD's NSR under Regulation 20.3 for major stationary sources.

The requirements under NSR include the following:

- Best Available Control Technology (BACT)
- Air Quality Impact Analysis (AQIA)
- PSD
- Emission Offsets

6.3.1 Best Available Control Technology

In accordance to SCAPCD Rule 20.3(d)(1)(i), BACT is required for any new or modified emission unit which has any increase in its potential to emit PM_{10}, $PM_{2.5}$ (as a subset of PM_{10}) NOx, VOCs, or SOx and which unit has a post-project potential to emit of 10 pounds per day (lb/day) or more of PM_{10}, $PM_{2.5}$, NOx, VOCs, or SOx. Using these criteria, BACT requirements are triggered for VOC emissions from the LFG (landfill) as detailed in Table 3 below.

Table 3. Summary of BACT Increases

Criteria Pollutant	Threshold (lb/day)	Increase from Project (lb/day)	BACT Triggered? (Yes/No)
NOx	10	0.0	No
VOC	10	110.7	Yes
SOx	10	0.0	No
PM_{10}	10	-246.3	No
$PM_{2.5}$	10	-125.0	No

The landfill will meet BACT/T-BACT requirements with the most stringent controls required per the LMR, NSPS, NESHAP, and Rule 59.

6.3.2 Toxic-Best Available Control Technology

The SCAPCD defines T-BACT as the most effective emission limitation or emission control devices which has been achieved in practice for that source or category of source, or any other emissions limitation or control technique found by the APCD Officer to be technologically feasible for that source or category of source. If there is an applicable Maximum Control Technology (MACT) standard or category of source, the APCD officer shall evaluated it for equivalency with T-BACT. The MACT standard for the landfill category (40 CFR Part 63, Subpart AAAA) establishes MACT as control equivalent to the landfill NSPS, which actually allows open or candlestick flares. Since the proposed project will not affect the current control devices, the current flares (and proposed flare from previously submitted application) meet the MACT requirement for MSW landfills, and therefore also meet T-BACT as defined by SCAPCD and other California Air Districts. Also, as noted above, compliance with the LMR, NSPS, and Rule 59 would be considered compliant with T-BACT since this combination represents the most stringent level of LFG control in California and nationally.

6.3.3 Air Impact Analysis and Modeling

In accordance with Rule 20.3, Table 20.3-1, the AQIA trigger levels for the proposed expansion are as follows:

Table 4. AQIA Summary of Increases

Criteria Pollutant	Threshold (tons/yr)	Increase from Project (tons/yr)	AQIA Triggered? (Yes/No)
NOx	40	0.0	No
CO	100	0.0	No
SOx	40	0.0	No
PM_{10}	15	-16.7	No
$PM_{2.5}$	10	-16.6	No

A screening level assessment of these emission rates was conducted to evaluate potential air impacts. Based on the emissions estimates listed above, the increase in emissions for all criteria pollutants are below the screening thresholds listed above. Therefore, an AQIA will not be required.

6.3.4 Prevention of Significant Deterioration

Per Rule 20.1, PSD is triggered if the aggregate potential to emit for one or more air contaminants in amounts equal to or greater than any of the emission rates listed in Table 20.1-11. For Table 20.1-11 and 40 CFR 166(b)(1)(i)(b), the trigger level for the stationary source is 250 tpy or more. In addition, an existing minor source can become a major source if a physical change results in an emission increase that by itself would be major. Per the estimated emissions, there are no criteria pollutants greater than 250 tpy; therefore, the facility is not subject to PSD requirements.

6.3.5 Emission Offsets

In accordance with Rule 20.3(b)(3), emissions increases resulting from an air contaminant emission control project shall be exempt from the emission offset requirements of Subsection (d)(5), (d)(6), (d)(7), and (d)(8) of this rule to the extent that the project does not include an increase in the capacity of the emission unit being controlled. Emission increases that are associated with an increase in capacity of the emission unit being controlled shall be subject to the emission offset provisions of this rule, as applicable.

The proposed project is a landfill expansion, which does include an increase in the capacity of the emission unit being controlled, in this case, the landfill. As such, the proposed project is subject to the offset requirements.

Per Rule 20.3(d)(5), emission offsets must be provided, on a pollutant specific basis, for emission increases of non-attainment air contaminants and their precursors. Since the facility is proposing an increase in the capacity of the emission unit, the emission increases for the project constitute a major modification for VOCs, and the increase in capacity results in an emissions increase of non-attainment air contaminants, VOCs (8-hr ozone), VOCs will be required to be offset. Per Rule 20.3(d)(8)(i)(B), the VOC emission increases shall be offset at a ratio of 1.2 to 1.0. The emissions increase for the project is approximately 20.2 tons per year; therefore, at a ratio of 1.2 to 1.0, approximately 24.23 tons will be required to be offset.

SLI requests to provide incremental offsets for the 24.23 tons of VOC ERCs required for this project. The current PTE estimate for VOCs is based on predictions of future LFG generation and emissions in

the peak year after landfill closure. However, many of the variables that go into this calculation will change into the future. For example, based on landfill diversion requirements in California for organics, it is expected that landfills will generate significantly less LFG in the future. Diversion requirements may also result in lower amounts of total waste being disposed in landfills in the future compared to current estimates. Further, the NMOC concentrations in LFG will likely change over time, and trends suggest that NMOC concentrations in LFG decrease over time as a landfill nears closure. Therefore, the future PTE for VOCs could be substantially lower than what is predicted in this application.

If ERCs are purchased for the full amount today, then SLI could end up severely over paying for ERCs that will never be used, and the unneeded ERCs would have no value in the future because they would represent emission that never occurred so they could not be turned back into ERCs. To address this concern, we are requesting the use of incremental offsetting to allow SLI to provide batches of ERCs in increments over time. Incremental offsetting would allow the facility to more accurately estimate offsets needed throughout the life of the project on a pre-determined schedule. Ann initial amount of ERCs would be due prior to ATC issuance. After that, the facility would supply ERCs in additional increments per the schedule in the permit as well as continue to comply with all associated limits, monitoring, recordkeeping, and reporting requirements. The VOC emissions, the associated amount of ERCs due, and other related limits would be required to be reviewed and the increments adjusted, if needed, on a periodic basis, per the permit, to ensure that the amount of ERCs provided is always in excess of the PTE in any given year. Please note that incremental offsetting has been approved previously in the Bay Area Air Quality Management District (BAAQMD). An example of a landfill air permit with this specific incremental offsetting language is provided in Appendix G.

7.0 GREENHOUSE GAS PERMITTING

This application includes greenhouse gas (GHG) emission calculations to determine which PSD and/or Title V permit requirements from the Tailoring Rule will apply to the Project, if any. LFG-derived emissions of CO_2 are considered biogenic, meaning they come from a biofuel and do not contribute to a net increase in atmospheric CO_2.

On July 1, 2011, the United States Environmental Protection Agency (U.S. EPA) issued a rule (40 CFR Parts 51, 52, 70, and 71, Federal Register Volume 76, No. 139, pages 43490 to 43508) to defer the inclusion of biogenic CO_2 in PSD and Title V programs under the Tailoring Rule. On July 12, 2013, the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) vacated the Deferral Rule that had suspended regulation of "biogenic" GHG emissions under the Clean Air Act (CAA). However, this legal finding vacating the deferral of biogenic GHG emissions did not take effect until the U.S Supreme Court Ruled on the GHG case. The case was heard in March 2014, and the ruling was issued in June limiting the ability to regulate GHGs under the CAA and striking down major provisions of the Tailoring Rule. On July 24, 2014, U.S. EPA issued a memorandum recognizing its limitations under the Tailoring Rule and clarify when Title V or PSD requirements for GHGs would be triggered. The most important of these limitations is that a facility cannot be major for GHGs alone.

With the Supreme Court ruling, there is some confusion in the regulation of biogenic GHGs since their ruling did not directly address those. On July 21, 2014, the biogenic deferral expired on its own, and it has not been reinstated. However, the Supreme Court ruling prevents any regulation of GHGs unless the source or project is major for other regulated pollutants. On November 19, 2014, U.S. EPA issued its "Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources" (Framework). The Framework clearly defines biogenic CO_2 coming from MSW as having a biogenic assessment factor (BAF) of zero, meaning CO_2 from LFG is fully biogenic, part of the natural carbon cycle, and should not be regulated under the CAA. As such, biogenic CO_2 should not be counted as part of the regulated GHG emissions from a LFG source.

Methane (CH_4) and nitrous oxide (N_2O) are combustion byproducts and are GHGs. Even when resulting from the combustion of a biofuel, CH_4 and N_2O are considered anthropogenic. All GHG from combustion of fossil fuels, such as diesel, are anthropogenic and must be included in the GHG emission for Title V compliance. SLI will operate diesel equipment, which has been included in the GHG emission calculations, including CO_2, N_2O and CH_4. The GHG sources at Sycamore are the previously proposed enclosed LFG flare, existing enclosed LFG flares, and LFG surface emissions. The previously proposed flare will operate at 150 MMBtu/hr and the existing flares are permitted to operate at 54 MMBtu/hr and 59 MMBtu/hr. Fugitive emissions are not considered to determine major source emission levels for GHGs under PSD and Title V. GHG emission factors are shown in Table 5 below.

Table 5. GHG Emission Factors

Fuel	Emission Factors (kilograms/MMBtu)		
	Carbon Dioxide	Methane	Nitrous Oxide
LFG	52.07	3.2E-03	6.3E-04

Current GHG sources and their non-fugitive anthropogenic GHG emissions are provided below. Note that with the expansion, the GHG estimates will not change. Fugitive emissions of GHGs are not counted under the CAA; therefore, fugitive LFG emissions have not been calculated for their GHG contribution. Not all GHG have equal impact on the climate, so emissions of CH_4 and N_2O have been converted into CO_2 equivalent (CO_2e) using a global warming potential factor of 28 for CH_4 and 265 for N_2O.

Table 6. Current GHG Emissions

Sources		**Current Flare No. 1**	**Current Flare No. 2**	**Previously Proposed Flare**
Activity Rate		59 MMBtu/hr	54 MMBtu/hr	151.8 MMBtu/hr
Emissions (metric tons)	**CO_2**	29,665	27,151	76,324
	CH_4	1.82	1.67	4.69
	N_2O	0.36	0.33	0.92
Total GHG Emissions (metric ton CO_2e)		29,811	27,285	76,700
Total (short ton CO_2e)		147,485		

Table 7. Regulated GHG Emissions

Sources		**Current Flare No. 1**	**Current Flare No. 2**	**Previously Proposed Flare**
Activity Rate		59 MMBtu/hr	54 MMBtu/hr	151.8 MMBtu/hr
Emissions (metric tons)	**CH_4**	1.82	1.67	4.69
	N_2O	0.36	0.33	0.92
Total GHG Emissions (metric ton CO_2e)		146.16	133.77	376.05
Total (short ton CO_2e)		723		

For purposes of the federal Title V and PSD rules, the facility's regulated GHGs (excluding fugitive emissions) from the project are estimated at 723 tpy of CO_2e, which is less than the 100,000 tpy CO_2e threshold set forth in the definition of "major source" and the 75,000 tpy CO_2e threshold for major modification. However, since the facility is already subject to Title V, the inclusion of this GHG inventory will satisfy the necessary requirements for adding GHGs to the Title V permit. Further, since the Site is not a major source under PSD for any other pollutants, it cannot trigger PSD for GHGs alone.

8.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) INFORMATION

A California Environmental Quality Act (CEQA) review is required for new major constructions that have not already undergone an Environmental Impact Analysis pursuant to CEQA regulations. SLI filed an Environmental Impact Report for the landfill expansion with the State Clearinghouse (SCH No. 2003041057) and it was certified by the City of San Diego Development Services Department on August 3, 2012. Therefore, CEQA has been addressed for this proposed project and documentation can be made available upon request.

9.0 PERMIT PROCESSING FEES AND FORMS

The SDAPCD Forms have been completed for the proposed project and can be found in Appendix H as follows:

- Permit/Registration Application (APCD 116)
- Supplemental Application Information (Landfill Gas Control Systems)
- Supplemental Application Information (Rule 1200 Toxics Evaluation)

As noted previously, per the Enhanced ATC process, the Title V permit will be revised through an Administrative Permit Amendment once the Enhanced ATC is approved. The permit processing fees for this project were calculated using the SDAPCD online application fee estimate and can be found in Appendix I. The appropriate fees of $15,942 for this application are enclosed. SLI understands that any additional fees will be invoiced at a later date.

Tables

TABLE 8
SUMMARY OF CURRENT ACTUAL AND FUTURE FACILITY-WIDE POTENTIAL TO EMIT
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	Total Emissions	
		lb/day	ton/yr
Current Landfill Gas Surface Emissions	Volatile Organic Compounds	199.33	36.38
	Non-Methane Organic Compounds	199.33	36.38
	Total Hazardous Air Pollutants	26.36	4.81
Previously Proposed Landfill Gas Flare (ZULE)	Volatile Organic Compounds	138.44	25.27
	Non-Methane Organic Compounds	179.57	32.77
	Sulfur Oxides	179.79	32.81
	Carbon Monoxide	218.59	39.89
	Nitrogen Oxides	91.08	16.62
	Particulate Matter < 2.5 Microns	21.60	3.94
	Particulate Matter < 10 Microns	21.60	3.94
	Total Suspended Particulates	21.60	3.94
	Total Hazardous Air Pollutants	1.87	0.34
Current Landfill Gas Flare (John Zink)	Volatile Organic Compounds	50.60	9.23
	Non-Methane Organic Compounds	50.60	9.23
	Sulfur Oxides	64.72	11.81
	Carbon Monoxide	259.20	47.30
	Nitrogen Oxides	77.76	14.19
	Particulate Matter < 2.5 Microns	22.03	4.02
	Particulate Matter < 10 Microns	22.03	4.02
	Total Suspended Particulates	22.03	4.02
	Total Hazardous Air Pollutants	0.37	0.07
Current Landfill Gas Flare (Perennial)	Volatile Organic Compounds	50.60	9.23
	Non-Methane Organic Compounds	50.60	9.23
	Sulfur Oxides	64.72	11.81
	Carbon Monoxide	259.20	47.30
	Nitrogen Oxides	77.76	14.19
	Particulate Matter < 2.5 Microns	22.03	4.02
	Particulate Matter < 10 Microns	22.03	4.02
	Total Suspended Particulates	22.03	4.02
	Total Hazardous Air Pollutants	0.37	0.07
Current Landfill Equipment	Particulate Matter < 2.5 Microns	0.68	0.11
	Particulate Matter < 10 Microns	6.81	1.06
	Total Suspended Particulates	15.13	2.36
	Hazardous Air Pollutants	4.40E-04	6.87E-05
Current Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	28.14	4.39
	Particulate Matter < 10 Microns	281.43	43.90
	Total Suspended Particulates	625.40	97.56
	Hazardous Air Pollutants	1.82E-02	2.84E-03

Emission Source	Regulated Air Pollutant	Total Emissions	
		lb/day	ton/yr
Current Unpaved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	1.39	0.22
	Particulate Matter < 10 Microns	13.95	2.18
	Total Suspended Particulates	30.99	4.83
	Hazardous Air Pollutants	9.02E-04	1.41E-04
Current Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.66	0.26
	Particulate Matter < 10 Microns	16.64	2.60
	Total Suspended Particulates	36.97	5.77
	Hazardous Air Pollutants	1.08E-03	1.68E-04
Current Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	1.02	0.16
	Particulate Matter < 10 Microns	10.17	1.59
	Total Suspended Particulates	22.60	3.53
	Hazardous Air Pollutants	6.58E-04	1.03E-04
Current Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	180.91	28.22
	Particulate Matter < 10 Microns	738.41	115.19
	Total Suspended Particulates	3,784.36	590.36
	Hazardous Air Pollutants	1.17E-01	1.83E-02
Current Paved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	10.69	1.67
	Particulate Matter < 10 Microns	43.65	6.81
	Total Suspended Particulates	223.69	34.90
	Hazardous Air Pollutants	6.92E-03	1.08E-03
Current Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	5.19	0.81
	Particulate Matter < 10 Microns	21.19	3.31
	Total Suspended Particulates	108.58	16.94
	Hazardous Air Pollutants	3.36E-03	5.24E-04
Current Paved Roadways - C&D	Particulate Matter < 2.5 Microns	3.75	0.58
	Particulate Matter < 10 Microns	15.29	2.39
	Total Suspended Particulates	78.36	12.22
	Hazardous Air Pollutants	2.42E-03	3.78E-04
Current Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59
	Total Suspended Particulates	117.92	21.52
	Hazardous Air Pollutants	3.75E-02	6.85E-03
Current Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	14.52	2.26
	Particulate Matter < 10 Microns	14.52	2.26
	Total Suspended Particulates	34.56	5.39
	Hazardous Air Pollutants	9.39E-03	1.47E-03
Current Material Handling - Travel	Particulate Matter < 2.5 Microns	0.50	0.08
	Particulate Matter < 10 Microns	4.97	0.78
	Total Suspended Particulates	11.05	1.72
	Hazardous Air Pollutants	3.22E-04	5.02E-05

Emission Source	Regulated Air Pollutant	Total Emissions	
		lb/day	ton/yr
Proposed Landfill Gas Surface Emissions	Volatile Organic Compounds	309.99	56.57
	Non-Methane Organic Compounds	309.99	56.57
	Total Hazardous Air Pollutants	40.99	7.48
Previously Proposed Landfill Gas Flare (ZULE)	Volatile Organic Compounds	138.44	25.27
	Non-Methane Organic Compounds	179.57	32.77
	Sulfur Oxides	179.79	32.81
	Carbon Monoxide	218.59	39.89
	Nitrogen Oxides	91.08	16.62
	Particulate Matter < 2.5 Microns	21.60	3.94
	Particulate Matter < 10 Microns	21.60	3.94
	Total Suspended Particulates	21.60	3.94
	Total Hazardous Air Pollutants	1.87	0.34
Current Landfill Gas Flare (John Zink)	Volatile Organic Compounds	50.60	9.23
	Non-Methane Organic Compounds	50.60	9.23
	Sulfur Oxides	64.72	11.81
	Carbon Monoxide	259.20	47.30
	Nitrogen Oxides	77.76	14.19
	Particulate Matter < 2.5 Microns	22.03	4.02
	Particulate Matter < 10 Microns	22.03	4.02
	Total Suspended Particulates	22.03	4.02
	Total Hazardous Air Pollutants	0.37	0.07
Current Landfill Gas Flare (Perennial)	Volatile Organic Compounds	50.60	9.23
	Non-Methane Organic Compounds	50.60	9.23
	Sulfur Oxides	64.72	11.81
	Carbon Monoxide	259.20	47.30
	Nitrogen Oxides	77.76	14.19
	Particulate Matter < 2.5 Microns	22.03	4.02
	Particulate Matter < 10 Microns	22.03	4.02
	Total Suspended Particulates	22.03	4.02
	Total Hazardous Air Pollutants	0.37	0.07
Proposed Landfill Equipment	Particulate Matter < 2.5 Microns	3.65	0.61
	Particulate Matter < 10 Microns	36.47	6.14
	Total Suspended Particulates	81.04	13.65
	Hazardous Air Pollutants	2.36E-03	3.97E-04
Proposed Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	61.09	11.00
	Particulate Matter < 10 Microns	610.92	109.97
	Total Suspended Particulates	1,357.61	244.37
	Hazardous Air Pollutants	0.04	0.01
Proposed Unpaved Roadways - Imported Base	Particulate Matter < 2.5 Microns	2.21	0.40
Material	Particulate Matter < 10 Microns	22.07	3.97
	Total Suspended Particulates	49.03	8.83
	Hazardous Air Pollutants	1.43E-03	2.57E-04

Emission Source	Regulated Air Pollutant	Total Emissions	
		lb/day	ton/yr
Proposed Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	3.52	0.63
	Particulate Matter < 10 Microns	35.16	6.33
	Total Suspended Particulates	78.14	14.07
	Hazardous Air Pollutants	2.28E-03	4.10E-04
Proposed Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	3.35	0.60
	Particulate Matter < 10 Microns	33.46	6.02
	Total Suspended Particulates	74.36	13.38
	Hazardous Air Pollutants	2.16E-03	3.90E-04
Proposed Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	37.96	6.83
	Particulate Matter < 10 Microns	154.95	27.89
	Total Suspended Particulates	794.12	142.94
	Hazardous Air Pollutants	0.02	0.00
Proposed Paved Roadways - Imported Base	Particulate Matter < 2.5 Microns	1.69	0.30
Material	Particulate Matter < 10 Microns	6.91	1.24
	Total Suspended Particulates	35.39	6.37
	Hazardous Air Pollutants	1.09E-03	1.97E-04
Proposed Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.10	0.20
	Particulate Matter < 10 Microns	4.48	0.81
	Total Suspended Particulates	22.95	4.13
	Hazardous Air Pollutants	7.10E-04	1.28E-04
Proposed Paved Roadways - C&D	Particulate Matter < 2.5 Microns	1.23	0.22
	Particulate Matter < 10 Microns	5.03	0.91
	Total Suspended Particulates	25.79	4.64
	Hazardous Air Pollutants	7.98E-04	1.44E-04
Proposed Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59
	Total Suspended Particulates	117.92	21.52
	Hazardous Air Pollutants	0.04	0.01
Proposed Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	7.22	1.30
	Particulate Matter < 10 Microns	7.22	1.30
	Total Suspended Particulates	17.18	3.09
	Hazardous Air Pollutants	4.67E-03	8.40E-04
Proposed Material Handling - Travel	Particulate Matter < 2.5 Microns	0.41	0.07
	Particulate Matter < 10 Microns	4.08	0.73
	Total Suspended Particulates	9.06	1.63
	Hazardous Air Pollutants	2.64E-04	4.75E-05

Emission Source	Regulated Air Pollutant	Total Emissions	
		lb/day	ton/yr
Proposed Total From All Emission Points	Volatile Organic Compounds	549.62	100.31
(Fugitive and Non-Fugitive)	Non-Methane Organic Compounds	590.75	107.81
	Sulfur Oxides	309.24	56.44
	Carbon Monoxide	736.99	134.50
	Nitrogen Oxides	246.60	45.00
	Particulate Matter < 2.5 Microns	253.97	45.98
	Particulate Matter < 10 Microns	1,113.06	200.24
	Total Suspended Particulates	2,859.09	514.10
	Total Hazardous Air Pollutants	43.71	7.98
Proposed Total From All Emission Points	Volatile Organic Compounds	239.63	43.73
(Non-Fugitive Only)	Non-Methane Organic Compounds	280.76	51.24
	Sulfur Oxides	309.24	56.44
	Carbon Monoxide	736.99	134.50
	Nitrogen Oxides	246.60	45.00
	Particulate Matter < 2.5 Microns	65.66	11.98
	Particulate Matter < 10 Microns	65.66	11.98
	Total Suspended Particulates	65.66	11.98
	Total Hazardous Air Pollutants	2.60	0.47

TABLE 9
SUMMARY OF PROPOSED EMISSIONS CHANGES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Pollutant	Current Facility-Wide Emissions		Proposed Facility-Wide Emissions		Emissions Change	
	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
Volatile Organic Compounds	439.0	80.1	549.6	100.3	110.7	20.2
Non-Methane Organic Compounds	480.1	87.6	590.8	107.8	110.7	20.2
Sulfur Oxides	309.2	56.4	309.2	56.4	0.0	0.0
Carbon Monoxide	737.0	134.5	737.0	134.5	0.0	0.0
Nitrogen Oxides	246.6	45.0	246.6	45.0	0.0	0.0
Particulate Matter < 2.5 Microns	372.1	61.3	247.1	44.7	-125.0	-16.6
Particulate Matter < 10 Microns	1,290.7	204.6	1,044.4	187.9	-246.3	-16.7
Total Suspended Particulates	5,155.3	809.1	2,728.3	490.6	-2,427.0	-318.5
Total Hazardous Air Pollutants	29.2	5.3	43.7	8.0	14.6	2.7

*Emissions includes fugitive sources

Appendix A

Map of Sycamore Landfill

VICINITY MAP
N.T.S.

LOCATION MAP
N.T.S.

- CONCEPTUAL PLAN -
FOR REVIEW AND PLANNING PURPOSES ONLY

NO.	REVISION	DATE

SHEET TITLE: VICINITY AND LOCATION MAP

PROJECT TITLE: SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CLIENT: REPUBLIC SERVICES

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
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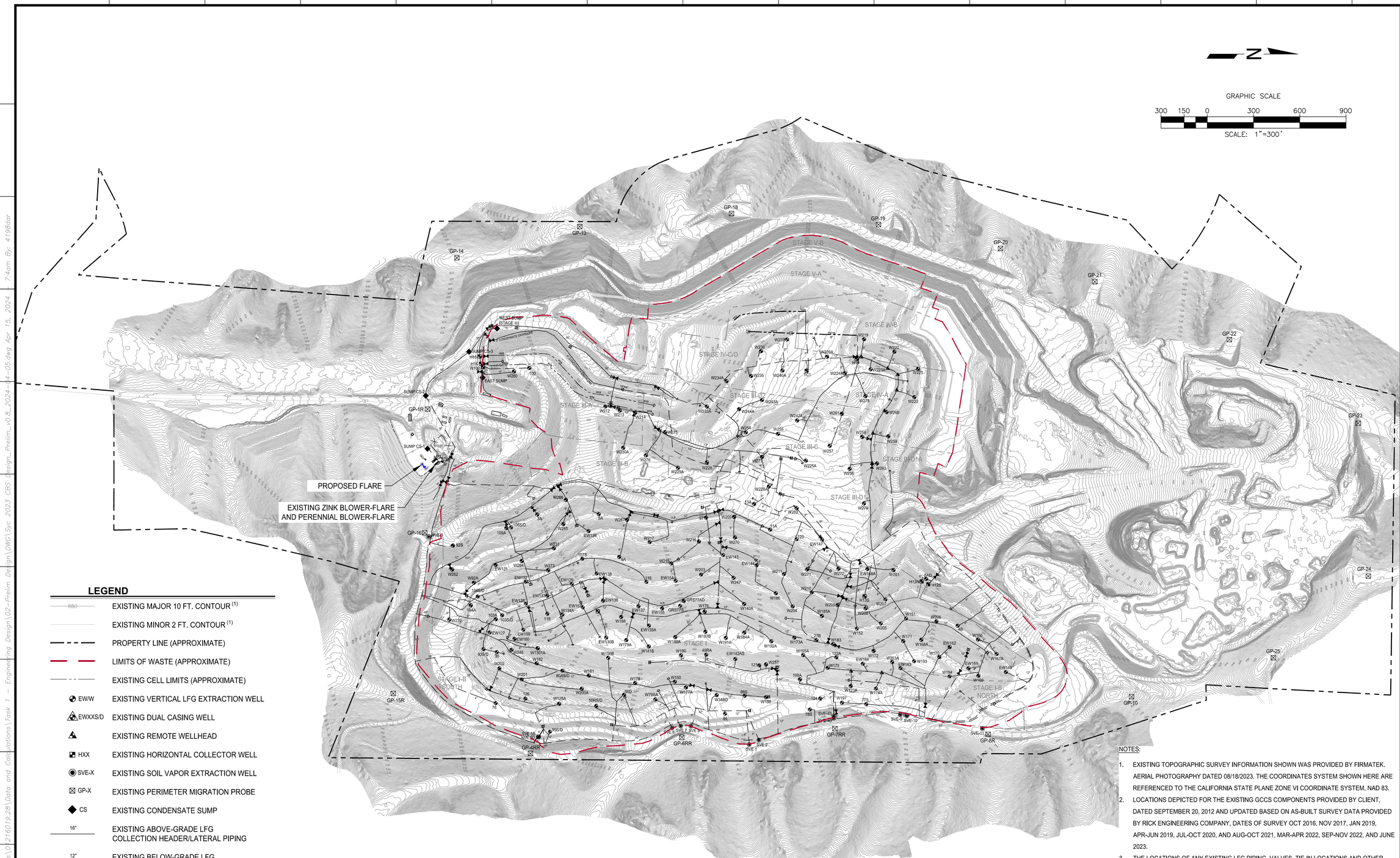
SAN DIEGO, CA 92123
(858) 571-5500 FAX: (562) 427-0805

PROJ. NO. 01216019.28 | DWN. BY: DRL | CHK. BY: GS | APP. BY: SV
DSN. BY: DRL | ACAD FILE: F_ENGINEERS

DATE: 04/03/2024

SCALE: AS SHOWN

SHEET: FIGURE 1



LEGEND

- EXISTING MAJOR 10 FT. CONTOUR [1]
- EXISTING MINOR 2 FT. CONTOUR [1]
- PROPERTY LINE (APPROXIMATE)
- LIMITS OF WASTE (APPROXIMATE)
- EXISTING CELL LIMITS (APPROXIMATE)
- EW/W — EXISTING VERTICAL LFG EXTRACTION WELL
- EWXXS/D — EXISTING DUAL CASING WELL
- EXISTING REMOTE WELLHEAD
- HXX — EXISTING HORIZONTAL COLLECTOR WELL
- SVE-X — EXISTING SOIL VAPOR EXTRACTION WELL
- GP-X — EXISTING PERIMETER MIGRATION PROBE
- CS — EXISTING CONDENSATE SUMP
- 16" — EXISTING ABOVE-GRADE LFG COLLECTION HEADER/LATERAL PIPING
- 12" — EXISTING BELOW-GRADE LFG COLLECTION HEADER/LATERAL PIPING
- EXISTING ISOLATION VALVE
- EXISTING FITTING - CAP, REDUCER, TEE

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS PROVIDED BY FIRMATEK. AERIAL PHOTOGRAPHY DATED 08/18/2023. THE COORDINATES SYSTEM SHOWN HERE ARE REFERENCED TO THE CALIFORNIA STATE PLANE ZONE VI COORDINATE SYSTEM, NAD 83.
2. LOCATIONS DEPICTED FOR THE EXISTING GCCS COMPONENTS PROVIDED BY CLIENT, DATED SEPTEMBER 20, 2012 AND UPDATED BASED ON AS-BUILT SURVEY DATA PROVIDED BY RICK ENGINEERING COMPANY, DATES OF SURVEY OCT 2016, NOV 2017, JAN 2019, APR-JUN 2019, JUL-OCT 2020, AND AUG-OCT 2021, MAR-APR 2022, SEP-NOV 2022, AND JUNE 2023.
3. THE LOCATIONS OF ANY EXISTING LFG PIPING, VALVES, TIE-IN LOCATIONS AND OTHER FEATURES ARE APPROXIMATE SHOULD BE USED FOR INFORMATION PURPOSES. ACTUAL FIELD CONDITIONS MAY VARY AND SUBJECT TO CHANGE BASED ON FUTURE FILL OPERATIONS, WASTE PLACEMENT, TOPOGRAPHIC FEATURES, AND OTHER SITE-SPECIFIC FACTORS.

- CONCEPTUAL PLAN -
FOR REVIEW AND PLANNING PURPOSES ONLY

NO.	REVISION	DATE

SHEET TITLE: PROPERTY MAP

PROJECT TITLE: SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CLIENT: REPUBLIC SERVICES

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
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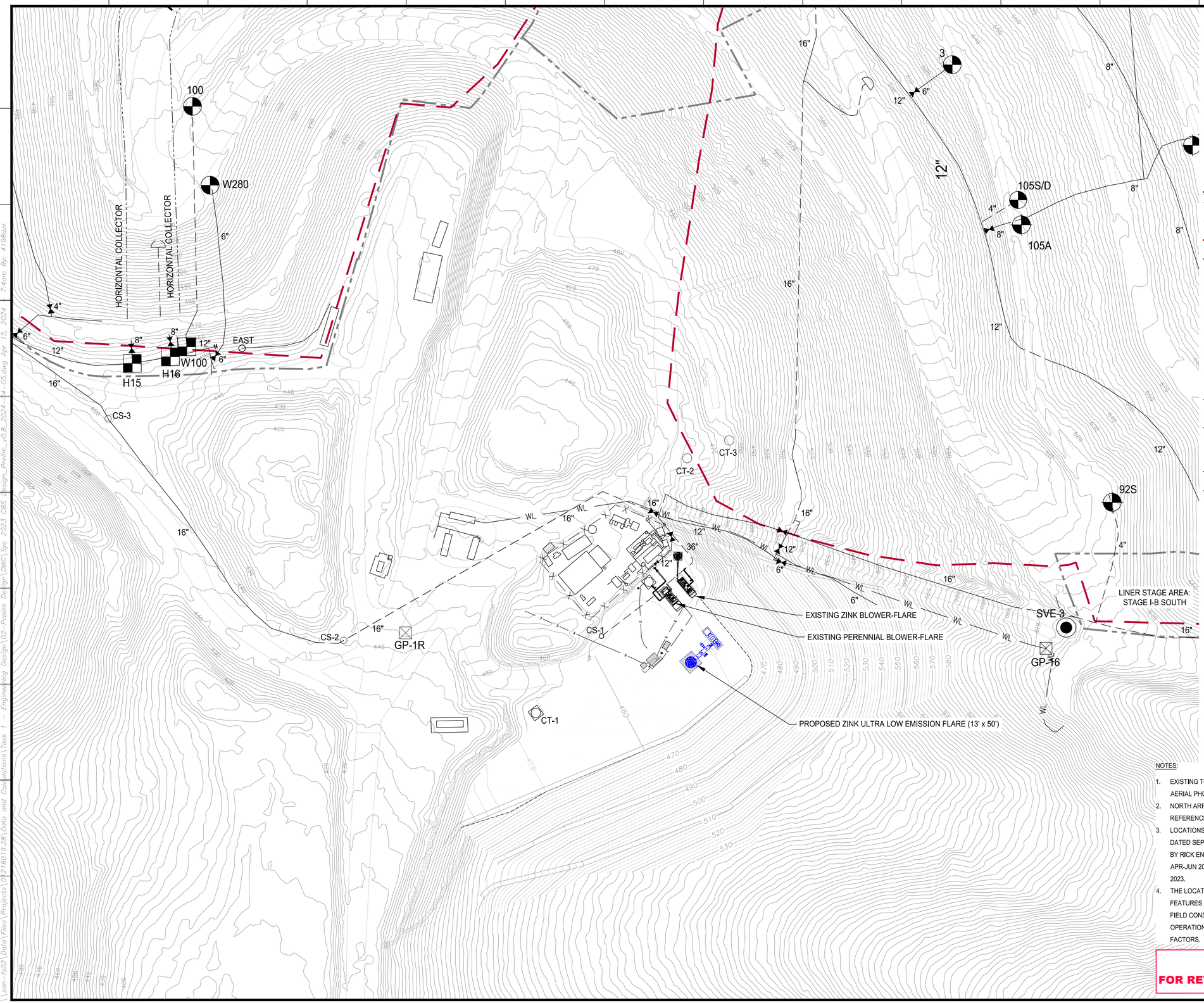
PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	APP. BY:	ACAD FILE:
01216019.28	DRL	DRL	GS	SV	E_ENGINEERS

DATE: 04/03/2024

SCALE: AS SHOWN

SHEET: FIGURE 2



N

GRAPHIC SCALE

60 30 0 60 120 180

SCALE: 1"=60'

LEGEND

- EXISTING MAJOR 10 FT. CONTOUR (1)
- EXISTING MINOR 2 FT. CONTOUR (1)
- LIMITS OF WASTE (APPROXIMATE)
- EXISTING CELL LIMITS (APPROXIMATE)
- EW/W — EXISTING VERTICAL LFG EXTRACTION WELL
- HXX — EXISTING HORIZONTAL COLLECTOR WELL
- SVE-X — EXISTING SOIL VAPOR EXTRACTION WELL
- GP-X — EXISTING PERIMETER MIGRATION PROBE
- CS-1 — EXISTING CONDENSATE SUMP
- CT-1 — EXISTING CONDENSATE TANK
- 16" — EXISTING ABOVE-GRADE LFG COLLECTION HEADER/LATERAL PIPING
- 12" — EXISTING BELOW-GRADE LFG COLLECTION HEADER/LATERAL PIPING
- EXISTING ISOLATION VALVE
- WL — EXISTING WATER LINE
- E — EXISTING UTILITY LINE

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS PROVIDED BY FIRMATEK. AERIAL PHOTOGRAPHY DATED 08/18/2023.
2. NORTH ARROW, THE GRID, AND THE COORDINATES SYSTEM SHOWN HERE ARE REFERENCED TO THE CALIFORNIA STATE PLANE ZONE VI COORDINATE SYSTEM, NAD 83.
3. LOCATIONS DEPICTED FOR THE EXISTING GCCS COMPONENTS PROVIDED BY CLIENT, DATED SEPTEMBER 20, 2012 AND UPDATED BASED ON AS-BUILT SURVEY DATA PROVIDED BY RICK ENGINEERING COMPANY, DATES OF SURVEY OCT 2016, NOV 2017, JAN 2019, APR-JUN 2019, JUL-OCT 2020, AND AUG-OCT 2021, MAR-APR 2022, SEP-NOV 2022, AND JUNE 2023.
4. THE LOCATIONS OF ANY EXISTING LFG PIPING, VALVES, TIE-IN LOCATIONS AND OTHER FEATURES ARE APPROXIMATE SHOULD BE USED FOR INFORMATION PURPOSES. ACTUAL FIELD CONDITIONS MAY VARY AND SUBJECT TO CHANGE BASED ON FUTURE FILL OPERATIONS, WASTE PLACEMENT, TOPOGRAPHIC FEATURES, AND OTHER SITE-SPECIFIC FACTORS.

- CONCEPTUAL PLAN -
FOR REVIEW AND PLANNING PURPOSES ONLY

DATE | REVISION | NO.

SHEET TITLE: BLOWER-FLARE STATION

PROJECT TITLE: SYCAMORE LANDFILL SANTEE, CALIFORNIA

CLIENT: REPUBLIC SERVICES

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
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PROJ. NO. 01216019.28 | DSN. BY: DRL | DWN. BY: DRL | CHK. BY: GS | APP. BY: SV | ACAD FILE: FIGURE3

DATE: 04/03/2024

SCALE: AS SHOWN

SHEET: FIGURE 3

GRAPHIC SCALE

280 140 0 280 560 840

SCALE: 1"=280'

LEGEND

600	EXISTING MAJOR 10 FT. CONTOUR [1]
	EXISTING MINOR 2 FT. CONTOUR [1]
	PROPERTY LINE (APPROXIMATE)
EW/W	EXISTING VERTICAL LFG EXTRACTION WELL
EWXXS/D	EXISTING DUAL CASING WELL
	EXISTING REMOTE WELLHEAD
HXX	EXISTING HORIZONTAL COLLECTOR WELL
SVE-X	EXISTING SOIL VAPOR EXTRACTION WELL
GP-X	EXISTING PERIMETER MIGRATION PROBE
CS	EXISTING CONDENSATE SUMP
16"	EXISTING ABOVE-GRADE LFG COLLECTION HEADER/LATERAL PIPING
12"	EXISTING BELOW-GRADE LFG COLLECTION HEADER/LATERAL PIPING
H/HC/SC/TC	EXISTING COLLECTOR HDPE PERF PIPE
	EXISTING ISOLATION VALVE
	EXISTING FITTING - CAP, REDUCER, TEE
	EXISTING UNPAVED ROAD
	EXISTING PAVED ROAD
	ACTIVE AREA
	FILL DIRECTION

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS PROVIDED BY FIRMATEK. AERIAL PHOTOGRAPHY DATED 11/19/2024.
2. NORTH ARROW AND THE COORDINATES SHOWN HERE ARE REFERENCED TO THE CALIFORNIA STATE PLANE ZONE VI COORDINATE SYSTEM, NAD 83.
3. LOCATIONS DEPICTED FOR THE EXISTING GCCS COMPONENTS PROVIDED BY CLIENT, DATED SEPTEMBER 20, 2012 AND UPDATED BASED ON AS-BUILT SURVEY DATA PROVIDED BY RICK ENGINEERING COMPANY, DATES OF SURVEY OCT 2016, NOV 2017, JAN 2019, APR-JUN 2019, JUL-OCT 2020, AUG-OCT 2021,MAR-APR 2022, SEP-NOV 2022, JUNE 2023, NOV-DEC 2023, AND AUG-SEP 2024.
4. THE LOCATIONS OF ANY EXISTING PIPING, VALVES, TIE-IN LOCATIONS AND OTHER FEATURES ARE APPROXIMATE AND SHOULD BE USED FOR INFORMATION PURPOSES ONLY. ACTUAL FIELD CONDITIONS MAY VARY AND SUBJECT TO CHANGE BASED ON FUTURE FILL OPERATIONS, WASTE PLACEMENT, TOPOGRAPHIC FEATURES, AND OTHER SITE-SPECIFIC FACTORS.

NO.	REVISION	DATE

SHEET TITLE: 2024 SITE MAP

PROJECT TITLE: SYCAMORE LANDFILL SANTEE, CALIFORNIA

CLIENT: REPUBLIC SERVICES

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PROJ. NO. 01216019.32 | DWN. BY: GE | ACAD FILE: F:/ENGINEERS
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DATE: 12-04-2024

SCALE: AS SHOWN

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F:\Engineers\Republic Services Inc\Sycamore LF\Sycamore Site Maps\Sycamore Gas Maps\Sycamore 2024 Gas Map\Syc GCCS Layout Site Update_2024-12-02.dwg Dec 04, 2024 - 11:12am By: gescobar

Appendix B

Solid Waste Facility Permit

Solid Waste Facilities Permit | 37-AA-0023

1. Name & Street Address of Facility:	2. Name & Mailing Address of Operator:	3. Name & Mailing Address of Owner:
Sycamore Landfill 8514 Mast Boulevard San Diego, CA 92145	Sycamore Landfill, Incorporated 8514 Mast Boulevard Santee, CA 92071	Sycamore Landfill, Incorporated 8514 Mast Boulevard Santee, CA 92071

4. Specifications:

a. Permitted Operation:	**Landfill Disposal Site**	
b. Permitted Hours of Operation:	**Monday – Friday Tipping**	**6:00 AM to 4:30 PM**
	Saturday – Sunday Tipping	**6:00 AM to 3:00 PM**
	Monday – Friday Scale House	**4:00 AM to 4:30 PM**
	Saturday – Sunday Scale House	**4:00 AM to 3:00 PM**
	Ancillary Operations	**24 Hours**
c. Maximum Permitted Tonnage for Disposal:	**5,000 tons per day**	
d. Maximum Daily Waste Traffic:	**869 municipal solid waste tickets per day**	

e. Key Design Parameters:

Permitted Area of Site:	**603 acres**
Permitted Area for Disposal:	**349.2 acres**
Design Capacity:	**147,908,000 cubic yards**
Maximum Elevation:	**1,050 feet above mean sea level**
Maximum Depth:	**431 feet above mean sea level**
Estimated Closure Date:	**2042**

Upon a significant change in design or operation from that described herein, this permit is subject to revocation or suspension. The attached permit findings and conditions are integral parts of this permit and supersede the conditions of any previously issued solid waste facility permit.

5. Approval:

William E. Prinz, REHS, MPA
LEA Program Manager

6. Local Enforcement Agency Name & Address:

City of San Diego
Development Services Department
Solid Waste Local Enforcement Agency (LEA)
1010 Second Avenue, Suite 600, MS 606L
San Diego, CA 92101

7. Date received by CalRecycle: August 29, 2017

8. CalRecycle concurrence date: September 8, 2017

9. Permit issuance date:

September 11, 2017

10. Permit review date:

September 11, 2022

11. Description of Facility:

Section 13 &14 of T15S, R2W and Section 7, 18, & 19 of T15S, R1W of San Bernardino Meridian.
Assessor Parcel Numbers and Legal Description: Refer to Joint Technical Document Section 3.4.

12. Prohibitions:

The permittee is prohibited from accepting the following wastes:

Hazardous, radioactive, medical (as defined in the Health and Safety Code Sections 117600-118360), liquid, designated, or other hazardous wastes requiring special treatment or handling, except as identified in the Joint Technical Document and approved amendments thereto and as approved by the LEA and/or other federal, state, and local agencies.

13. Findings:

a. This permit is consistent with the 2012 San Diego County Integrated Waste Management Plan, which was approved by the Department of Resources Recycling and Recovery (CalRecycle) in March 2013.

b. The LEA finds that this permit is consistent with the standards adopted by CalRecycle, pursuant to Public Resources Code (PRC) 44010.

c. The LEA has determined that the design and operation of the facility is consistent with the State Minimum Standards for Solid Waste Handling and Disposal pursuant to PRC 44009.

d. An Environmental Impact Report (EIR) was filed with the State Clearinghouse (SCH No. 2003041057) and certified by the City of San Diego Development Services Department on August 3, 2012. The EIR describes and supports the design and operation of this project, which will be authorized by the issuance of this permit.

14. The following documents describe and/or restrict the operation of this facility:

DOCUMENT	DATE	DOCUMENT	DATE
Joint Technical Document (JTD)	February 2015 May 2017 Amendment	Preliminary Closure and Postclosure Maintenance Plan	August 2017
Planned Development Permit No. 9309	September 21, 2012	Site Development Permit No. 9310	September 21, 2012
Environmental Impact Report-Master Development Plan SCH No. 2003041057.	August 3, 2012	Conformance with San Diego Countywide Siting Element	September 20-21, 2005
Conditional Use Permit No. 83-0789	August 13, 1984		

15. Self-Monitoring:

The owner/operator shall submit the results of all self-monitoring programs to the LEA in accordance with Condition 16a below

PROGRAM	REPORTING FREQUENCY
a. TONNAGE RECORDS: The operator shall maintain and keep current all records used to determine daily tonnage. b. TRAFFIC RECORDS: The operator shall maintain and keep current a record of all vehicles hauling solid waste to the facility. c. REMAINING CAPACITY: The operator shall prepare and submit a report regarding the remaining volumetric capacity at the site. d. SPECIAL OCCURRENCES: A summary of special occurrences including, but not limited to fires, explosions, the discharge and disposition of hazardous waste, and significant injuries, accidents, or property damage. e. LANDFILL GAS MONITORING: The operator shall provide records of all landfill gas monitoring conducted at the required frequency. f. HAZARDOUS WASTE LOAD CHECK: The operator shall provide a summary of the results of all load check/load rejection activities and enforcement actions.	Program records shall be submitted to the LEA in accordance with LEA Condition 16a.

16. LEA Conditions:

a. Tonnage, traffic, remaining capacity, special occurrences, landfill gas monitoring, and load check records shall be summarized and submitted to the LEA on a quarterly basis. The reporting periods and due dates are: January through March, due May 1; April through June, due August 1; July through September, due November 1; and October through December, due February 1.

b. The operator shall submit to unannounced inspections during permitted hours of operation. Such inspections may occur before the start or after the end of waste deposition activities.

c. This solid waste facilities permit is subject to review by the LEA and may be suspended or revoked at any time for sufficient cause in accordance with Division 30 of the PRC, Part 4, Article 2, Sections 44305 et seq. and associated regulations.

d. Any change that would cause the design or operation of the facility not to conform to the terms and conditions of this permit is prohibited. Such change may be considered a significant change, requiring a permit revision. In no case shall the operator implement changes without first submitting a written notice of the proposed change, in the form of a Report of Facility Information amendment, at least 180 days in advance of the proposed change unless otherwise determined by the EA.

e. Additional information related to compliance with this permit or information concerning the design and operation of this facility shall be furnished to the LEA upon request.

f. The LEA reserves the right to suspend or modify waste receiving and handling operations due to an emergency.

Appendix C

Baseline Actual Emission Estimates

TABLE C-1
BASELINE POTENTIAL TO EMIT ESTIMATES FOR THE EXISTING PERMITTED CAPACITY LANDFILL (LFG)
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[(b)]	Total Pollutant Flow Rate (tons/yr)[(c)]	LFG Collection System Efficiency (%)[(d)]	Pollutant Flow Rate to Control Device (tons/yr)	Pollutant Emission Rate from Landfill (tons/yr)	Pollutant Emission Rate from Landfill (lbs/yr)	Pollutant Emission Rate from Landfill (lbs/day)
Hazardous Air Pollutants (HAPs)[(a)]									
71-55-6	1,1,1-Trichloroethane (methyl chloroform)+ - HAP	133.41	0.069	2.43E-02	85.0%	2.07E-02	3.65E-03	7.30E+00	2.00E-02
79-00-5	1,1,2-Trichloroethane+ - HAP	133.4	0.069	2.43E-02	85.0%	2.07E-02	3.65E-03	7.30E+00	2.00E-02
79-34-5	1,1,2,2-Tetrachloroethane+ - HAP/VOC	167.85	0.069	3.06E-02	85.0%	2.60E-02	4.59E-03	9.19E+00	2.52E-02
75-34-3	1,1-Dichloroethane (ethylidene dichloride)+ - HAP/VOC	98.97	0.069	1.81E-02	85.0%	1.53E-02	2.71E-03	5.42E+00	1.48E-02
75-35-4	1,1-Dichloroethene (vinylidene chloride)+ - HAP/VOC	96.94	0.069	1.77E-02	85.0%	1.50E-02	2.65E-03	5.31E+00	1.45E-02
107-06-2	1,2-Dichloroethane (ethylene dichloride)+ - HAP/VOC	98.96	0.493	1.30E-01	85.0%	1.10E-01	1.95E-02	3.90E+01	1.07E-01
78-87-5	1,2-Dichloropropane (propylene dichloride)+ - HAP/VOC	112.99	0.069	2.06E-02	85.0%	1.75E-02	3.09E-03	6.18E+00	1.69E-02
540-59-0	1,2-Dichloroethene+ - VOC	96.94	0.274	7.08E-02	85.0%	6.01E-02	1.06E-02	2.12E+01	5.82E-02
120-82-1	1,2,4-Trichlorobenzene+ - HAP	181.45	0.069	3.31E-02	85.0%	2.81E-02	4.97E-03	9.93E+00	2.72E-02
95.63-6	1,2,4-Trimethylbenzene+	120.19	0.069	2.19E-02	85.0%	1.86E-02	3.29E-03	6.58E+00	1.80E-02
95-50-1	1,2-Dichlorobenzene+	147.01	0.069	2.68E-02	85.0%	2.28E-02	4.02E-03	8.05E+00	2.20E-02
108-67-8	1,3,5-Trimethylbenzene+	120.19	0.069	2.19E-02	85.0%	1.86E-02	3.29E-03	6.58E+00	1.80E-02
106-99-0	1,3-Butadiene+ - HAP	54.09	0.069	9.87E-03	85.0%	8.39E-03	1.48E-03	2.96E+00	8.11E-03
541-73-1	1,3-Dichlorobenzene+	147.00	0.069	2.68E-02	85.0%	2.28E-02	4.02E-03	8.05E+00	2.20E-02
123-91-1	1,4-Dioxane+ - HAP	88.11	0.069	1.61E-02	85.0%	1.37E-02	2.41E-03	4.82E+00	1.32E-02
14720-74-2	2,2,4-Trimethylpentane+ - HAP	142.28	0.562	2.13E-01	85.0%	1.81E-01	3.19E-02	6.39E+01	1.75E-01
95-49-8	2-Chlorotoluene+	126.58	0.069	2.31E-02	85.0%	1.96E-02	3.46E-03	6.93E+00	1.90E-02
591-78-6	2-Hexanone+	100.16	0.246	6.56E-02	85.0%	5.58E-02	9.84E-03	1.97E+01	5.39E-02
554-14-3	2-Methylthiophene*	98.16	0.446	1.17E-01	85.0%	9.91E-02	1.75E-02	3.50E+01	9.58E-02
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	89.300	1.43E+01	85.0%	1.22E+01	2.14E+00	4.29E+03	1.18E+01
616-44-4	3-Methylthiopene*	98.16	0.076	1.99E-02	85.0%	1.69E-02	2.98E-03	5.96E+00	1.63E-02
622-96-8	4-Ethyltoluene+	120.20	0.584	1.87E-01	85.0%	1.59E-01	2.80E-02	5.61E+01	1.54E-01
75-07-0	Acetaldehyde+ - HAP	44.05	2.850	3.34E-01	85.0%	2.84E-01	5.02E-02	1.00E+02	2.75E-01
67-64-1	Acetone+	58.08	39.200	6.06E+00	85.0%	5.15E+00	9.10E-01	1.82E+03	4.98E+00
107-02-8	Acrolein+ - HAP	56.06	0.137	2.05E-02	85.0%	1.74E-02	3.07E-03	6.14E+00	1.68E-02
107-13-1	Acrylonitrile+ - HAP/VOC	53.06	0.137	1.94E-02	85.0%	1.65E-02	2.90E-03	5.81E+00	1.59E-02
107-05-1	Allyl Chloride+ - HAP	76.53	0.069	1.40E-02	85.0%	1.19E-02	2.09E-03	4.19E+00	1.15E-02
100-44-7	Benzylchloride+ - HAP	126.58	0.069	2.31E-02	85.0%	1.96E-02	3.46E-03	6.93E+00	1.90E-02
75-25-2	Bromodichloromethane+ - VOC	163.83	0.069	2.99E-02	85.0%	2.54E-02	4.48E-03	8.97E+00	2.46E-02
71-43-2	Benzene+ - HAP/VOC	78.11	1.550	3.22E-01	85.0%	2.74E-01	4.84E-02	9.67E+01	2.65E-01
75-25-2	Bromoform+ - HAP	252.73	0.069	4.61E-02	85.0%	3.92E-02	6.92E-03	1.38E+01	3.79E-02
74-83-9	Bromomethane+ - HAP	94.94	0.069	1.73E-02	85.0%	1.47E-02	2.60E-03	5.20E+00	1.42E-02
1003-09-4	Bromothiophene*	163.04	0.025	1.09E-02	85.0%	9.23E-03	1.63E-03	3.26E+00	8.92E-03
10061-01-5	cis-1,3-Dichloropropene+ - HAP	110.97	0.069	2.02E-02	85.0%	1.72E-02	3.04E-03	6.07E+00	1.66E-02
110-82-7	Cyclohexane+	84.16	0.844	1.89E-01	85.0%	1.61E-01	2.84E-02	5.68E+01	1.56E-01
75-15-0	Carbon disulfide*+ - HAP/VOC	76.13	0.115	2.33E-02	85.0%	1.98E-02	3.50E-03	7.00E+00	1.92E-02
56-23-5	Carbon tetrachloride+ - HAP/VOC	153.84	0.069	2.81E-02	85.0%	2.39E-02	4.21E-03	8.42E+00	2.31E-02
46-358-1	Carbonyl sulfide+ - HAP/VOC	60.07	0.069	1.10E-02	85.0%	9.32E-03	1.64E-03	3.29E+00	9.01E-03
108-90-7	Chlorobenzene+ - HAP/VOC	112.56	0.069	2.05E-02	85.0%	1.75E-02	3.08E-03	6.16E+00	1.69E-02
75-45-6	Chlorodifluoromethane+	86.47	0.534	1.23E-01	85.0%	1.05E-01	1.84E-02	3.69E+01	1.01E-01
75-00-3	Chloroethane (ethyl chloride)+ - HAP/VOC	64.52	0.069	1.18E-02	85.0%	1.00E-02	1.77E-03	3.53E+00	9.68E-03
67-66-3	Chloroform+ - HAP/VOC	119.39	0.069	2.18E-02	85.0%	1.85E-02	3.27E-03	6.54E+00	1.79E-02
74-87-3	Chloromethane (methyl chloride)+ - VOC	50.49	0.137	1.84E-02	85.0%	1.57E-02	2.76E-03	5.53E+00	1.51E-02
124-48-1	Dibromochloromethane+	208.28	0.069	3.80E-02	85.0%	3.23E-02	5.70E-03	1.14E+01	3.12E-02
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)+ - HAP/VOC	147.00	0.429	1.68E-01	85.0%	1.43E-01	2.52E-02	5.04E+01	1.38E-01
75-43-4	Dichlorodifluoromethane+	120.91	0.597	1.92E-01	85.0%	1.63E-01	2.88E-02	5.77E+01	1.58E-01
75-71-8	Dichlorofluoromethane+	102.92	0.311	8.53E-02	85.0%	7.25E-02	1.28E-02	2.56E+01	7.01E-02
75-09-2	Dichloromethane (methylene chloride)+ - HAP	84.94	0.864	1.95E-01	85.0%	1.66E-01	2.93E-02	5.86E+01	1.61E-01
76-14-2	Dichlorotetrafluoroethane (Freon 114)+	170.92	0.069	3.12E-02	85.0%	2.65E-02	4.68E-03	9.36E+00	2.56E-02
110-81-6	Diethyl Disulfide*	122.25	0.025	8.14E-03	85.0%	6.92E-03	1.22E-03	2.44E+00	6.69E-03
352-93-2	Diethyl Sulfide*	90.18	0.025	6.01E-03	85.0%	5.10E-03	9.01E-04	1.80E+00	4.94E-03
624-92-0	Dimethyl Disulfide*	94.19	0.025	6.27E-03	85.0%	5.33E-03	9.41E-04	1.88E+00	5.16E-03
75-18-3	Dimethyl sulfide (methyl sulfide)* - VOC	62.13	18.700	3.09E+00	85.0%	2.63E+00	4.64E-01	9.28E+02	2.54E+00
64-17-5	Ethanol+ - VOC	46.08	462.000	5.67E+01	85.0%	4.82E+01	8.51E+00	1.70E+04	4.66E+01
141-78-6	Ethyl Acetate+	88.11	27.900	6.55E+00	85.0%	5.57E+00	9.82E-01	1.96E+03	5.38E+00
75-08-1	Ethyl mercaptan* - VOC	62.13	0.125	2.07E-02	85.0%	1.76E-02	3.10E-03	6.21E+00	1.70E-02
100-41-4	Ethylbenzene+ - HAP/VOC	106.16	6.320	1.79E+00	85.0%	1.52E+00	2.68E-01	5.36E+02	1.47E+00
106-93-4	Ethylene dibromide (1,2-Dibromoethane)+ - HAP/VOC	187.88	0.069	3.43E-02	85.0%	2.91E-02	5.14E-03	1.03E+01	2.82E-02
75-69-4	Fluorotrichloromethane+ - VOC	137.40	0.069	2.51E-02	85.0%	2.13E-02	3.76E-03	7.52E+00	2.06E-02
142-82-5	Heptane+	100.21	3.000	8.01E-01	85.0%	6.81E-01	1.20E-01	2.40E+02	6.58E-01
87-68-3	Hexachlorobutadiene+ - HAP	260.76	0.069	4.76E-02	85.0%	4.04E-02	7.14E-03	1.43E+01	3.91E-02
110-54-3	Hexane+ - HAP/VOC	86.18	1.020	2.34E-01	85.0%	1.99E-01	3.51E-02	7.02E+01	1.92E-01
2148-87-8	Hydrogen Sulfide*	34.08	128.000	1.16E+01	85.0%	9.88E+00	1.74E+00	3.49E+03	9.55E+00
513-44-0	Isobutyl Mercaptan*	90.18	0.099	2.38E-02	85.0%	2.02E-02	3.57E-03	7.13E+00	1.95E-02
75-33-2	Isopropyl Mercaptan*	76.16	0.777	1.58E-01	85.0%	1.34E-01	2.36E-02	4.73E+01	1.30E-01
98-82-8	Isopropyl benzene (Cumene)+ - HAP	120.19	0.563	1.80E-01	85.0%	1.53E-01	2.70E-02	5.41E+01	1.48E-01
7439-97-6	Mercury (total)(e) - HAP	200.61	0.00029	1.56E-04	85.0%	1.33E-04	2.34E-05	4.68E-02	1.28E-04
67-56-1	Methanol+ - HAP	32.04	180.00	1.54E+01	85.0%	1.31E+01	2.30E+00	4.61E+03	1.26E+01
78-93-3	Methyl ethyl ketone+ - VOC	72.11	35.100	6.74E+00	85.0%	5.73E+00	1.01E+00	2.02E+03	5.54E+00
108-10-1	Methyl isobutyl ketone+ - HAP/VOC	100.16	2.850	7.60E-01	85.0%	6.46E-01	1.14E-01	2.28E+02	6.25E-01

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[(b)]	Total Pollutant Flow Rate (tons/yr)[(c)]	LFG Collection System Efficiency (%)[(d)]	Pollutant Flow Rate to Control Device (tons/yr)	Pollutant Emission Rate from Landfill (tons/yr)	Pollutant Emission Rate from Landfill (lbs/yr)	Pollutant Emission Rate from Landfill (lbs/day)
74-93-1	Methyl mercaptan* - VOC	48.11	7.640	9.79E-01	85.0%	8.32E-01	1.47E-01	2.94E+02	8.05E-01
80-62-6	Methyl Methacrylate+ - HAP	100.12	0.069	1.83E-02	85.0%	1.55E-02	2.74E-03	5.48E+00	1.50E-02
1634-04-4	Methyl Tert Butyl Ether (MTBE)+ - HAP	88.15	0.069	1.61E-02	85.0%	1.37E-02	2.41E-03	4.83E+00	1.32E-02
624-89-5	Methyl ethyl sulfide*	76.16	0.025	5.07E-03	85.0%	4.31E-03	7.61E-04	1.52E+00	4.17E-03
91-20-3	Naphthalene+ - HAP	128.17	0.069	2.34E-02	85.0%	1.99E-02	3.51E-03	7.02E+00	1.92E-02
109-79-5	n-Butyl Mercaptan*	90.20	0.051	1.23E-02	85.0%	1.04E-02	1.84E-03	3.68E+00	1.01E-02
107-03-9	n-Propyl Mercaptan*	76.16	0.025	5.07E-03	85.0%	4.31E-03	7.61E-04	1.52E+00	4.17E-03
127-18-4	Perchloroethylene (tetrachloroethylene)+ - HAP	165.83	0.504	2.23E-01	85.0%	1.89E-01	3.34E-02	6.68E+01	1.83E-01
115-07-1	Propene+	42.08	15.700	1.76E+00	85.0%	1.50E+00	2.64E-01	5.28E+02	1.45E+00
513-53-1	sec-Butyl Mercaptan / Thiophene*	90.18	1.000	2.40E-01	85.0%	2.04E-01	3.60E-02	7.21E+01	1.97E-01
100-42-5	Styrene+ - HAP	104.15	0.889	2.47E-01	85.0%	2.10E-01	3.70E-02	7.40E+01	2.03E-01
109-99-9	Tetrahydrofuran*	72.11	12.900	2.48E+00	85.0%	2.11E+00	3.72E-01	7.43E+02	2.04E+00
108-98-5	Thiophenol*	110.19	0.025	7.34E-03	85.0%	6.24E-03	1.10E-03	2.20E+00	6.03E-03
75-65-0	Tert Butanol (TBA)+	74.12	1.070	2.11E-01	85.0%	1.80E-01	3.17E-02	6.34E+01	1.74E-01
75-66-1	tert-Butyl Mercaptan*	90.18	0.138	3.31E-02	85.0%	2.82E-02	4.97E-03	9.94E+00	2.72E-02
79-01-6	Trichloroethylene (trichloroethene)+ - HAP/VOC	131.40	0.221	7.74E-02	85.0%	6.57E-02	1.16E-02	2.32E+01	6.36E-02
76-13-1	Trichlorotrifluoroethane (Freon 113)+	187.38	0.069	3.42E-02	85.0%	2.91E-02	5.13E-03	1.03E+01	2.81E-02
108-05-4	Vinyl Acetate+ - HAP	86.09	0.137	3.14E-02	85.0%	2.67E-02	4.71E-03	9.42E+00	2.58E-02
593-60-2	Vinyl Bromide+ - HAP	106.95	0.069	1.95E-02	85.0%	1.66E-02	2.93E-03	5.85E+00	1.60E-02
75-01-4	Vinyl chloride+ - HAP/VOC	62.50	0.069	1.14E-02	85.0%	9.69E-03	1.71E-03	3.42E+00	9.37E-03
108-88-3	Toluene+ - HAP/VOC	92.13	27.000	6.63E+00	85.0%	5.63E+00	9.94E-01	1.99E+03	5.45E+00
1330-20-7	Xylenes+ - HAP/VOC	106.16	16.170	4.57E+00	85.0%	3.89E+00	6.86E-01	1.37E+03	3.76E+00
Totals				145.29			21.79	43,587.16	119.42
Totals: HAPs only				0.05		27.26	4.81	9,621.42	26.36
Criteria Air Pollutants									
Total Non-Methane Organics (NMOCs) as Hexane (f)		86.18	1,056	242.51	85.0%	206.14	36.38	72,754.15	199.33
VOCs (f)(g)		86.18	1,056	242.51	85.0%	206.14	36.38	72,754.15	199.33

Notes:

(a) List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Default Concentrations for Landfill Gas Constituents, 8/24") and SDAPCD list from previous small expansion.

(b) Average concentration of HAPs found in LFG were taken from 11/12/19 Sample (Sycamore LFGTE Facility) (denoted as "*") and from 10/7/15 sample (most recent TO-15 analysis) and averaged (consistent with SDAPCD from previous small expansion) (denoted as "+"). If ND, 1/2 the detection limit was used.

(c) Total pollutant emission rate based on 2021-2022 LFG generation rate and 85% collection efficiency.

(d) Based on CARB AB 32 LMR guidance and consistent with previously approved small expansion by SDAPCD.

(e) Concentration of Mercury based on EPA AP-42 Section 2.4 Table 2.4-1 (11/98).

(f) Concentration from SDAPCD small expansion evaluation spreadsheet (based on sum of all non-exempt compounds concentrations as more conservative than 595 ppmv) per note.

(g) NMOCs assumed to equal VOCs.

(h) LFG generation based on actual 2021-2022 recovery normalized to 50% methane and 85% collection efficiency consistent with previously SDAPCD-approved small expansion.

Variables:

MODEL INPUT VARIABLES:		
Methane Concentration (%)	50%	
LFG generation rate (year 2021-2022 ave) (h)	3,903	SCFM
Actual LFG recovered (year 2021-2022 ave)(h)	3,317	SCFM
Actual LFG recovered (year 2021-2022 ave)(h)	1,743,574,777	**SCF**
LFG Collection System efficiency (d)	85%	

CONVERSIONS

ton conversion	2000	
lb conversion	453.6	g
hour conversion	60	min
day conversion	24	hrs
12 months	365	days
mol conversion	24.04	L @ STP
cf conversion	28.32	L
mmbtu conversion	1,000,000	btu

EXAMPLE CALCULATIONS

(HAPS AND VOCS)

Total Pollutant Flow Rate (To Flare)= ((Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000) *(Total LFG to Flare [cfm])*(60min*24hr*365 days)*(1ton/2000 lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

Pollutant Flow rate = (Total pollutant flow rate [tons/yr])*(Collection efficiency)

Pollutant Emissions through landfill = (Total pollutant flow rate [tons/yr]) * (1 - collection efficiency)

TABLE C-2
POTENTIAL TO EMIT ESTIMATES FOR EXISTING ENCLOSED JOHN ZINK LANDFILL FLARE (NO. 1)
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [d]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
Hazardous Air Pollutants (HAPs)[a]									
71-55-6	1,1,1-Trichloroethane (methyl chloroform)+ - HAP	133.41	0.069	1.12E-02	98.0%	5.13E-05	1.23E-03	4.49E-01	2.25E-04
79-00-5	1,1,2-Trichloroethane+ - HAP	133.4	0.069	1.12E-02	98.0%	5.13E-05	1.23E-03	4.49E-01	2.25E-04
79-34-5	1,1,2,2-Tetrachloroethane+ - HAP/VOC	167.85	0.069	1.41E-02	98.0%	6.45E-05	1.55E-03	5.65E-01	2.83E-04
75-34-3	1,1-Dichloroethane (ethylidene dichloride)+ - HAP/VOC	98.97	0.069	8.33E-03	98.0%	3.80E-05	9.13E-04	3.33E-01	1.67E-04
75-35-4	1,1-Dichloroethene (vinylidene chloride)+ - HAP/VOC	96.94	0.069	8.16E-03	98.0%	3.73E-05	8.94E-04	3.26E-01	1.63E-04
107-06-2	1,2-Dichloroethane (ethylene dichloride)+ - HAP/VOC	98.96	0.493	5.99E-02	98.0%	2.74E-04	6.57E-03	2.40E+00	1.20E-03
78-87-5	1,2-Dichloropropane (propylene dichloride)+ - HAP/VOC	112.99	0.069	9.51E-03	98.0%	4.34E-05	1.04E-03	3.80E-01	1.90E-04
540-59-0	1,2-Dichloroethene+ - VOC	96.94	0.274	3.26E-02	98.0%	1.49E-04	3.58E-03	1.31E+00	6.53E-04
120-82-1	1,2,4-Trichlorobenzene+ - HAP	181.45	0.069	1.53E-02	98.0%	6.97E-05	1.67E-03	6.11E-01	3.05E-04
95.63-6	1,2,4-Trimethylbenzene+	120.19	0.069	1.01E-02	99.7%	6.93E-06	1.66E-04	6.07E-02	3.03E-05
95-50-1	1,2-Dichlorobenzene+	147.01	0.069	1.24E-02	98.0%	5.65E-05	1.36E-03	4.95E-01	2.47E-04
108-67-8	1,3,5-Trimethylbenzene+	120.19	0.069	1.01E-02	99.7%	6.93E-06	1.66E-04	6.07E-02	3.03E-05
106-99-0	1,3-Butadiene+ - HAP	54.09	0.069	4.55E-03	99.7%	3.12E-06	7.48E-05	2.73E-02	1.37E-05
541-73-1	1,3-Dichlorobenzene+	147.00	0.069	1.24E-02	98.0%	5.65E-05	1.36E-03	4.95E-01	2.47E-04
123-91-1	1,4-Dioxane+ - HAP	88.11	0.069	7.41E-03	99.7%	5.08E-06	1.22E-04	4.45E-02	2.22E-05
14720-74-2	2,2,4-Trimethylpentane+ - HAP	142.28	0.562	9.82E-02	99.7%	6.73E-05	1.61E-03	5.89E-01	2.95E-04
95-49-8	2-Chlorotoluene+	126.58	0.069	1.07E-02	98.0%	4.86E-05	1.17E-03	4.26E-01	2.13E-04
591-78-6	2-Hexanone+	100.16	0.246	3.03E-02	99.7%	2.07E-05	4.98E-04	1.82E-01	9.08E-05
554-14-3	2-Methylthiophene*	98.16	0.446	5.38E-02	99.7%	3.68E-05	8.84E-04	3.23E-01	1.61E-04
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	89.300	6.59E+00	99.7%	4.52E-03	1.08E-01	3.96E+01	1.98E-02
616-44-4	3-Methylthiopene*	98.16	0.076	9.16E-03	99.7%	6.28E-06	1.51E-04	5.50E-02	2.75E-05
622-96-8	4-Ethyltoluene+	120.20	0.584	8.62E-02	99.7%	5.91E-05	1.42E-03	5.17E-01	2.59E-04
75-07-0	Acetaldehyde+ - HAP	44.05	2.850	1.54E-01	99.7%	1.06E-04	2.54E-03	9.25E-01	4.63E-04
67-64-1	Acetone+	58.08	39.200	2.80E+00	99.7%	1.92E-03	4.60E-02	1.68E+01	8.39E-03
107-02-8	Acrolein+ - HAP	56.06	0.137	9.44E-03	99.7%	6.46E-06	1.55E-04	5.66E-02	2.83E-05
107-13-1	Acrylonitrile+ - HAP/VOC	53.06	0.137	8.93E-03	99.7%	6.12E-06	1.47E-04	5.36E-02	2.68E-05
107-05-1	Allyl Chloride+ - HAP	76.53	0.069	6.44E-03	98.0%	2.94E-05	7.06E-04	2.58E-01	1.29E-04
100-44-7	Benzylchloride+ - HAP	126.58	0.069	1.07E-02	98.0%	4.86E-05	1.17E-03	4.26E-01	2.13E-04
75-25-2	Bromodichloromethane+ - VOC	163.83	0.069	1.38E-02	98.0%	6.30E-05	1.51E-03	5.51E-01	2.76E-04
71-43-2	Benzene+ - HAP/VOC	78.11	1.550	1.49E-01	99.7%	1.02E-04	2.45E-03	8.92E-01	4.46E-04
75-25-2	Bromoform+ - HAP	252.73	0.069	2.13E-02	99.7%	1.46E-05	3.50E-04	1.28E-01	6.38E-05
74-83-9	Bromomethane+ - HAP	94.94	0.069	7.99E-03	99.7%	5.47E-06	1.31E-04	4.79E-02	2.40E-05
1003-09-4	Bromothiophene*	163.04	0.025	5.01E-03	99.7%	3.43E-06	8.23E-05	3.00E-02	1.50E-05
10061-01-5	cis-1,3-Dichloropropene+ - HAP	110.97	0.069	9.34E-03	98.0%	4.26E-05	1.02E-03	3.74E-01	1.87E-04
110-82-7	Cyclohexane+	84.16	0.844	8.73E-02	99.7%	5.98E-05	1.43E-03	5.24E-01	2.62E-04
75-15-0	Carbon disulfide*+ - HAP/VOC	76.13	0.115	1.08E-02	99.7%	7.37E-06	1.77E-04	6.45E-02	3.23E-05
56-23-5	Carbon tetrachloride+ - HAP/VOC	153.84	0.069	1.29E-02	98.0%	5.91E-05	1.42E-03	5.18E-01	2.59E-04
46-358-1	Carbonyl sulfide+ - HAP/VOC	60.07	0.069	5.06E-03	99.7%	3.46E-06	8.31E-05	3.03E-02	1.52E-05
108-90-7	Chlorobenzene+ - HAP/VOC	112.56	0.069	9.47E-03	98.0%	4.33E-05	1.04E-03	3.79E-01	1.89E-04
75-45-6	Chlorodifluoromethane+	86.47	0.534	5.67E-02	98.0%	2.59E-04	6.22E-03	2.27E+00	1.13E-03
75-00-3	Chloroethane (ethyl chloride)+ - HAP/VOC	64.52	0.069	5.43E-03	98.0%	2.48E-05	5.95E-04	2.17E-01	1.09E-04
67-66-3	Chloroform+ - HAP/VOC	119.39	0.069	1.00E-02	98.0%	4.59E-05	1.10E-03	4.02E-01	2.01E-04
74-87-3	Chloromethane (methyl chloride)+ - VOC	50.49	0.137	8.50E-03	98.0%	3.88E-05	9.31E-04	3.40E-01	1.70E-04
124-48-1	Dibromochloromethane+	208.28	0.069	1.75E-02	98.0%	8.00E-05	1.92E-03	7.01E-01	3.51E-04
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)+ - HAP/VOC	147.00	0.429	7.75E-02	98.0%	3.54E-04	8.49E-03	3.10E+00	1.55E-03
75-43-4	Dichlorodifluoromethane+	120.91	0.597	8.87E-02	98.0%	4.05E-04	9.72E-03	3.55E+00	1.77E-03
75-71-8	Dichlorofluoromethane+	102.92	0.311	3.93E-02	98.0%	1.80E-04	4.31E-03	1.57E+00	7.86E-04
75-09-2	Dichloromethane (methylene chloride)+ - HAP	84.94	0.864	9.02E-02	98.0%	4.12E-04	9.88E-03	3.61E+00	1.80E-03
76-14-2	Dichlorotetrafluoroethane (Freon 114)+	170.92	0.069	1.44E-02	98.0%	6.57E-05	1.58E-03	5.75E-01	2.88E-04
110-81-6	Diethyl Disulfide*	122.25	0.025	3.75E-03	99.7%	2.57E-06	6.17E-05	2.25E-02	1.13E-05
352-93-2	Diethyl Sulfide*	90.18	0.025	2.77E-03	99.7%	1.90E-06	4.55E-05	1.66E-02	8.31E-06
624-92-0	Dimethyl Disulfide*	94.19	0.025	2.89E-03	99.7%	1.98E-06	4.76E-05	1.74E-02	8.68E-06
75-18-3	Dimethyl sulfide (methyl sulfide)* - VOC	62.13	18.700	1.43E+00	99.7%	9.78E-04	2.35E-02	8.56E+00	4.28E-03
64-17-5	Ethanol+ - VOC	46.08	462.000	2.62E+01	99.7%	1.79E-02	4.30E-01	1.57E+02	7.85E-02
141-78-6	Ethyl Acetate+	88.11	27.900	3.02E+00	99.7%	2.07E-03	4.96E-02	1.81E+01	9.06E-03
75-08-1	Ethyl mercaptan* - VOC	62.13	0.125	9.54E-03	99.7%	6.53E-06	1.57E-04	5.72E-02	2.86E-05
100-41-4	Ethylbenzene+ - HAP/VOC	106.16	6.320	8.24E-01	99.7%	5.65E-04	1.35E-02	4.95E+00	2.47E-03
106-93-4	Ethylene dibromide (1,2-Dibromoethane)+ - HAP/VOC	187.88	0.069	1.58E-02	99.7%	1.08E-05	2.60E-04	9.49E-02	4.74E-05
75-69-4	Fluorotrichloromethane+ - VOC	137.40	0.069	1.16E-02	98.0%	5.28E-05	1.27E-03	4.63E-01	2.31E-04
142-82-5	Heptane+	100.21	3.000	3.69E-01	99.7%	2.53E-04	6.07E-03	2.22E+00	1.11E-03
87-68-3	Hexachlorobutadiene+ - HAP	260.76	0.069	2.19E-02	98.0%	1.00E-04	2.40E-03	8.78E-01	4.39E-04
110-54-3	Hexane+ - HAP/VOC	86.18	1.020	1.08E-01	99.7%	7.40E-05	1.78E-03	6.48E-01	3.24E-04
2148-87-8	Hydrogen Sulfide	34.08	150.000	6.28E+00	99.7%	4.30E-03	1.03E-01	3.77E+01	1.88E-02
7647-01-0	Hydrochloric acid (f)	36.50	42.000	1.88E+00	--	4.34E-01	1.04E+01	3.80E+03	1.90E+00
513-44-0	Isobutyl Mercaptan*	90.18	0.099	1.10E-02	99.7%	7.51E-06	1.80E-04	6.58E-02	3.29E-05
75-33-2	Isopropyl Mercaptan*	76.16	0.777	7.27E-02	99.7%	4.98E-05	1.20E-03	4.36E-01	2.18E-04
98-82-8	Isopropyl benzene (Cumene)+ - HAP	120.19	0.563	8.31E-02	99.7%	5.69E-05	1.37E-03	4.99E-01	2.49E-04
7439-97-6	Mercury (total)(e) - HAP	200.61	0.00029	7.20E-05	--	1.64E-05	3.94E-04	1.44E-01	7.20E-05
67-56-1	Methanol+ - HAP	32.04	180.00	7.09E+00	99.7%	4.85E-03	1.16E-01	4.25E+01	2.13E-02
78-93-3	Methyl ethyl ketone+ - VOC	72.11	35.100	3.11E+00	99.7%	2.13E-03	5.11E-02	1.87E+01	9.33E-03
108-10-1	Methyl isobutyl ketone+ - HAP/VOC	100.16	2.850	3.51E-01	99.7%	2.40E-04	5.76E-03	2.10E+00	1.05E-03
74-93-1	Methyl mercaptan* - VOC	48.11	7.640	4.52E-01	99.7%	3.09E-04	7.42E-03	2.71E+00	1.35E-03
80-62-6	Methyl Methacrylate+ - HAP	100.12	0.069	8.43E-03	99.7%	5.77E-06	1.39E-04	5.06E-02	2.53E-05
1634-04-4	Methyl Tert Butyl Ether (MTBE)+ - HAP	88.15	0.069	7.42E-03	99.7%	5.08E-06	1.22E-04	4.45E-02	2.23E-05
624-89-5	Methyl ethyl sulfide*	76.16	0.025	2.34E-03	99.7%	1.60E-06	3.85E-05	1.40E-02	7.02E-06
91-20-3	Naphthalene+ - HAP	128.17	0.069	1.08E-02	99.7%	7.39E-06	1.77E-04	6.47E-02	3.24E-05
109-79-5	n-Butyl Mercaptan*	90.20	0.051	5.65E-03	99.7%	3.87E-06	9.29E-05	3.39E-02	1.70E-05
107-03-9	n-Propyl Mercaptan*	76.16	0.025	2.34E-03	99.7%	1.60E-06	3.85E-05	1.40E-02	7.02E-06
127-18-4	Perchloroethylene (tetrachloroethylene)+ - HAP	165.83	0.504	1.03E-01	98.0%	4.69E-04	1.13E-02	4.11E+00	2.05E-03
115-07-1	Propene+	42.08	15.700	8.12E-01	99.7%	5.56E-04	1.33E-02	4.87E+00	2.43E-03
513-53-1	sec-Butyl Mercaptan / Thiophene*	90.18	1.000	1.11E-01	99.7%	7.59E-05	1.82E-03	6.65E-01	3.32E-04
100-42-5	Styrene+ - HAP	104.15	0.889	1.14E-01	99.7%	7.79E-05	1.87E-03	6.82E-01	3.41E-04
109-99-9	Tetrahydrofuran*	72.11	12.900	1.14E+00	99.7%	7.83E-04	1.88E-02	6.86E+00	3.43E-03
108-98-5	Thiophenol*	110.19	0.025	3.38E-03	99.7%	2.32E-06	5.56E-05	2.03E-02	1.02E-05
75-65-0	Tert Butanol (TBA)+	74.12	1.070	9.74E-02	99.7%	6.67E-05	1.60E-03	5.85E-01	2.92E-04
75-66-1	tert-Butyl Mercaptan*	90.18	0.138	1.53E-02	99.7%	1.05E-05	2.51E-04	9.17E-02	4.59E-05

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [d]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
79-01-6	Trichloroethylene (trichloroethene)+ - HAP/VOC	131.40	0.221	3.57E-02	98.0%	1.63E-04	3.91E-03	1.43E+00	7.14E-04
76-13-1	Trichlorotrifluoroethane (Freon 113)+	187.38	0.069	1.58E-02	98.0%	7.20E-05	1.73E-03	6.31E-01	3.15E-04
108-05-4	Vinyl Acetate+ - HAP	86.09	0.137	1.45E-02	99.7%	9.92E-06	2.38E-04	8.69E-02	4.35E-05
593-60-2	Vinyl Bromide+ - HAP	106.95	0.069	9.00E-03	99.7%	6.16E-06	1.48E-04	5.40E-02	2.70E-05
75-01-4	Vinyl chloride+ - HAP/VOC	62.50	0.069	5.26E-03	98.0%	2.40E-05	5.76E-04	2.10E-01	1.05E-04
108-88-3	Toluene+ - HAP/VOC	92.13	27.000	3.06E+00	99.7%	2.09E-03	5.02E-02	1.83E+01	9.17E-03
1330-20-7	Xylenes+ - HAP/VOC	106.16	16.170	2.11E+00	99.7%	1.44E-03	3.47E-02	1.27E+01	6.33E-03
Totals				**69.82**		**0.49**	**11.69**	**4,265.19**	**2.13**
Totals: HAPs only				**14.80**		**0.02**	**0.37**	**133.54**	**0.07**

CAS Number	Compounds	Emission Factor (lb/mmscf)(g)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
7440-38-2	Arsenic (g)	0.0118	1.27E-03	3.06E-02	11.16	5.58E-03
	PAHs (without Naphthalene)(g)	4.09E-05	4.42E-06	1.06E-04	0.04	1.93E-05
91-20-3	Naphthalene(h)	1.01E-05	1.09E-09	2.62E-08	0.01	4.78E-06
50-00-0	Formaldehyde(h)	0.016	1.73E-03	4.15E-02	15.14	7.57E-03
Totals: HAPs			**3.01E-03**	**7.22E-02**	**26.35**	**1.32E-02**

Criteria Air Pollutants	Molecular weight	Outlet Concentration of Compound (ppmv)	Emission Factor ($lb/MMft^3$)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Pollutant Flow Rate from Flare (tons/yr) (j)
Total Non-Methane Organics (NMOCs) as Hexane @3% O_2	86.18	20.00	--	2.11	50.60	18,467.48	9.23
VOCs (i)	86.18	20.00	--	2.11	50.60	18,467.48	9.23

Criteria Air Pollutants	Molecular Weight (g/Mol)	Rep. Concentration of Compound (ppmv)	Emission Factor ($lb/MMft^3$)	Emission Factor (lb/MMBtu)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (tons/yr)
Nitrogen Oxides (NO_X)	--	--	--	0.06	3.24	77.76	14.19
Carbon Monoxide (CO)	--	--	--	0.20	10.80	259.20	47.30
Sulfur Dioxide (SO_2)	64.10	150.00	--	--	2.70	64.72	11.81
Particulate Matter (PM_{10})/PM/$PM_{2.5}$	--	--	17.00	--	0.92	22.03	4.02

Notes:

(a) List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Default Concentrations for Landfill Gas Constituents, 11/98" and SDAPCD laboratory analyses).

(b) Average concentration of HAPs found in LFG were taken from 11/12/19 Sample (Sycamore LFGTE Facility) (denoted as "*") and from 10/7/15 sample (most recent TO-15 analysis) and averaged (consistent with SDAPCD from previous small expansion) (denoted as "+"). If ND, 1/2 the detection limit was used.

(c) Pollutant emission rate based on estimated maximum rate that control device is equipped to handle.

(d) Values taken from AP-42 Table 2.4-3 ("Control Efficiencies for LFG Consituents")

(e) Concentration of Mercury based on EPA AP-42 Section 2.4 Table 2.4-1 (8/24).

(f) Concentration of HCl is based on AP-42 default, 2.4.4.2, (8/24).

(g) Emission factor taken from SDAPCD emission inventories for facility.

(h) Site-specific information for conventional flare not available and default emission factors overestimated so emission factors based on SCEC source test for 2,000 scfm std flare at Mid-Valley Sanitary Landfill in SCAQMD on November 8, 2012 for PAHs and June 19, 2013 for formaldehyde.

(i) VOCs assumed to equal NMOCs per SDAPCD.

(j) Based on outlet concentration of 20 ppmv as hexane (BACT/NSPS) and an estimated maximum exhaust rate of 7,849 SCFM @ 3% oxygen.

(k) Max LFG exhaust rate from flare is an estimate that is scaled from specifications for West Miramar's 2,800 scfm flare. Assumed 3% exhaust oxygen.

Variables:

MODEL INPUT VARIABLES:		
Methane Content	50%	%
Max LFG Collection Rate to Flare (c)	1,800	SCFM
Max LFG Exhaust Rate from Flare (k)	7,849	SCFM
Flare Rating	54	MMBtu/hr

Criteria pollutant emission factors used for flare:

Pollutant	Emission Factor	Data Source
NMOCs/VOCs	20 ppmv outlet @3% O2 as hexane	BACT
CO	0.2 lb/MMBtu	BACT
SO_2	150 ppmv	Maximum Expected/BACT
NO_x	0.06 lb/MMBtu	BACT
$PM_{10}/PM_{2.5}$	17 lb/MMft3 as methane	BACT/AP-42 Table 2.4-5

CONVERSIONS

ton conversion	2000	lbs
lb conversion	453.6	g
hour conversion	60	min
day conversion	24	hrs
12 months	365	days
mol conversion	24.04	L @ STP
cf conversion	28.32	L
mmbtu conversion	1,000,000	btu

EXAMPLE CALCULATIONS

(HAPS)

Total Pollutant Flow Rate (To Flare)= ((Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(Total LFG to Flare [cfm]) *(60min*24hr*365 days)*(1ton/2000 lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

Pollutant Flow rate to Flare = (Total pollutant flow rate [tons/yr])*(Collection efficiency)

Pollutant Emissions through landfill = (Total pollutant flow rate [tons/yr]) * (1 - collection efficiency)

Emission = Rate * Emission Factor;

(NMOCs/VOCs)

Maximum Flare flow rate = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG Flow from flare [cfm]) *(60min*24hr*365days)*(1ton/2000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

TABLE C-3
POTENTIAL TO EMIT ESTIMATES FOR EXISTING ENCLOSED PERENNIAL LANDFILL FLARE (NO. 2)
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [d]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
Hazardous Air Pollutants (HAPs)[a]									
71-55-6	1,1,1-Trichloroethane (methyl chloroform)+ - HAP	133.41	0.069	1.12E-02	98.0%	5.13E-05	1.23E-03	4.49E-01	2.25E-04
79-00-5	1,1,2-Trichloroethane+ - HAP	133.4	0.069	1.12E-02	98.0%	5.13E-05	1.23E-03	4.49E-01	2.25E-04
79-34-5	1,1,2,2-Tetrachloroethane+ - HAP/VOC	167.85	0.069	1.41E-02	98.0%	6.45E-05	1.55E-03	5.65E-01	2.83E-04
75-34-3	1,1-Dichloroethane (ethylidene dichloride)+ - HAP/VOC	98.97	0.069	8.33E-03	98.0%	3.80E-05	9.13E-04	3.33E-01	1.67E-04
75-35-4	1,1-Dichloroethene (vinylidene chloride)+ - HAP/VOC	96.94	0.069	8.16E-03	98.0%	3.73E-05	8.94E-04	3.26E-01	1.63E-04
107-06-2	1,2-Dichloroethane (ethylene dichloride)+ - HAP/VOC	98.96	0.493	5.99E-02	98.0%	2.74E-04	6.57E-03	2.40E+00	1.20E-03
78-87-5	1,2-Dichloropropane (propylene dichloride)+ - HAP/VOC	112.99	0.069	9.51E-03	98.0%	4.34E-05	1.04E-03	3.80E-01	1.90E-04
540-59-0	1,2-Dichloroethene+ - VOC	96.94	0.274	3.26E-02	98.0%	1.49E-04	3.58E-03	1.31E+00	6.53E-04
120-82-1	1,2,4-Trichlorobenzene+ - HAP	181.45	0.069	1.53E-02	98.0%	6.97E-05	1.67E-03	6.11E-01	3.05E-04
95.63-6	1,2,4-Trimethylbenzene+	120.19	0.069	1.01E-02	99.7%	6.93E-06	1.66E-04	6.07E-02	3.03E-05
95-50-1	1,2-Dichlorobenzene+	147.01	0.069	1.24E-02	98.0%	5.65E-05	1.36E-03	4.95E-01	2.47E-04
108-67-8	1,3,5-Trimethylbenzene+	120.19	0.069	1.01E-02	99.7%	6.93E-06	1.66E-04	6.07E-02	3.03E-05
106-99-0	1,3-Butadiene+ - HAP	54.09	0.069	4.55E-03	99.7%	3.12E-06	7.48E-05	2.73E-02	1.37E-05
541-73-1	1,3-Dichlorobenzene+	147.00	0.069	1.24E-02	98.0%	5.65E-05	1.36E-03	4.95E-01	2.47E-04
123-91-1	1,4-Dioxane+ - HAP	88.11	0.069	7.41E-03	99.7%	5.08E-06	1.22E-04	4.45E-02	2.22E-05
14720-74-2	2,2,4-Trimethylpentane+ - HAP	142.28	0.562	9.82E-02	99.7%	6.73E-05	1.61E-03	5.89E-01	2.95E-04
95-49-8	2-Chlorotoluene+	126.58	0.069	1.07E-02	98.0%	4.86E-05	1.17E-03	4.26E-01	2.13E-04
591-78-6	2-Hexanone+	100.16	0.246	3.03E-02	99.7%	2.07E-05	4.98E-04	1.82E-01	9.08E-05
554-14-3	2-Methylthiophene*	98.16	0.446	5.38E-02	99.7%	3.68E-05	8.84E-04	3.23E-01	1.61E-04
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	89.300	6.59E+00	99.7%	4.52E-03	1.08E-01	3.96E+01	1.98E-02
616-44-4	3-Methylthiopene*	98.16	0.076	9.16E-03	99.7%	6.28E-06	1.51E-04	5.50E-02	2.75E-05
622-96-8	4-Ethyltoluene+	120.20	0.584	8.62E-02	99.7%	5.91E-05	1.42E-03	5.17E-01	2.59E-04
75-07-0	Acetaldehyde+ - HAP	44.05	2.850	1.54E-01	99.7%	1.06E-04	2.54E-03	9.25E-01	4.63E-04
67-64-1	Acetone+	58.08	39.200	2.80E+00	99.7%	1.92E-03	4.60E-02	1.68E+01	8.39E-03
107-02-8	Acrolein+ - HAP	56.06	0.137	9.44E-03	99.7%	6.46E-06	1.55E-04	5.66E-02	2.83E-05
107-13-1	Acrylonitrile+ - HAP/VOC	53.06	0.137	8.93E-03	99.7%	6.12E-06	1.47E-04	5.36E-02	2.68E-05
107-05-1	Allyl Chloride+ - HAP	76.53	0.069	6.44E-03	98.0%	2.94E-05	7.06E-04	2.58E-01	1.29E-04
100-44-7	Benzylchloride+ - HAP	126.58	0.069	1.07E-02	98.0%	4.86E-05	1.17E-03	4.26E-01	2.13E-04
75-25-2	Bromodichloromethane+ - VOC	163.83	0.069	1.38E-02	98.0%	6.30E-05	1.51E-03	5.51E-01	2.76E-04
71-43-2	Benzene+ - HAP/VOC	78.11	1.550	1.49E-01	99.7%	1.02E-04	2.45E-03	8.92E-01	4.46E-04
75-25-2	Bromoform+ - HAP	252.73	0.069	2.13E-02	99.7%	1.46E-05	3.50E-04	1.28E-01	6.38E-05
74-83-9	Bromomethane+ - HAP	94.94	0.069	7.99E-03	99.7%	5.47E-06	1.31E-04	4.79E-02	2.40E-05
1003-09-4	Bromothiophene*	163.04	0.025	5.01E-03	99.7%	3.43E-06	8.23E-05	3.00E-02	1.50E-05
10061-01-5	cis-1,3-Dichloropropene+ - HAP	110.97	0.069	9.34E-03	98.0%	4.26E-05	1.02E-03	3.74E-01	1.87E-04
110-82-7	Cyclohexane+	84.16	0.844	8.73E-02	99.7%	5.98E-05	1.43E-03	5.24E-01	2.62E-04
75-15-0	Carbon disulfide*+ - HAP/VOC	76.13	0.115	1.08E-02	99.7%	7.37E-06	1.77E-04	6.45E-02	3.23E-05
56-23-5	Carbon tetrachloride+ - HAP/VOC	153.84	0.069	1.29E-02	98.0%	5.91E-05	1.42E-03	5.18E-01	2.59E-04
46-358-1	Carbonyl sulfide+ - HAP/VOC	60.07	0.069	5.06E-03	99.7%	3.46E-06	8.31E-05	3.03E-02	1.52E-05
108-90-7	Chlorobenzene+ - HAP/VOC	112.56	0.069	9.47E-03	98.0%	4.33E-05	1.04E-03	3.79E-01	1.89E-04
75-45-6	Chlorodifluoromethane+	86.47	0.534	5.67E-02	98.0%	2.59E-04	6.22E-03	2.27E+00	1.13E-03
75-00-3	Chloroethane (ethyl chloride)+ - HAP/VOC	64.52	0.069	5.43E-03	98.0%	2.48E-05	5.95E-04	2.17E-01	1.09E-04
67-66-3	Chloroform+ - HAP/VOC	119.39	0.069	1.00E-02	98.0%	4.59E-05	1.10E-03	4.02E-01	2.01E-04
74-87-3	Chloromethane (methyl chloride)+ - VOC	50.49	0.137	8.50E-03	98.0%	3.88E-05	9.31E-04	3.40E-01	1.70E-04
124-48-1	Dibromochloromethane+	208.28	0.069	1.75E-02	98.0%	8.00E-05	1.92E-03	7.01E-01	3.51E-04
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)+ - HAP/VOC	147.00	0.429	7.75E-02	98.0%	3.54E-04	8.49E-03	3.10E+00	1.55E-03
75-43-4	Dichlorodifluoromethane+	120.91	0.597	8.87E-02	98.0%	4.05E-04	9.72E-03	3.55E+00	1.77E-03
75-71-8	Dichlorofluoromethane+	102.92	0.311	3.93E-02	98.0%	1.80E-04	4.31E-03	1.57E+00	7.86E-04
75-09-2	Dichloromethane (methylene chloride)+ - HAP	84.94	0.864	9.02E-02	98.0%	4.12E-04	9.88E-03	3.61E+00	1.80E-03
76-14-2	Dichlorotetrafluoroethane (Freon 114)+	170.92	0.069	1.44E-02	98.0%	6.57E-05	1.58E-03	5.75E-01	2.88E-04
110-81-6	Diethyl Disulfide*	122.25	0.025	3.75E-03	99.7%	2.57E-06	6.17E-05	2.25E-02	1.13E-05
352-93-2	Diethyl Sulfide*	90.18	0.025	2.77E-03	99.7%	1.90E-06	4.55E-05	1.66E-02	8.31E-06
624-92-0	Dimethyl Disulfide*	94.19	0.025	2.89E-03	99.7%	1.98E-06	4.76E-05	1.74E-02	8.68E-06
75-18-3	Dimethyl sulfide (methyl sulfide)* - VOC	62.13	18.700	1.43E+00	99.7%	9.78E-04	2.35E-02	8.56E+00	4.28E-03
64-17-5	Ethanol+ - VOC	46.08	462.000	2.62E+01	99.7%	1.79E-02	4.30E-01	1.57E+02	7.85E-02
141-78-6	Ethyl Acetate+	88.11	27.900	3.02E+00	99.7%	2.07E-03	4.96E-02	1.81E+01	9.06E-03
75-08-1	Ethyl mercaptan* - VOC	62.13	0.125	9.54E-03	99.7%	6.53E-06	1.57E-04	5.72E-02	2.86E-05
100-41-4	Ethylbenzene+ - HAP/VOC	106.16	6.320	8.24E-01	99.7%	5.65E-04	1.35E-02	4.95E+00	2.47E-03
106-93-4	Ethylene dibromide (1,2-Dibromoethane)+ - HAP/VOC	187.88	0.069	1.58E-02	99.7%	1.08E-05	2.60E-04	9.49E-02	4.74E-05
75-69-4	Fluorotrichloromethane+ - VOC	137.40	0.069	1.16E-02	98.0%	5.28E-05	1.27E-03	4.63E-01	2.31E-04
142-82-5	Heptane+	100.21	3.000	3.69E-01	99.7%	2.53E-04	6.07E-03	2.22E+00	1.11E-03
87-68-3	Hexachlorobutadiene+ - HAP	260.76	0.069	2.19E-02	98.0%	1.00E-04	2.40E-03	8.78E-01	4.39E-04
110-54-3	Hexane+ - HAP/VOC	86.18	1.020	1.08E-01	99.7%	7.40E-05	1.78E-03	6.48E-01	3.24E-04
2148-87-8	Hydrogen Sulfide	34.08	150.000	6.28E+00	99.7%	4.30E-03	1.03E-01	3.77E+01	1.88E-02
7647-01-0	Hydrochloric acid (f)	36.50	42.000	1.88E+00	--	4.34E-01	1.04E+01	3.80E+03	1.90E+00
513-44-0	Isobutyl Mercaptan*	90.18	0.099	1.10E-02	99.7%	7.51E-06	1.80E-04	6.58E-02	3.29E-05
75-33-2	Isopropyl Mercaptan*	76.16	0.777	7.27E-02	99.7%	4.98E-05	1.20E-03	4.36E-01	2.18E-04
98-82-8	Isopropyl benzene (Cumene)+ - HAP	120.19	0.563	8.31E-02	99.7%	5.69E-05	1.37E-03	4.99E-01	2.49E-04
7439-97-6	Mercury (total)(e) - HAP	200.61	0.00029	7.20E-05	--	1.64E-05	3.94E-04	1.44E-01	7.20E-05
67-56-1	Methanol+ - HAP	32.04	180.00	7.09E+00	99.7%	4.85E-03	1.16E-01	4.25E+01	2.13E-02
78-93-3	Methyl ethyl ketone+ - VOC	72.11	35.100	3.11E+00	99.7%	2.13E-03	5.11E-02	1.87E+01	9.33E-03
108-10-1	Methyl isobutyl ketone+ - HAP/VOC	100.16	2.850	3.51E-01	99.7%	2.40E-04	5.76E-03	2.10E+00	1.05E-03
74-93-1	Methyl mercaptan* - VOC	48.11	7.640	4.52E-01	99.7%	3.09E-04	7.42E-03	2.71E+00	1.35E-03
80-62-6	Methyl Methacrylate+ - HAP	100.12	0.069	8.43E-03	99.7%	5.77E-06	1.39E-04	5.06E-02	2.53E-05
1634-04-4	Methyl Tert Butyl Ether (MTBE)+ - HAP	88.15	0.069	7.42E-03	99.7%	5.08E-06	1.22E-04	4.45E-02	2.23E-05
624-89-5	Methyl ethyl sulfide*	76.16	0.025	2.34E-03	99.7%	1.60E-06	3.85E-05	1.40E-02	7.02E-06
91-20-3	Naphthalene+ - HAP	128.17	0.069	1.08E-02	99.7%	7.39E-06	1.77E-04	6.47E-02	3.24E-05
109-79-5	n-Butyl Mercaptan*	90.20	0.051	5.65E-03	99.7%	3.87E-06	9.29E-05	3.39E-02	1.70E-05
107-03-9	n-Propyl Mercaptan*	76.16	0.025	2.34E-03	99.7%	1.60E-06	3.85E-05	1.40E-02	7.02E-06
127-18-4	Perchloroethylene (tetrachloroethylene)+ - HAP	165.83	0.504	1.03E-01	98.0%	4.69E-04	1.13E-02	4.11E+00	2.05E-03
115-07-1	Propene+	42.08	15.700	8.12E-01	99.7%	5.56E-04	1.33E-02	4.87E+00	2.43E-03
513-53-1	sec-Butyl Mercaptan / Thiophene*	90.18	1.000	1.11E-01	99.7%	7.59E-05	1.82E-03	6.65E-01	3.32E-04
100-42-5	Styrene+ - HAP	104.15	0.889	1.14E-01	99.7%	7.79E-05	1.87E-03	6.82E-01	3.41E-04
109-99-9	Tetrahydrofuran*	72.11	12.900	1.14E+00	99.7%	7.83E-04	1.88E-02	6.86E+00	3.43E-03
108-98-5	Thiophenol*	110.19	0.025	3.38E-03	99.7%	2.32E-06	5.56E-05	2.03E-02	1.02E-05
75-65-0	Tert Butanol (TBA)+	74.12	1.070	9.74E-02	99.7%	6.67E-05	1.60E-03	5.85E-01	2.92E-04
75-66-1	tert-Butyl Mercaptan*	90.18	0.138	1.53E-02	99.7%	1.05E-05	2.51E-04	9.17E-02	4.59E-05
79-01-6	Trichloroethylene (trichloroethene)+ - HAP/VOC	131.40	0.221	3.57E-02	98.0%	1.63E-04	3.91E-03	1.43E+00	7.14E-04
76-13-1	Trichlorotrifluoroethane (Freon 113)+	187.38	0.069	1.58E-02	98.0%	7.20E-05	1.73E-03	6.31E-01	3.15E-04
108-05-4	Vinyl Acetate+ - HAP	86.09	0.137	1.45E-02	99.7%	9.92E-06	2.38E-04	8.69E-02	4.35E-05

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[(b)]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [(d)]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
593-60-2	Vinyl Bromide+ - HAP	106.95	0.069	9.00E-03	99.7%	6.16E-06	1.48E-04	5.40E-02	2.70E-05
75-01-4	Vinyl chloride+ - HAP/VOC	62.50	0.069	5.26E-03	98.0%	2.40E-05	5.76E-04	2.10E-01	1.05E-04
108-88-3	Toluene+ - HAP/VOC	92.13	27.000	3.06E+00	99.7%	2.09E-03	5.02E-02	1.83E+01	9.17E-03
1330-20-7	Xylenes+ - HAP/VOC	106.16	16.170	2.11E+00	99.7%	1.44E-03	3.47E-02	1.27E+01	6.33E-03
Totals				**69.82**		**0.49**	**11.69**	**4,265.19**	**2.13**
Totals: HAPs only				**14.80**		**0.02**	**0.37**	**133.54**	**0.07**

CAS Number	Compounds	Emission Factor (lb/mmscf)(g)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
7440-38-2	Arsenic (g)	0.0118	1.27E-03	3.06E-02	11.16	5.58E-03
	PAHs (without Naphthalene)(g)	4.09E-05	4.42E-06	1.06E-04	0.04	1.93E-05
91-20-3	Naphthalene(h)	1.01E-05	1.09E-09	2.62E-08	0.01	4.78E-06
50-00-0	Formaldehyde(h)	0.016	1.73E-03	4.15E-02	15.14	7.57E-03
Totals: HAPs			**3.01E-03**	**7.22E-02**	**26.35**	**1.32E-02**

Criteria Air Pollutants	Molecular weight	Outlet Concentration of Compound (ppmv)	Emission Factor (lb/MMft^3)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Pollutant Flow Rate from Flare (tons/yr) (j)
Total Non-Methane Organics (NMOCs) as Hexane @3% O_2	86.18	20.00	--	2.11	50.60	18,467.48	9.23
VOCs (i)	86.18	20.00	--	2.11	50.60	18,467.48	9.23

Criteria Air Pollutants	Molecular Weight (g/Mol)	Rep. Concentration of Compound (ppmv)	Emission Factor (lb/MMft^3)	Emission Factor (lb/MMBtu)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (tons/yr)
Nitrogen Oxides (NO_X)	--	--	--	0.06	3.24	77.76	14.19
Carbon Monoxide (CO)	--	--	--	0.20	10.80	259.20	47.30
Sulfur Dioxide (SO_2)	64.10	150.00	--	--	2.70	64.72	11.81
Particulate Matter (PM_{10})/PM/$PM_{2.5}$	--	--	17.00	--	0.92	22.03	4.02

Notes:

(a) List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Default Concentrations for Landfill Gas Constituents, 11/98" and SDAPCD laboratory analyses).

(b) Average concentration of HAPs found in LFG were taken from 11/12/19 Sample (Sycamore LFGTE Facility) (denoted as "*") and from 10/7/15 sample (most recent TO-15 analysis) and averaged (consistent with SDAPCD from previous small expansion) (denoted as "+"). If ND, 1/2 the detection limit was used.

(c) Pollutant emission rate based on estimated maximum rate that control device is equipped to handle.

(d) Values taken from AP-42 Table 2.4-3 ("Control Efficiencies for LFG Consituents")

(e) Concentration of Mercury based on EPA AP-42 Section 2.4 Table 2.4-1 (8/24).

(f) Concentration of HCl is based on AP-42 default, 2.4.4.2, (8/24).

(g) Emission factor taken from SDAPCD emission inventories for facility.

(h) Site-specific information for conventional flare not available and default emission factors overestimated so emission factors based on SCEC source test for 2,000 scfm std flare at Mid-Valley Sanitary Landfill in SCAQMD on November 8, 2012 for PAHs and June 19, 2013 for formaldehyde.

(i) VOCs assumed to equal NMOCs per SDAPCD.

(j) Based on outlet concentration of 20 ppmv as hexane (BACT/NSPS) and an estimated maximum exhaust rate of 7,849 SCFM @ 3% oxygen.

(k) Max LFG exhaust rate from flare is an estimate that is scaled from specifications for West Miramar's 2,800 scfm flare. Assumed 3% exhaust oxygen.

Variables:

MODEL INPUT VARIABLES:		
Methane Content	50%	%
Max LFG Collection Rate to Flare (c)	1,800	SCFM
Max LFG Exhaust Rate from Flare (k)	7,849	SCFM
Flare Rating	54	MMBtu/hr

Criteria pollutant emission factors used for flare:

Pollutant	Emission Factor	Data Source
NMOCs/VOCs	20 ppmv outlet @3% O2 as hexane	BACT
CO	0.2 lb/MMBtu	BACT
SO_2	150 ppmv	Maximum Expected/BACT
NO_x	0.06 lb/MMBtu	BACT
PM_{10}/$PM_{2.5}$	17 lb/MMft3 as methane	BACT/AP-42 Table 2.4-5

CONVERSIONS

ton conversion	2000	lbs
lb conversion	453.6	g
hour conversion	60	min
day conversion	24	hrs
12 months	365	days
mol conversion	24.04	L @ STP
cf conversion	28.32	L
mmbtu conversion	1,000,000	btu

EXAMPLE CALCULATIONS

(HAPS)

Total Pollutant Flow Rate (To Flare)= ((Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(Total LFG to Flare [cfm]) *(60min*24hr*365 days)*(1ton/2000 lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

Pollutant Flow rate to Flare = (Total pollutant flow rate [tons/yr])*(Collection efficiency)

Pollutant Emissions through landfill = (Total pollutant flow rate [tons/yr]) * (1 - collection efficiency)

Emission = Rate * Emission Factor;

(NMOCs/VOCs)

Maximum Flare flow rate = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG Flow from flare [cfm]) *(60min*24hr*365days)*(1ton/2000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

TABLE C-4
POTENTIAL TO EMIT ESTIMATES FOR PREVIOUSLY PROPOSED ENCLOSED ULE LANDFILL FLARE
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CAS NUMBER	COMPOUNDS	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [d]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
Hazardous Air Pollutants (HAPs)[a]									
71-55-6	1,1,1-Trichloroethane (methyl chloroform)+ - HAP	133.41	0.069	3.12E-02	98.0%	1.42E-04	3.42E-03	1.25E+00	6.24E-04
79-00-5	1,1,2-Trichloroethane+ - HAP	133.4	0.069	3.12E-02	98.0%	1.42E-04	3.42E-03	1.25E+00	6.24E-04
79-34-5	1,1,2,2-Tetrachloroethane+ - HAP/VOC	167.85	0.069	3.92E-02	98.0%	1.79E-04	4.30E-03	1.57E+00	7.85E-04
75-34-3	1,1-Dichloroethane (ethylidene dichloride)+ - HAP/VOC	98.97	0.069	2.31E-02	98.0%	1.06E-04	2.54E-03	9.25E-01	4.63E-04
75-35-4	1,1-Dichloroethene (vinylidene chloride)+ - HAP/VOC	96.94	0.069	2.27E-02	98.0%	1.03E-04	2.48E-03	9.06E-01	4.53E-04
107-06-2	1,2-Dichloroethane (ethylene dichloride)+ - HAP/VOC	98.96	0.493	1.66E-01	98.0%	7.60E-04	1.82E-02	6.66E+00	3.33E-03
78-87-5	1,2-Dichloropropane (propylene dichloride)+ - HAP/VOC	112.99	0.069	2.64E-02	98.0%	1.21E-04	2.89E-03	1.06E+00	5.28E-04
540-59-0	1,2-Dichloroethene+ - VOC	96.94	0.274	9.06E-02	98.0%	4.14E-04	9.93E-03	3.63E+00	1.81E-03
120-82-1	1,2,4-Trichlorobenzene+ - HAP	181.45	0.069	4.24E-02	98.0%	1.94E-04	4.65E-03	1.70E+00	8.48E-04
95.63-6	1,2,4-Trimethylbenzene+	120.19	0.069	2.81E-02	99.7%	1.92E-05	4.62E-04	1.69E-01	8.43E-05
95-50-1	1,2-Dichlorobenzene+	147.01	0.069	3.44E-02	98.0%	1.57E-04	3.77E-03	1.37E+00	6.87E-04
108-67-8	1,3,5-Trimethylbenzene+	120.19	0.069	2.81E-02	99.7%	1.92E-05	4.62E-04	1.69E-01	8.43E-05
106-99-0	1,3-Butadiene+ - HAP	54.09	0.069	1.26E-02	99.7%	8.66E-06	2.08E-04	7.59E-02	3.79E-05
541-73-1	1,3-Dichlorobenzene+	147.00	0.069	3.44E-02	98.0%	1.57E-04	3.77E-03	1.37E+00	6.87E-04
123-91-1	1,4-Dioxane+ - HAP	88.11	0.069	2.06E-02	99.7%	1.41E-05	3.39E-04	1.24E-01	6.18E-05
14720-74-2	2,2,4-Trimethylpentane+ - HAP	142.28	0.562	2.73E-01	99.7%	1.87E-04	4.49E-03	1.64E+00	8.19E-04
95-49-8	2-Chlorotoluene+	126.58	0.069	2.96E-02	98.0%	1.35E-04	3.24E-03	1.18E+00	5.92E-04
591-78-6	2-Hexanone+	100.16	0.246	8.41E-02	99.7%	5.76E-05	1.38E-03	5.05E-01	2.52E-04
554-14-3	2-Methylthiophene*	98.16	0.446	1.49E-01	99.7%	1.02E-04	2.46E-03	8.96E-01	4.48E-04
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	89.300	1.83E+01	99.7%	1.25E-02	3.01E-01	1.10E+02	5.50E-02
616-44-4	3-Methylthiopene*	98.16	0.076	2.55E-02	99.7%	1.74E-05	4.18E-04	1.53E-01	7.64E-05
622-96-8	4-Ethyltoluene+	120.20	0.584	2.40E-01	99.7%	1.64E-04	3.94E-03	1.44E+00	7.19E-04
75-07-0	Acetaldehyde+ - HAP	44.05	2.850	4.28E-01	99.7%	2.93E-04	7.04E-03	2.57E+00	1.29E-03
67-64-1	Acetone+	58.08	39.200	7.77E+00	99.7%	5.32E-03	1.28E-01	4.66E+01	2.33E-02
107-02-8	Acrolein+ - HAP	56.06	0.137	2.62E-02	99.7%	1.80E-05	4.31E-04	1.57E-01	7.86E-05
107-13-1	Acrylonitrile+ - HAP/VOC	53.06	0.137	2.48E-02	99.7%	1.70E-05	4.08E-04	1.49E-01	7.44E-05
107-05-1	Allyl Chloride+ - HAP	76.53	0.069	1.79E-02	98.0%	8.17E-05	1.96E-03	7.16E-01	3.58E-04
100-44-7	Benzylchloride+ - HAP	126.58	0.069	2.96E-02	98.0%	1.35E-04	3.24E-03	1.18E+00	5.92E-04
75-25-2	Bromodichloromethane+ - VOC	163.83	0.069	3.83E-02	98.0%	1.75E-04	4.20E-03	1.53E+00	7.66E-04
71-43-2	Benzene+ - HAP/VOC	78.11	1.550	4.13E-01	99.7%	2.83E-04	6.79E-03	2.48E+00	1.24E-03
75-25-2	Bromoform+ - HAP	252.73	0.069	5.91E-02	99.7%	4.05E-05	9.71E-04	3.54E-01	1.77E-04
74-83-9	Bromomethane+ - HAP	94.94	0.069	2.22E-02	99.7%	1.52E-05	3.65E-04	1.33E-01	6.66E-05
1003-09-4	Bromothiophene*	163.04	0.025	1.39E-02	99.7%	9.53E-06	2.29E-04	8.35E-02	4.17E-05
10061-01-5	cis-1,3-Dichloropropene+ - HAP	110.97	0.069	2.59E-02	98.0%	1.18E-04	2.84E-03	1.04E+00	5.19E-04
110-82-7	Cyclohexane+	84.16	0.844	2.42E-01	99.7%	1.66E-04	3.98E-03	1.45E+00	7.27E-04
75-15-0	Carbon disulfide*+ - HAP/VOC	76.13	0.115	2.99E-02	99.7%	2.05E-05	4.91E-04	1.79E-01	8.96E-05
56-23-5	Carbon tetrachloride+ - HAP/VOC	153.84	0.069	3.60E-02	98.0%	1.64E-04	3.94E-03	1.44E+00	7.19E-04
46-358-1	Carbonyl sulfide+ - HAP/VOC	60.07	0.069	1.40E-02	99.7%	9.62E-06	2.31E-04	8.43E-02	4.21E-05
108-90-7	Chlorobenzene+ - HAP/VOC	112.56	0.069	2.63E-02	98.0%	1.20E-04	2.88E-03	1.05E+00	5.26E-04
75-45-6	Chlorodifluoromethane+	86.47	0.534	1.58E-01	98.0%	7.20E-04	1.73E-02	6.30E+00	3.15E-03
75-00-3	Chloroethane (ethyl chloride)+ - HAP/VOC	64.52	0.069	1.51E-02	98.0%	6.89E-05	1.65E-03	6.03E-01	3.02E-04
67-66-3	Chloroform+ - HAP/VOC	119.39	0.069	2.79E-02	98.0%	1.27E-04	3.06E-03	1.12E+00	5.58E-04
74-87-3	Chloromethane (methyl chloride)+ - VOC	50.49	0.137	2.36E-02	98.0%	1.08E-04	2.59E-03	9.44E-01	4.72E-04
124-48-1	Dibromochloromethane+	208.28	0.069	4.87E-02	98.0%	2.22E-04	5.34E-03	1.95E+00	9.74E-04
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)+ - HAP/VOC	147.00	0.429	2.15E-01	98.0%	9.83E-04	2.36E-02	8.61E+00	4.30E-03
75-43-4	Dichlorodifluoromethane+	120.91	0.597	2.46E-01	98.0%	1.12E-03	2.70E-02	9.85E+00	4.93E-03
75-71-8	Dichlorofluoromethane+	102.92	0.311	1.09E-01	98.0%	4.99E-04	1.20E-02	4.37E+00	2.18E-03
75-09-2	Dichloromethane (methylene chloride)+ - HAP	84.94	0.864	2.50E-01	98.0%	1.14E-03	2.74E-02	1.00E+01	5.01E-03
76-14-2	Dichlorotetrafluoroethane (Freon 114)+	170.92	0.069	4.00E-02	98.0%	1.82E-04	4.38E-03	1.60E+00	7.99E-04
110-81-6	Diethyl Disulfide*	122.25	0.025	1.04E-02	99.7%	7.14E-06	1.71E-04	6.26E-02	3.13E-05
352-93-2	Diethyl Sulfide*	90.18	0.025	7.69E-03	99.7%	5.27E-06	1.26E-04	4.62E-02	2.31E-05
624-92-0	Dimethyl Disulfide*	94.19	0.025	8.04E-03	99.7%	5.50E-06	1.32E-04	4.82E-02	2.41E-05
75-18-3	Dimethyl sulfide (methyl sulfide)* - VOC	62.13	18.700	3.96E+00	99.7%	2.72E-03	6.52E-02	2.38E+01	1.19E-02
64-17-5	Ethanol+ - VOC	46.08	462.000	7.26E+01	99.7%	4.98E-02	1.19E+00	4.36E+02	2.18E-01
141-78-6	Ethyl Acetate+	88.11	27.900	8.39E+00	99.7%	5.75E-03	1.38E-01	5.03E+01	2.52E-02
75-08-1	Ethyl mercaptan* - VOC	62.13	0.125	2.65E-02	99.7%	1.82E-05	4.36E-04	1.59E-01	7.95E-05
100-41-4	Ethylbenzene+ - HAP/VOC	106.16	6.320	2.29E+00	99.7%	1.57E-03	3.76E-02	1.37E+01	6.87E-03
106-93-4	Ethylene dibromide (1,2-Dibromoethane)+ - HAP/VOC	187.88	0.069	4.39E-02	99.7%	3.01E-05	7.22E-04	2.64E-01	1.32E-04
75-69-4	Fluorotrichloromethane+ - VOC	137.40	0.069	3.21E-02	98.0%	1.47E-04	3.52E-03	1.28E+00	6.42E-04
142-82-5	Heptane+	100.21	3.000	1.03E+00	99.7%	7.03E-04	1.69E-02	6.16E+00	3.08E-03
87-68-3	Hexachlorobutadiene+ - HAP	260.76	0.069	6.10E-02	98.0%	2.78E-04	6.68E-03	2.44E+00	1.22E-03
110-54-3	Hexane+ - HAP/VOC	86.18	1.020	3.00E-01	99.7%	2.05E-04	4.93E-03	1.80E+00	9.00E-04
2148-87-8	Hydrogen Sulfide	34.08	150.000	1.74E+01	99.7%	1.19E-02	2.87E-01	1.05E+02	5.23E-02
7647-01-0	Hydrochloric acid (f)	36.50	42.000	5.23E+00	--	1.21E+00	2.89E+01	1.06E+04	5.28E+00
513-44-0	Isobutyl Mercaptan*	90.18	0.099	3.05E-02	99.7%	2.09E-05	5.01E-04	1.83E-01	9.14E-05
75-33-2	Isopropyl Mercaptan*	76.16	0.777	2.02E-01	99.7%	1.38E-04	3.32E-03	1.21E+00	6.06E-04
98-82-8	Isopropyl benzene (Cumene)+ - HAP	120.19	0.563	2.31E-01	99.7%	1.58E-04	3.80E-03	1.39E+00	6.93E-04
7439-97-6	Mercury (total)(e) - HAP	200.61	0.00029	2.00E-04	--	4.56E-05	1.10E-03	4.00E-01	2.00E-04
67-56-1	Methanol+ - HAP	32.04	180.00	1.97E+01	99.7%	1.35E-02	3.24E-01	1.18E+02	5.90E-02
78-93-3	Methyl ethyl ketone+ - VOC	72.11	35.100	8.64E+00	99.7%	5.92E-03	1.42E-01	5.18E+01	2.59E-02
108-10-1	Methyl isobutyl ketone+ - HAP/VOC	100.16	2.850	9.74E-01	99.7%	6.67E-04	1.60E-02	5.84E+00	2.92E-03
74-93-1	Methyl mercaptan* - VOC	48.11	7.640	1.25E+00	99.7%	8.59E-04	2.06E-02	7.53E+00	3.76E-03
80-62-6	Methyl Methacrylate+ - HAP	100.12	0.069	2.34E-02	99.7%	1.60E-05	3.85E-04	1.40E-01	7.02E-05
1634-04-4	Methyl Tert Butyl Ether (MTBE)+ - HAP	88.15	0.069	2.06E-02	99.7%	1.41E-05	3.39E-04	1.24E-01	6.18E-05
624-89-5	Methyl ethyl sulfide*	76.16	0.025	6.50E-03	99.7%	4.45E-06	1.07E-04	3.90E-02	1.95E-05
91-20-3	Naphthalene+ - HAP	128.17	0.069	3.00E-02	99.7%	2.05E-05	4.93E-04	1.80E-01	8.99E-05
109-79-5	n-Butyl Mercaptan*	90.20	0.051	1.57E-02	99.7%	1.08E-05	2.58E-04	9.42E-02	4.71E-05
107-03-9	n-Propyl Mercaptan*	76.16	0.025	6.50E-03	99.7%	4.45E-06	1.07E-04	3.90E-02	1.95E-05
127-18-4	Perchloroethylene (tetrachloroethylene)+ - HAP	165.83	0.504	2.85E-01	98.0%	1.30E-03	3.13E-02	1.14E+01	5.70E-03
115-07-1	Propene+	42.08	15.700	2.25E+00	99.7%	1.54E-03	3.71E-02	1.35E+01	6.76E-03
513-53-1	sec-Butyl Mercaptan / Thiophene*	90.18	1.000	3.08E-01	99.7%	2.11E-04	5.06E-03	1.85E+00	9.23E-04
100-42-5	Styrene+ - HAP	104.15	0.889	3.16E-01	99.7%	2.16E-04	5.19E-03	1.90E+00	9.48E-04
109-99-9	Tetrahydrofuran*	72.11	12.900	3.17E+00	99.7%	2.17E-03	5.22E-02	1.90E+01	9.52E-03
108-98-5	Thiophenol*	110.19	0.025	9.40E-03	99.7%	6.44E-06	1.55E-04	5.64E-02	2.82E-05

CAS NUMBER	COMPOUNDS	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[(b)]	Pollutant Flow Rate to Flare (tons/yr)	Flare Destruction Efficiency (%) [(d)]	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
75-65-0	Tert Butanol (TBA)+	74.12	1.070	2.71E-01	99.7%	1.85E-04	4.45E-03	1.62E+00	8.12E-04
75-66-1	tert-Butyl Mercaptan*	90.18	0.138	4.25E-02	99.7%	2.91E-05	6.98E-04	2.55E-01	1.27E-04
79-01-6	Trichloroethylene (trichloroethene)+ - HAP/VOC	131.40	0.221	9.91E-02	98.0%	4.53E-04	1.09E-02	3.96E+00	1.98E-03
76-13-1	Trichlorotrifluoroethane (Freon 113)+	187.38	0.069	4.38E-02	98.0%	2.00E-04	4.80E-03	1.75E+00	8.76E-04
108-05-4	Vinyl Acetate+ - HAP	86.09	0.137	4.02E-02	99.7%	2.76E-05	6.62E-04	2.41E-01	1.21E-04
593-60-2	Vinyl Bromide+ - HAP	106.95	0.069	2.50E-02	99.7%	1.71E-05	4.11E-04	1.50E-01	7.50E-05
75-01-4	Vinyl chloride+ - HAP/VOC	62.50	0.069	1.46E-02	98.0%	6.67E-05	1.60E-03	5.84E-01	2.92E-04
108-88-3	Toluene+ - HAP/VOC	92.13	27.000	8.49E+00	99.7%	5.81E-03	1.40E-01	5.09E+01	2.55E-02
1330-20-7	Xylenes+ - HAP/VOC	106.16	16.170	5.86E+00	99.7%	4.01E-03	9.63E-02	3.51E+01	1.76E-02
Totals				**193.93**		**1.39**	**33.32**	**12,160.60**	**6.08**
Totals: HAPs only				**41.10**		**0.08**	**1.87**	**682.61**	**0.34**

CAS Number	Compounds	Emission Factor (lb/mmscf)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Maximum Emissions from Flare (tons/yr)
7440-38-2	Arsenic (g)	0.0118	3.54E-03	8.50E-02	31.01	1.55E-02
50-00-0	Formaldehyde (g)	0.135	4.05E-02	9.72E-01	354.78	1.77E-01
	PAHs (without Naphthalene) (h)	0.000071	2.13E-05	5.11E-04	0.19	9.33E-05
91-20-3	Naphthalene (h)	0.000024	7.19E-09	1.73E-07	0.06	3.15E-05
Totals: HAPs			**4.41E-02**	**1.06**	**386.04**	**1.93E-01**

Criteria Air Pollutants	Molecular Weight (g/mol)	Outlet Concentration of Compound (ppmv)	Emission Factor (lb/MMft^3)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (lbs/yr)	Pollutant Flow Rate from Flare (tons/yr) (h)
Total Non-Methane Organics (NMOCs) as Hexane @3% O_2	86.18	20.00	--	7.48	179.57	65,543.18	32.77

Criteria Air Pollutants	Molecular Weight (g/Mol)	Rep. Concentration of Compound (ppmv)	Emission Factor (lb/MMft^3)	Emission Factor (lb/MMBtu)	Maximum Emissions from Flare (lbs/hr)	Maximum Emissions from Flare (lbs/day)	Maximum Emissions from Flare (tons/yr)
Nitrogen Oxides (NO_X)	--	--	--	0.025	3.80	91.08	16.62
Carbon Monoxide (CO)	--	--	--	0.06	9.11	218.59	39.89
Volatile Organic Compounds (VOCs)	--	--	--	0.038	5.77	138.44	25.27
Sulfur Dioxide (SO_2)	64.10	150.00	--	--	7.49	179.79	32.81
Particulate Matter (PM_{10})/PM/$PM_{2.5}$	--	--	6.00	--	0.90	21.60	3.94

Notes:

(a) List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Default Concentrations for Landfill Gas Constituents, 11/98" and SDAPCD laboratory analyses).

(b) Average concentration of HAPs found in LFG were taken from 11/12/19 Sample (Sycamore LFGTE Facility) (denoted as "*") and from 10/7/15 sample (most recent TO-15 analysis) and averaged (consistent with SDAPCD from previous small expansion) (denoted as "+"). If ND, 1/2 the detection limit was used.

(c) Pollutant emission rate based on estimated maximum rate that control device is equipped to handle.

(d) Values taken from AP-42 Table 2.4-3 ("Control Efficiencies for LFG Consituents")

(e) Concentration of Mercury based on EPA AP-42 Section 2.4 Table 2.4-1 (8/24).

(f) Concentration of HCl is based on AP-42 default, 2.4.4.2, (8/24).

(g) Emission factor taken from SDAPCD emission inventories for facility.

(h) Site-specific information for ULE flare not available and default emission factors overestimated so emission factors based on SCEC source test for 4,000 scfm ULE flare at Chiquita Canyon Landfill in SCAQMD on Dec 8-9, 2009 and reported Jan 2010.

(i) Max LFG exhaust rate from flare from John Zink at 1,600 degrees F @ 3% oxygen.

Variables:

MODEL INPUT VARIABLES:		
Methane Content	50%	%
Max LFG Collection Rate to Flare (c)	5,000	SCFM
Max LFG Exhaust Rate from Flare (i)	27,858	SCFM
Flare Rating	151.8	MMBtu/hr

Criteria pollutant emission factors used for flare:

Pollutant	Emission Factor	Data Source
NMOCs	20 ppmv outlet or 98% destruction efficiency	BACT/LAER
VOC	0.038 lb/MMBtu	BACT/LAER
CO	0.06 lb/MMBtu	BACT/LAER
SO_2	150 ppmv	Maximum Expected/BACT
NO_x	0.025 lb/MMBtu	BACT/LAER
PM_{10}/$PM_{2.5}$	6 lb/MMft^3 as methane	BACT/LAER

CONVERSIONS

ton conversion	2000	lbs
lb conversion	453.6	g
hour conversion	60	min
day conversion	24	hrs
12 months	365	days
mol conversion	24.04	L @ STP
cf conversion	28.32	L
mmbtu conversion	1,000,000	btu

EXAMPLE CALCULATIONS

(HAPS)

Total Pollutant Flow Rate (To Flare)= ((Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(Total LFG to Flare [cfm]) *(60min*24hr*365 days)*(1ton/2000 lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

Pollutant Flow rate to Flare = (Total pollutant flow rate [tons/yr])*(Collection efficiency)
Pollutant Emissions through landfill = (Total pollutant flow rate [tons/yr]) * (1 - collection efficiency)

Emission = Rate * Emission Factor;

(NMOCs/VOCs)

Maximum Flare flow rate = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG Flow from flare [cfm]) *(60min*24hr*365days)*(1ton/2000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

TABLE C-5A
2022 ACTUAL FUGITIVE DUST EMISSIONS DAILY OPERATIONS FROM LANDFILL EQUIPMENT
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Landfill Equipment

Process ID: LE

Vehicle Miles Traveled

Type of Landfill Equipment*	# of Vehicles	Avg. Vehicle Speed (mph)	Actual Operating Hours** (hrs/year)	Operations**** (days/year)	Total VMT		
					miles/hr	miles/day	miles/yr
Compactors							
836 Compactor (#1)	1	2	1,377	312	0.84	9	2,754
836 Compactor (#2)	1	2	1,672	312	1.02	11	3,344
836 Compactor (#3)	1	2	1,461	312	0.89	9	2,922
836 Compactor (#4)	1	2	1,220	312	0.74	8	2,440
Dozers							
CAT D9 Dozer (#1)	1	2	1,012	312	0.62	6	2,024
CAT D9 Dozer (#2)	1	2	608	312	0.37	4	1,216
LIEBHERR Dozer	1	1	289	312	0.09	1	289
CAT D6 Dozer (Dirt)	1	2	1,083	312	0.66	7	2,166
CAT D8 Dozer (new Nov. 2021)	1	2	154	312	0.09	1	308
CAT D6 Dozer (Dirt) (new Dec 2021)	1	2	0	312	0.00	0	0
CAT D8T Dozer (new May 2021)	1	2	1,005	312	0.61	6	2,010
CAT D7 Dozer	1	2	2,373	312	1.45	15	4,746
Motor Graders							
14G Grader	1	5	316	312	0.48	5	1,580
Loaders							
CAT 972M Wheel Loader (Dec. 2018) (#1723)	1	5	861	312	1.31	14	4,305
CAT 950 Wheel Loader	1	5	0	312	0.00	0	0
Backhoes							
CAT 420 Backhoe	1	5	192	312	0.29	3	960
CAT 430 Backhoe (Nov 2021)	1	5	45	312	0.07	1	225
Water Trucks* **							
Water Truck International (2011)	1	2	1,140	312	0.70	7	2,280
Water Truck Peterbilt (Oct 2019)	1	2	626	312	0.38	4	1,252
Water Truck Kenworth (2022)	1	2	626	312	0.38	4	1,252
Water Truck Peterbilt (Transferred 2022)	1	2	626	312	0.38	4	1,252
Total - All Vehicles					9.6	100.3	31,289

*Equipment types, numbers and average vehicle speed from 2022 actual equipment registration list.
from site operations personnel.

**Actual operating hours based on odometer readings for 2022. For miles/hr, assume 10.5 hrs/day from actual miles/day.

***Water trucks utilized on site for dust control are assumed to emit no particulate matter. Assume 10.5 hrs/day.

****Operational days per year based on Monday through Saturday from 6:00 am through 4:30 pm.

Assumptions:

Water trucks/dust suppressants are utilized as needed for control efficiency of 96% PM_{10}

*Based on PTO Conditions 96% $PM_{2.5}$

Mean Vehicle Weight (W)

Type of Construction Vehicle	Operating Weight		Soil Density***	Soil Loading Capacity		Average Vehicle Weight
	(lbs)	(tons)	(lb/cf)	(cy)	(tons)	(tons)
Compactors						
836 Compactor (#1)	118,000	59	--	--	--	59.00
836 Compactor (#2)	118,000	59	--	--	--	59.00
836 Compactor (#3)	118,000	59	--	--	--	59.00
836 Compactor (#4)	118,000	59	--	--	--	59.00
Dozers						
CAT D9 Dozer (#1)	98,000	49	100	21.40	28.89	66.05
CAT D9 Dozer (#2)	98,000	49	100	21.40	28.89	66.05
LIEBHERR Dozer	71,800	36	100	21.40	28.89	54.39
CAT D6 Dozer (Dirt)	36,000	18	100	6.57	8.87	23.23
CAT D8 Dozer (new Nov. 2021)	53,502	27	100	11.38	15.36	35.82
CAT D6 Dozer (Dirt) (new Dec 2021)	36,000	18	100	6.57	8.87	23.23
CAT D8T Dozer (new May 2021)	87,733	44	100	11.40	15.39	52.95
CAT D7 Dozer	57,441	29	100	6.57	8.87	33.95
Motor Graders						
14G Grader	45,610	23	--	--	--	22.81
Loaders						
CAT 972M Wheel Loader (Dec. 2018) (#1723)	54,871	27	100	6.00	8.10	31.24
CAT 950 Wheel Loader	28,500	14	100	2.00	2.70	15.52
Backhoes						
CAT 420 Backhoe	16,116	8	100	1.30	1.75	9.02
CAT 430 Backhoe (Nov 2021)	16,215	8	100	1.31	1.77	9.08
Water Trucks* **						
Water Truck International (2011)	44,600	22	--	--	--	22.30
Water Truck Peterbilt (Oct 2019)	50,000	25	--	--	--	25.00
Water Truck Kenworth (2022)	26,000	13	--	--	--	13.00
Water Truck Peterbilt (Transferred 2022)	50,000	25	--	--	--	25.00

*Water trucks utilized on site for dust control are assumed to emit no particulate matter.

**Operating weight based on equipment information from site personnel.

***Soil density based on 1.35 tons/yd^3 from 2012 EIR Air Quality Analysis, Table AQ-F-28

Methodologies:

AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:

Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads -

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Fleet Average Vehicle Weight (W) =	45.26	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	2.67	mph	(actual)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM LANDFILL EQUIPMENT

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	9.6	100.3	31,289	0.14	96%	0.05	0.56	16.91	0.09
PM_{10}	9.6	100.3	31,289	1.41	96%	0.54	5.64	169.13	0.88
TSP	9.6	100.3	31,289	3.12	96%	1.19	12.53	375.85	1.95
Arsenic	9.6	100.3	31,289	2.81E-06	96%	1.07E-06	1.13E-05	3.38E-04	1.76E-06
Beryllium	9.6	100.3	31,289	1.41E-07	96%	5.37E-08	5.64E-07	1.69E-05	8.79E-08
Cadmium	9.6	100.3	31,289	1.41E-07	96%	5.37E-08	5.64E-07	1.69E-05	8.79E-08
Chromium	9.6	100.3	31,289	7.03E-06	96%	2.68E-06	2.82E-05	8.46E-04	4.40E-06
Lead	9.6	100.3	31,289	7.03E-06	96%	2.68E-06	2.82E-05	8.46E-04	4.40E-06
Mangagnese	9.6	100.3	31,289	7.03E-05	96%	2.68E-05	2.82E-04	8.46E-03	4.40E-05
Nickel	9.6	100.3	31,289	2.81E-06	96%	1.07E-06	1.13E-05	3.38E-04	1.76E-06
Selenium	9.6	100.3	31,289	7.03E-07	96%	2.68E-07	2.82E-06	8.46E-05	4.40E-07
Total HAPs						3.47E-05	3.65E-04	1.09E-02	5.69E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-5B
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	105	32,859	15,840	3.0	316.0	98,577
Transfer Trucks	121	37,653	15,840	3.0	362.0	112,959
Pickup Trucks	114	35,505	15,840	3.0	341.4	106,515
Totals	**340**	**106,017**			**1,019**	**318,051**

[1] Vehicles traveling on unpaved roads for MSW and aggregate delivery.
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	105	2,317
Transfer Trucks	39.5	16	27.75	121	3,349
Pickup Trucks	2.8	2.3	2.55	114	290
TOTAL				**340**	**5,956**
				Average Vehicle Weight (tons)	**17.53**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-8.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Collection Trucks Vehicle Weight (W) =	22.00	tons	
Transfer Trucks Vehicle Weight (W) =	27.75	tons	
Pickup Trucks Vehicle Weight (W) =	2.55	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	15	mph	(APCD default)
Number of Vehicle Wheels (w) =	10	(dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(APCD default for general public trucks in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb (APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	316.0	98,577	0.75	96%	0.91	9.53	285.83	1.49
PM_{10}	1.0	316.0	98,577	7.54	96%	9.07	95.28	2,858.30	14.86
TSP	1.0	316.0	98,577	16.75	96%	20.16	211.73	6,351.78	33.03
Arsenic	1.0	316.0	98,577	1.51E-05	96%	1.81E-05	1.91E-04	5.72E-03	2.97E-05
Beryllium	1.0	316.0	98,577	7.54E-07	96%	9.07E-07	9.53E-06	2.86E-04	1.49E-06
Cadmium	1.0	316.0	98,577	7.54E-07	96%	9.07E-07	9.53E-06	2.86E-04	1.49E-06
Chromium	1.0	316.0	98,577	3.77E-05	96%	4.54E-05	4.76E-04	1.43E-02	7.43E-05
Lead	1.0	316.0	98,577	3.77E-05	96%	4.54E-05	4.76E-04	1.43E-02	7.43E-05
Mangagnese	1.0	316.0	98,577	3.77E-04	96%	4.54E-04	4.76E-03	1.43E-01	7.43E-04
Mercury	1.0	316.0	98,577	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	316.0	98,577	1.51E-05	96%	1.81E-05	1.91E-04	5.72E-03	2.97E-05
Selenium	1.0	316.0	98,577	3.77E-06	96%	4.54E-06	4.76E-05	1.43E-03	7.43E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	362.0	112,959	0.89	96%	1.22	12.84	385.34	2.00
PM_{10}	1.0	362.0	112,959	8.87	96%	12.23	128.45	3,853.38	20.04
TSP	1.0	362.0	112,959	19.71	96%	27.18	285.44	8,563.06	44.53
Arsenic	1.0	362.0	112,959	1.77E-05	96%	2.45E-05	2.57E-04	7.71E-03	4.01E-05
Beryllium	1.0	362.0	112,959	8.87E-07	96%	1.22E-06	1.28E-05	3.85E-04	2.00E-06
Cadmium	1.0	362.0	112,959	8.87E-07	96%	1.22E-06	1.28E-05	3.85E-04	2.00E-06
Chromium	1.0	362.0	112,959	4.43E-05	96%	6.12E-05	6.42E-04	1.93E-02	1.00E-04
Lead	1.0	362.0	112,959	4.43E-05	96%	6.12E-05	6.42E-04	1.93E-02	1.00E-04
Mangagnese	1.0	362.0	112,959	4.43E-04	96%	6.12E-04	6.42E-03	1.93E-01	1.00E-03
Mercury	1.0	362.0	112,959	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	362.0	112,959	1.77E-05	96%	2.45E-05	2.57E-04	7.71E-03	4.01E-05
Selenium	1.0	362.0	112,959	4.43E-06	96%	6.12E-06	6.42E-05	1.93E-03	1.00E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

Pollutant	Total VMT			Emission Factor (lb/VMT)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	VMT/hr	VMT/day	VMT/yr			lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	341.4	106,515	0.11	96%	0.14	1.44	43.22	0.22
PM_{10}	1.0	341.4	106,515	1.05	96%	1.37	14.41	432.17	2.25
TSP	1.0	341.4	106,515	2.34	96%	3.05	32.01	960.38	4.99
Arsenic	1.0	341.4	106,515	2.11E-06	96%	2.74E-06	2.88E-05	8.64E-04	4.49E-06
Beryllium	1.0	341.4	106,515	1.05E-07	96%	1.37E-07	1.44E-06	4.32E-05	2.25E-07
Cadmium	1.0	341.4	106,515	1.05E-07	96%	1.37E-07	1.44E-06	4.32E-05	2.25E-07
Chromium	1.0	341.4	106,515	5.27E-06	96%	6.86E-06	7.20E-05	2.16E-03	1.12E-05
Lead	1.0	341.4	106,515	5.27E-06	96%	6.86E-06	7.20E-05	2.16E-03	1.12E-05
Mangagnese	1.0	341.4	106,515	5.27E-05	96%	6.86E-05	7.20E-04	2.16E-02	1.12E-04
Mercury	1.0	341.4	106,515	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	341.4	106,515	2.11E-06	96%	2.74E-06	2.88E-05	8.64E-04	4.49E-06
Selenium	1.0	341.4	106,515	5.27E-07	96%	6.86E-07	7.20E-06	2.16E-04	1.12E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	2.27	23.81	714.39	3.71
PM_{10}	22.68	238.13	7,143.85	37.15
TSP	50.40	529.17	15,875.23	82.55
Arsenic	4.54E-05	4.76E-04	0.01	7.43E-05
Beryllium	2.27E-06	2.38E-05	0.001	3.71E-06
Cadmium	2.27E-06	2.38E-05	0.001	3.71E-06
Chromium	1.13E-04	1.19E-03	0.04	1.86E-04
Lead	1.13E-04	1.19E-03	0.04	1.86E-04
Manganese	1.13E-03	1.19E-02	0.36	1.86E-03
Mercury	0.00E+00	0.00E+00	0.00	0.00E+00
Nickel	4.54E-05	4.76E-04	0.01	7.43E-05
Selenium	1.13E-05	1.19E-04	0.00	1.86E-05
Total HAPs	1.47E-03	1.54E-02	4.62E-01	2.40E-03

TABLE C-5C
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	13	4,111	15,840	3.0	39.5	12,333
Totals	**13**	**4,111**			**40**	**12,333**

[1] Vehicles traveling on unpaved roads for imported base material delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	13	395
TOTAL				**13**	**395**
				Average Vehicle Weight (tons)	**30.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-9.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			30.00 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	Factor	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	39.5	12,333	0.94	96%	0.14	1.48	44.43	0.23
PM_{10}	1.0	39.5	12,333	9.37	96%	1.41	14.81	444.31	2.31
TSP	1.0	39.5	12,333	20.82	96%	3.13	32.91	987.37	5.13
Arsenic	1.0	39.5	12,333	1.87E-05	96%	2.82E-06	2.96E-05	8.89E-04	4.62E-06
Beryllium	1.0	39.5	12,333	9.37E-07	96%	1.41E-07	1.48E-06	4.44E-05	2.31E-07
Cadmium	1.0	39.5	12,333	9.37E-07	96%	1.41E-07	1.48E-06	4.44E-05	2.31E-07
Chromium	1.0	39.5	12,333	4.68E-05	96%	7.05E-06	7.41E-05	2.22E-03	1.16E-05
Lead	1.0	39.5	12,333	4.68E-05	96%	7.05E-06	7.41E-05	2.22E-03	1.16E-05
Manganese	1.0	39.5	12,333	4.68E-04	96%	7.05E-05	7.41E-04	2.22E-02	1.16E-04
Mercury	1.0	39.5	12,333	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	39.5	12,333	1.87E-05	96%	2.82E-06	2.96E-05	8.89E-04	4.62E-06
Selenium	1.0	39.5	12,333	4.68E-06	96%	7.05E-07	7.41E-06	2.22E-04	1.16E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.14	1.48	44.43	0.23
PM_{10}	1.41	14.81	444.31	2.31
TSP	3.13	32.91	987.37	5.13
Arsenic	2.82E-06	2.96E-05	8.89E-04	4.62E-06
Beryllium	1.41E-07	1.48E-06	4.44E-05	2.31E-07
Cadmium	1.41E-07	1.48E-06	4.44E-05	2.31E-07
Chromium	7.05E-06	7.41E-05	2.22E-03	1.16E-05
Lead	7.05E-06	7.41E-05	2.22E-03	1.16E-05
Mangagnese	7.05E-05	7.41E-04	2.22E-02	1.16E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.82E-06	2.96E-05	8.89E-04	4.62E-06
Selenium	7.05E-07	7.41E-06	2.22E-04	1.16E-06
Total HAPs	9.13E-05	9.58E-04	2.87E-02	1.49E-04

TABLE C-5D
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	31	9,637	15,840	3.0	92.7	28,911
Totals	**31**	**9,637**			**93**	**28,911**

[1] Vehicles traveling on unpaved roads for green waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	31	301
TOTAL				**31**	**301**
				Average Vehicle Weight (tons)	**9.75**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-10.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			9.75 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for GW truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	92.7	28,911	0.43	96%	0.15	1.58	47.42	0.25
PM_{10}	1.0	92.7	28,911	4.26	96%	1.51	15.81	474.25	2.47
TSP	1.0	92.7	28,911	9.48	96%	3.35	35.13	1,053.88	5.48
Arsenic	1.0	92.7	28,911	8.53E-06	96%	3.01E-06	3.16E-05	9.48E-04	4.93E-06
Beryllium	1.0	92.7	28,911	4.26E-07	96%	1.51E-07	1.58E-06	4.74E-05	2.47E-07
Cadmium	1.0	92.7	28,911	4.26E-07	96%	1.51E-07	1.58E-06	4.74E-05	2.47E-07
Chromium	1.0	92.7	28,911	2.13E-05	96%	7.53E-06	7.90E-05	2.37E-03	1.23E-05
Lead	1.0	92.7	28,911	2.13E-05	96%	7.53E-06	7.90E-05	2.37E-03	1.23E-05
Mangagnese	1.0	92.7	28,911	2.13E-04	96%	7.53E-05	7.90E-04	2.37E-02	1.23E-04
Mercury	1.0	92.7	28,911	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	92.7	28,911	8.53E-06	96%	3.01E-06	3.16E-05	9.48E-04	4.93E-06
Selenium	1.0	92.7	28,911	2.13E-06	96%	7.53E-07	7.90E-06	2.37E-04	1.23E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.15	1.58	47.42	0.25
PM_{10}	1.51	15.81	474.25	2.47
TSP	3.35	35.13	1,053.88	5.48
Arsenic	3.01E-06	3.16E-05	9.48E-04	4.93E-06
Beryllium	1.51E-07	1.58E-06	4.74E-05	2.47E-07
Cadmium	1.51E-07	1.58E-06	4.74E-05	2.47E-07
Chromium	7.53E-06	7.90E-05	2.37E-03	1.23E-05
Lead	7.53E-06	7.90E-05	2.37E-03	1.23E-05
Mangagnese	7.53E-05	7.90E-04	2.37E-02	1.23E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.01E-06	3.16E-05	9.48E-04	4.93E-06
Selenium	7.53E-07	7.90E-06	2.37E-04	1.23E-06
Total HAPs	9.74E-05	1.02E-03	3.07E-02	1.60E-04

TABLE C-5E
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - C&D

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	17	5,364	15,840	3.0	51.6	16,092
Totals	**17**	**5,364**			**52**	**16,092**

[1] Vehicles traveling on unpaved roads for C&D waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	17	206
TOTAL				**17**	**206**
				Average Vehicle Weight (tons)	**12.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-11.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =	12.00	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	15	mph	(APCD default)
Number of Vehicle Wheels (w) =	10	(dimensionles	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	51.6	16,092	0.49	96%	0.10	1.02	30.53	0.16
PM_{10}	1.0	51.6	16,092	4.93	96%	0.97	10.18	305.26	1.59
TSP	1.0	51.6	16,092	10.96	96%	2.15	22.61	678.36	3.53
Arsenic	1.0	51.6	16,092	9.86E-06	96%	1.94E-06	2.04E-05	6.11E-04	3.17E-06
Beryllium	1.0	51.6	16,092	4.93E-07	96%	9.69E-08	1.02E-06	3.05E-05	1.59E-07
Cadmium	1.0	51.6	16,092	4.93E-07	96%	9.69E-08	1.02E-06	3.05E-05	1.59E-07
Chromium	1.0	51.6	16,092	2.47E-05	96%	4.85E-06	5.09E-05	1.53E-03	7.94E-06
Lead	1.0	51.6	16,092	2.47E-05	96%	4.85E-06	5.09E-05	1.53E-03	7.94E-06
Manganese	1.0	51.6	16,092	2.47E-04	96%	4.85E-05	5.09E-04	1.53E-02	7.94E-05
Mercury	1.0	51.6	16,092	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	51.6	16,092	9.86E-06	96%	1.94E-06	2.04E-05	6.11E-04	3.17E-06
Selenium	1.0	51.6	16,092	2.47E-06	96%	4.85E-07	5.09E-06	1.53E-04	7.94E-07

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.10	1.02	30.53	0.16
PM_{10}	0.97	10.18	305.26	1.59
TSP	2.15	22.61	678.36	3.53
Arsenic	1.94E-06	2.04E-05	6.11E-04	3.17E-06
Beryllium	9.69E-08	1.02E-06	3.05E-05	1.59E-07
Cadmium	9.69E-08	1.02E-06	3.05E-05	1.59E-07
Chromium	4.85E-06	5.09E-05	1.53E-03	7.94E-06
Lead	4.85E-06	5.09E-05	1.53E-03	7.94E-06
Mangagnese	4.85E-05	5.09E-04	1.53E-02	7.94E-05
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.94E-06	2.04E-05	6.11E-04	3.17E-06
Selenium	4.85E-07	5.09E-06	1.53E-04	7.94E-07
Total HAPs	6.27E-05	6.58E-04	1.98E-02	1.03E-04

TABLE C-5F
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	105	32,859	10,560	2.0	210.6	65,718
Transfer Trucks	121	37,653	10,560	2.0	241.4	75,306
Pickup Trucks	114	35,505	10,560	2.0	227.6	71,010
Totals	**340**	**106,017**			**680**	**212,034**

[1] Vehicles traveling on paved roads for MSW and aggregate delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	105	2,317
Transfer Trucks	39.5	16	27.75	121	3,349
Pickup Trucks	2.8	2.3	2.55	114	290
TOTAL				**340**	**5,956**
				Average Vehicle Weight (tons)	**17.53**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- sL = Road surface silt loading factor (grams per m^2)
- W = Vehicle weight in tons
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

TABLE C-5F
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)	
k factor for PM_{10} =	0.016 lb/VMT	(from AP-42, Table 13.2-1.1)	
k factor for TSP =	0.082 lb/VMT	(from AP-42, Table 13.2-1.1)	
Silt Loading Factor (sL) =	13.6 g/m^2	(APCD default)	
Collection Trucks Vehicle Weight (W) =	22.00 tons		
Transfer Trucks Vehicle Weight (W) =	27.75 tons		
Pickup Trucks Vehicle Weight (W) =	2.55 tons		
Control efficiency (e) =	0 %	(APCD default)	
Concentration of each listed substance in haul road emissions (Ci) =			

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	210.6	65,718	0.27	0%	5.43	57.00	1,710.09	8.89
PM_{10}	1.0	210.6	65,718	1.10	0%	22.16	232.67	6,979.98	36.30
TSP	1.0	210.6	65,718	5.66	0%	113.56	1,192.41	35,772.38	186.02
Arsenic	1.0	210.6	65,718	5.41E-06	0%	1.09E-04	1.14E-03	3.42E-02	1.78E-04
Beryllium	1.0	210.6	65,718	2.71E-07	0%	5.43E-06	5.70E-05	1.71E-03	8.89E-06
Cadmium	1.0	210.6	65,718	2.71E-07	0%	5.43E-06	5.70E-05	1.71E-03	8.89E-06
Chromium	1.0	210.6	65,718	1.35E-05	0%	2.71E-04	2.85E-03	8.55E-02	4.45E-04
Lead	1.0	210.6	65,718	1.35E-05	0%	2.71E-04	2.85E-03	8.55E-02	4.45E-04
Mangagnese	1.0	210.6	65,718	1.35E-04	0%	2.71E-03	2.85E-02	8.55E-01	4.45E-03
Mercury	1.0	210.6	65,718	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	210.6	65,718	5.41E-06	0%	1.09E-04	1.14E-03	3.42E-02	1.78E-04
Selenium	1.0	210.6	65,718	1.35E-06	0%	2.71E-05	2.85E-04	8.55E-03	4.45E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	241.4	75,306	0.38	0%	8.81	92.53	2,776.04	14.44
PM_{10}	1.0	241.4	75,306	1.56	0%	35.97	377.69	11,330.78	58.92
TSP	1.0	241.4	75,306	8.02	0%	184.35	1,935.67	58,070.22	301.97
Arsenic	1.0	241.4	75,306	7.67E-06	0%	1.76E-04	1.85E-03	5.55E-02	2.89E-04
Beryllium	1.0	241.4	75,306	3.83E-07	0%	8.81E-06	9.25E-05	2.78E-03	1.44E-05
Cadmium	1.0	241.4	75,306	3.83E-07	0%	8.81E-06	9.25E-05	2.78E-03	1.44E-05
Chromium	1.0	241.4	75,306	1.92E-05	0%	4.41E-04	4.63E-03	1.39E-01	7.22E-04
Lead	1.0	241.4	75,306	1.92E-05	0%	4.41E-04	4.63E-03	1.39E-01	7.22E-04
Mangagnese	1.0	241.4	75,306	1.92E-04	0%	4.41E-03	4.63E-02	1.39E+00	7.22E-03
Mercury	1.0	241.4	75,306	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	241.4	75,306	7.67E-06	0%	1.76E-04	1.85E-03	5.55E-02	2.89E-04
Selenium	1.0	241.4	75,306	1.92E-06	0%	4.41E-05	4.63E-04	1.39E-02	7.22E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-5F
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	227.6	71,010	0.01	0%	0.23	2.43	72.92	0.38
PM_{10}	1.0	227.6	71,010	0.04	0%	0.94	9.92	297.62	1.55
TSP	1.0	227.6	71,010	0.22	0%	4.84	50.84	1,525.31	7.93
Arsenic	1.0	227.6	71,010	2.14E-07	0%	4.63E-06	4.86E-05	1.46E-03	7.58E-06
Beryllium	1.0	227.6	71,010	1.07E-08	0%	2.31E-07	2.43E-06	7.29E-05	3.79E-07
Cadmium	1.0	227.6	71,010	1.07E-08	0%	2.31E-07	2.43E-06	7.29E-05	3.79E-07
Chromium	1.0	227.6	71,010	5.34E-07	0%	1.16E-05	1.22E-04	3.65E-03	1.90E-05
Lead	1.0	227.6	71,010	5.34E-07	0%	1.16E-05	1.22E-04	3.65E-03	1.90E-05
Mangagnese	1.0	227.6	71,010	5.34E-06	0%	1.16E-04	1.22E-03	3.65E-02	1.90E-04
Mercury	1.0	227.6	71,010	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	227.6	71,010	2.14E-07	0%	4.63E-06	4.86E-05	1.46E-03	7.58E-06
Selenium	1.0	227.6	71,010	5.34E-08	0%	1.16E-06	1.22E-05	3.65E-04	1.90E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	14.47	151.97	4559.05	23.71
PM_{10}	59.07	620.28	18,608.37	96.76
TSP	302.76	3178.93	95,367.91	495.91
Arsenic	2.89E-04	3.04E-03	9.12E-02	4.74E-04
Beryllium	1.45E-05	1.52E-04	4.56E-03	2.37E-05
Cadmium	1.45E-05	1.52E-04	4.56E-03	2.37E-05
Chromium	7.24E-04	7.60E-03	2.28E-01	1.19E-03
Lead	7.24E-04	7.60E-03	2.28E-01	1.19E-03
Mangagnese	7.24E-03	7.60E-02	2.28E+00	1.19E-02
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.89E-04	3.04E-03	9.12E-02	4.74E-04
Selenium	7.24E-05	7.60E-04	2.28E-02	1.19E-04
Total HAPs	9.36E-03	9.83E-02	2.95E+00	1.53E-02

TABLE C-5G
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	13	4,111	10,560	2.0	26.4	8,222
Totals	**13**	**4,111**			**26**	**8,222**

[1] Vehicles traveling on paved roads for imported base material delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	13	395
TOTAL				**13**	**395**
				Average Vehicle Weight (tons)	**30.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- sL = Road surface silt loading factor (grams per m^2)
- W = Vehicle weight in tons
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

TABLE C-5G
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	30.00	tons	
Control efficiency (e) =	0	%	(APCD default)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	26.4	8,222	0.43	0%	1.08	11.36	340.69	1.77
PM_{10}	1.0	26.4	8,222	1.76	0%	4.41	46.35	1,390.58	7.23
TSP	1.0	26.4	8,222	9.01	0%	22.62	237.56	7,126.70	37.06
Arsenic	1.0	26.4	8,222	8.62E-06	0%	2.16E-05	2.27E-04	6.81E-03	3.54E-05
Beryllium	1.0	26.4	8,222	4.31E-07	0%	1.08E-06	1.14E-05	3.41E-04	1.77E-06
Cadmium	1.0	26.4	8,222	4.31E-07	0%	1.08E-06	1.14E-05	3.41E-04	1.77E-06
Chromium	1.0	26.4	8,222	2.15E-05	0%	5.41E-05	5.68E-04	1.70E-02	8.86E-05
Lead	1.0	26.4	8,222	2.15E-05	0%	5.41E-05	5.68E-04	1.70E-02	8.86E-05
Mangagnese	1.0	26.4	8,222	2.15E-04	0%	5.41E-04	5.68E-03	1.70E-01	8.86E-04
Mercury	1.0	26.4	8,222	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	26.4	8,222	8.62E-06	0%	2.16E-05	2.27E-04	6.81E-03	3.54E-05
Selenium	1.0	26.4	8,222	2.15E-06	0%	5.41E-06	5.68E-05	1.70E-03	8.86E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.08	11.36	340.69	1.77
PM_{10}	4.41	46.35	1390.58	7.23
TSP	22.62	237.56	7126.70	37.06
Arsenic	2.16E-05	2.27E-04	6.81E-03	3.54E-05
Beryllium	1.08E-06	1.14E-05	3.41E-04	1.77E-06
Cadmium	1.08E-06	1.14E-05	3.41E-04	1.77E-06
Chromium	5.41E-05	5.68E-04	1.70E-02	8.86E-05
Lead	5.41E-05	5.68E-04	1.70E-02	8.86E-05
Mangagnese	5.41E-04	5.68E-03	1.70E-01	8.86E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.16E-05	2.27E-04	6.81E-03	3.54E-05
Selenium	5.41E-06	5.68E-05	1.70E-03	8.86E-06
Total HAPs	7.00E-04	7.35E-03	2.20E-01	1.15E-03

TABLE C-5H
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	31	9,637	10,560	2.0	61.8	19,274
Totals	**31**	**9,637**			**62**	**19,274**

[1] Vehicles traveling on paved roads for green waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	31	301
TOTAL				**31**	**301**
				Average Vehicle Weight (tons)	**9.75**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE C-5H
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	9.75	tons	
Control efficiency (e) =	0	%	(APCD default)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	61.8	19,274	0.08	0%	0.47	4.93	147.97	0.77
PM_{10}	1.0	61.8	19,274	0.33	0%	1.92	20.13	603.97	3.14
TSP	1.0	61.8	19,274	1.67	0%	9.83	103.18	3,095.34	16.10
Arsenic	1.0	61.8	19,274	1.60E-06	0%	9.40E-06	9.86E-05	2.96E-03	1.54E-05
Beryllium	1.0	61.8	19,274	7.98E-08	0%	4.70E-07	4.93E-06	1.48E-04	7.69E-07
Cadmium	1.0	61.8	19,274	7.98E-08	0%	4.70E-07	4.93E-06	1.48E-04	7.69E-07
Chromium	1.0	61.8	19,274	3.99E-06	0%	2.35E-05	2.47E-04	7.40E-03	3.85E-05
Lead	1.0	61.8	19,274	3.99E-06	0%	2.35E-05	2.47E-04	7.40E-03	3.85E-05
Mangagnese	1.0	61.8	19,274	3.99E-05	0%	2.35E-04	2.47E-03	7.40E-02	3.85E-04
Mercury	1.0	61.8	19,274	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	61.8	19,274	1.60E-06	0%	9.40E-06	9.86E-05	2.96E-03	1.54E-05
Selenium	1.0	61.8	19,274	3.99E-07	0%	2.35E-06	2.47E-05	7.40E-04	3.85E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.47	4.93	147.97	0.77
PM_{10}	1.92	20.13	603.97	3.14
TSP	9.83	103.18	3095.34	16.10
Arsenic	9.40E-06	9.86E-05	2.96E-03	1.54E-05
Beryllium	4.70E-07	4.93E-06	1.48E-04	7.69E-07
Cadmium	4.70E-07	4.93E-06	1.48E-04	7.69E-07
Chromium	2.35E-05	2.47E-04	7.40E-03	3.85E-05
Lead	2.35E-05	2.47E-04	7.40E-03	3.85E-05
Mangagnese	2.35E-04	2.47E-03	7.40E-02	3.85E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	9.40E-06	9.86E-05	2.96E-03	1.54E-05
Selenium	2.35E-06	2.47E-05	7.40E-04	3.85E-06
Total HAPs	3.04E-04	3.19E-03	9.57E-02	4.98E-04

TABLE C-5I
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	17	5,364	10,560	2.0	34.4	10,728
Totals	**17**	**5,364**			**34**	**10,728**

[1] Vehicles traveling on paved roads for C&D waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2022 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	17	206
TOTAL				**17**	**206**
				Average Vehicle Weight (tons)	**12.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- sL = Road surface silt loading factor (grams per m^2)
- W = Vehicle weight in tons
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

TABLE C-5I
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =			0.00392 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.016 lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =			0.082 lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =			13.6 g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =			12.00 tons	
Control efficiency (e) =			0 %	(APCD default)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	34.4	10,728	0.11	0%	0.36	3.75	112.46	0.58
PM_{10}	1.0	34.4	10,728	0.44	0%	1.46	15.30	459.01	2.39
TSP	1.0	34.4	10,728	2.28	0%	7.47	78.41	2,352.45	12.23
Arsenic	1.0	34.4	10,728	2.18E-06	0%	7.14E-06	7.50E-05	2.25E-03	1.17E-05
Beryllium	1.0	34.4	10,728	1.09E-07	0%	3.57E-07	3.75E-06	1.12E-04	5.85E-07
Cadmium	1.0	34.4	10,728	1.09E-07	0%	3.57E-07	3.75E-06	1.12E-04	5.85E-07
Chromium	1.0	34.4	10,728	5.45E-06	0%	1.79E-05	1.87E-04	5.62E-03	2.92E-05
Lead	1.0	34.4	10,728	5.45E-06	0%	1.79E-05	1.87E-04	5.62E-03	2.92E-05
Mangagnese	1.0	34.4	10,728	5.45E-05	0%	1.79E-04	1.87E-03	5.62E-02	2.92E-04
Mercury	1.0	34.4	10,728	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	34.4	10,728	2.18E-06	0%	7.14E-06	7.50E-05	2.25E-03	1.17E-05
Selenium	1.0	34.4	10,728	5.45E-07	0%	1.79E-06	1.87E-05	5.62E-04	2.92E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.36	3.75	3.75	0.58
PM_{10}	1.46	15.30	15.30	2.39
TSP	7.47	78.41	78.41	12.23
Arsenic	7.14E-06	7.50E-05	7.50E-05	1.17E-05
Beryllium	3.57E-07	3.75E-06	3.75E-06	5.85E-07
Cadmium	3.57E-07	3.75E-06	3.75E-06	5.85E-07
Chromium	1.79E-05	1.87E-04	1.87E-04	2.92E-05
Lead	1.79E-05	1.87E-04	1.87E-04	2.92E-05
Mangagnese	1.79E-04	1.87E-03	1.87E-03	2.92E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7.14E-06	7.50E-05	7.50E-05	1.17E-05
Selenium	1.79E-06	1.87E-05	1.87E-05	2.92E-06
Total HAPs	2.31E-04	2.43E-03	2.43E-03	3.78E-04

TABLE C-5J
2022 ACTUAL FUGITIVE DUST EMISSIONS FROM STOCKPILES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Cover Stockpile\Surface

Process ID: STK

Methodologies:
AP-42, Section 8.19 for Crushed Stone Processing (9/85) which are SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 8.19 for Crushed Stone Processing):

$$E_a = (A)[(Efa*Da) + (Efi*Di)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **A** = Area of soil stockpile (acres)
- **EFa** = Emission factor for active days (lb/acre/active day)
- **Da** = Number of active days (days/yr)
- **EFi** = Emission factor for inactive days (lb/acre/active day)
- **Di** = Number of inactive days (days/yr)
- **Ci** = Concentration of each listed substance in soil (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

Area of soil stockpile (A) =	10	acres	(per SLI personnel)
TSP Emission factor for active days (EFa) =	13.2	lb/acre/day	(AP-42, Section 8.19)
TSP Emission factor for inactive days (EFi) =	3.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
Number of Active Days/Year (Da) =	312	days	(per SLI personnel)
Number of Inactive Days/Year (Di) =	53	days	(per SLI personnel)
Control efficiency (e) =	0.0%		(Water trucks not utilized)

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

Note: Loader and water truck used for stockpiles and already accounted for in fugitive dust estimates for landfill equipment.

SUMMARY OF EMISSIONS FROM COVER STORAGE PILES

Pollutant	Estimated Actual Emissions (lb/hr)	(lb/day)	(lb/month)	(tons/yr)
$PM_{2.5}$	2.42	58.03	1740.90	10.59
PM_{10}	2.42	58.03	1740.90	10.59
TSP	4.91	117.92	3537.45	21.52
Arsenic	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Beryllium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Cadmium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Chromium	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Lead	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Mangagnese	1.21E-03	2.90E-02	8.70E-01	5.30E-03
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Selenium	1.21E-05	2.90E-04	8.70E-03	5.30E-05
Total HAPs	1.56E-03	3.75E-02	1.13E+00	6.85E-03

TABLE C-5K
2022 ACTUAL FUGITIVE DUST EMISSIONS FROM MATERIAL HANDLING - EARTHMOVING ACTIVITIES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Material Handling - Earthmoving Activities
Process ID: EMA

Amount of Soil Moved

Type of Vehicle	Soil Density[1]	Load Volume[2]	Vehicle Load Weight	Total Soil Moved[3]		Amount (Tons)	
	tons/yd^3	yd^3/load	tons/load	yd^3/day	yd^3/year	(per day)	(per year)
Articulated Dump Trucks (#1, #2 and #3)	1.35	16	21.07	396.72	123,778	535.6	167,100

[1] Soil density from 2012 EIR Air Quality Analysis, Table AQ-F-28, 2015-2019.
[2] Soil volume based on actual volume for articulated dump truck.
[3] Amount of soil moved based on 2022 actual soil data (airspace consumed by clean soil).

Operations Data[1]

312	days per year

[1]Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:
Cumulative Total Control: 0% *Per SDAPCD*

Emissions Calculation Methodology (SDAPCD Defaults):

TSP	=	0.05	lb/ton	(TSP)
PM_{10}	=	0.021	lb/ton	(PM_{10})
$PM_{2.5}$	=	0.021	lb/ton	($PM_{2.5}$)

SDAPCD has no default emission factor for $PM_{2.5}$. Assumed $PM_{2.5}$ equal to PM_{10}.

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

SUMMARY OF PARTICULATE EMISSIONS FROM MATERIAL HANDLING

Pollutant	Total Amount		Emission	Control	Estimated Actual Emissions			
	ton/day	ton/yr	Factor (lb/ton)[1]	Efficiency (%)	lb/hr	lbs/day	lb/month	tons/yr
$PM_{2.5}$	535.6	167,100	2.10E-02	0%	1.07E+00	1.12E+01	3.37E+02	1.75E+00
PM_{10}	535.6	167,100	2.10E-02	0%	1.07E+00	1.12E+01	3.37E+02	1.75E+00
TSP	535.6	167,100	5.00E-02	0%	2.55E+00	2.68E+01	8.03E+02	4.18E+00
Arsenic	535.6	167,100	4.20E-07	0%	2.14E-05	2.25E-04	6.75E-03	3.51E-05
Beryllium	535.6	167,100	2.10E-08	0%	1.07E-06	1.12E-05	3.37E-04	1.75E-06
Cadmium	535.6	167,100	2.10E-08	0%	1.07E-06	1.12E-05	3.37E-04	1.75E-06
Chromium	535.6	167,100	1.05E-06	0%	5.36E-05	5.62E-04	1.69E-02	8.77E-05
Lead	535.6	167,100	1.05E-06	0%	5.36E-05	5.62E-04	1.69E-02	8.77E-05
Mangagnese	535.6	167,100	1.05E-05	0%	5.36E-04	5.62E-03	1.69E-01	8.77E-04
Mercury	535.6	167,100	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	535.6	167,100	4.20E-07	0%	2.14E-05	2.25E-04	6.75E-03	3.51E-05
Selenium	535.6	167,100	1.05E-07	0%	5.36E-06	5.62E-05	1.69E-03	8.77E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MATERIAL HANDLING

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.07	11.25	337.41	1.75
PM_{10}	1.07	11.25	337.41	1.75
TSP	2.55	26.78	803.37	4.18
Arsenic	2.14E-05	2.25E-04	6.75E-03	3.51E-05
Beryllium	1.07E-06	1.12E-05	3.37E-04	1.75E-06
Cadmium	1.07E-06	1.12E-05	3.37E-04	1.75E-06
Chromium	5.36E-05	5.62E-04	1.69E-02	8.77E-05
Lead	5.36E-05	5.62E-04	1.69E-02	8.77E-05
Mangagnese	5.36E-04	5.62E-03	1.69E-01	8.77E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.14E-05	2.25E-04	6.75E-03	3.51E-05
Selenium	5.36E-06	5.62E-05	1.69E-03	8.77E-06
Total HAPs	6.93E-04	7.28E-03	2.18E-01	1.14E-03

TABLE C-5L
2022 ACTUAL FUGITIVE DUST EMISSIONS FOR EARTHMOVING EQUIPMENT ON UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Earthmoving Activities - Travel
Process ID: EMA-UPR

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	Soil Density[2]	Load Volume[3]	Vehicle Load Weight	Total Soil Moved[4]				# of Vehicles trips per day	# of Vehicle trips per Year[5]	Length of road (round trip)[6]		VMT Data	
	tons/yd^3	yd^3/load	tons/load	yd^3/day	yd^3/year	tons/day	tons/yr			Feet	Miles	(per day)	(per yr)
Articulated Dump Truck (#1)	1.35	10	14.00	396.72	123,778	536	167,100	5	1,669	2,640	0.5	2.7	834
Articulated Dump Truck (#2)	1.35	18	24.60					10	2,977	2,640	0.5	4.8	1,488
Articulated Dump Truck (#3)	1.35	18	24.60					9	2,866	2,640	0.5	4.6	1,433
Totals								**24**	**7,512**			**12**	**3,756**

[1] Vehicles traveling on unpaved roads for earthmoving activities.
[2] Soil density from 2012 EIR Air Quality Analysis, Table AQ-F-28, 2015-2019.
[3] Soil volume based on actual volume for articulated dump truck.
[4] Amount of soil moved based on 2022 actual soil data (airspace consumed by clean soil).
[5] Number of trips per day based on each vehicle's operating hours over 312 total days and amount of soil moved (267 hrs for #1, 837 hrs for #2, and 806 hrs for #3).
[6] Length of roads provided by site personnel.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm where scrapers used on during wet weather (30 days/yr)

Fugitive Dust Control Measur Control Efficier Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressents:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Type of Construction Vehicle*	Operating Weight (lbs)	Operating Weight (tons)	Soil Density*** (lb/cf)	Soil Loading Capacity (cy)	Soil Loading Capacity (tons)	Average Vehicle Weight (tons)
Articulating Dump Truck	52,533	26	2,700	15.60	21.07	47.3

*Weights based on site personnel and soil density of 1.35 tons/cy.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Vehicle Weight (W) =	47.33	tons	(Actual)
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	15	mph	(APCD default)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM ARTICULATED DUMP TRUCKS (EARTHMOVING TRAVEL)

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	12.0	3,756	0.82	96%	0.04	0.39	11.78	0.06
PM_{10}	1.0	12.0	3,756	8.15	96%	0.37	3.93	117.76	0.61
TSP	1.0	12.0	3,756	18.12	96%	0.83	8.72	261.68	1.36
Arsenic	1.0	12.0	3,756	1.63E-05	96%	7.48E-07	7.85E-06	2.36E-04	1.22E-06
Beryllium	1.0	12.0	3,756	8.15E-07	96%	3.74E-08	3.93E-07	1.18E-05	6.12E-08
Cadmium	1.0	12.0	3,756	8.15E-07	96%	3.74E-08	3.93E-07	1.18E-05	6.12E-08
Chromium	1.0	12.0	3,756	4.08E-05	96%	1.87E-06	1.96E-05	5.89E-04	3.06E-06
Lead	1.0	12.0	3,756	4.08E-05	96%	1.87E-06	1.96E-05	5.89E-04	3.06E-06
Mangagnese	1.0	12.0	3,756	4.08E-04	96%	1.87E-05	1.96E-04	5.89E-03	3.06E-05
Mercury	1.0	12.0	3,756	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	12.0	3,756	1.63E-05	96%	7.48E-07	7.85E-06	2.36E-04	1.22E-06
Selenium	1.0	12.0	3,756	4.08E-06	96%	1.87E-07	1.96E-06	5.89E-05	3.06E-07
Total HAPs						2.42E-05	2.54E-04	7.62E-03	3.96E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-5M
SUMMARY OF 2022 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	Actual	
		lb/day	ton/yr
2022 Landfill Equipment	Particulate Matter < 2.5 Microns	0.56	0.09
	Particulate Matter < 10 Microns	5.64	0.88
	Total Suspended Particulates	12.53	1.95
	Hazardous Air Pollutants	3.65E-04	5.69E-05
2022 Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	23.81	3.71
	Particulate Matter < 10 Microns	238.13	37.15
	Total Suspended Particulates	529.17	82.55
	Hazardous Air Pollutants	1.54E-02	2.40E-03
2022 Unpaved Roadways - Imported Base	Particulate Matter < 2.5 Microns	1.48	0.23
Material	Particulate Matter < 10 Microns	14.81	2.31
	Total Suspended Particulates	32.91	5.13
	Hazardous Air Pollutants	9.58E-04	1.49E-04
2022 Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.58	0.25
	Particulate Matter < 10 Microns	15.81	2.47
	Total Suspended Particulates	35.13	5.48
	Hazardous Air Pollutants	1.02E-03	1.60E-04
2022 Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	1.02	0.16
	Particulate Matter < 10 Microns	10.18	1.59
	Total Suspended Particulates	22.61	3.53
	Hazardous Air Pollutants	6.58E-04	1.03E-04
2022 Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	151.97	23.71
	Particulate Matter < 10 Microns	620.28	96.76
	Total Suspended Particulates	3,178.93	495.91
	Hazardous Air Pollutants	9.83E-02	1.53E-02
2022 Paved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	11.36	1.77
	Particulate Matter < 10 Microns	46.35	7.23
	Total Suspended Particulates	237.56	37.06
	Hazardous Air Pollutants	7.35E-03	1.15E-03
2022 Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	4.93	0.77
	Particulate Matter < 10 Microns	20.13	3.14
	Total Suspended Particulates	103.18	16.10
	Hazardous Air Pollutants	3.19E-03	4.98E-04
2022 Paved Roadways - C&D	Particulate Matter < 2.5 Microns	3.75	0.58
	Particulate Matter < 10 Microns	15.30	2.39
	Total Suspended Particulates	78.41	12.23
	Hazardous Air Pollutants	2.43E-03	3.78E-04

TABLE C-5M
SUMMARY OF 2022 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	Actual	
		lb/day	ton/yr
2022 Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59
	Total Suspended Particulates	117.92	21.52
	Hazardous Air Pollutants	3.75E-02	6.85E-03
2022 Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	11.25	1.75
	Particulate Matter < 10 Microns	11.25	1.75
	Total Suspended Particulates	26.78	4.18
	Hazardous Air Pollutants	7.28E-03	1.14E-03
2022 Material Handling - Travel	Particulate Matter < 2.5 Microns	0.39	0.06
	Particulate Matter < 10 Microns	3.93	0.61
	Total Suspended Particulates	8.72	1.36
	Hazardous Air Pollutants	2.54E-04	3.96E-05
2022 Total From All Emission Points	Volatile Organic Compounds	--	--
(Fugitive and Non-Fugitive)	Non-Methane Organic Compounds	--	--
	Sulfur Oxides	--	--
	Carbon Monoxide	--	--
	Nitrogen Oxides	--	--
	Particulate Matter < 2.5 Microns	270.13	43.68
	Particulate Matter < 10 Microns	1,059.83	166.87
	Total Suspended Particulates	4,383.85	687.01
	Total Hazardous Air Pollutants	0.17	0.03

TABLE C-6A
2023 ACTUAL FUGITIVE DUST EMISSIONS DAILY OPERATIONS FROM LANDFILL EQUIPMENT
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Landfill Equipment

Process ID: LE

Vehicle Miles Traveled

Type of Landfill Equipment*	# of Vehicles	Avg. Vehicle Speed (mph)	Actual Operating Hours** (hrs/year)	Operations**** (days/year)	Total VMT		
					miles/hr	miles/day	miles/year
Compactors							
836 Compactor (#1)	1	2	698	312	0.43	4	1,396
836 Compactor (#2)	1	2	1,963	312	1.20	13	3,926
836 Compactor (#3)	1	2	2,093	312	1.28	13	4,186
836 Compactor (#4)	1	2	1,105	312	0.67	7	2,210
836 Compactor (#5) (Nov 2023)	1	2	142	312	0.09	1	284
Dozers							
CAT D9 Dozer (#1)	1	2	921	312	0.56	6	1,842
CAT D9 Dozer (#2)	1	2	607	312	0.37	4	1,214
LIEBHERR Dozer	1	1	767	312	0.23	2	767
CAT D6 Dozer (Dirt)	1	2	933	312	0.57	6	1,866
CAT D8 Dozer (new Nov. 2021)	1	2	1,968	312	1.20	13	3,936
CAT D6 Dozer (Dirt) (new Dec 2021)	1	2	2,706	312	1.65	17	5,412
CAT D8T Dozer (new May 2021)	1	2	1,705	312	1.04	11	3,410
CAT D7 Dozer	1	2	1,410	312	0.86	9	2,820
Motor Graders							
14G Grader	1	5	997	312	1.52	16	4,985
Loaders							
CAT 972M Wheel Loader (Dec. 2018) (#1723)	1	5	1,264	312	1.93	20	6,320
Backhoes							
CAT 430 Backhoe (Nov 2021)	1	5	190	312	0.29	3	950
Water Trucks* **							
Water Truck International (2011)	1	2	784	312	0.48	5	1,568
Total - All Vehicles					13.9	145.9	45,524

*Equipment types, numbers and average vehicle speed from 2023 actual equipment registration list. from site operations personnel.

**Actual operating hours based on odometer readings for 2023. For miles/hr, assume 10.5 hrs/day from actual miles/day.

***Water trucks utilized on site for dust control are assumed to emit no particulate matter. Assume 10.5 hrs/day.

****Operational days per year based on Monday through Saturday from 6:00 am through 4:30 pm.

Assumptions:

Water trucks/dust suppressants are utilized as needed for control efficiency of 96% PM_{10}

*Based on PTO Conditions 96% $PM_{2.5}$

Mean Vehicle Weight (W)

Type of Construction Vehicle	Operating Weight		Soil Density***	Soil Loading Capacity		Average Vehicle Weight
	(lbs)	(tons)	(lb/cf)	(cy)	(tons)	(tons)
Compactors						
836 Compactor (#1)	118,000	59	--	--	--	59.00
836 Compactor (#2)	118,000	59	--	--	--	59.00
836 Compactor (#3)	118,000	59	--	--	--	59.00
836 Compactor (#4)	118,000	59	--	--	--	59.00
836 Compactor (#5) (Nov 2023)	118,000	59	--	--	--	59.00
Dozers						
CAT D9 Dozer (#1)	98,000	49	100	21.40	28.89	66.05
CAT D9 Dozer (#2)	98,000	49	100	21.40	28.89	66.05
LIEBHERR Dozer	71,800	36	100	21.40	28.89	54.39
CAT D6 Dozer (Dirt)	36,000	18	100	6.57	8.87	23.23
CAT D8 Dozer (new Nov. 2021)	53,502	27	100	11.38	15.36	35.82
CAT D6 Dozer (Dirt) (new Dec 2021)	36,000	18	100	6.57	8.87	23.23
CAT D8T Dozer (new May 2021)	87,733	44	100	11.40	15.39	52.95
CAT D7 Dozer	57,441	29	100	6.57	8.87	33.95
Motor Graders						
14G Grader	45,610	23	--	--	--	22.81
Loaders						
CAT 972M Wheel Loader (Dec. 2018) (#1723)	54,871	27	100	6.00	8.10	31.24
Backhoes						
CAT 430 Backhoe (Nov 2021)	16,215	8	100	1.31	1.77	9.08
Water Trucks* **						
Water Truck International (2011)	44,600	22	--	--	--	22.30

*Water trucks utilized on site for dust control are assumed to emit no particulate matter.

**Operating weight based on equipment information from site personnel.

***Soil density based on 1.35 tons/yd^3 from 2012 EIR Air Quality Analysis, Table AQ-F-28

Methodologies:

AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:

Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads -

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Fleet Average Vehicle Weight (W) =	40.81	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	2.79	mph	(actual)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM LANDFILL EQUIPMENT

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	13.9	145.9	45,524	0.136709292	96%	0.08	0.80	23.94	0.12
PM_{10}	13.9	145.9	45,524	1.37	96%	0.76	7.98	239.37	1.24
TSP	13.9	145.9	45,524	3.04	96%	1.69	17.73	531.93	2.77
Arsenic	13.9	145.9	45,524	2.73E-06	96%	1.52E-06	1.60E-05	4.79E-04	2.49E-06
Beryllium	13.9	145.9	45,524	1.37E-07	96%	7.60E-08	7.98E-07	2.39E-05	1.24E-07
Cadmium	13.9	145.9	45,524	1.37E-07	96%	7.60E-08	7.98E-07	2.39E-05	1.24E-07
Chromium	13.9	145.9	45,524	6.84E-06	96%	3.80E-06	3.99E-05	1.20E-03	6.22E-06
Lead	13.9	145.9	45,524	6.84E-06	96%	3.80E-06	3.99E-05	1.20E-03	6.22E-06
Mangagnese	13.9	145.9	45,524	6.84E-05	96%	3.80E-05	3.99E-04	1.20E-02	6.22E-05
Nickel	13.9	145.9	45,524	2.73E-06	96%	1.52E-06	1.60E-05	4.79E-04	2.49E-06
Selenium	13.9	145.9	45,524	6.84E-07	96%	3.80E-07	3.99E-06	1.20E-04	6.22E-07
Total HAPs						4.92E-05	5.16E-04	1.55E-02	8.05E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-6B
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	158	49,446	15,840	3.0	475.4	148,338
Transfer Trucks	159	49,668	15,840	3.0	477.6	149,004
Pickup Trucks	94	29,401	15,840	3.0	282.7	88,203
Totals	**412**	**128,515**			**1,236**	**385,545**

[1] Vehicles traveling on unpaved roads for MSW and aggregate delivery.
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures:

	Control Efficiency	Source:
Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	158	3,487
Transfer Trucks	39.5	16	27.75	159	4,418
Pickup Trucks	2.8	2.3	2.55	94	240
TOTAL				**412**	**8,144**
				Average Vehicle Weight (tons)	**19.77**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-8.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Collection Trucks Vehicle Weight (W) =	22.00	tons	
Transfer Trucks Vehicle Weight (W) =	27.75	tons	
Pickup Trucks Vehicle Weight (W) =	2.55	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	15	mph	(APCD default)
Number of Vehicle Wheels (w) =	10	(dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(APCD default for general public trucks in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	475.4	148,338	0.75	96%	1.37	14.34	430.12	2.24
PM_{10}	1.0	475.4	148,338	7.54	96%	13.65	143.37	4,301.16	22.37
TSP	1.0	475.4	148,338	16.75	96%	30.34	318.60	9,558.12	49.70
Arsenic	1.0	475.4	148,338	1.51E-05	96%	2.73E-05	2.87E-04	8.60E-03	4.47E-05
Beryllium	1.0	475.4	148,338	7.54E-07	96%	1.37E-06	1.43E-05	4.30E-04	2.24E-06
Cadmium	1.0	475.4	148,338	7.54E-07	96%	1.37E-06	1.43E-05	4.30E-04	2.24E-06
Chromium	1.0	475.4	148,338	3.77E-05	96%	6.83E-05	7.17E-04	2.15E-02	1.12E-04
Lead	1.0	475.4	148,338	3.77E-05	96%	6.83E-05	7.17E-04	2.15E-02	1.12E-04
Mangagnese	1.0	475.4	148,338	3.77E-04	96%	6.83E-04	7.17E-03	2.15E-01	1.12E-03
Mercury	1.0	475.4	148,338	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	475.4	148,338	1.51E-05	96%	2.73E-05	2.87E-04	8.60E-03	4.47E-05
Selenium	1.0	475.4	148,338	3.77E-06	96%	6.83E-06	7.17E-05	2.15E-03	1.12E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	477.6	149,004	0.89	96%	1.61	16.94	508.30	2.64
PM_{10}	1.0	477.6	149,004	8.87	96%	16.14	169.43	5,082.98	26.43
TSP	1.0	477.6	149,004	19.71	96%	35.86	376.52	11,295.52	58.74
Arsenic	1.0	477.6	149,004	1.77E-05	96%	3.23E-05	3.39E-04	1.02E-02	5.29E-05
Beryllium	1.0	477.6	149,004	8.87E-07	96%	1.61E-06	1.69E-05	5.08E-04	2.64E-06
Cadmium	1.0	477.6	149,004	8.87E-07	96%	1.61E-06	1.69E-05	5.08E-04	2.64E-06
Chromium	1.0	477.6	149,004	4.43E-05	96%	8.07E-05	8.47E-04	2.54E-02	1.32E-04
Lead	1.0	477.6	149,004	4.43E-05	96%	8.07E-05	8.47E-04	2.54E-02	1.32E-04
Mangagnese	1.0	477.6	149,004	4.43E-04	96%	8.07E-04	8.47E-03	2.54E-01	1.32E-03
Mercury	1.0	477.6	149,004	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	477.6	149,004	1.77E-05	96%	3.23E-05	3.39E-04	1.02E-02	5.29E-05
Selenium	1.0	477.6	149,004	4.43E-06	96%	8.07E-06	8.47E-05	2.54E-03	1.32E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

Pollutant	Total VMT			Emission Factor (lb/VMT)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	VMT/hr	VMT/day	VMT/yr			lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	282.7	88,203	0.11	96%	0.11	1.19	35.79	0.19
PM_{10}	1.0	282.7	88,203	1.05	96%	1.14	11.93	357.87	1.86
TSP	1.0	282.7	88,203	2.34	96%	2.52	26.51	795.27	4.14
Arsenic	1.0	282.7	88,203	2.11E-06	96%	2.27E-06	2.39E-05	7.16E-04	3.72E-06
Beryllium	1.0	282.7	88,203	1.05E-07	96%	1.14E-07	1.19E-06	3.58E-05	1.86E-07
Cadmium	1.0	282.7	88,203	1.05E-07	96%	1.14E-07	1.19E-06	3.58E-05	1.86E-07
Chromium	1.0	282.7	88,203	5.27E-06	96%	5.68E-06	5.96E-05	1.79E-03	9.30E-06
Lead	1.0	282.7	88,203	5.27E-06	96%	5.68E-06	5.96E-05	1.79E-03	9.30E-06
Mangagnese	1.0	282.7	88,203	5.27E-05	96%	5.68E-05	5.96E-04	1.79E-02	9.30E-05
Mercury	1.0	282.7	88,203	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	282.7	88,203	2.11E-06	96%	2.27E-06	2.39E-05	7.16E-04	3.72E-06
Selenium	1.0	282.7	88,203	5.27E-07	96%	5.68E-07	5.96E-06	1.79E-04	9.30E-07

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	3.09	32.47	974.20	5.07
PM_{10}	30.93	324.73	9,742.01	50.66
TSP	68.73	721.63	21,648.92	112.57
Arsenic	6.19E-05	6.49E-04	0.02	1.01E-04
Beryllium	3.09E-06	3.25E-05	0.001	5.07E-06
Cadmium	3.09E-06	3.25E-05	0.001	5.07E-06
Chromium	1.55E-04	1.62E-03	0.05	2.53E-04
Lead	1.55E-04	1.62E-03	0.05	2.53E-04
Manganese	1.55E-03	1.62E-02	0.49	2.53E-03
Mercury	0.00E+00	0.00E+00	0.00	0.00E+00
Nickel	6.19E-05	6.49E-04	0.02	1.01E-04
Selenium	1.55E-05	1.62E-04	0.00	2.53E-05
Total HAPs	2.00E-03	2.10E-02	6.30E-01	3.28E-03

TABLE C-6C
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	12	3,631	15,840	3.0	34.9	10,893
Totals	**12**	**3,631**			**35**	**10,893**

[1] Vehicles traveling on unpaved roads for imported base material delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	12	349
TOTAL				**12**	**349**
				Average Vehicle Weight (tons)	**30.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-9.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			30.00 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	Factor	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	34.9	10,893	0.94	96%	0.12	1.31	39.24	0.20
PM_{10}	1.0	34.9	10,893	9.37	96%	1.25	13.08	392.44	2.04
TSP	1.0	34.9	10,893	20.82	96%	2.77	29.07	872.08	4.53
Arsenic	1.0	34.9	10,893	1.87E-05	96%	2.49E-06	2.62E-05	7.85E-04	4.08E-06
Beryllium	1.0	34.9	10,893	9.37E-07	96%	1.25E-07	1.31E-06	3.92E-05	2.04E-07
Cadmium	1.0	34.9	10,893	9.37E-07	96%	1.25E-07	1.31E-06	3.92E-05	2.04E-07
Chromium	1.0	34.9	10,893	4.68E-05	96%	6.23E-06	6.54E-05	1.96E-03	1.02E-05
Lead	1.0	34.9	10,893	4.68E-05	96%	6.23E-06	6.54E-05	1.96E-03	1.02E-05
Manganese	1.0	34.9	10,893	4.68E-04	96%	6.23E-05	6.54E-04	1.96E-02	1.02E-04
Mercury	1.0	34.9	10,893	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	34.9	10,893	1.87E-05	96%	2.49E-06	2.62E-05	7.85E-04	4.08E-06
Selenium	1.0	34.9	10,893	4.68E-06	96%	6.23E-07	6.54E-06	1.96E-04	1.02E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.12	1.31	39.24	0.20
PM_{10}	1.25	13.08	392.44	2.04
TSP	2.77	29.07	872.08	4.53
Arsenic	2.49E-06	2.62E-05	7.85E-04	4.08E-06
Beryllium	1.25E-07	1.31E-06	3.92E-05	2.04E-07
Cadmium	1.25E-07	1.31E-06	3.92E-05	2.04E-07
Chromium	6.23E-06	6.54E-05	1.96E-03	1.02E-05
Lead	6.23E-06	6.54E-05	1.96E-03	1.02E-05
Mangagnese	6.23E-05	6.54E-04	1.96E-02	1.02E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.49E-06	2.62E-05	7.85E-04	4.08E-06
Selenium	6.23E-07	6.54E-06	1.96E-04	1.02E-06
Total HAPs	8.06E-05	8.46E-04	2.54E-02	1.32E-04

TABLE C-6D
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	34	10,647	15,840	3.0	102.4	31,941
Totals	**34**	**10,647**			**102**	**31,941**

[1] Vehicles traveling on unpaved roads for green waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	34	333
TOTAL				**34**	**333**
				Average Vehicle Weight (tons)	**9.75**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-10.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			9.75 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for GW truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	102.4	31,941	0.43	96%	0.17	1.75	52.39	0.27
PM_{10}	1.0	102.4	31,941	4.26	96%	1.66	17.46	523.95	2.72
TSP	1.0	102.4	31,941	9.48	96%	3.70	38.81	1,164.33	6.05
Arsenic	1.0	102.4	31,941	8.53E-06	96%	3.33E-06	3.49E-05	1.05E-03	5.45E-06
Beryllium	1.0	102.4	31,941	4.26E-07	96%	1.66E-07	1.75E-06	5.24E-05	2.72E-07
Cadmium	1.0	102.4	31,941	4.26E-07	96%	1.66E-07	1.75E-06	5.24E-05	2.72E-07
Chromium	1.0	102.4	31,941	2.13E-05	96%	8.32E-06	8.73E-05	2.62E-03	1.36E-05
Lead	1.0	102.4	31,941	2.13E-05	96%	8.32E-06	8.73E-05	2.62E-03	1.36E-05
Mangagnese	1.0	102.4	31,941	2.13E-04	96%	8.32E-05	8.73E-04	2.62E-02	1.36E-04
Mercury	1.0	102.4	31,941	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	102.4	31,941	8.53E-06	96%	3.33E-06	3.49E-05	1.05E-03	5.45E-06
Selenium	1.0	102.4	31,941	2.13E-06	96%	8.32E-07	8.73E-06	2.62E-04	1.36E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.17	1.75	52.39	0.27
PM_{10}	1.66	17.46	523.95	2.72
TSP	3.70	38.81	1,164.33	6.05
Arsenic	3.33E-06	3.49E-05	1.05E-03	5.45E-06
Beryllium	1.66E-07	1.75E-06	5.24E-05	2.72E-07
Cadmium	1.66E-07	1.75E-06	5.24E-05	2.72E-07
Chromium	8.32E-06	8.73E-05	2.62E-03	1.36E-05
Lead	8.32E-06	8.73E-05	2.62E-03	1.36E-05
Mangagnese	8.32E-05	8.73E-04	2.62E-02	1.36E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.33E-06	3.49E-05	1.05E-03	5.45E-06
Selenium	8.32E-07	8.73E-06	2.62E-04	1.36E-06
Total HAPs	1.08E-04	1.13E-03	3.39E-02	1.76E-04

TABLE C-6E
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - C&D

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	17	5,357	15,840	3.0	51.5	16,071
Totals	**17**	**5,357**			**52**	**16,071**

[1] Vehicles traveling on unpaved roads for C&D waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	17	206
TOTAL				**17**	**206**
				Average Vehicle Weight (tons)	**12.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-11.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- s = Surface material silt content [%]
- S = Mean vehicle speed (mph)
- W = Vehicle weight [tons]
- w = Number of vehicle wheels (dimensionless)
- p = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			12.00 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionles	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	51.5	16,071	0.49	96%	0.10	1.02	30.49	0.16
PM_{10}	1.0	51.5	16,071	4.93	96%	0.97	10.16	304.86	1.59
TSP	1.0	51.5	16,071	10.96	96%	2.15	22.58	677.48	3.52
Arsenic	1.0	51.5	16,071	9.86E-06	96%	1.94E-06	2.03E-05	6.10E-04	3.17E-06
Beryllium	1.0	51.5	16,071	4.93E-07	96%	9.68E-08	1.02E-06	3.05E-05	1.59E-07
Cadmium	1.0	51.5	16,071	4.93E-07	96%	9.68E-08	1.02E-06	3.05E-05	1.59E-07
Chromium	1.0	51.5	16,071	2.47E-05	96%	4.84E-06	5.08E-05	1.52E-03	7.93E-06
Lead	1.0	51.5	16,071	2.47E-05	96%	4.84E-06	5.08E-05	1.52E-03	7.93E-06
Manganese	1.0	51.5	16,071	2.47E-04	96%	4.84E-05	5.08E-04	1.52E-02	7.93E-05
Mercury	1.0	51.5	16,071	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	51.5	16,071	9.86E-06	96%	1.94E-06	2.03E-05	6.10E-04	3.17E-06
Selenium	1.0	51.5	16,071	2.47E-06	96%	4.84E-07	5.08E-06	1.52E-04	7.93E-07

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.10	1.02	30.49	0.16
PM_{10}	0.97	10.16	304.86	1.59
TSP	2.15	22.58	677.48	3.52
Arsenic	1.94E-06	2.03E-05	6.10E-04	3.17E-06
Beryllium	9.68E-08	1.02E-06	3.05E-05	1.59E-07
Cadmium	9.68E-08	1.02E-06	3.05E-05	1.59E-07
Chromium	4.84E-06	5.08E-05	1.52E-03	7.93E-06
Lead	4.84E-06	5.08E-05	1.52E-03	7.93E-06
Mangagnese	4.84E-05	5.08E-04	1.52E-02	7.93E-05
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.94E-06	2.03E-05	6.10E-04	3.17E-06
Selenium	4.84E-07	5.08E-06	1.52E-04	7.93E-07
Total HAPs	6.26E-05	6.57E-04	1.97E-02	1.03E-04

TABLE C-6F
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	158	49,446	10,560	2.0	317.0	98,892
Transfer Trucks	159	49,668	10,560	2.0	318.4	99,336
Pickup Trucks	94	29,401	10,560	2.0	188.5	58,802
Totals	**412**	**128,515**			**824**	**257,030**

[1] Vehicles traveling on paved roads for MSW and aggregate delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	158	3,487
Transfer Trucks	39.5	16	27.75	159	4,418
Pickup Trucks	2.8	2.3	2.55	94	240
TOTAL				**412**	**8,144**
				Average Vehicle Weight (tons)	**19.77**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE C-6F
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)	
k factor for PM_{10} =	0.016 lb/VMT	(from AP-42, Table 13.2-1.1)	
k factor for TSP =	0.082 lb/VMT	(from AP-42, Table 13.2-1.1)	
Silt Loading Factor (sL) =	13.6 g/m^2	(APCD default)	
Collection Trucks Vehicle Weight (W) =	22.00 tons		
Transfer Trucks Vehicle Weight (W) =	27.75 tons		
Pickup Trucks Vehicle Weight (W) =	2.55 tons		
Control efficiency (e) =	0 %	(APCD default)	
Concentration of each listed substance in haul road emissions (Ci) =			
Arsenic	20 ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1 ppmw =	1.00E-06 lbs/lb	
Cadmium	1 ppmw =	1.00E-06 lbs/lb	
Chromium	50 ppmw =	5.00E-05 lbs/lb	
Lead	50 ppmw =	5.00E-05 lbs/lb	
Mangagnese	500 ppmw =	5.00E-04 lbs/lb	
Mercury	0 ppmw =	0.00E+00 lbs/lb	
Nickel	20 ppmw =	2.00E-05 lbs/lb	
Selenium	5 ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000 ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000 ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	317.0	98,892	0.27	0%	8.17	85.78	2,573.34	13.38
PM_{10}	1.0	317.0	98,892	1.10	0%	33.34	350.11	10,503.42	54.62
TSP	1.0	317.0	98,892	5.66	0%	170.89	1,794.33	53,830.03	279.92
Arsenic	1.0	317.0	98,892	5.41E-06	0%	1.63E-04	1.72E-03	5.15E-02	2.68E-04
Beryllium	1.0	317.0	98,892	2.71E-07	0%	8.17E-06	8.58E-05	2.57E-03	1.34E-05
Cadmium	1.0	317.0	98,892	2.71E-07	0%	8.17E-06	8.58E-05	2.57E-03	1.34E-05
Chromium	1.0	317.0	98,892	1.35E-05	0%	4.08E-04	4.29E-03	1.29E-01	6.69E-04
Lead	1.0	317.0	98,892	1.35E-05	0%	4.08E-04	4.29E-03	1.29E-01	6.69E-04
Mangagnese	1.0	317.0	98,892	1.35E-04	0%	4.08E-03	4.29E-02	1.29E+00	6.69E-03
Mercury	1.0	317.0	98,892	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	317.0	98,892	5.41E-06	0%	1.63E-04	1.72E-03	5.15E-02	2.68E-04
Selenium	1.0	317.0	98,892	1.35E-06	0%	4.08E-05	4.29E-04	1.29E-02	6.69E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	318.4	99,336	0.38	0%	11.62	122.06	3,661.87	19.04
PM_{10}	1.0	318.4	99,336	1.56	0%	47.45	498.21	14,946.40	77.72
TSP	1.0	318.4	99,336	8.02	0%	243.18	2,553.34	76,600.32	398.32
Arsenic	1.0	318.4	99,336	7.67E-06	0%	2.32E-04	2.44E-03	7.32E-02	3.81E-04
Beryllium	1.0	318.4	99,336	3.83E-07	0%	1.16E-05	1.22E-04	3.66E-03	1.90E-05
Cadmium	1.0	318.4	99,336	3.83E-07	0%	1.16E-05	1.22E-04	3.66E-03	1.90E-05
Chromium	1.0	318.4	99,336	1.92E-05	0%	5.81E-04	6.10E-03	1.83E-01	9.52E-04
Lead	1.0	318.4	99,336	1.92E-05	0%	5.81E-04	6.10E-03	1.83E-01	9.52E-04
Mangagnese	1.0	318.4	99,336	1.92E-04	0%	5.81E-03	6.10E-02	1.83E+00	9.52E-03
Mercury	1.0	318.4	99,336	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	318.4	99,336	7.67E-06	0%	2.32E-04	2.44E-03	7.32E-02	3.81E-04
Selenium	1.0	318.4	99,336	1.92E-06	0%	5.81E-05	6.10E-04	1.83E-02	9.52E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-6F
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

Pollutant	Total VMT			Emission Factor (lb/VMT)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	VMT/hr	VMT/day	VMT/yr			lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	188.5	58,802	0.01	0%	0.19	2.01	60.38	0.31
PM_{10}	1.0	188.5	58,802	0.04	0%	0.78	8.22	246.46	1.28
TSP	1.0	188.5	58,802	0.22	0%	4.01	42.10	1,263.08	6.57
Arsenic	1.0	188.5	58,802	2.14E-07	0%	3.83E-06	4.03E-05	1.21E-03	6.28E-06
Beryllium	1.0	188.5	58,802	1.07E-08	0%	1.92E-07	2.01E-06	6.04E-05	3.14E-07
Cadmium	1.0	188.5	58,802	1.07E-08	0%	1.92E-07	2.01E-06	6.04E-05	3.14E-07
Chromium	1.0	188.5	58,802	5.34E-07	0%	9.58E-06	1.01E-04	3.02E-03	1.57E-05
Lead	1.0	188.5	58,802	5.34E-07	0%	9.58E-06	1.01E-04	3.02E-03	1.57E-05
Mangagnese	1.0	188.5	58,802	5.34E-06	0%	9.58E-05	1.01E-03	3.02E-02	1.57E-04
Mercury	1.0	188.5	58,802	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	188.5	58,802	2.14E-07	0%	3.83E-06	4.03E-05	1.21E-03	6.28E-06
Selenium	1.0	188.5	58,802	5.34E-08	0%	9.58E-07	1.01E-05	3.02E-04	1.57E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	19.99	209.85	6295.59	32.74
PM_{10}	81.58	856.54	25,696.28	133.62
TSP	418.07	4389.78	131,693.43	684.81
Arsenic	4.00E-04	4.20E-03	1.26E-01	6.55E-04
Beryllium	2.00E-05	2.10E-04	6.30E-03	3.27E-05
Cadmium	2.00E-05	2.10E-04	6.30E-03	3.27E-05
Chromium	9.99E-04	1.05E-02	3.15E-01	1.64E-03
Lead	9.99E-04	1.05E-02	3.15E-01	1.64E-03
Mangagnese	9.99E-03	1.05E-01	3.15E+00	1.64E-02
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.00E-04	4.20E-03	1.26E-01	6.55E-04
Selenium	9.99E-05	1.05E-03	3.15E-02	1.64E-04
Total HAPs	1.29E-02	1.36E-01	4.07E+00	2.12E-02

TABLE C-6G
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	12	3,631	10,560	2.0	23.3	7,262
Totals	**12**	**3,631**			**23**	**7,262**

[1] Vehicles traveling on paved roads for imported base material delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 0%
Source: Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	12	349
TOTAL				**12**	**349**
				Average Vehicle Weight (tons)	**30.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE C-6G
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	30.00	tons	
Control efficiency (e) =	0	%	(APCD default)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	23.3	7,262	0.43	0%	0.96	10.03	300.91	1.56
PM_{10}	1.0	23.3	7,262	1.76	0%	3.90	40.94	1,228.21	6.39
TSP	1.0	23.3	7,262	9.01	0%	19.98	209.82	6,294.59	32.73
Arsenic	1.0	23.3	7,262	8.62E-06	0%	1.91E-05	2.01E-04	6.02E-03	3.13E-05
Beryllium	1.0	23.3	7,262	4.31E-07	0%	9.55E-07	1.00E-05	3.01E-04	1.56E-06
Cadmium	1.0	23.3	7,262	4.31E-07	0%	9.55E-07	1.00E-05	3.01E-04	1.56E-06
Chromium	1.0	23.3	7,262	2.15E-05	0%	4.78E-05	5.02E-04	1.50E-02	7.82E-05
Lead	1.0	23.3	7,262	2.15E-05	0%	4.78E-05	5.02E-04	1.50E-02	7.82E-05
Mangagnese	1.0	23.3	7,262	2.15E-04	0%	4.78E-04	5.02E-03	1.50E-01	7.82E-04
Mercury	1.0	23.3	7,262	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	23.3	7,262	8.62E-06	0%	1.91E-05	2.01E-04	6.02E-03	3.13E-05
Selenium	1.0	23.3	7,262	2.15E-06	0%	4.78E-06	5.02E-05	1.50E-03	7.82E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.96	10.03	300.91	1.56
PM_{10}	3.90	40.94	1228.21	6.39
TSP	19.98	209.82	6294.59	32.73
Arsenic	1.91E-05	2.01E-04	6.02E-03	3.13E-05
Beryllium	9.55E-07	1.00E-05	3.01E-04	1.56E-06
Cadmium	9.55E-07	1.00E-05	3.01E-04	1.56E-06
Chromium	4.78E-05	5.02E-04	1.50E-02	7.82E-05
Lead	4.78E-05	5.02E-04	1.50E-02	7.82E-05
Mangagnese	4.78E-04	5.02E-03	1.50E-01	7.82E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.91E-05	2.01E-04	6.02E-03	3.13E-05
Selenium	4.78E-06	5.02E-05	1.50E-03	7.82E-06
Total HAPs	6.18E-04	6.49E-03	1.95E-01	1.01E-03

TABLE C-6H
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	34	10,647	10,560	2.0	68.3	21,294
Totals	**34**	**10,647**			**68**	**21,294**

[1] Vehicles traveling on paved roads for green waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: **Control Efficiency** **Source:**
Watering Roads as needed: 0% Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	34	333
TOTAL				**34**	**333**
				Average Vehicle Weight (tons)	**9.75**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE C-6H
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	9.75	tons	
Control efficiency (e) =	0	%	(APCD default)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	68.3	21,294	0.08	0%	0.52	5.45	163.48	0.85
PM_{10}	1.0	68.3	21,294	0.33	0%	2.12	22.24	667.27	3.47
TSP	1.0	68.3	21,294	1.67	0%	10.86	113.99	3,419.74	17.78
Arsenic	1.0	68.3	21,294	1.60E-06	0%	1.04E-05	1.09E-04	3.27E-03	1.70E-05
Beryllium	1.0	68.3	21,294	7.98E-08	0%	5.19E-07	5.45E-06	1.63E-04	8.50E-07
Cadmium	1.0	68.3	21,294	7.98E-08	0%	5.19E-07	5.45E-06	1.63E-04	8.50E-07
Chromium	1.0	68.3	21,294	3.99E-06	0%	2.59E-05	2.72E-04	8.17E-03	4.25E-05
Lead	1.0	68.3	21,294	3.99E-06	0%	2.59E-05	2.72E-04	8.17E-03	4.25E-05
Mangagnese	1.0	68.3	21,294	3.99E-05	0%	2.59E-04	2.72E-03	8.17E-02	4.25E-04
Mercury	1.0	68.3	21,294	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	68.3	21,294	1.60E-06	0%	1.04E-05	1.09E-04	3.27E-03	1.70E-05
Selenium	1.0	68.3	21,294	3.99E-07	0%	2.59E-06	2.72E-05	8.17E-04	4.25E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.52	5.45	163.48	0.85
PM_{10}	2.12	22.24	667.27	3.47
TSP	10.86	113.99	3419.74	17.78
Arsenic	1.04E-05	1.09E-04	3.27E-03	1.70E-05
Beryllium	5.19E-07	5.45E-06	1.63E-04	8.50E-07
Cadmium	5.19E-07	5.45E-06	1.63E-04	8.50E-07
Chromium	2.59E-05	2.72E-04	8.17E-03	4.25E-05
Lead	2.59E-05	2.72E-04	8.17E-03	4.25E-05
Mangagnese	2.59E-04	2.72E-03	8.17E-02	4.25E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.04E-05	1.09E-04	3.27E-03	1.70E-05
Selenium	2.59E-06	2.72E-05	8.17E-04	4.25E-06
Total HAPs	3.36E-04	3.53E-03	1.06E-01	5.50E-04

TABLE C-6I
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	17	5,357	10,560	2.0	34.3	10,714
Totals	**17**	**5,357**			**34**	**10,714**

[1] Vehicles traveling on paved roads for C&D waste delivery
[2] Length of roads provided by site personnel.
[3] Based on 2023 actual vehicle data from vehicle ticket counts and 312 operational days per year.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: **Control Efficiency** **Source:**
Watering Roads as needed: 0% Based on control efficiency from SDAPCD EI guidance

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	17	206
TOTAL				**17**	**206**
				Average Vehicle Weight (tons)	**12.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE C-6I
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)	
k factor for PM_{10} =	0.016 lb/VMT	(from AP-42, Table 13.2-1.1)	
k factor for TSP =	0.082 lb/VMT	(from AP-42, Table 13.2-1.1)	
Silt Loading Factor (sL) =	13.6 g/m^2	(APCD default)	
Transfer Trucks Vehicle Weight (W) =	12.00 tons		
Control efficiency (e) =	0 %	(APCD default)	
Concentration of each listed substance in haul road emissions (Ci) =			
Arsenic	20 ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1 ppmw =	1.00E-06 lbs/lb	
Cadmium	1 ppmw =	1.00E-06 lbs/lb	
Chromium	50 ppmw =	5.00E-05 lbs/lb	
Lead	50 ppmw =	5.00E-05 lbs/lb	
Mangagnese	500 ppmw =	5.00E-04 lbs/lb	
Mercury	0 ppmw =	0.00E+00 lbs/lb	
Nickel	20 ppmw =	2.00E-05 lbs/lb	
Selenium	5 ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000 ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000 ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor		Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Control Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	34.3	10,714	0.11	0%	0.36	3.74	112.31	0.58
PM_{10}	1.0	34.3	10,714	0.44	0%	1.46	15.28	458.42	2.38
TSP	1.0	34.3	10,714	2.28	0%	7.46	78.31	2,349.38	12.22
Arsenic	1.0	34.3	10,714	2.18E-06	0%	7.13E-06	7.49E-05	2.25E-03	1.17E-05
Beryllium	1.0	34.3	10,714	1.09E-07	0%	3.57E-07	3.74E-06	1.12E-04	5.84E-07
Cadmium	1.0	34.3	10,714	1.09E-07	0%	3.57E-07	3.74E-06	1.12E-04	5.84E-07
Chromium	1.0	34.3	10,714	5.45E-06	0%	1.78E-05	1.87E-04	5.62E-03	2.92E-05
Lead	1.0	34.3	10,714	5.45E-06	0%	1.78E-05	1.87E-04	5.62E-03	2.92E-05
Mangagnese	1.0	34.3	10,714	5.45E-05	0%	1.78E-04	1.87E-03	5.62E-02	2.92E-04
Mercury	1.0	34.3	10,714	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	34.3	10,714	2.18E-06	0%	7.13E-06	7.49E-05	2.25E-03	1.17E-05
Selenium	1.0	34.3	10,714	5.45E-07	0%	1.78E-06	1.87E-05	5.62E-04	2.92E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.36	3.74	3.74	0.58
PM_{10}	1.46	15.28	15.28	2.38
TSP	7.46	78.31	78.31	12.22
Arsenic	7.13E-06	7.49E-05	7.49E-05	1.17E-05
Beryllium	3.57E-07	3.74E-06	3.74E-06	5.84E-07
Cadmium	3.57E-07	3.74E-06	3.74E-06	5.84E-07
Chromium	1.78E-05	1.87E-04	1.87E-04	2.92E-05
Lead	1.78E-05	1.87E-04	1.87E-04	2.92E-05
Mangagnese	1.78E-04	1.87E-03	1.87E-03	2.92E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7.13E-06	7.49E-05	7.49E-05	1.17E-05
Selenium	1.78E-06	1.87E-05	1.87E-05	2.92E-06
Total HAPs	2.31E-04	2.42E-03	2.42E-03	3.78E-04

TABLE C-6J
2023 ACTUAL FUGITIVE DUST EMISSIONS FROM STOCKPILES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Cover Stockpile\Surface

Process ID: STK

Methodologies:
AP-42, Section 8.19 for Crushed Stone Processing (9/85) which are SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 8.19 for Crushed Stone Processing):

$$E_a = (A)[(Efa*Da) + (Efi*Di)](Ci)(1-e)$$

Where:

E_a = Annual emissions of each contaminant (lb/yr)
A = Area of soil stockpile (acres)
EFa = Emission factor for active days (lb/acre/active day)
Da = Number of active days (days/yr)
EFi = Emission factor for inactive days (lb/acre/active day)
Di = Number of inactive days (days/yr)
Ci = Concentration of each listed substance in soil (lbs/lb)
e = Control Efficiency (%)

Variables:

Area of soil stockpile (A) =	10	acres	(per SLI personnel)
TSP Emission factor for active days (EFa) =	13.2	lb/acre/day	(AP-42, Section 8.19)
TSP Emission factor for inactive days (EFi) =	3.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
Number of Active Days/Year (Da) =	312	days	(per SLI personnel)
Number of Inactive Days/Year (Di) =	53	days	(per SLI personnel)
Control efficiency (e) =	0.0%		(Water trucks not utilized)

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

Note: Loader and water truck used for stockpiles and already accounted for in fugitive dust estimates for landfill equipment.

SUMMARY OF EMISSIONS FROM COVER STORAGE PILES

	Estimated Actual Emissions			
Pollutant	(lb/hr)	(lb/day)	(lb/month)	(tons/yr)
$PM_{2.5}$	2.42	58.03	1740.90	10.59
PM_{10}	2.42	58.03	1740.90	10.59
TSP	4.91	117.92	3537.45	21.52
Arsenic	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Beryllium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Cadmium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Chromium	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Lead	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Mangagnese	1.21E-03	2.90E-02	8.70E-01	5.30E-03
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Selenium	1.21E-05	2.90E-04	8.70E-03	5.30E-05
Total HAPs	1.56E-03	3.75E-02	1.13E+00	6.85E-03

TABLE C-6K
2023 ACTUAL FUGITIVE DUST EMISSIONS FROM MATERIAL HANDLING - EARTHMOVING ACTIVITIES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Material Handling - Earthmoving Activities
Process ID: EMA

Amount of Soil Moved

Type of Vehicle	Soil Density[1]	Load Volume[2]	Vehicle Load Weight	Total Soil Moved[3]		Amount (Tons)	
	tons/yd^3	yd^3/load	tons/load	yd^3/day	yd^3/year	(per day)	(per year)
Articulated Dump Trucks (#1, #2 and #3)	1.35	16	21.07	627.33	195,728	846.9	264,233

[1] Soil density from 2012 EIR Air Quality Analysis, Table AQ-F-28, 2015-2019.
[2] Soil volume based on actual volume for articulated dump truck.
[3] Amount of soil moved based on 2023 actual soil data (airspace consumed by clean soil).

Operations Data[1]

312	days per year

[1]Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:
Cumulative Total Control: 0% *Per SDAPCD*

Emissions Calculation Methodology (SDAPCD Defaults):

TSP	=	0.05	lb/ton	(TSP)
PM_{10}	=	0.021	lb/ton	(PM_{10})
$PM_{2.5}$	=	0.021	lb/ton	($PM_{2.5}$)

SDAPCD has no default emission factor for $PM_{2.5}$. Assumed $PM_{2.5}$ equal to PM_{10}.

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

SUMMARY OF PARTICULATE EMISSIONS FROM MATERIAL HANDLING

Pollutant	Total Amount		Emission Factor (lb/ton)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	ton/day	ton/yr			lb/hr	lbs/day	lb/month	tons/yr
$PM_{2.5}$	846.9	264,233	2.10E-02	0%	1.69E+00	1.78E+01	5.34E+02	2.77E+00
PM_{10}	846.9	264,233	2.10E-02	0%	1.69E+00	1.78E+01	5.34E+02	2.77E+00
TSP	846.9	264,233	5.00E-02	0%	4.03E+00	4.23E+01	1.27E+03	6.61E+00
Arsenic	846.9	264,233	4.20E-07	0%	3.39E-05	3.56E-04	1.07E-02	5.55E-05
Beryllium	846.9	264,233	2.10E-08	0%	1.69E-06	1.78E-05	5.34E-04	2.77E-06
Cadmium	846.9	264,233	2.10E-08	0%	1.69E-06	1.78E-05	5.34E-04	2.77E-06
Chromium	846.9	264,233	1.05E-06	0%	8.47E-05	8.89E-04	2.67E-02	1.39E-04
Lead	846.9	264,233	1.05E-06	0%	8.47E-05	8.89E-04	2.67E-02	1.39E-04
Mangagnese	846.9	264,233	1.05E-05	0%	8.47E-04	8.89E-03	2.67E-01	1.39E-03
Mercury	846.9	264,233	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	846.9	264,233	4.20E-07	0%	3.39E-05	3.56E-04	1.07E-02	5.55E-05
Selenium	846.9	264,233	1.05E-07	0%	8.47E-06	8.89E-05	2.67E-03	1.39E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MATERIAL HANDLING

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.69	17.78	533.55	2.77
PM_{10}	1.69	17.78	533.55	2.77
TSP	4.03	42.35	1270.35	6.61
Arsenic	3.39E-05	3.56E-04	1.07E-02	5.55E-05
Beryllium	1.69E-06	1.78E-05	5.34E-04	2.77E-06
Cadmium	1.69E-06	1.78E-05	5.34E-04	2.77E-06
Chromium	8.47E-05	8.89E-04	2.67E-02	1.39E-04
Lead	8.47E-05	8.89E-04	2.67E-02	1.39E-04
Mangagnese	8.47E-04	8.89E-03	2.67E-01	1.39E-03
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.39E-05	3.56E-04	1.07E-02	5.55E-05
Selenium	8.47E-06	8.89E-05	2.67E-03	1.39E-05
Total HAPs	1.10E-03	1.15E-02	3.45E-01	1.80E-03

TABLE C-6L
2023 ACTUAL FUGITIVE DUST EMISSIONS FOR EARTHMOVING EQUIPMENT ON UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Earthmoving Activities - Travel
Process ID: EMA-UPR

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	Soil Density[2]	Load Volume[3]	Vehicle Load Weight	Total Soil Moved[4]				# of Vehicles trips per day	# of Vehicle trips per Year[5]	Length of road (round trip)[6]		VMT Data	
	tons/yd^3	yd^3/load	tons/load	yd^3/day	yd^3/year	tons/day	tons/yr			Feet	Miles	(per day)	(per year)
Articulated Dump Truck (#1)	1.35	10	14.00	627.33	195,728	847	264,233	6	1,806	2,640	0.5	2.9	903
Articulated Dump Truck (#2)	1.35	18	24.60					15	4,703	2,640	0.5	7.5	2,352
Articulated Dump Truck (#3)	1.35	18	24.60					16	5,010	2,640	0.5	8.0	2,505
Totals								**37**	**11,519**			**18**	**5,760**

[1] Vehicles traveling on unpaved roads for earthmoving activities.
[2] Soil density from 2012 EIR Air Quality Analysis, Table AQ-F-28, 2015-2019.
[3] Soil volume based on actual volume for articulated dump truck.
[4] Amount of soil moved based on 2023 actual soil data (airspace consumed by clean soil).
[5] Number of trips per day based on each vehicle's operating hours over 312 total days and amount of soil moved (231 hrs for #1, 1,057 hrs for #2, and 1,126hrs for #3).
[6] Length of roads provided by site personnel.

Operations Data

312	days per year
10.5	hrs/day

*Operational days per year based on Monday through Saturday from 6:00 am to 4:30 pm where scrapers used on during wet weather (30 days/yr)

Fugitive Dust Control Measures Control Efficier Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressents:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

	Operating Weight		Soil Density***	Soil Loading Capacity		Average Vehicle Weight
Type of Construction Vehicle*	(lbs)	(tons)	(lb/cf)	(cy)	(tons)	(tons)
Articulating Dump Truck	52,533	26	2,700	15.60	21.07	47.3

*Weights based on site personnel and soil density of 1.35 tons/cy.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

E_a = Annual emissions of each contaminant (lb/yr)
VMT = Vehicle miles traveled on site (miles/yr)
k = Empirical constant [lb/VMT]
s = Surface material silt content [%]
S = Mean vehicle speed (mph)
W = Vehicle weight [tons]
w = Number of vehicle wheels (dimensionless)
p = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
e = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8	lb/VMT	(from AP-42, Table 13.2.2)
Vehicle Weight (W) =			47.33	tons	(Actual)
Mean Silt content (s) =			15	%	(APCD default)
Mean Vehicle Speed (S) =			15	mph	(APCD default)
Number of Vehicle Wheels (w) =			4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96	%	PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =					
Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM ARTICULATED DUMP TRUCKS (EARTHMOVING TRAVEL)

	Total VMT			Emission Factor	Control Efficiency (%)	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]		lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	18.5	5,760	0.82	96%	0.06	0.60	18.06	0.09
PM_{10}	1.0	18.5	5,760	8.15	96%	0.57	6.02	180.59	0.94
TSP	1.0	18.5	5,760	18.12	96%	1.27	13.38	401.30	2.09
Arsenic	1.0	18.5	5,760	1.63E-05	96%	1.15E-06	1.20E-05	3.61E-04	1.88E-06
Beryllium	1.0	18.5	5,760	8.15E-07	96%	5.73E-08	6.02E-07	1.81E-05	9.39E-08
Cadmium	1.0	18.5	5,760	8.15E-07	96%	5.73E-08	6.02E-07	1.81E-05	9.39E-08
Chromium	1.0	18.5	5,760	4.08E-05	96%	2.87E-06	3.01E-05	9.03E-04	4.70E-06
Lead	1.0	18.5	5,760	4.08E-05	96%	2.87E-06	3.01E-05	9.03E-04	4.70E-06
Mangagnese	1.0	18.5	5,760	4.08E-04	96%	2.87E-05	3.01E-04	9.03E-03	4.70E-05
Mercury	1.0	18.5	5,760	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	18.5	5,760	1.63E-05	96%	1.15E-06	1.20E-05	3.61E-04	1.88E-06
Selenium	1.0	18.5	5,760	4.08E-06	96%	2.87E-07	3.01E-06	9.03E-05	4.70E-07
Total HAPs						3.71E-05	3.89E-04	1.17E-02	6.08E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE C-6M
SUMMARY OF 2023 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	Actual	
		lb/day	ton/yr
2023 Landfill Equipment	Particulate Matter < 2.5 Microns	0.80	0.12
	Particulate Matter < 10 Microns	7.98	1.24
	Total Suspended Particulates	17.73	2.77
	Hazardous Air Pollutants	5.16E-04	8.05E-05
2023 Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	32.47	5.07
	Particulate Matter < 10 Microns	324.73	50.66
	Total Suspended Particulates	721.63	112.57
	Hazardous Air Pollutants	2.10E-02	3.28E-03
2023 Unpaved Roadways - Imported Base	Particulate Matter < 2.5 Microns	1.31	0.20
Material	Particulate Matter < 10 Microns	13.08	2.04
	Total Suspended Particulates	29.07	4.53
	Hazardous Air Pollutants	8.46E-04	1.32E-04
2023 Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.75	0.27
	Particulate Matter < 10 Microns	17.46	2.72
	Total Suspended Particulates	38.81	6.05
	Hazardous Air Pollutants	1.13E-03	1.76E-04
2023 Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	1.02	0.16
	Particulate Matter < 10 Microns	10.16	1.59
	Total Suspended Particulates	22.58	3.52
	Hazardous Air Pollutants	6.57E-04	1.03E-04
2023 Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	209.85	32.74
	Particulate Matter < 10 Microns	856.54	133.62
	Total Suspended Particulates	4,389.78	684.81
	Hazardous Air Pollutants	1.36E-01	2.12E-02
2023 Paved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	10.03	1.56
	Particulate Matter < 10 Microns	40.94	6.39
	Total Suspended Particulates	209.82	32.73
	Hazardous Air Pollutants	6.49E-03	1.01E-03
2023 Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	5.45	0.85
	Particulate Matter < 10 Microns	22.24	3.47
	Total Suspended Particulates	113.99	17.78
	Hazardous Air Pollutants	3.53E-03	5.50E-04
2023 Paved Roadways - C&D	Particulate Matter < 2.5 Microns	3.74	0.58
	Particulate Matter < 10 Microns	15.28	2.38
	Total Suspended Particulates	78.31	12.22
	Hazardous Air Pollutants	2.42E-03	3.78E-04

TABLE C-6M
SUMMARY OF 2023 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	Actual	
		lb/day	ton/yr
2023 Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59
	Total Suspended Particulates	117.92	21.52
	Hazardous Air Pollutants	3.75E-02	6.85E-03
2023 Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	17.78	2.77
	Particulate Matter < 10 Microns	17.78	2.77
	Total Suspended Particulates	42.35	6.61
	Hazardous Air Pollutants	1.15E-02	1.80E-03
2023 Material Handling - Travel	Particulate Matter < 2.5 Microns	0.60	0.09
	Particulate Matter < 10 Microns	6.02	0.94
	Total Suspended Particulates	13.38	2.09
	Hazardous Air Pollutants	3.89E-04	6.08E-05
2023 Total From All Emission Points	Volatile Organic Compounds	--	--
(Fugitive and Non-Fugitive)	Non-Methane Organic Compounds	--	--
	Sulfur Oxides	--	--
	Carbon Monoxide	--	--
	Nitrogen Oxides	--	--
	Particulate Matter < 2.5 Microns	342.84	55.02
	Particulate Matter < 10 Microns	1,390.26	218.42
	Total Suspended Particulates	5,795.37	907.20
	Total Hazardous Air Pollutants	0.22	0.04

TABLE C-7
SUMMARY OF 2022-2023 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	2023 Actual		2022 Actual		2-Year Average	
		lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
Landfill Equipment	Particulate Matter < 2.5 Microns	0.80	0.12	0.56	0.09	0.68	0.11
	Particulate Matter < 10 Microns	7.98	1.24	5.64	0.88	6.81	1.06
	Total Suspended Particulates	17.73	2.77	12.53	1.95	15.13	2.36
	Hazardous Air Pollutants	5.16E-04	8.05E-05	3.65E-04	5.69E-05	4.40E-04	6.87E-05
Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	32.47	5.07	23.81	3.71	28.14	4.39
	Particulate Matter < 10 Microns	324.73	50.66	238.13	37.15	281.43	43.90
	Total Suspended Particulates	721.63	112.57	529.17	82.55	625.40	97.56
	Hazardous Air Pollutants	2.10E-02	3.28E-03	1.54E-02	2.40E-03	1.82E-02	2.84E-03
Unpaved Roadways - Imported Base	Particulate Matter < 2.5 Microns	1.31	0.20	1.48	0.23	1.39	0.22
Material	Particulate Matter < 10 Microns	13.08	2.04	14.81	2.31	13.95	2.18
	Total Suspended Particulates	29.07	4.53	32.91	5.13	30.99	4.83
	Hazardous Air Pollutants	8.46E-04	1.32E-04	9.58E-04	1.49E-04	9.02E-04	1.41E-04
Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.75	0.27	1.58	0.25	1.66	0.26
	Particulate Matter < 10 Microns	17.46	2.72	15.81	2.47	16.64	2.60
	Total Suspended Particulates	38.81	6.05	35.13	5.48	36.97	5.77
	Hazardous Air Pollutants	1.13E-03	1.76E-04	1.02E-03	1.60E-04	1.08E-03	1.68E-04
Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	1.02	0.16	1.02	0.16	1.02	0.16
	Particulate Matter < 10 Microns	10.16	1.59	10.18	1.59	10.17	1.59
	Total Suspended Particulates	22.58	3.52	22.61	3.53	22.60	3.53
	Hazardous Air Pollutants	6.57E-04	1.03E-04	6.58E-04	1.03E-04	6.58E-04	1.03E-04
Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	209.85	32.74	151.97	23.71	180.91	28.22
	Particulate Matter < 10 Microns	856.54	133.62	620.28	96.76	738.41	115.19
	Total Suspended Particulates	4,389.78	684.81	3,178.93	495.91	3,784.36	590.36
	Hazardous Air Pollutants	1.36E-01	2.12E-02	9.83E-02	1.53E-02	1.17E-01	1.83E-02

TABLE C-7
SUMMARY OF 2022-2023 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	2023 Actual		2022 Actual		2-Year Average	
		lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
Paved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	10.03	1.56	11.36	1.77	10.69	1.67
	Particulate Matter < 10 Microns	40.94	6.39	46.35	7.23	43.65	6.81
	Total Suspended Particulates	209.82	32.73	237.56	37.06	223.69	34.90
	Hazardous Air Pollutants	6.49E-03	1.01E-03	7.35E-03	1.15E-03	6.92E-03	1.08E-03
Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	5.45	0.85	4.93	0.77	5.19	0.81
	Particulate Matter < 10 Microns	22.24	3.47	20.13	3.14	21.19	3.31
	Total Suspended Particulates	113.99	17.78	103.18	16.10	108.58	16.94
	Hazardous Air Pollutants	3.53E-03	5.50E-04	3.19E-03	4.98E-04	3.36E-03	5.24E-04
Paved Roadways - C&D	Particulate Matter < 2.5 Microns	3.74	0.58	3.75	0.58	3.75	0.58
	Particulate Matter < 10 Microns	15.28	2.38	15.30	2.39	15.29	2.39
	Total Suspended Particulates	78.31	12.22	78.41	12.23	78.36	12.22
	Hazardous Air Pollutants	2.42E-03	3.78E-04	2.43E-03	3.78E-04	2.42E-03	3.78E-04
Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59	58.03	10.59	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59	58.03	10.59	58.03	10.59
	Total Suspended Particulates	117.92	21.52	117.92	21.52	117.92	21.52
	Hazardous Air Pollutants	3.75E-02	6.85E-03	3.75E-02	6.85E-03	3.75E-02	6.85E-03
Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	17.78	2.77	11.25	1.75	14.52	2.26
	Particulate Matter < 10 Microns	17.78	2.77	11.25	1.75	14.52	2.26
	Total Suspended Particulates	42.35	6.61	26.78	4.18	34.56	5.39
	Hazardous Air Pollutants	1.15E-02	1.80E-03	7.28E-03	1.14E-03	9.39E-03	1.47E-03
Material Handling - Travel	Particulate Matter < 2.5 Microns	0.60	0.09	0.39	0.06	0.50	0.08
	Particulate Matter < 10 Microns	6.02	0.94	3.93	0.61	4.97	0.78
	Total Suspended Particulates	13.38	2.09	8.72	1.36	11.05	1.72
	Hazardous Air Pollutants	3.89E-04	6.08E-05	2.54E-04	3.96E-05	3.22E-04	5.02E-05

TABLE C-7
SUMMARY OF 2022-2023 FUGITIVE DUST ACTUAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	2023 Actual		2022 Actual		2-Year Average	
		lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
Total From All Emission Points	Volatile Organic Compounds	--	--	--	--	--	--
(Fugitive and Non-Fugitive)	Non-Methane Organic Compounds	--	--	--	--	--	--
	Sulfur Oxides	--	--	--	--	--	--
	Carbon Monoxide	--	--	--	--	--	--
	Nitrogen Oxides	--	--	--	--	--	--
	Particulate Matter < 2.5 Microns	342.84	55.02	270.13	43.68	306.48	49.35
	Particulate Matter < 10 Microns	1,390.26	218.42	1,059.83	166.87	1,225.04	192.64
	Total Suspended Particulates	5,795.37	907.20	4,383.85	687.01	5,089.61	797.10
	Total Hazardous Air Pollutants	0.22	0.04	0.17	0.03	0.20	0.03

Appendix D

IPCC Model Results

Data Input: Landfill Characteristics

Landfill Name:	Sycamore Landfill	**Year Opened:**	1967	Click for lists of k values	
State/Country:	CA	**If Closed, Year:**		**k Value:**	0.020
City/County:	Santee/San Diego			**M Value:**	6

Data Input: Waste Deposit History

	Waste			Daily Cover			
	Waste Deposited			Greenwaste & Compost		Sludge	
Year	Tons	% ANDOC		Tons	% ANDOC	Tons	% ANDOC
1900							
1901							
1902							
1903							
1904							
1905							
1906							
1907							
1908							
1909							
1910							
1911							
1912							
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1947							
1948							
1949							
1950							
1951							

Data Input: Landfill Characteristics

Landfill Name:	Sycamore Landfill	**Year Opened:**	1967	Click for lists of k values	
State/Country:	CA	**If Closed, Year:**		**k Value:**	0.020
City/County:	Santee/San Diego			**M Value:**	6

Data Input: Waste Deposit History

	Waste			Daily Cover			
	Waste Deposited			Greenwaste & Compost		Sludge	
Year	Tons	% ANDOC		Tons	% ANDOC	Tons	% ANDOC
1952							
1953							
1954							
1955							
1956							
1957							
1958							
1959							
1960							
1961							
1962							
1963							
1964							
1965							
1966							
1967	115,200	9.53%					
1968	134,400	9.53%					
1969	153,600	9.53%					
1970	172,800	9.53%					
1971	192,000	9.53%					
1972	211,200	9.53%					
1973	230,400	9.53%					
1974	249,600	9.53%					
1975	268,800	9.59%					
1976	288,000	9.59%					
1977	290,160	9.59%					
1978	292,320	9.59%					
1979	294,480	9.59%					
1980	296,640	9.59%					
1981	298,800	9.59%					
1982	319,100	9.59%					
1983	339,400	9.59%					
1984	359,700	9.59%					
1985	380,000	10.26%					
1986	405,980	10.26%					
1987	431,960	10.26%					
1988	457,941	10.26%					
1989	483,921	10.26%					
1990	509,901	10.26%					
1991	418,767	10.26%					
1992	385,473	10.26%					
1993	379,756	10.88%					
1994	333,191	10.88%					
1995	267,706	10.88%					
1996	264,290	7.80%					
1997	529,344	7.80%					
1998	605,481	7.80%					
1999	701,816	7.80%					
2000	891,311	7.80%		52,531	5.51%		
2001	909,694	7.80%		65,568	5.51%		
2002	878,306	7.80%		191,796	5.51%		
2003	900,626	6.73%		162,433	5.51%		

Data Input: Landfill Characteristics

Landfill Name:	Sycamore Landfill	**Year Opened:**	1967	Click for lists of k values	
State/Country:	CA	**If Closed, Year:**		**k Value:**	0.020
City/County:	Santee/San Diego			**M Value:**	6

Data Input: Waste Deposit History

	Waste			Daily Cover			
	Waste Deposited			Greenwaste & Compost		Sludge	
Year	Tons	% ANDOC		Tons	% ANDOC	Tons	% ANDOC
2004	922,086	6.73%		172,549	5.51%		
2005	882,576	6.73%		168,357	5.51%		
2006	861,883	6.73%		127,824	5.51%		
2007	974,428	6.73%		134,931	5.51%		
2008	876,921	6.73%		151,882	5.51%		
2009	817,977	6.73%		122,898	5.51%		
2010	886,480	6.73%		113,097	5.51%		
2011	859,953	6.73%		112,145	5.51%		
2012	865,596	6.73%		77,178	5.51%		
2013	952,310	6.73%		69,862	5.51%		
2014	946,545	6.73%		68,523	5.51%		
2015	937,705	6.73%		73,258	5.51%		
2016	973,524	6.73%		85,002	5.51%		
2017	966,280	6.73%		86,843	5.51%		
2018	955,600	6.73%		64,127	5.51%		
2019	975,601	6.73%		62,982	5.51%		
2020	996,435	6.73%		46,102	5.51%		
2021	1,033,824	6.73%		40,818	5.51%		
2022	1,019,827	6.73%		32,292	5.51%		
2023	1,202,570	6.73%		31,964	5.51%		
2024	1,169,792	6.73%		32,124	5.51%		
2025	1,175,641	6.73%		32,284	5.51%		
2026	1,181,519	6.73%		32,446	5.51%		
2027	1,187,427	6.73%		32,608	5.51%		
2028	1,193,364	6.73%		32,771	5.51%		
2029	1,199,331	6.73%		32,935	5.51%		
2030	1,205,327	6.73%		33,100	5.51%		
2031	1,211,354	6.73%		33,265	5.51%		
2032	1,217,411	6.73%		33,431	5.51%		
2033	1,223,498	6.73%		33,599	5.51%		
2034	1,229,615	6.73%		33,767	5.51%		
2035	1,235,763	6.73%		33,935	5.51%		
2036	1,241,942	6.73%		34,105	5.51%		
2037	1,248,152	6.73%		34,276	5.51%		
2038	1,254,393	6.73%		34,447	5.51%		
2039	1,260,665	6.73%		34,619	5.51%		
2040	1,266,968	6.73%		34,792	5.51%		
2041	1,273,303	6.73%		34,966	5.51%		
2042	1,279,669	6.73%		35,141	5.51%		
2043	1,286,068	6.73%		35,317	5.51%		
2044	1,292,498	6.73%		35,493	5.51%		
2045	1,298,960	6.73%		35,671	5.51%		
2046	1,305,455	6.73%		35,849	5.51%		
2047	1,311,983	6.73%		36,029	5.51%		
2048	1,318,542	6.73%		36,209	5.51%		
2049	1,325,135	6.73%		36,390	5.51%		
2050	1,331,761	6.73%		36,572	5.51%		
2051	1,338,420	6.73%		36,755	5.51%		
2052	1,345,112	6.73%		36,938	5.51%		
2053	1,351,837	6.73%		37,123	5.51%		
2054	1,358,597	6.73%		37,309	5.51%		
2055	1,365,390	6.73%		37,495	5.51%		

Data Input: Landfill Characteristics

Landfill Name:	Sycamore Landfill	**Year Opened:**	1967	Click for lists of k values	
State/Country:	CA	**If Closed, Year:**		**k Value:**	0.020
City/County:	Santee/San Diego			**M Value:**	6

Data Input: Waste Deposit History

	Waste			Daily Cover			
	Waste Deposited			Greenwaste & Compost		Sludge	
Year	Tons	% ANDOC		Tons	% ANDOC	Tons	% ANDOC
2056	1,372,216	6.73%		37,683	5.51%		
2057	1,379,078	6.73%		37,871	5.51%		
2058	1,385,973	6.73%		38,060	5.51%		
2059	1,392,903	6.73%		38,251	5.51%		
2060	1,399,867	6.73%		38,442	5.51%		
2061	1,406,867	6.73%		38,634	5.51%		
2062	1,413,901	6.73%		38,827	5.51%		
2063	1,420,970	6.73%		39,021	5.51%		
2064	1,428,075	6.73%		39,217	5.51%		
2065	1,435,216	6.73%		39,413	5.51%		
2066	1,442,392	6.73%		39,610	5.51%		
2067	1,449,604	6.73%		39,808	5.51%		
2068	1,456,852	6.73%		40,007	5.51%		
2069	1,464,136	6.73%		40,207	5.51%		
2070	1,471,457	6.73%		40,408	5.51%		
2071	1,478,814	6.73%		40,610	5.51%		
2072	1,486,208	6.73%		40,813	5.51%		
2073	1,493,639	6.73%		41,017	5.51%		
2074	1,501,107	6.73%		41,222	5.51%		
2075	1,508,613	6.73%		41,428	5.51%		
2076	1,516,156	6.73%		41,635	5.51%		
2077	1,523,737	6.73%		41,844	5.51%		
2078	1,531,355	6.73%		42,053	5.51%		
2079	1,539,012	6.73%		42,263	5.51%		
2080	1,546,707	6.73%		42,474	5.51%		
2081	1,554,441	6.73%		42,687	5.51%		
2082	817,501	6.73%		42,900	5.51%		

Model Output: Landfill Characteristics

Landfill Name: Sycamore Lan
State: CA
City/County: Santee/San Diego
Year Opened: 1967
If Closed, Year:
k Value: 0.020
M Value: 6

Model Output: Methane and Carbon Dioxide Emissions (metric tonnes of CO_2 equivalent)

Year	CH_4	CO_2
1900		
1901		
1902		
1903		
1904		
1905		
1906		
1907		
1908		
1909		
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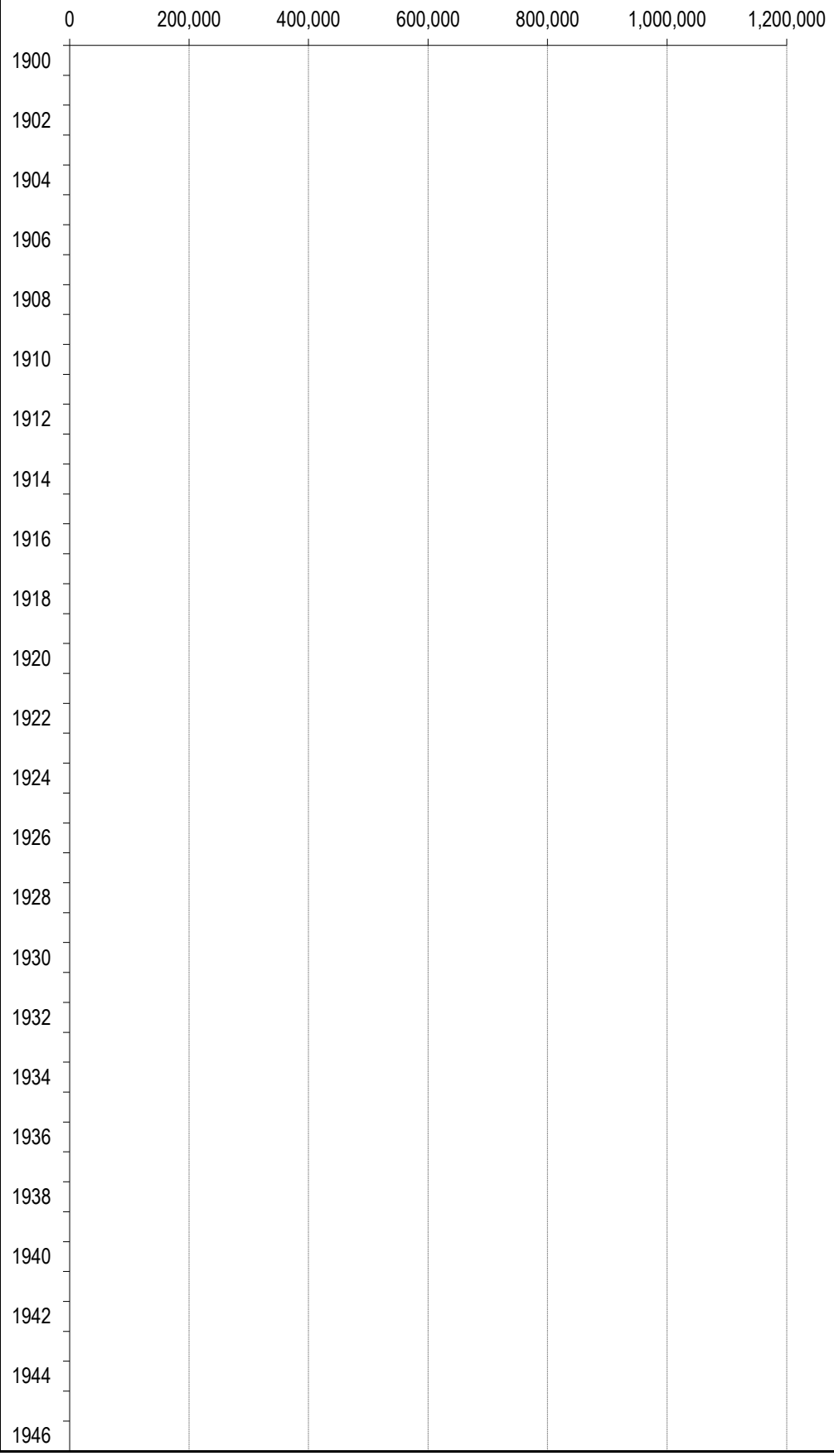
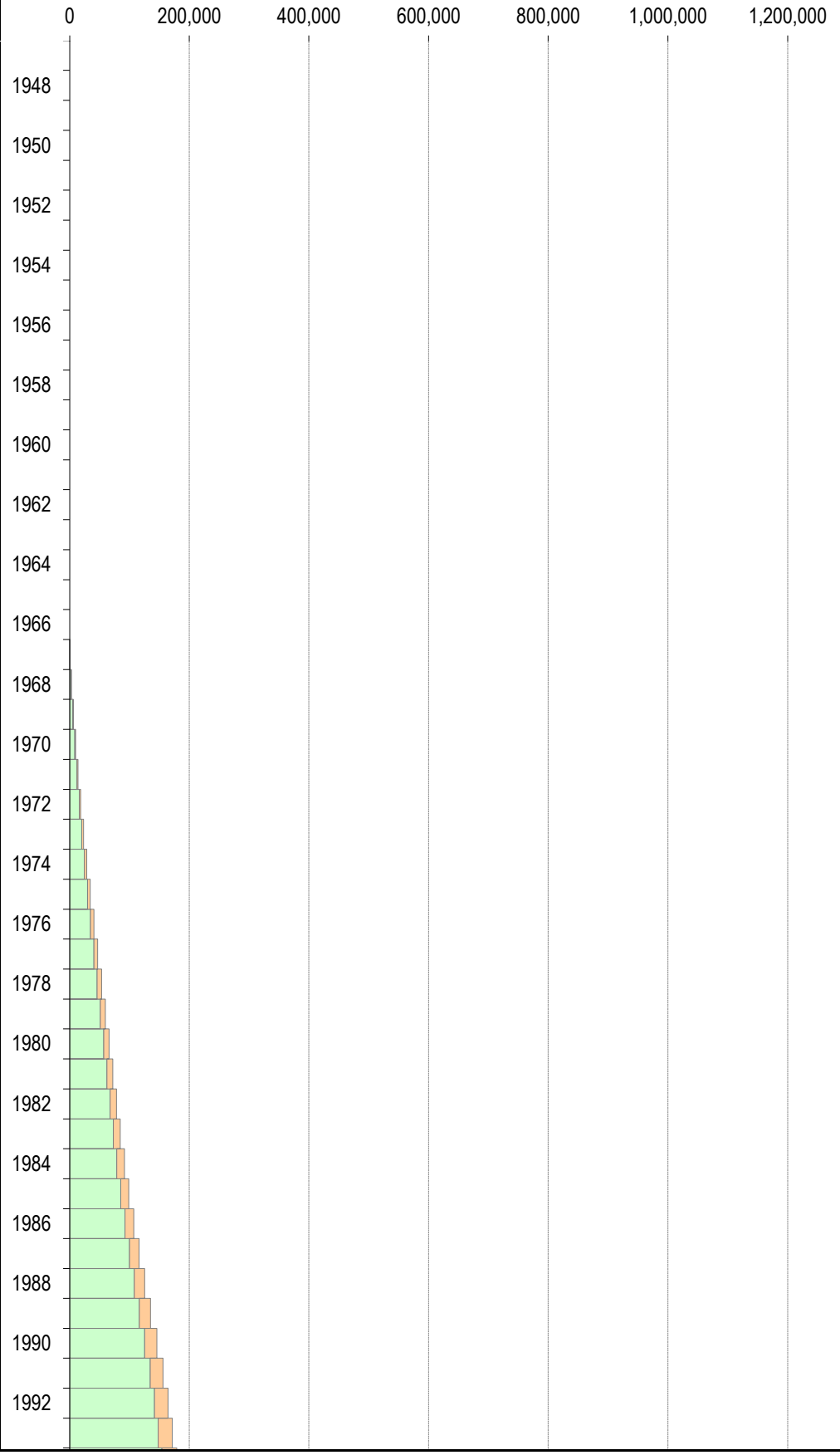


Model Output: Landfill Characteristics

Landfill Name: Sycamore Lan
State: CA
City/County: Santee/San Diego
Year Opened: 1967
If Closed, Year:
k Value: 0.020
M Value: 6

Model Output: Methane and Carbon Dioxide Emissions (metric tonnes of CO_2 equivalent)

Year	CH_4	CO_2
1952		
1953		
1954		
1955		
1956		
1957		
1958		
1959		
1960		
1961		
1962		
1963		
1964		
1965		
1966		
1967	313	50
1968	2,540	406
1969	5,395	862
1970	8,609	1,375
1971	12,174	1,944
1972	16,084	2,569
1973	20,331	3,247
1974	24,909	3,978
1975	29,815	4,761
1976	35,064	5,600
1977	40,584	6,481
1978	46,087	7,360
1979	51,528	8,229
1980	56,909	9,088
1981	62,230	9,938
1982	67,542	10,786
1983	73,141	11,681
1984	79,071	12,628
1985	85,397	13,638
1986	92,492	14,771
1987	100,102	15,986
1988	108,165	17,274
1989	116,673	18,633
1990	125,617	20,061
1991	134,645	21,503
1992	141,882	22,658
1993	148,183	23,665
1994	154,419	24,661
1995	159,517	25,475
1996	162,919	26,018
1997	165,197	26,382
1998	170,877	27,289
1999	178,251	28,467
2000	187,429	29,932
2001	199,705	31,893
2002	212,730	33,973
2003	226,054	36,101

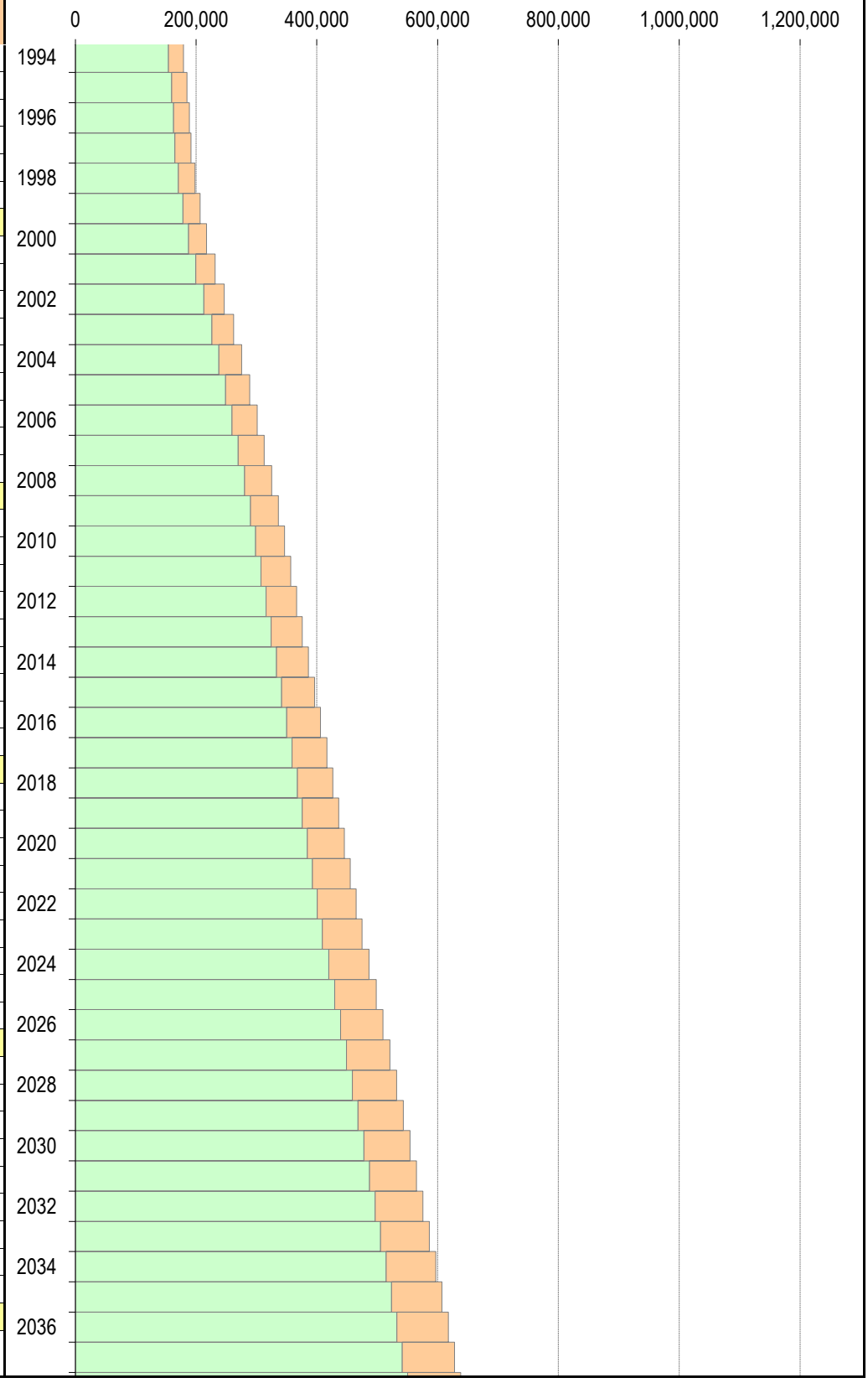


Model Output: Landfill Characteristics

Landfill Name: Sycamore Lan
State: CA
City/County: Santee/San Diego
Year Opened: 1967
If Closed, Year:
k Value: 0.020
M Value: 6

Model Output: Methane and Carbon Dioxide Emissions (metric tonnes of CO_2 equivalent)

Year	CH_4	CO_2
2004	237,683	37,958
2005	249,072	39,777
2006	259,696	41,473
2007	269,640	43,061
2008	280,478	44,792
2009	290,211	46,346
2010	298,761	47,712
2011	307,626	49,128
2012	316,073	50,477
2013	324,192	51,773
2014	333,019	53,183
2015	341,735	54,575
2016	350,296	55,942
2017	359,188	57,362
2018	367,868	58,748
2019	376,066	60,057
2020	384,278	61,369
2021	392,508	62,683
2022	400,926	64,028
2023	409,350	65,373
2024	419,595	67,009
2025	429,620	68,610
2026	439,465	70,182
2027	449,207	71,738
2028	458,848	73,278
2029	468,390	74,802
2030	477,837	76,310
2031	487,191	77,804
2032	496,453	79,283
2033	505,626	80,748
2034	514,713	82,199
2035	523,716	83,637
2036	532,636	85,061
2037	541,476	86,473
2038	550,238	87,872
2039	558,923	89,260
2040	567,535	90,635
2041	576,075	91,999
2042	584,544	93,351
2043	592,945	94,693
2044	601,279	96,024
2045	609,549	97,345
2046	617,756	98,655
2047	625,902	99,956
2048	633,989	101,247
2049	642,018	102,530
2050	649,990	103,803
2051	657,908	105,067



Model Output: Landfill Characteristics

Landfill Name: Sycamore Landfil
State: CA
City/County: Santee/San Diego

Year Opened: 1967
If Closed, Year:

k Value: 0.020
M Value: 6

Model Output: Landfill Gas Captured and Captured Gas Heat (graph values in MMbtu/hr)

Year	Expected Gas Recovery Flow Rate (scf/min)	Heat Input Capacity (MMbtu/hr)
1900		
1901		
1902		
1903		
1904		
1905		
1906		
1907		
1908		
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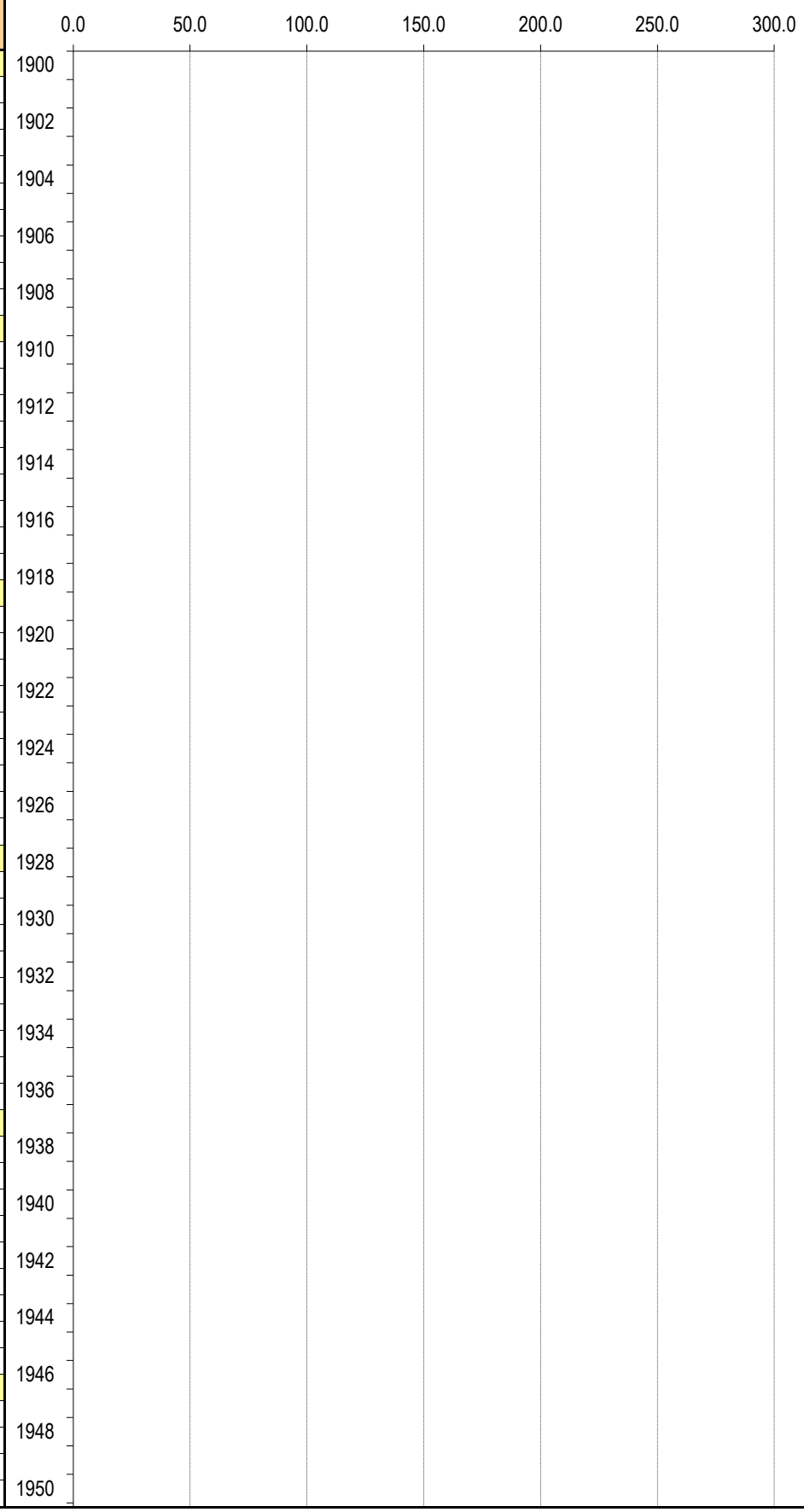
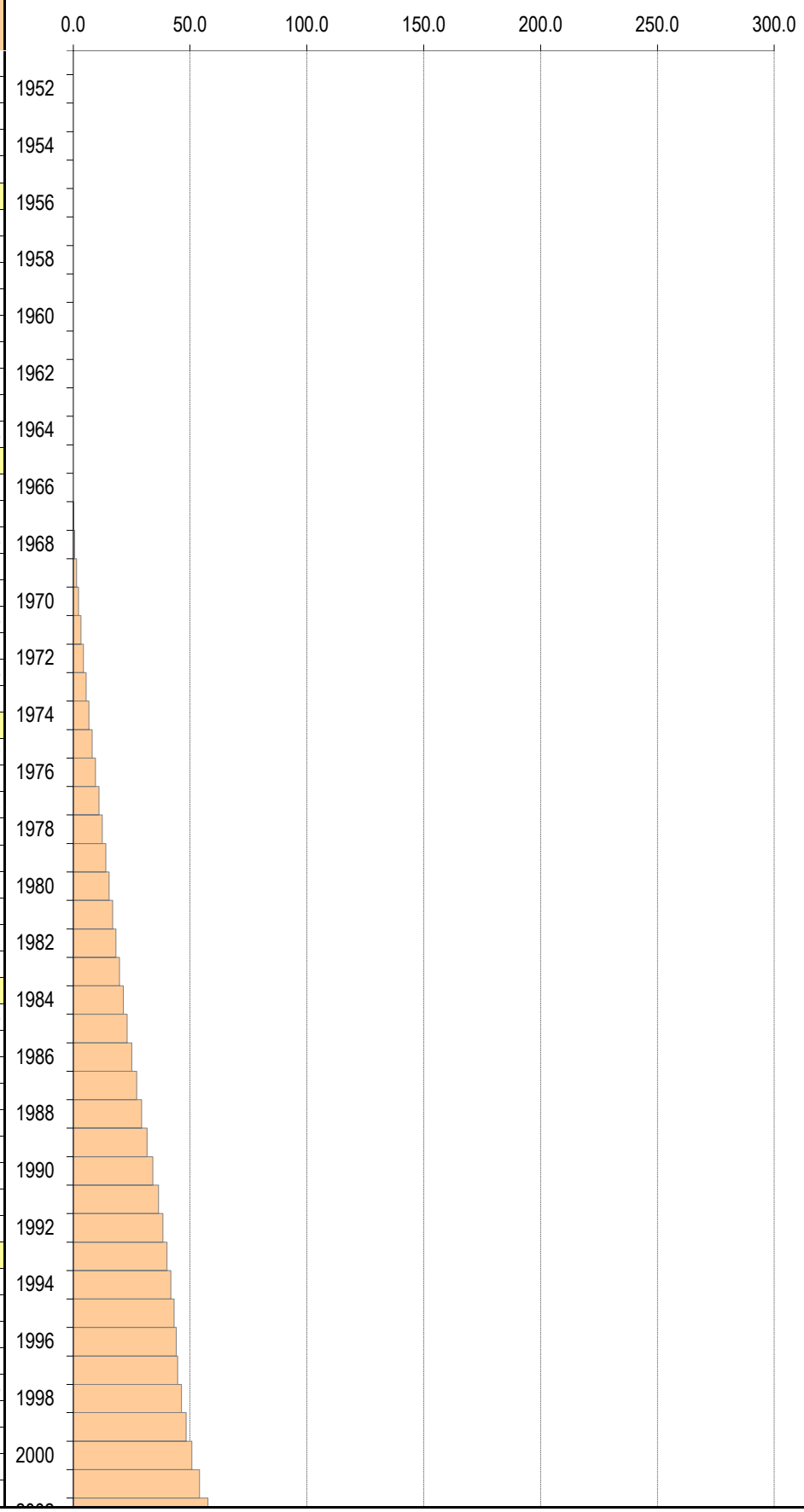


Model Output: Landfill Characteristics

Landfill Name: Sycamore Landfil
State: CA
City/County: Santee/San Diego
Year Opened: 1967
If Closed, Year:
k Value: 0.020
M Value: 6

Model Output: Landfill Gas Captured and Captured Gas Heat (graph values in MMbtu/hr)

Year	Expected Gas Recovery Flow Rate (scf/min)	Heat Input Capacity (MMbtu/hr)
1955		
1956		
1957		
1958		
1959		
1960		
1961		
1962		
1963		
1964		
1965		
1966		
1967	3	0.1
1968	23	0.7
1969	48	1.5
1970	77	2.3
1971	109	3.3
1972	144	4.4
1973	181	5.5
1974	222	6.7
1975	266	8.1
1976	313	9.5
1977	362	11.0
1978	411	12.5
1979	460	14.0
1980	508	15.4
1981	555	16.9
1982	603	18.3
1983	653	19.8
1984	706	21.4
1985	762	23.1
1986	825	25.1
1987	893	27.1
1988	965	29.3
1989	1,041	31.6
1990	1,121	34.0
1991	1,202	36.5
1992	1,266	38.4
1993	1,322	40.2
1994	1,378	41.8
1995	1,424	43.2
1996	1,454	44.1
1997	1,474	44.8
1998	1,525	46.3
1999	1,591	48.3
2000	1,673	50.8
2001	1,782	54.1
2002	1,899	57.6
2003	2,017	61.2
2004	2,121	64.4
2005	2,223	67.5
2006	2,318	70.4
2007	2,406	73.1
2008	2,503	76.0
2009	2,590	78.6



Model Output: Landfill Characteristics

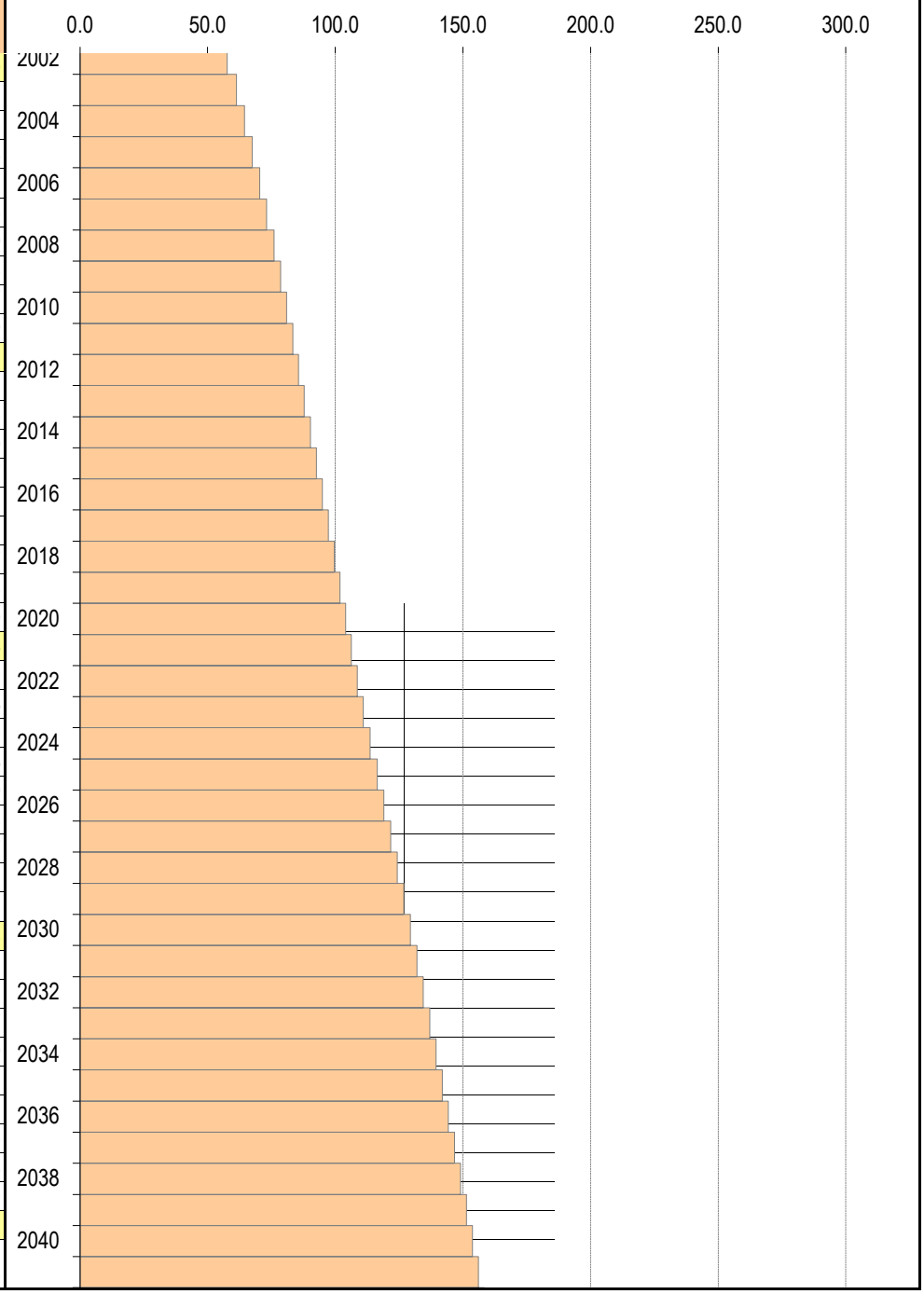
Landfill Name: Sycamore Landfil
State: CA
City/County: Santee/San Diego

Year Opened: 1967
If Closed, Year:

k Value: 0.020
M Value: 6

Model Output: Landfill Gas Captured and Captured Gas Heat (graph values in MMbtu/hr)

Year	Expected Gas Recovery Flow Rate (scf/min)	Heat Input Capacity (MMbtu/hr)
2010	2,666	80.9
2011	2,745	83.4
2012	2,821	85.6
2013	2,893	87.8
2014	2,972	90.2
2015	3,050	92.6
2016	3,126	94.9
2017	3,206	97.3
2018	3,283	99.7
2019	3,356	101.9
2020	3,430	104.1
2021	3,503	106.4
2022	3,578	108.6
2023	3,653	110.9
2024	3,745	113.7
2025	3,834	116.4
2026	3,922	119.1
2027	4,009	121.7
2028	4,095	124.3
2029	4,180	126.9
2030	4,265	129.5
2031	4,348	132.0
2032	4,431	134.5
2033	4,513	137.0
2034	4,594	139.5
2035	4,674	141.9
2036	4,754	144.3
2037	4,832	146.7
2038	4,911	149.1
2039	4,988	151.4
2040	5,065	153.8
2041	5,141	156.1
2042	5,217	158.4
2043	5,292	160.7
2044	5,366	162.9
2045	5,440	165.2
2046	5,513	167.4
2047	5,586	169.6
2048	5,658	171.8
2049	5,730	174.0
2050	5,801	176.1
2051	5,872	178.3



Appendix E

Proposed Potential to Emit Emission Estimates

TABLE E-1
POTENTIAL TO EMIT ESTIMATES FOR PROPOSED PERMITTED CAPACITY LANDFILL (LFG)
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Total Pollutant Flow Rate (tons/yr)[c]	LFG Collection System Efficiency (%)[d]	Pollutant Flow Rate to Control Device (tons/yr)	Pollutant Emission Rate from Landfill (tons/yr)	Pollutant Emission Rate from Landfill (lbs/yr)	Pollutant Emission Rate from Landfill (lbs/day)
Hazardous Air Pollutants (HAPs)[a]									
71-55-6	1,1,1-Trichloroethane (methyl chloroform)+ - HAP	133.41	0.069	3.79E-02	85.0%	3.22E-02	5.68E-03	1.14E+01	3.11E-02
79-00-5	1,1,2-Trichloroethane+ - HAP	133.4	0.069	3.79E-02	85.0%	3.22E-02	5.68E-03	1.14E+01	3.11E-02
79-34-5	1,1,2,2-Tetrachloroethane+ - HAP/VOC	167.85	0.069	4.76E-02	85.0%	4.05E-02	7.14E-03	1.43E+01	3.91E-02
75-34-3	1,1-Dichloroethane (ethylidene dichloride)+ - HAP/VOC	98.97	0.069	2.81E-02	85.0%	2.39E-02	4.21E-03	8.43E+00	2.31E-02
75-35-4	1,1-Dichloroethene (vinylidene chloride)+ - HAP/VOC	96.94	0.069	2.75E-02	85.0%	2.34E-02	4.13E-03	8.25E+00	2.26E-02
107-06-2	1,2-Dichloroethane (ethylene dichloride)+ - HAP/VOC	98.96	0.493	2.02E-01	85.0%	1.72E-01	3.03E-02	6.06E+01	1.66E-01
78-87-5	1,2-Dichloropropane (propylene dichloride)+ - HAP/VOC	112.99	0.069	3.21E-02	85.0%	2.73E-02	4.81E-03	9.62E+00	2.64E-02
540-59-0	1,2-Dichloroethene+ - VOC	96.94	0.274	1.10E-01	85.0%	9.35E-02	1.65E-02	3.30E+01	9.04E-02
120-82-1	1,2,4-Trichlorobenzene+ - HAP	181.45	0.069	5.15E-02	85.0%	4.38E-02	7.72E-03	1.54E+01	4.23E-02
95.63-6	1,2,4-Trimethylbenzene+	120.19	0.069	3.41E-02	85.0%	2.90E-02	5.12E-03	1.02E+01	2.80E-02
95-50-1	1,2-Dichlorobenzene+	147.01	0.069	4.17E-02	85.0%	3.55E-02	6.26E-03	1.25E+01	3.43E-02
108-67-8	1,3,5-Trimethylbenzene+	120.19	0.069	3.41E-02	85.0%	2.90E-02	5.12E-03	1.02E+01	2.80E-02
106-99-0	1,3-Butadiene+ - HAP	54.09	0.069	1.53E-02	85.0%	1.30E-02	2.30E-03	4.60E+00	1.26E-02
541-73-1	1,3-Dichlorobenzene+	147.00	0.069	4.17E-02	85.0%	3.55E-02	6.26E-03	1.25E+01	3.43E-02
123-91-1	1,4-Dioxane+ - HAP	88.11	0.069	2.50E-02	85.0%	2.13E-02	3.75E-03	7.50E+00	2.05E-02
14720-74-2	2,2,4-Trimethylpentane+ - HAP	142.28	0.562	3.31E-01	85.0%	2.82E-01	4.97E-02	9.94E+01	2.72E-01
95-49-8	2-Chlorotoluene+	126.58	0.069	3.59E-02	85.0%	3.05E-02	5.39E-03	1.08E+01	2.95E-02
591-78-6	2-Hexanone+	100.16	0.246	1.02E-01	85.0%	8.68E-02	1.53E-02	3.06E+01	8.39E-02
554-14-3	2-Methylthiophene*	98.16	0.446	1.81E-01	85.0%	1.54E-01	2.72E-02	5.44E+01	1.49E-01
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	89.300	2.22E+01	85.0%	1.89E+01	3.34E+00	6.67E+03	1.83E+01
616-44-4	3-Methylthiopene*	98.16	0.076	3.09E-02	85.0%	2.63E-02	4.64E-03	9.27E+00	2.54E-02
622-96-8	4-Ethyltoluene+	120.20	0.584	2.91E-01	85.0%	2.47E-01	4.36E-02	8.72E+01	2.39E-01
75-07-0	Acetaldehyde+ - HAP	44.05	2.850	5.20E-01	85.0%	4.42E-01	7.80E-02	1.56E+02	4.27E-01
67-64-1	Acetone+	58.08	39.200	9.43E+00	85.0%	8.02E+00	1.41E+00	2.83E+03	7.75E+00
107-02-8	Acrolein+ - HAP	56.06	0.137	3.18E-02	85.0%	2.70E-02	4.77E-03	9.54E+00	2.61E-02
107-13-1	Acrylonitrile+ - HAP/VOC	53.06	0.137	3.01E-02	85.0%	2.56E-02	4.52E-03	9.03E+00	2.47E-02
107-05-1	Allyl Chloride+ - HAP	76.53	0.069	2.17E-02	85.0%	1.85E-02	3.26E-03	6.51E+00	1.78E-02
100-44-7	Benzylchloride+ - HAP	126.58	0.069	3.59E-02	85.0%	3.05E-02	5.39E-03	1.08E+01	2.95E-02
75-25-2	Bromodichloromethane+ - VOC	163.83	0.069	4.65E-02	85.0%	3.95E-02	6.97E-03	1.39E+01	3.82E-02
71-43-2	Benzene+ - HAP/VOC	78.11	1.550	5.02E-01	85.0%	4.26E-01	7.52E-02	1.50E+02	4.12E-01
75-25-2	Bromoform+ - HAP	252.73	0.069	7.17E-02	85.0%	6.10E-02	1.08E-02	2.15E+01	5.89E-02
74-83-9	Bromomethane+ - HAP	94.94	0.069	2.69E-02	85.0%	2.29E-02	4.04E-03	8.08E+00	2.21E-02
1003-09-4	Bromothiophene*	163.04	0.025	1.69E-02	85.0%	1.44E-02	2.53E-03	5.07E+00	1.39E-02
10061-01-5	cis-1,3-Dichloropropene+ - HAP	110.97	0.069	3.15E-02	85.0%	2.68E-02	4.72E-03	9.45E+00	2.59E-02
110-82-7	Cyclohexane+	84.16	0.844	2.94E-01	85.0%	2.50E-01	4.41E-02	8.83E+01	2.42E-01
75-15-0	Carbon disulfide*+ - HAP/VOC	76.13	0.115	3.63E-02	85.0%	3.08E-02	5.44E-03	1.09E+01	2.98E-02
56-23-5	Carbon tetrachloride+ - HAP/VOC	153.84	0.069	4.37E-02	85.0%	3.71E-02	6.55E-03	1.31E+01	3.59E-02
46-358-1	Carbonyl sulfide+ - HAP/VOC	60.07	0.069	1.70E-02	85.0%	1.45E-02	2.56E-03	5.11E+00	1.40E-02
108-90-7	Chlorobenzene+ - HAP/VOC	112.56	0.069	3.19E-02	85.0%	2.71E-02	4.79E-03	9.58E+00	2.63E-02
75-45-6	Chlorodifluoromethane+	86.47	0.534	1.91E-01	85.0%	1.63E-01	2.87E-02	5.74E+01	1.57E-01
75-00-3	Chloroethane (ethyl chloride)+ - HAP/VOC	64.52	0.069	1.83E-02	85.0%	1.56E-02	2.75E-03	5.49E+00	1.50E-02
67-66-3	Chloroform+ - HAP/VOC	119.39	0.069	3.39E-02	85.0%	2.88E-02	5.08E-03	1.02E+01	2.78E-02
74-87-3	Chloromethane (methyl chloride)+ - VOC	50.49	0.137	2.87E-02	85.0%	2.44E-02	4.30E-03	8.60E+00	2.36E-02
124-48-1	Dibromochloromethane+	208.28	0.069	5.91E-02	85.0%	5.02E-02	8.87E-03	1.77E+01	4.86E-02
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)+ - HAP/VOC	147.00	0.429	2.61E-01	85.0%	2.22E-01	3.92E-02	7.84E+01	2.15E-01
75-43-4	Dichlorodifluoromethane+	120.91	0.597	2.99E-01	85.0%	2.54E-01	4.49E-02	8.97E+01	2.46E-01
75-71-8	Dichlorofluoromethane+	102.92	0.311	1.33E-01	85.0%	1.13E-01	1.99E-02	3.98E+01	1.09E-01
75-09-2	Dichloromethane (methylene chloride)+ - HAP	84.94	0.864	3.04E-01	85.0%	2.58E-01	4.56E-02	9.12E+01	2.50E-01
76-14-2	Dichlorotetrafluoroethane (Freon 114)+	170.92	0.069	4.85E-02	85.0%	4.12E-02	7.27E-03	1.45E+01	3.99E-02
110-81-6	Diethyl Disulfide*	122.25	0.025	1.27E-02	85.0%	1.08E-02	1.90E-03	3.80E+00	1.04E-02
352-93-2	Diethyl Sulfide*	90.18	0.025	9.34E-03	85.0%	7.94E-03	1.40E-03	2.80E+00	7.68E-03
624-92-0	Dimethyl Disulfide*	94.19	0.025	9.75E-03	85.0%	8.29E-03	1.46E-03	2.93E+00	8.02E-03
75-18-3	Dimethyl sulfide (methyl sulfide)* - VOC	62.13	18.700	4.81E+00	85.0%	4.09E+00	7.22E-01	1.44E+03	3.96E+00
64-17-5	Ethanol+ - VOC	46.08	462.000	8.82E+01	85.0%	7.50E+01	1.32E+01	2.65E+04	7.25E+01
141-78-6	Ethyl Acetate+	88.11	27.900	1.02E+01	85.0%	8.66E+00	1.53E+00	3.05E+03	8.37E+00
75-08-1	Ethyl mercaptan* - VOC	62.13	0.125	3.22E-02	85.0%	2.73E-02	4.83E-03	9.65E+00	2.64E-02
100-41-4	Ethylbenzene+ - HAP/VOC	106.16	6.320	2.78E+00	85.0%	2.36E+00	4.17E-01	8.34E+02	2.28E+00
106-93-4	Ethylene dibromide (1,2-Dibromoethane)+ - HAP/VOC	187.88	0.069	5.33E-02	85.0%	4.53E-02	8.00E-03	1.60E+01	4.38E-02
75-69-4	Fluorotrichloromethane+ - VOC	137.40	0.069	3.90E-02	85.0%	3.31E-02	5.85E-03	1.17E+01	3.20E-02
142-82-5	Heptane+	100.21	3.000	1.25E+00	85.0%	1.06E+00	1.87E-01	3.74E+02	1.02E+00
87-68-3	Hexachlorobutadiene+ - HAP	260.76	0.069	7.40E-02	85.0%	6.29E-02	1.11E-02	2.22E+01	6.08E-02
110-54-3	Hexane+ - HAP/VOC	86.18	1.020	3.64E-01	85.0%	3.10E-01	5.46E-02	1.09E+02	2.99E-01
2148-87-8	Hydrogen Sulfide*	34.08	128.000	1.81E+01	85.0%	1.54E+01	2.71E+00	5.42E+03	1.49E+01
513-44-0	Isobutyl Mercaptan*	90.18	0.099	3.70E-02	85.0%	3.14E-02	5.55E-03	1.11E+01	3.04E-02
75-33-2	Isopropyl Mercaptan*	76.16	0.777	2.45E-01	85.0%	2.08E-01	3.68E-02	7.35E+01	2.01E-01
98-82-8	Isopropyl benzene (Cumene)+ - HAP	120.19	0.563	2.80E-01	85.0%	2.38E-01	4.20E-02	8.41E+01	2.30E-01
7439-97-6	Mercury (total)(e) - HAP	200.61	0.00029	2.43E-04	85.0%	2.06E-04	3.64E-05	7.28E-02	1.99E-04
67-56-1	Methanol+ - HAP	32.04	180.00	2.39E+01	85.0%	2.03E+01	3.58E+00	7.17E+03	1.96E+01
78-93-3	Methyl ethyl ketone+ - VOC	72.11	35.100	1.05E+01	85.0%	8.91E+00	1.57E+00	3.15E+03	8.62E+00
108-10-1	Methyl isobutyl ketone+ - HAP/VOC	100.16	2.850	1.18E+00	85.0%	1.01E+00	1.77E-01	3.55E+02	9.72E-01
74-93-1	Methyl mercaptan* - VOC	48.11	7.640	1.52E+00	85.0%	1.29E+00	2.28E-01	4.57E+02	1.25E+00
80-62-6	Methyl Methacrylate+ - HAP	100.12	0.069	2.84E-02	85.0%	2.41E-02	4.26E-03	8.52E+00	2.34E-02
1634-04-4	Methyl Tert Butyl Ether (MTBE)+ - HAP	88.15	0.069	2.50E-02	85.0%	2.13E-02	3.75E-03	7.50E+00	2.06E-02
624-89-5	Methyl ethyl sulfide*	76.16	0.025	7.89E-03	85.0%	6.70E-03	1.18E-03	2.37E+00	6.48E-03
91-20-3	Naphthalene+ - HAP	128.17	0.069	3.64E-02	85.0%	3.09E-02	5.46E-03	1.09E+01	2.99E-02
109-79-5	n-Butyl Mercaptan*	90.20	0.051	1.91E-02	85.0%	1.62E-02	2.86E-03	5.72E+00	1.57E-02

CAS Number	Compounds	Molecular Weight (g/Mol)	Ave. Concentration of Compounds Found In LFG (ppmv)[b]	Total Pollutant Flow Rate (tons/yr)[c]	LFG Collection System Efficiency (%)[d]	Pollutant Flow Rate to Control Device (tons/yr)	Pollutant Emission Rate from Landfill (tons/yr)	Pollutant Emission Rate from Landfill (lbs/yr)	Pollutant Emission Rate from Landfill (lbs/day)
107-03-9	n-Propyl Mercaptan*	76.16	0.025	7.89E-03	85.0%	6.70E-03	1.18E-03	2.37E+00	6.48E-03
127-18-4	Perchloroethylene (tetrachloroethylene)+ - HAP	165.83	0.504	3.46E-01	85.0%	2.94E-01	5.19E-02	1.04E+02	2.85E-01
115-07-1	Propene+	42.08	15.700	2.74E+00	85.0%	2.33E+00	4.11E-01	8.21E+02	2.25E+00
513-53-1	sec-Butyl Mercaptan / Thiophene*	90.18	1.000	3.74E-01	85.0%	3.18E-01	5.60E-02	1.12E+02	3.07E-01
100-42-5	Styrene+ - HAP	104.15	0.889	3.84E-01	85.0%	3.26E-01	5.75E-02	1.15E+02	3.15E-01
109-99-9	Tetrahydrofuran*	72.11	12.900	3.85E+00	85.0%	3.28E+00	5.78E-01	1.16E+03	3.17E+00
108-98-5	Thiophenol*	110.19	0.025	1.14E-02	85.0%	9.70E-03	1.71E-03	3.42E+00	9.38E-03
75-65-0	Tert Butanol (TBA)+	74.12	1.070	3.29E-01	85.0%	2.79E-01	4.93E-02	9.86E+01	2.70E-01
75-66-1	tert-Butyl Mercaptan*	90.18	0.138	5.16E-02	85.0%	4.38E-02	7.73E-03	1.55E+01	4.24E-02
79-01-6	Trichloroethylene (trichloroethene)+ - HAP/VOC	131.40	0.221	1.20E-01	85.0%	1.02E-01	1.80E-02	3.61E+01	9.89E-02
76-13-1	Trichlorotrifluoroethane (Freon 113)+	187.38	0.069	5.32E-02	85.0%	4.52E-02	7.98E-03	1.60E+01	4.37E-02
108-05-4	Vinyl Acetate+ - HAP	86.09	0.137	4.89E-02	85.0%	4.15E-02	7.33E-03	1.47E+01	4.02E-02
593-60-2	Vinyl Bromide+ - HAP	106.95	0.069	3.03E-02	85.0%	2.58E-02	4.55E-03	9.10E+00	2.49E-02
75-01-4	Vinyl chloride+ - HAP/VOC	62.50	0.069	1.77E-02	85.0%	1.51E-02	2.66E-03	5.32E+00	1.46E-02
108-88-3	Toluene+ - HAP/VOC	92.13	27.000	1.03E+01	85.0%	8.76E+00	1.55E+00	3.09E+03	8.47E+00
1330-20-7	Xylenes+ - HAP/VOC	106.16	16.170	7.11E+00	85.0%	6.04E+00	1.07E+00	2.13E+03	5.84E+00
Totals				225.95			33.89	67,785.82	185.71
Totals: HAPs only				0.09		42.40	7.48	14,963.03	40.99
Criteria Air Pollutants									
Total Non-Methane Organics (NMOCs) as Hexane (f)		86.18	1,056	377.15	85.0%	320.58	56.57	113,145.71	309.99
VOCs (f)(g)		86.18	1,056	377.15	85.0%	320.58	56.57	113,145.71	309.99

Notes:

(a) List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Default Concentrations for Landfill Gas Constituents, 8/24") and SDAPCD list from previous small expansion.

(b) Average concentration of HAPs found in LFG were taken from 11/12/19 Sample (Sycamore LFGTE Facility) (denoted as "*") and from 10/7/15 sample (most recent TO-15 analysis) and averaged (consistent with SDAPCD from previous small expansion) (denoted as "+"). If ND, 1/2 the detection limit was used.

(c) Total pollutant emission rate based on 2082 LFG generation rate and 85% collection efficiency.

(d) Based on CARB AB 32 LMR guidance and consistent with previously approved small expansion by SDAPCD.

(e) Concentration of Mercury based on EPA AP-42 Section 2.4 Table 2.4-1 (11/98).

(f) Concentration from SDAPCD small expansion evaluation spreadsheet (based on sum of all non-exempt compounds concentrations as more conservative than 595 ppmv) per note.

(g) NMOCs assumed to equal VOCs.

(h) LFG generation based on % increase from baseline 2021 to 2082 from CARB IPCC model consistent with previously SDAPCD-approved small expansion. CARB model estimated 55.53% increase from baseline 2021 expected recovery to 2082 expected recovery.

Variables:

MODEL INPUT VARIABLES:		
Methane Concentration (%)	50%	
LFG generation rate (year 2082) (h)	6,069	SCFM
Maximum estimated LFG recovered (year 2082)(h)	5,159	SCFM
LFG Collection System efficiency (d)	85%	

CONVERSIONS

ton conversion	2000	
lb conversion	453.6	g
hour conversion	60	min
day conversion	24	hrs
12 months	365	days
mol conversion	24.04	L @ STP
cf conversion	28.32	L
mmbtu conversion	1,000,000	btu

EXAMPLE CALCULATIONS

(HAPS AND VOCS)

Total Pollutant Flow Rate (To Flare)= ((Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000) *(Total LFG to Flare [cfm])*(60min*24hr*365 days)*(1ton/2000 lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

Pollutant Flow rate = (Total pollutant flow rate [tons/yr])*(Collection efficiency)

Pollutant Emissions through landfill = (Total pollutant flow rate [tons/yr]) * (1 - collection efficiency)

TABLE E-2
PROPOSED FUTURE FUGITIVE DUST EMISSIONS DAILY OPERATIONS FROM LANDFILL EQUIPMENT
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Landfill Equipment

Process ID: LE

Vehicle Miles Traveled

Type of Landfill Equipment*	# of Vehicles	Avg. Vehicle Speed (mph)	Operating Hours*** (hrs/day)	Operations*** (days/year)	Total VMT		
					miles/hr	miles/day	miles/yr
Compactors							
836 Compactor	5	2	10.5	360	10.00	105	37,800
Dozers							
CAT D9 Dozer	3	2	10.5	360	6.00	63	22,680
CAT D9 Crawler Tractor	3	2	10.5	360	6.00	63	22,680
CAT D6 Dozer	2	2	10.5	360	4.00	42	15,120
Motor Graders							
14G Grader	1	5	10.5	360	5.00	53	18,900
Loaders							
CAT 950 Wheel Loader	3	5	10.5	360	15.00	158	56,700
Backhoes							
CAT 420 Backhoe	1	5	10.5	360	5.00	53	18,900
Trackhoes (Excavators)							
CAT 320 Sorting Excavator	1	2	10.5	360	2.00	21	7,560
Scrapers							
CAT 627 Scraper	2	2	10.5	30	4.00	42	1,260
Water Trucks**							
Water Truck Peterbilt	2	2	10.5	360	4.00	42	15,120
Total - All Vehicles					51.0	598.5	201,600

*Equipment types and numbers from 2012 EIR Air Quality Analysis, Table AQ-I-11, 2037-2042 performance analysis and standards adjusted by site personnel.

**Water trucks utilized on site for dust control are assumed to emit no particulate matter.

***Operational hours and days based on 2012 EIR Air Quality Anaysis, Table AQ-I-6 and adjusted by site personnel.

Assumptions:

Water trucks/dust suppressants are utilized as needed for control efficiency of 96% PM_{10}

*Based on PTO Conditions 96% $PM_{2.5}$

Mean Vehicle Weight (W)

Type of Construction Vehicle	Operating Weight		Soil Density***	Soil Loading Capacity		Average Vehicle Weight
	(lbs)	(tons)	(lb/cf)	(cy)	(tons)	(tons)
Compactors						
836 Compactor	118,000	59	--	--	--	59.00
Dozers						
CAT D9 Dozer	98,000	49	100	21.40	28.89	66.05
CAT D9 Crawler Tractor	109,277	55	100	21.40	28.89	73.13
CAT D6 Dozer	36,000	18	100	6.57	8.87	23.68
Motor Graders						
14G Grader	45,610	23	--	--	--	22.81
Loaders						
CAT 950 Wheel Loader	28,500	14	100	2.00	2.70	15.52
Backhoes						
CAT 420 Backhoe	16,116	8	100	1.30	1.75	9.02
Trackhoes (Excavators)						
CAT 320 Sorting Excavator	47,973	24	100	1.00	1.35	24.80
Scrapers						
CAT 627 Scraper	90,213	45	100	24.00	32.40	65.84
Water Trucks**						
Water Truck Peterbilt	50,000	25	--	--	--	25.00

*Water trucks utilized on site for dust control are assumed to emit no particulate matter.

**Operating weight based on equipment information from site personnel.

***Soil density based on 1.35 tons/yd^3 from 2012 EIR Air Quality Analysis, Table AQ-F-28

Methodologies:

AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:

Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads -

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Fleet Average Vehicle Weight (W) =	37.19	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	3.32	mph	(actual)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM LANDFILL EQUIPMENT

	Total VMT					Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	Emission Factor (lb/VMT)[1]	Control Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	51.0	598.5	201,600	0.152328894	96%	0.31	3.65	109.40	0.61
PM_{10}	51.0	598.5	201,600	1.52	96%	3.11	36.47	1,094.03	6.14
TSP	51.0	598.5	201,600	3.39	96%	6.91	81.04	2,431.17	13.65
Arsenic	51.0	598.5	201,600	3.05E-06	96%	6.22E-06	7.29E-05	2.19E-03	1.23E-05
Beryllium	51.0	598.5	201,600	1.52E-07	96%	3.11E-07	3.65E-06	1.09E-04	6.14E-07
Cadmium	51.0	598.5	201,600	1.52E-07	96%	3.11E-07	3.65E-06	1.09E-04	6.14E-07
Chromium	51.0	598.5	201,600	7.62E-06	96%	1.55E-05	1.82E-04	5.47E-03	3.07E-05
Lead	51.0	598.5	201,600	7.62E-06	96%	1.55E-05	1.82E-04	5.47E-03	3.07E-05
Mangagnese	51.0	598.5	201,600	7.62E-05	96%	1.55E-04	1.82E-03	5.47E-02	3.07E-04
Nickel	51.0	598.5	201,600	3.05E-06	96%	6.22E-06	7.29E-05	2.19E-03	1.23E-05
Selenium	51.0	598.5	201,600	7.62E-07	96%	1.55E-06	1.82E-05	5.47E-04	3.07E-06
Total HAPs						2.01E-04	2.36E-03	7.08E-02	3.97E-04

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE E-3
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	320	115,237	15,840	3.0	960.3	345,711
Transfer Trucks	259	93,286	15,840	3.0	777.4	279,857
Pickup Trucks	360	129,513	15,840	3.0	1,079.3	388,540
Totals	**939**	**338,036**			**2,817**	**1,014,108**

[1] Vehicles traveling on unpaved roads for MSW and aggregate delivery, including biosolids, recyclables, and employees.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures:

	Control Efficiency	Source:
Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	320	7,042
Transfer Trucks	39.5	16	27.75	259	7,191
Pickup Trucks	2.8	2.3	2.55	360	917
TOTAL				**939**	**15,150**
				Average Vehicle Weight (tons)	**16.13**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-8.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Collection Trucks Vehicle Weight (W) =	22.00	tons	
Transfer Trucks Vehicle Weight (W) =	27.75	tons	
Pickup Trucks Vehicle Weight (W) =	2.55	tons	
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	15	mph	(APCD default)
Number of Vehicle Wheels (w) =	10	(dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
Number of Vehicle Wheels (w) =	4	(dimensionless)	(APCD default for general public trucks in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	(PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb (APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	960.3	345,711	0.75	96%	2.76	28.96	868.76	5.21
PM_{10}	1.0	960.3	345,711	7.54	96%	27.58	289.59	8,687.55	52.13
TSP	1.0	960.3	345,711	16.75	96%	61.29	643.52	19,305.68	115.83
Arsenic	1.0	960.3	345,711	1.51E-05	96%	5.52E-05	5.79E-04	1.74E-02	1.04E-04
Beryllium	1.0	960.3	345,711	7.54E-07	96%	2.76E-06	2.90E-05	8.69E-04	5.21E-06
Cadmium	1.0	960.3	345,711	7.54E-07	96%	2.76E-06	2.90E-05	8.69E-04	5.21E-06
Chromium	1.0	960.3	345,711	3.77E-05	96%	1.38E-04	1.45E-03	4.34E-02	2.61E-04
Lead	1.0	960.3	345,711	3.77E-05	96%	1.38E-04	1.45E-03	4.34E-02	2.61E-04
Mangagnese	1.0	960.3	345,711	3.77E-04	96%	1.38E-03	1.45E-02	4.34E-01	2.61E-03
Mercury	1.0	960.3	345,711	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	960.3	345,711	1.51E-05	96%	5.52E-05	5.79E-04	1.74E-02	1.04E-04
Selenium	1.0	960.3	345,711	3.77E-06	96%	1.38E-05	1.45E-04	4.34E-03	2.61E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	777.4	279,857	0.89	96%	2.63	27.58	827.39	4.96
PM_{10}	1.0	777.4	279,857	8.87	96%	26.27	275.80	8,273.88	49.64
TSP	1.0	777.4	279,857	19.71	96%	58.37	612.88	18,386.40	110.32
Arsenic	1.0	777.4	279,857	1.77E-05	96%	5.25E-05	5.52E-04	1.65E-02	9.93E-05
Beryllium	1.0	777.4	279,857	8.87E-07	96%	2.63E-06	2.76E-05	8.27E-04	4.96E-06
Cadmium	1.0	777.4	279,857	8.87E-07	96%	2.63E-06	2.76E-05	8.27E-04	4.96E-06
Chromium	1.0	777.4	279,857	4.43E-05	96%	1.31E-04	1.38E-03	4.14E-02	2.48E-04
Lead	1.0	777.4	279,857	4.43E-05	96%	1.31E-04	1.38E-03	4.14E-02	2.48E-04
Mangagnese	1.0	777.4	279,857	4.43E-04	96%	1.31E-03	1.38E-02	4.14E-01	2.48E-03
Mercury	1.0	777.4	279,857	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	777.4	279,857	1.77E-05	96%	5.25E-05	5.52E-04	1.65E-02	9.93E-05
Selenium	1.0	777.4	279,857	4.43E-06	96%	1.31E-05	1.38E-04	4.14E-03	2.48E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

Pollutant	Total VMT			Emission Factor (lb/VMT)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	VMT/hr	VMT/day	VMT/yr			lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	1,079.3	388,540	0.11	96%	0.43	4.55	136.63	0.82
PM_{10}	1.0	1,079.3	388,540	1.05	96%	4.34	45.54	1,366.26	8.20
TSP	1.0	1,079.3	388,540	2.34	96%	9.64	101.20	3,036.13	18.22
Arsenic	1.0	1,079.3	388,540	2.11E-06	96%	8.67E-06	9.11E-05	2.73E-03	1.64E-05
Beryllium	1.0	1,079.3	388,540	1.05E-07	96%	4.34E-07	4.55E-06	1.37E-04	8.20E-07
Cadmium	1.0	1,079.3	388,540	1.05E-07	96%	4.34E-07	4.55E-06	1.37E-04	8.20E-07
Chromium	1.0	1,079.3	388,540	5.27E-06	96%	2.17E-05	2.28E-04	6.83E-03	4.10E-05
Lead	1.0	1,079.3	388,540	5.27E-06	96%	2.17E-05	2.28E-04	6.83E-03	4.10E-05
Mangagnese	1.0	1,079.3	388,540	5.27E-05	96%	2.17E-04	2.28E-03	6.83E-02	4.10E-04
Mercury	1.0	1,079.3	388,540	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	1,079.3	388,540	2.11E-06	96%	8.67E-06	9.11E-05	2.73E-03	1.64E-05
Selenium	1.0	1,079.3	388,540	5.27E-07	96%	2.17E-06	2.28E-05	6.83E-04	4.10E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	5.82	61.09	1,832.77	11.00
PM_{10}	58.18	610.92	18,327.69	109.97
TSP	129.30	1357.61	40,728.21	244.37
Arsenic	1.16E-04	1.22E-03	0.04	2.20E-04
Beryllium	5.82E-06	6.11E-05	0.002	1.10E-05
Cadmium	5.82E-06	6.11E-05	0.002	1.10E-05
Chromium	2.91E-04	3.05E-03	0.09	5.50E-04
Lead	2.91E-04	3.05E-03	0.09	5.50E-04
Manganese	2.91E-03	3.05E-02	0.92	5.50E-03
Mercury	0.00E+00	0.00E+00	0.00	0.00E+00
Nickel	1.16E-04	1.22E-03	0.04	2.20E-04
Selenium	2.91E-05	3.05E-04	0.01	5.50E-05
Total HAPs	3.76E-03	3.95E-02	1.19E+00	7.11E-03

TABLE E-4
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	20	7,067	15,840	3.0	58.9	21,201
Totals	**20**	**7,067**			**59**	**21,201**

[1] Vehicles traveling on unpaved roads for imported base material delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	20	589
TOTAL				**20**	**589**
				Average Vehicle Weight (tons)	**30.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-9.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- s = Surface material silt content [%]
- S = Mean vehicle speed (mph)
- W = Vehicle weight [tons]
- w = Number of vehicle wheels (dimensionless)
- p = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			30.00 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	Factor	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	58.9	21,201	0.94	96%	0.21	2.21	66.20	0.40
PM_{10}	1.0	58.9	21,201	9.37	96%	2.10	22.07	661.97	3.97
TSP	1.0	58.9	21,201	20.82	96%	4.67	49.03	1,471.05	8.83
Arsenic	1.0	58.9	21,201	1.87E-05	96%	4.20E-06	4.41E-05	1.32E-03	7.94E-06
Beryllium	1.0	58.9	21,201	9.37E-07	96%	2.10E-07	2.21E-06	6.62E-05	3.97E-07
Cadmium	1.0	58.9	21,201	9.37E-07	96%	2.10E-07	2.21E-06	6.62E-05	3.97E-07
Chromium	1.0	58.9	21,201	4.68E-05	96%	1.05E-05	1.10E-04	3.31E-03	1.99E-05
Lead	1.0	58.9	21,201	4.68E-05	96%	1.05E-05	1.10E-04	3.31E-03	1.99E-05
Manganese	1.0	58.9	21,201	4.68E-04	96%	1.05E-04	1.10E-03	3.31E-02	1.99E-04
Mercury	1.0	58.9	21,201	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	58.9	21,201	1.87E-05	96%	4.20E-06	4.41E-05	1.32E-03	7.94E-06
Selenium	1.0	58.9	21,201	4.68E-06	96%	1.05E-06	1.10E-05	3.31E-04	1.99E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.21	2.21	66.20	0.40
PM_{10}	2.10	22.07	661.97	3.97
TSP	4.67	49.03	1,471.05	8.83
Arsenic	4.20E-06	4.41E-05	1.32E-03	7.94E-06
Beryllium	2.10E-07	2.21E-06	6.62E-05	3.97E-07
Cadmium	2.10E-07	2.21E-06	6.62E-05	3.97E-07
Chromium	1.05E-05	1.10E-04	3.31E-03	1.99E-05
Lead	1.05E-05	1.10E-04	3.31E-03	1.99E-05
Mangagnese	1.05E-04	1.10E-03	3.31E-02	1.99E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.20E-06	4.41E-05	1.32E-03	7.94E-06
Selenium	1.05E-06	1.10E-05	3.31E-04	1.99E-06
Total HAPs	1.36E-04	1.43E-03	4.28E-02	2.57E-04

TABLE E-5
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	69	24,735	15,840	3.0	206.1	74,205
Totals	**69**	**24,735**			**206**	**74,205**

[1] Vehicles traveling on unpaved roads for green waste delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	69	670
TOTAL				**69**	**670**
				Average Vehicle Weight (tons)	**9.75**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-10.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			9.75 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionless)	(APCD default for GW truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	206.1	74,205	0.43	96%	0.33	3.52	105.49	0.63
PM_{10}	1.0	206.1	74,205	4.26	96%	3.35	35.16	1,054.93	6.33
TSP	1.0	206.1	74,205	9.48	96%	7.44	78.14	2,344.30	14.07
Arsenic	1.0	206.1	74,205	8.53E-06	96%	6.70E-06	7.03E-05	2.11E-03	1.27E-05
Beryllium	1.0	206.1	74,205	4.26E-07	96%	3.35E-07	3.52E-06	1.05E-04	6.33E-07
Cadmium	1.0	206.1	74,205	4.26E-07	96%	3.35E-07	3.52E-06	1.05E-04	6.33E-07
Chromium	1.0	206.1	74,205	2.13E-05	96%	1.67E-05	1.76E-04	5.27E-03	3.16E-05
Lead	1.0	206.1	74,205	2.13E-05	96%	1.67E-05	1.76E-04	5.27E-03	3.16E-05
Mangagnese	1.0	206.1	74,205	2.13E-04	96%	1.67E-04	1.76E-03	5.27E-02	3.16E-04
Mercury	1.0	206.1	74,205	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	206.1	74,205	8.53E-06	96%	6.70E-06	7.03E-05	2.11E-03	1.27E-05
Selenium	1.0	206.1	74,205	2.13E-06	96%	1.67E-06	1.76E-05	5.27E-04	3.16E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.33	3.52	105.49	0.63
PM_{10}	3.35	35.16	1,054.93	6.33
TSP	7.44	78.14	2,344.30	14.07
Arsenic	6.70E-06	7.03E-05	2.11E-03	1.27E-05
Beryllium	3.35E-07	3.52E-06	1.05E-04	6.33E-07
Cadmium	3.35E-07	3.52E-06	1.05E-04	6.33E-07
Chromium	1.67E-05	1.76E-04	5.27E-03	3.16E-05
Lead	1.67E-05	1.76E-04	5.27E-03	3.16E-05
Mangagnese	1.67E-04	1.76E-03	5.27E-02	3.16E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	6.70E-06	7.03E-05	2.11E-03	1.27E-05
Selenium	1.67E-06	1.76E-05	5.27E-04	3.16E-06
Total HAPs	2.17E-04	2.28E-03	6.83E-02	4.10E-04

TABLE E-6
FUTIRE POTENTIAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Unpaved Roadways
Process ID: UPR - C&D

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	57	20,353	15,840	3.0	169.6	61,060
Totals	**57**	**20,353**			**170**	**61,060**

[1] Vehicles traveling on unpaved roads for C&D waste delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Control Efficiency Source:

Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressants:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	57	678
TOTAL				**57**	**678**
				Average Vehicle Weight (tons)	**12.00**

Vehicle weights based on 2012 EIR (facility information) Table AQ-F-11.

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =			0.036 lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =			0.36 lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =			0.8 lb/VMT	(from AP-42, Table 13.2.2)
Transfer Trucks Vehicle Weight (W) =			12.00 tons	
Mean Silt content (s) =			15 %	(APCD default)
Mean Vehicle Speed (S) =			15 mph	(APCD default)
Number of Vehicle Wheels (w) =			10 (dimensionles	(APCD default for refuse truck/commercial haulers in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =			40 days/year	(APCD default; for San Diego County)
Control efficiency (e) =			96 %	(PTO Conditions)
Concentration of each listed substance in haul road emissions (Ci) =				
Arsenic	20	ppmw =	2.00E-05 lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06 lbs/lb	
Cadmium	1	ppmw =	1.00E-06 lbs/lb	
Chromium	50	ppmw =	5.00E-05 lbs/lb	
Lead	50	ppmw =	5.00E-05 lbs/lb	
Mangagnese	500	ppmw =	5.00E-04 lbs/lb	
Mercury	0	ppmw =	0.00E+00 lbs/lb	
Nickel	20	ppmw =	2.00E-05 lbs/lb	
Selenium	5	ppmw =	5.00E-06 lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00 lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00 lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control Efficiency	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	(%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	169.6	61,060	0.49	96%	0.32	3.35	100.39	0.60
PM_{10}	1.0	169.6	61,060	4.93	96%	3.19	33.46	1,003.86	6.02
TSP	1.0	169.6	61,060	10.96	96%	7.08	74.36	2,230.80	13.38
Arsenic	1.0	169.6	61,060	9.86E-06	96%	6.37E-06	6.69E-05	2.01E-03	1.20E-05
Beryllium	1.0	169.6	61,060	4.93E-07	96%	3.19E-07	3.35E-06	1.00E-04	6.02E-07
Cadmium	1.0	169.6	61,060	4.93E-07	96%	3.19E-07	3.35E-06	1.00E-04	6.02E-07
Chromium	1.0	169.6	61,060	2.47E-05	96%	1.59E-05	1.67E-04	5.02E-03	3.01E-05
Lead	1.0	169.6	61,060	2.47E-05	96%	1.59E-05	1.67E-04	5.02E-03	3.01E-05
Manganese	1.0	169.6	61,060	2.47E-04	96%	1.59E-04	1.67E-03	5.02E-02	3.01E-04
Mercury	1.0	169.6	61,060	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	169.6	61,060	9.86E-06	96%	6.37E-06	6.69E-05	2.01E-03	1.20E-05
Selenium	1.0	169.6	61,060	2.47E-06	96%	1.59E-06	1.67E-05	5.02E-04	3.01E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.32	3.35	100.39	0.60
PM_{10}	3.19	33.46	1,003.86	6.02
TSP	7.08	74.36	2,230.80	13.38
Arsenic	6.37E-06	6.69E-05	2.01E-03	1.20E-05
Beryllium	3.19E-07	3.35E-06	1.00E-04	6.02E-07
Cadmium	3.19E-07	3.35E-06	1.00E-04	6.02E-07
Chromium	1.59E-05	1.67E-04	5.02E-03	3.01E-05
Lead	1.59E-05	1.67E-04	5.02E-03	3.01E-05
Mangagnese	1.59E-04	1.67E-03	5.02E-02	3.01E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	6.37E-06	6.69E-05	2.01E-03	1.20E-05
Selenium	1.59E-06	1.67E-05	5.02E-04	3.01E-06
Total HAPs	2.06E-04	2.16E-03	6.49E-02	3.90E-04

TABLE E-7
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - MSW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Collection Trucks	320	115,237	10,560	2.0	640.2	230,474
Transfer Trucks	259	93,286	10,560	2.0	518.3	186,571
Pickup Trucks	360	129,513	10,560	2.0	719.5	259,027
Totals	**939**	**338,036**			**1,878**	**676,072**

[1] Vehicles traveling on paved roads for MSW and aggregate delivery, including biosolids, recyclables, and employees.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 90%
Source: Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Collection Trucks	29	15	22	320	7,042
Transfer Trucks	39.5	16	27.75	259	7,191
Pickup Trucks	2.8	2.3	2.55	360	917
TOTAL				**939**	**15,150**
				Average Vehicle Weight (tons)	**16.13**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE E-7
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Collection Trucks Vehicle Weight (W) =	22.00	tons	
Transfer Trucks Vehicle Weight (W) =	27.75	tons	
Pickup Trucks Vehicle Weight (W) =	2.55	tons	
Control efficiency (e) =	90	%	Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM COLLECTION TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	640.2	230,474	0.27	90%	1.65	17.33	519.77	3.12
PM_{10}	1.0	640.2	230,474	1.10	90%	6.73	70.72	2,121.50	12.73
TSP	1.0	640.2	230,474	5.66	90%	34.52	362.42	10,872.69	65.24
Arsenic	1.0	640.2	230,474	5.41E-06	90%	3.30E-05	3.47E-04	1.04E-02	6.24E-05
Beryllium	1.0	640.2	230,474	2.71E-07	90%	1.65E-06	1.73E-05	5.20E-04	3.12E-06
Cadmium	1.0	640.2	230,474	2.71E-07	90%	1.65E-06	1.73E-05	5.20E-04	3.12E-06
Chromium	1.0	640.2	230,474	1.35E-05	90%	8.25E-05	8.66E-04	2.60E-02	1.56E-04
Lead	1.0	640.2	230,474	1.35E-05	90%	8.25E-05	8.66E-04	2.60E-02	1.56E-04
Mangagnese	1.0	640.2	230,474	1.35E-04	90%	8.25E-04	8.66E-03	2.60E-01	1.56E-03
Mercury	1.0	640.2	230,474	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	640.2	230,474	5.41E-06	90%	3.30E-05	3.47E-04	1.04E-02	6.24E-05
Selenium	1.0	640.2	230,474	1.35E-06	90%	8.25E-06	8.66E-05	2.60E-03	1.56E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	518.3	186,571	0.38	90%	1.89	19.87	596.06	3.58
PM_{10}	1.0	518.3	186,571	1.56	90%	7.72	81.10	2,432.92	14.60
TSP	1.0	518.3	186,571	8.02	90%	39.58	415.62	12,468.69	74.81
Arsenic	1.0	518.3	186,571	7.67E-06	90%	3.78E-05	3.97E-04	1.19E-02	7.15E-05
Beryllium	1.0	518.3	186,571	3.83E-07	90%	1.89E-06	1.99E-05	5.96E-04	3.58E-06
Cadmium	1.0	518.3	186,571	3.83E-07	90%	1.89E-06	1.99E-05	5.96E-04	3.58E-06
Chromium	1.0	518.3	186,571	1.92E-05	90%	9.46E-05	9.93E-04	2.98E-02	1.79E-04
Lead	1.0	518.3	186,571	1.92E-05	90%	9.46E-05	9.93E-04	2.98E-02	1.79E-04
Mangagnese	1.0	518.3	186,571	1.92E-04	90%	9.46E-04	9.93E-03	2.98E-01	1.79E-03
Mercury	1.0	518.3	186,571	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	518.3	186,571	7.67E-06	90%	3.78E-05	3.97E-04	1.19E-02	7.15E-05
Selenium	1.0	518.3	186,571	1.92E-06	90%	9.46E-06	9.93E-05	2.98E-03	1.79E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE E-7
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR MSW AND AGGREGATE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

SUMMARY OF PARTICULATE EMISSIONS FROM PICKUP TRUCKS

Pollutant	Total VMT			Emission Factor (lb/VMT)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	VMT/hr	VMT/day	VMT/yr			lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	719.5	259,027	0.01	90%	0.07	0.77	23.05	0.14
PM_{10}	1.0	719.5	259,027	0.04	90%	0.30	3.14	94.09	0.56
TSP	1.0	719.5	259,027	0.22	90%	1.53	16.07	482.21	2.89
Arsenic	1.0	719.5	259,027	2.14E-07	90%	1.46E-06	1.54E-05	4.61E-04	2.77E-06
Beryllium	1.0	719.5	259,027	1.07E-08	90%	7.32E-08	7.68E-07	2.31E-05	1.38E-07
Cadmium	1.0	719.5	259,027	1.07E-08	90%	7.32E-08	7.68E-07	2.31E-05	1.38E-07
Chromium	1.0	719.5	259,027	5.34E-07	90%	3.66E-06	3.84E-05	1.15E-03	6.92E-06
Lead	1.0	719.5	259,027	5.34E-07	90%	3.66E-06	3.84E-05	1.15E-03	6.92E-06
Mangagnese	1.0	719.5	259,027	5.34E-06	90%	3.66E-05	3.84E-04	1.15E-02	6.92E-05
Mercury	1.0	719.5	259,027	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	719.5	259,027	2.14E-07	90%	1.46E-06	1.54E-05	4.61E-04	2.77E-06
Selenium	1.0	719.5	259,027	5.34E-08	90%	3.66E-07	3.84E-06	1.15E-04	6.92E-07

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MSW DELIVERY

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	3.62	37.96	1138.88	6.83
PM_{10}	14.76	154.95	4,648.51	27.89
TSP	75.63	794.12	23,823.59	142.94
Arsenic	7.23E-05	7.59E-04	2.28E-02	1.37E-04
Beryllium	3.62E-06	3.80E-05	1.14E-03	6.83E-06
Cadmium	3.62E-06	3.80E-05	1.14E-03	6.83E-06
Chromium	1.81E-04	1.90E-03	5.69E-02	3.42E-04
Lead	1.81E-04	1.90E-03	5.69E-02	3.42E-04
Mangagnese	1.81E-03	1.90E-02	5.69E-01	3.42E-03
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7.23E-05	7.59E-04	2.28E-02	1.37E-04
Selenium	1.81E-05	1.90E-04	5.69E-03	3.42E-05
Total HAPs	2.34E-03	2.46E-02	7.37E-01	4.42E-03

TABLE E-8
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - IBM

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[3]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	20	7,067	10,560	2.0	39.3	14,134
Totals	**20**	**7,067**			**39**	**14,134**

[1] Vehicles traveling on paved roads for imported base material delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 90%
Source: Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	40	20	30	20	589
TOTAL				**20**	**589**
				Average Vehicle Weight (tons)	**30.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- VMT = Vehicle miles traveled on site (miles/yr)
- k = Empirical constant [lb/VMT]
- sL = Road surface silt loading factor (grams per m^2)
- W = Vehicle weight in tons
- Ci = Concentration of each listed substance in haul road emissions (lbs/lb)
- e = Control Efficiency (%)

TABLE E-8
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR IMPORTED BASE MATERIAL DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	30.00	tons	
Control efficiency (e) =	90	%	Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	39.3	14,134	0.43	90%	0.16	1.69	50.76	0.30
PM_{10}	1.0	39.3	14,134	1.76	90%	0.66	6.91	207.18	1.24
TSP	1.0	39.3	14,134	9.01	90%	3.37	35.39	1,061.79	6.37
Arsenic	1.0	39.3	14,134	8.62E-06	90%	3.22E-06	3.38E-05	1.02E-03	6.09E-06
Beryllium	1.0	39.3	14,134	4.31E-07	90%	1.61E-07	1.69E-06	5.08E-05	3.05E-07
Cadmium	1.0	39.3	14,134	4.31E-07	90%	1.61E-07	1.69E-06	5.08E-05	3.05E-07
Chromium	1.0	39.3	14,134	2.15E-05	90%	8.06E-06	8.46E-05	2.54E-03	1.52E-05
Lead	1.0	39.3	14,134	2.15E-05	90%	8.06E-06	8.46E-05	2.54E-03	1.52E-05
Mangagnese	1.0	39.3	14,134	2.15E-04	90%	8.06E-05	8.46E-04	2.54E-02	1.52E-04
Mercury	1.0	39.3	14,134	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	39.3	14,134	8.62E-06	90%	3.22E-06	3.38E-05	1.02E-03	6.09E-06
Selenium	1.0	39.3	14,134	2.15E-06	90%	8.06E-07	8.46E-06	2.54E-04	1.52E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM IMPORTED BASE MATERIAL DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.16	1.69	50.76	0.30
PM_{10}	0.66	6.91	207.18	1.24
TSP	3.37	35.39	1061.79	6.37
Arsenic	3.22E-06	3.38E-05	1.02E-03	6.09E-06
Beryllium	1.61E-07	1.69E-06	5.08E-05	3.05E-07
Cadmium	1.61E-07	1.69E-06	5.08E-05	3.05E-07
Chromium	8.06E-06	8.46E-05	2.54E-03	1.52E-05
Lead	8.06E-06	8.46E-05	2.54E-03	1.52E-05
Mangagnese	8.06E-05	8.46E-04	2.54E-02	1.52E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.22E-06	3.38E-05	1.02E-03	6.09E-06
Selenium	8.06E-07	8.46E-06	2.54E-04	1.52E-06
Total HAPs	1.04E-04	1.09E-03	3.28E-02	1.97E-04

TABLE E-9
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	69	24,735	10,560	2.0	137.4	49,470
Totals	**69**	**24,735**			**137**	**49,470**

[1] Vehicles traveling on paved roads for green waste delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures: Watering Roads as needed:
Control Efficiency 90%
Source: Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	13	6.5	9.75	69	670
TOTAL				**69**	**670**
				Average Vehicle Weight (tons)	**9.75**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE E-9
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR GREEN WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	9.75	tons	
Control efficiency (e) =	90	%	Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	137.4	49,470	0.08	90%	0.10	1.10	32.92	0.20
PM_{10}	1.0	137.4	49,470	0.33	90%	0.43	4.48	134.35	0.81
TSP	1.0	137.4	49,470	1.67	90%	2.19	22.95	688.54	4.13
Arsenic	1.0	137.4	49,470	1.60E-06	90%	2.09E-06	2.19E-05	6.58E-04	3.95E-06
Beryllium	1.0	137.4	49,470	7.98E-08	90%	1.04E-07	1.10E-06	3.29E-05	1.97E-07
Cadmium	1.0	137.4	49,470	7.98E-08	90%	1.04E-07	1.10E-06	3.29E-05	1.97E-07
Chromium	1.0	137.4	49,470	3.99E-06	90%	5.22E-06	5.49E-05	1.65E-03	9.87E-06
Lead	1.0	137.4	49,470	3.99E-06	90%	5.22E-06	5.49E-05	1.65E-03	9.87E-06
Mangagnese	1.0	137.4	49,470	3.99E-05	90%	5.22E-05	5.49E-04	1.65E-02	9.87E-05
Mercury	1.0	137.4	49,470	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	137.4	49,470	1.60E-06	90%	2.09E-06	2.19E-05	6.58E-04	3.95E-06
Selenium	1.0	137.4	49,470	3.99E-07	90%	5.22E-07	5.49E-06	1.65E-04	9.87E-07

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM GREEN WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.10	1.10	32.92	0.20
PM_{10}	0.43	4.48	134.35	0.81
TSP	2.19	22.95	688.54	4.13
Arsenic	2.09E-06	2.19E-05	6.58E-04	3.95E-06
Beryllium	1.04E-07	1.10E-06	3.29E-05	1.97E-07
Cadmium	1.04E-07	1.10E-06	3.29E-05	1.97E-07
Chromium	5.22E-06	5.49E-05	1.65E-03	9.87E-06
Lead	5.22E-06	5.49E-05	1.65E-03	9.87E-06
Mangagnese	5.22E-05	5.49E-04	1.65E-02	9.87E-05
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.09E-06	2.19E-05	6.58E-04	3.95E-06
Selenium	5.22E-07	5.49E-06	1.65E-04	9.87E-07
Total HAPs	6.76E-05	7.10E-04	2.13E-02	1.28E-04

TABLE E-10
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Paved Roadways
Process ID: PVR - GW

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles per day[2]	# of Vehicles per Year[3]	Length of road (round trip)[2]		VMT Data	
			Feet	Miles	(per day)	(per year)
Transfer Trucks	57	20,353	10,560	2.0	113.1	40,707
Totals	**57**	**20,353**			**113**	**40,707**

[1] Vehicles traveling on paved roads for C&D waste delivery.
[2] Length of roads provided by site personnel.
[3] Vehicle usage data and length of roads provided by 2012 EIR Air Quality Analysis, Table 6-9 for 2035-2042 (11,450 TPD) but adjusted based on SWFP limit of 869 municipal solid waste tickets per day allowed.

Operations Data

360	days per year
10.5	hrs/day

*Operational days per year based on 2012 EIR Air Quality Analysis, Section 6.2.2.1.1 from 6:00 am to 4:30 pm.

Fugitive Dust Control Measures:	**Control Efficiency**	**Source:**
Watering Roads as needed:	90%	Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Mean Vehicle Weight (W)

Vehicle Type	Average Full Weight (tons)	Average Tare Weight (tons)	Average Weight (tons)	Average Number of Vehicles/Day	Weight times # of vehicles
Transfer Trucks	16	8	12	57	678
TOTAL				**57**	**678**
				Average Vehicle Weight (tons)	**12.00**

Methodologies:
AP-42, Section 13.2.1 for Paved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 13.2.1 for Paved Roads):
Calculation of emission factor for fugitive emissions for refuse vehicles on paved haul roads - Use Equation (2) in AP-42 Section 13.2.1, p. 13.2.1-5.

$$E_a = (VMT)\,[k(sL/2)^{0.65}(W/3)^{1.5}](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **sL** = Road surface silt loading factor (grams per m^2)
- **W** = Vehicle weight in tons
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

TABLE E-10
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR C&D WASTE DELIVERY FROM PAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Variables:

k factor for $PM_{2.5}$ =	0.00392	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.016	lb/VMT	(from AP-42, Table 13.2-1.1)
k factor for TSP =	0.082	lb/VMT	(from AP-42, Table 13.2-1.1)
Silt Loading Factor (sL) =	13.6	g/m^2	(APCD default)
Transfer Trucks Vehicle Weight (W) =	12.00	tons	
Control efficiency (e) =	90	%	Based on watering roads every 4 hours consistent with unpaved road PTO conditions.

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF PARTICULATE EMISSIONS FROM TRANSFER TRUCKS

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	113.1	40,707	0.11	90%	0.12	1.23	36.98	0.22
PM_{10}	1.0	113.1	40,707	0.44	90%	0.48	5.03	150.95	0.91
TSP	1.0	113.1	40,707	2.28	90%	2.46	25.79	773.61	4.64
Arsenic	1.0	113.1	40,707	2.18E-06	90%	2.35E-06	2.47E-05	7.40E-04	4.44E-06
Beryllium	1.0	113.1	40,707	1.09E-07	90%	1.17E-07	1.23E-06	3.70E-05	2.22E-07
Cadmium	1.0	113.1	40,707	1.09E-07	90%	1.17E-07	1.23E-06	3.70E-05	2.22E-07
Chromium	1.0	113.1	40,707	5.45E-06	90%	5.87E-06	6.16E-05	1.85E-03	1.11E-05
Lead	1.0	113.1	40,707	5.45E-06	90%	5.87E-06	6.16E-05	1.85E-03	1.11E-05
Mangagnese	1.0	113.1	40,707	5.45E-05	90%	5.87E-05	6.16E-04	1.85E-02	1.11E-04
Mercury	1.0	113.1	40,707	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	113.1	40,707	2.18E-06	90%	2.35E-06	2.47E-05	7.40E-04	4.44E-06
Selenium	1.0	113.1	40,707	5.45E-07	90%	5.87E-07	6.16E-06	1.85E-04	1.11E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM C&D WASTE DELIVERY

	Estimated Actual Emissions			
Pollutant	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.12	1.23	1.23	0.22
PM_{10}	0.48	5.03	5.03	0.91
TSP	2.46	25.79	25.79	4.64
Arsenic	2.35E-06	2.47E-05	2.47E-05	4.44E-06
Beryllium	1.17E-07	1.23E-06	1.23E-06	2.22E-07
Cadmium	1.17E-07	1.23E-06	1.23E-06	2.22E-07
Chromium	5.87E-06	6.16E-05	6.16E-05	1.11E-05
Lead	5.87E-06	6.16E-05	6.16E-05	1.11E-05
Mangagnese	5.87E-05	6.16E-04	6.16E-04	1.11E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.35E-06	2.47E-05	2.47E-05	4.44E-06
Selenium	5.87E-07	6.16E-06	6.16E-06	1.11E-06
Total HAPs	7.60E-05	7.98E-04	7.98E-04	1.44E-04

TABLE E-11
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FROM STOCKPILES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Cover Stockpile\Surface

Process ID: STK

Methodologies:
AP-42, Section 8.19 for Crushed Stone Processing (9/85) which are SDAPCD Defaults

Emissions Calculation Methodology (AP-42, Section 8.19 for Crushed Stone Processing):

$$E_a = (A)[(Efa*Da) + (Efi*Di)](Ci)(1-e)$$

Where:

- **E_a** = Annual emissions of each contaminant (lb/yr)
- **A** = Area of soil stockpile (acres)
- **EFa** = Emission factor for active days (lb/acre/active day)
- **Da** = Number of active days (days/yr)
- **EFi** = Emission factor for inactive days (lb/acre/active day)
- **Di** = Number of inactive days (days/yr)
- **Ci** = Concentration of each listed substance in soil (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

Area of soil stockpile (A) =	10	acres	(per SLI personnel)
TSP Emission factor for active days (EFa) =	13.2	lb/acre/day	(AP-42, Section 8.19)
TSP Emission factor for inactive days (EFi) =	3.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
PM_{10} Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for active days (EFa) =	6.5	lb/acre/day	(AP-42, Section 8.19)
$PM_{2.5}$ Emission factor for inactive days (EFi) =	1.7	lb/acre/day	(AP-42, Section 8.19)
Number of Active Days/Year (Da) =	312	days	(per SLI personnel)
Number of Inactive Days/Year (Di) =	53	days	(per SLI personnel)
Control efficiency (e) =	0.0%		(Water trucks not utilized)

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

Note: Loader and water truck used for stockpiles and already accounted for in fugitive dust estimates for landfill equipment.

SUMMARY OF EMISSIONS FROM COVER STORAGE PILES

	Estimated Actual Emissions			
Pollutant	(lb/hr)	(lb/day)	(lb/month)	(tons/yr)
$PM_{2.5}$	2.42	58.03	1740.90	10.59
PM_{10}	2.42	58.03	1740.90	10.59
TSP	4.91	117.92	3537.45	21.52
Arsenic	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Beryllium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Cadmium	2.42E-06	5.80E-05	1.74E-03	1.06E-05
Chromium	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Lead	1.21E-04	2.90E-03	8.70E-02	5.30E-04
Mangagnese	1.21E-03	2.90E-02	8.70E-01	5.30E-03
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.84E-05	1.16E-03	3.48E-02	2.12E-04
Selenium	1.21E-05	2.90E-04	8.70E-03	5.30E-05
Total HAPs	1.56E-03	3.75E-02	1.13E+00	6.85E-03

TABLE E-12
FUTIRE POTENTIAL FUGITIVE DUST EMISSIONS FROM MATERIAL HANDLING - EARTHMOVING ACTIVITIES
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Material Handling - Earthmoving Activities
Process ID: EMA

Amount of Soil Moved - Unloading and Loading Topsoil

Type of Vehicle	Soil Density[1]	Load Volume[1]	Vehicle Load Weight	Total Soil Moved[1]		Amount (Tons)	
	tons/yd^3	yd^3/load	tons/load	yd^3/day	yd^3/year	(per day)	(per year)
Articulated Dump Trucks	1.35	16	21.60	2,319	834,840	1,718	618,480
Scrapers	1.35	15	20.25	2,319	834,840	1,718	618,480
Totals				**4,638**	**1,669,680**	**3,436**	**1,236,960**

[1] Soil density, load volume, and amount of soil moved from 2012 EIR Air Quality Analysis, Table AQ-F-28, 2035+

Operations Data[1]

360	days per year

[1] Per 2012 EIR Air Quality Analysis, Table AQ-F-28, facility uses dump trucks used exclusively in future scenario for loading as all soil has been stockpiled and scrapers for unloading soil.

Fugitive Dust Control Measures: Control Efficiency Source:
Cumulative Total Control: 90% *Based on EIR and watering on unpaved surface every four hours.*

Emissions Calculation Methodology (SDAPCD Defaults):

TSP	=	0.05	lb/ton	(TSP)
PM_{10}	=	0.021	lb/ton	(PM_{10})
$PM_{2.5}$	=	0.021	lb/ton	($PM_{2.5}$)

SDAPCD has no default emission factor for $PM_{2.5}$. Assumed $PM_{2.5}$ equal to PM_{10}.

Concentration of each listed substance in soil stockpile emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb
Beryllium	1	ppmw =	1.00E-06	lbs/lb
Cadmium	1	ppmw =	1.00E-06	lbs/lb
Chromium	50	ppmw =	5.00E-05	lbs/lb
Lead	50	ppmw =	5.00E-05	lbs/lb
Mangagnese	500	ppmw =	5.00E-04	lbs/lb
Mercury	0	ppmw =	0.00E+00	lbs/lb
Nickel	20	ppmw =	2.00E-05	lbs/lb
Selenium	5	ppmw =	5.00E-06	lbs/lb
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb

SUMMARY OF PARTICULATE EMISSIONS FROM MATERIAL HANDLING

Pollutant	Total Amount		Emission Factor (lb/ton)[1]	Control Efficiency (%)	Estimated Actual Emissions			
	ton/day	ton/yr			lb/hr	lbs/day	lb/month	tons/yr
$PM_{2.5}$	3,436.0	1,236,960	2.10E-02	90%	6.87E-01	7.22E+00	2.16E+02	1.30E+00
PM_{10}	3,436.0	1,236,960	2.10E-02	90%	6.87E-01	7.22E+00	2.16E+02	1.30E+00
TSP	3,436.0	1,236,960	5.00E-02	90%	1.64E+00	1.72E+01	5.15E+02	3.09E+00
Arsenic	3,436.0	1,236,960	4.20E-07	90%	1.37E-05	1.44E-04	4.33E-03	2.60E-05
Beryllium	3,436.0	1,236,960	2.10E-08	90%	6.87E-07	7.22E-06	2.16E-04	1.30E-06
Cadmium	3,436.0	1,236,960	2.10E-08	90%	6.87E-07	7.22E-06	2.16E-04	1.30E-06
Chromium	3,436.0	1,236,960	1.05E-06	90%	3.44E-05	3.61E-04	1.08E-02	6.49E-05
Lead	3,436.0	1,236,960	1.05E-06	90%	3.44E-05	3.61E-04	1.08E-02	6.49E-05
Mangagnese	3,436.0	1,236,960	1.05E-05	90%	3.44E-04	3.61E-03	1.08E-01	6.49E-04
Mercury	3,436.0	1,236,960	0.00E+00	90%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3,436.0	1,236,960	4.20E-07	90%	1.37E-05	1.44E-04	4.33E-03	2.60E-05
Selenium	3,436.0	1,236,960	1.05E-07	90%	3.44E-06	3.61E-05	1.08E-03	6.49E-06

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

SUMMARY OF EMISSIONS FROM MATERIAL HANDLING

Pollutant	Estimated Actual Emissions			
	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	0.69	7.22	216.47	1.30
PM_{10}	0.69	7.22	216.47	1.30
TSP	1.64	17.18	515.40	3.09
Arsenic	1.37E-05	1.44E-04	4.33E-03	2.60E-05
Beryllium	6.87E-07	7.22E-06	2.16E-04	1.30E-06
Cadmium	6.87E-07	7.22E-06	2.16E-04	1.30E-06
Chromium	3.44E-05	3.61E-04	1.08E-02	6.49E-05
Lead	3.44E-05	3.61E-04	1.08E-02	6.49E-05
Mangagnese	3.44E-04	3.61E-03	1.08E-01	6.49E-04
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.37E-05	1.44E-04	4.33E-03	2.60E-05
Selenium	3.44E-06	3.61E-05	1.08E-03	6.49E-06
Total HAPs	4.45E-04	4.67E-03	1.40E-01	8.40E-04

TABLE E-13
FUTURE POTENTIAL FUGITIVE DUST EMISSIONS FOR EARTHMOVING EQUIPMENT ON UNPAVED ROADS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source: Earthmoving Activities - Travel
Process ID: EMA-UPR

Vehicle Miles Traveled (VMT)

Type of Vehicle[1]	# of Vehicles trips per day[2]	# of Vehicle trips per Year[5]	Length of road (round trip)[3]		VMT Data	
			Feet	Miles	(per day)	(per year)
Scrapers	155	55,800	2,640	0.5	77.5	27,900
Totals	**155**	**55,800**			**78**	**27,900**

[1] Vehicles traveling on unpaved roads for earthmoving activities.
[2] Vehicle usage data from 2012 EIR Air Quality Analysis
[3] Per 2012 EIR Air Quality Analysis, Table AQ-F-28, average roundtrip distance is 0.5 miles/trip

Operations Data[1]

360	days per year
10.5	hrs/day

[1] Per 2012 EIR Air Quality Analysis, Table AQ-F-28, facility uses scrapers exclusively in future scenario.

Fugitive Dust Control Measures:	Control Efficiency	Source:
Watering Roads as needed:	90%	Based on watering roads every 4 hours per PTO Conditions
Chemical Dust Suppressents:	60%	PTO Conditions per SDAPCD/Suppressant Manufacturer
Cumulative Total Control:	96%	*Per SDAPCD*

Methodologies:
AP-42, Section 13.2.2 for Unpaved Roads (10/97) and SDAPCD Defaults

Emissions Calculation Methodology:
Calculation of emission factor for fugitive emissions for construction vehicles on landfill surface and unpaved haul roads - Use Equation 1a in AP-42 Section 13.2.2, p. 13.2.2-4, with an adjustment for rainfall per AP-42 Equation 2 (p. 13.2.2-7).

$$E_a = (VMT)[(k)(5.9)(s/12)(S/30)(W/3)^{0.7}(w/4)^{0.5}(365-p/365)](Ci)(1-e)$$

Where:

- E_a = Annual emissions of each contaminant (lb/yr)
- **VMT** = Vehicle miles traveled on site (miles/yr)
- **k** = Empirical constant [lb/VMT]
- **s** = Surface material silt content [%]
- **S** = Mean vehicle speed (mph)
- **W** = Vehicle weight [tons]
- **w** = Number of vehicle wheels (dimensionless)
- **p** = Number of days per year with >0.01 inch of rainfall (AP-42, Figure 13.2.2-1 or climate website)
- **Ci** = Concentration of each listed substance in haul road emissions (lbs/lb)
- **e** = Control Efficiency (%)

Variables:

k factor for $PM_{2.5}$ =	0.036	lb/VMT	(per SDAPCD; use current AP-42 ratios since no factor in 1997)
k factor for PM_{10} =	0.36	lb/VMT	(from AP-42, Table 13.2.2)
k factor for TSP =	0.8	lb/VMT	(from AP-42, Table 13.2.2)
Vehicle Weight (W) =	25.80	tons	from 2012 EIR
Mean Silt content (s) =	15	%	(APCD default)
Mean Vehicle Speed (S) =	3.7	mph	2012 EIR Air Quality Analysis, Table AQ-F-27
Number of Vehicle Wheels (w) =	4	(dimensionless)	(from APCD default for Sycamore truck/scraper in 2014 EI)
# of days w/ >0.01 in. rainfall (p) =	40	days/year	(APCD default; for San Diego County)
Control efficiency (e) =	96	%	PTO Conditions)

Concentration of each listed substance in haul road emissions (Ci) =

Arsenic	20	ppmw =	2.00E-05	lbs/lb	(APCD default)
Beryllium	1	ppmw =	1.00E-06	lbs/lb	
Cadmium	1	ppmw =	1.00E-06	lbs/lb	
Chromium	50	ppmw =	5.00E-05	lbs/lb	
Lead	50	ppmw =	5.00E-05	lbs/lb	
Mangagnese	500	ppmw =	5.00E-04	lbs/lb	
Mercury	0	ppmw =	0.00E+00	lbs/lb	
Nickel	20	ppmw =	2.00E-05	lbs/lb	
Selenium	5	ppmw =	5.00E-06	lbs/lb	
TSP	1,000,000	ppmw =	1.00E+00	lbs/lb	
PM_{10}	1,000,000	ppmw =	1.00E+00	lbs/lb	

SUMMARY OF EMISSIONS FROM ARTICULATED DUMP TRUCKS (EARTHMOVING TRAVEL)

	Total VMT			Emission Factor	Control	Estimated Actual Emissions			
Pollutant	VMT/hr	VMT/day	VMT/yr	(lb/VMT)[1]	Efficiency (%)	lb/hr	lb/day	lb/month	tons/yr
$PM_{2.5}$	1.0	77.5	27,900	0.13	96%	0.04	0.41	12.23	0.07
PM_{10}	1.0	77.5	27,900	1.31	96%	0.39	4.08	122.28	0.73
TSP	1.0	77.5	27,900	2.92	96%	0.86	9.06	271.74	1.63
Arsenic	1.0	77.5	27,900	2.63E-06	96%	7.76E-07	8.15E-06	2.45E-04	1.47E-06
Beryllium	1.0	77.5	27,900	1.31E-07	96%	3.88E-08	4.08E-07	1.22E-05	7.34E-08
Cadmium	1.0	77.5	27,900	1.31E-07	96%	3.88E-08	4.08E-07	1.22E-05	7.34E-08
Chromium	1.0	77.5	27,900	6.57E-06	96%	1.94E-06	2.04E-05	6.11E-04	3.67E-06
Lead	1.0	77.5	27,900	6.57E-06	96%	1.94E-06	2.04E-05	6.11E-04	3.67E-06
Mangagnese	1.0	77.5	27,900	6.57E-05	96%	1.94E-05	2.04E-04	6.11E-03	3.67E-05
Mercury	1.0	77.5	27,900	0.00E+00	96%	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.0	77.5	27,900	2.63E-06	96%	7.76E-07	8.15E-06	2.45E-04	1.47E-06
Selenium	1.0	77.5	27,900	6.57E-07	96%	1.94E-07	2.04E-06	6.11E-05	3.67E-07
Total HAPs						2.51E-05	2.64E-04	7.91E-03	4.75E-05

[1] Per SDAPCD, since k value for $PM_{2.5}$ is not provided in AP-42 (10/97), use current AP-42 ratio of PM_{10} to $PM_{2.5}$ k value. Since k value for metals not provided in AP-42 guidance, k value of $PM_{2.5}$ used.

TABLE E-14
SUMMARY OF FUTURE FUGITIVE DUST POTENTIAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	PTE	
		lb/day	ton/yr
Future Landfill Equipment	Particulate Matter < 2.5 Microns	3.65	0.61
	Particulate Matter < 10 Microns	36.47	6.14
	Total Suspended Particulates	81.04	13.65
	Hazardous Air Pollutants	2.36E-03	3.97E-04
Future Unpaved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	61.09	11.00
	Particulate Matter < 10 Microns	610.92	109.97
	Total Suspended Particulates	1,357.61	244.37
	Hazardous Air Pollutants	3.95E-02	7.11E-03
Future Unpaved Roadways - Imported Base	Particulate Matter < 2.5 Microns	2.21	0.40
Material	Particulate Matter < 10 Microns	22.07	3.97
	Total Suspended Particulates	49.03	8.83
	Hazardous Air Pollutants	1.43E-03	2.57E-04
Future Unpaved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	3.52	0.63
	Particulate Matter < 10 Microns	35.16	6.33
	Total Suspended Particulates	78.14	14.07
	Hazardous Air Pollutants	2.28E-03	4.10E-04
Future Unpaved Roadways - C&D	Particulate Matter < 2.5 Microns	3.35	0.60
	Particulate Matter < 10 Microns	33.46	6.02
	Total Suspended Particulates	74.36	13.38
	Hazardous Air Pollutants	2.16E-03	3.90E-04
Future Paved Roadways - MSW and Aggregate	Particulate Matter < 2.5 Microns	37.96	6.83
	Particulate Matter < 10 Microns	154.95	27.89
	Total Suspended Particulates	794.12	142.94
	Hazardous Air Pollutants	2.46E-02	4.42E-03
Future Paved Roadways - Imported Base Material	Particulate Matter < 2.5 Microns	1.69	0.30
	Particulate Matter < 10 Microns	6.91	1.24
	Total Suspended Particulates	35.39	6.37
	Hazardous Air Pollutants	1.09E-03	1.97E-04
Future Paved Roadways - Greenwaste	Particulate Matter < 2.5 Microns	1.10	0.20
	Particulate Matter < 10 Microns	4.48	0.81
	Total Suspended Particulates	22.95	4.13
	Hazardous Air Pollutants	7.10E-04	1.28E-04
Future Paved Roadways - C&D	Particulate Matter < 2.5 Microns	1.23	0.22
	Particulate Matter < 10 Microns	5.03	0.91
	Total Suspended Particulates	25.79	4.64
	Hazardous Air Pollutants	7.98E-04	1.44E-04

TABLE E-14
SUMMARY OF FUTURE FUGITIVE DUST POTENTIAL EMISSIONS
SYCAMORE LANDFILL
SANTEE, CALIFORNIA

Emission Source	Regulated Air Pollutant	PTE	
		lb/day	ton/yr
Future Wind Erosion (Stockpiles)	Particulate Matter < 2.5 Microns	58.03	10.59
	Particulate Matter < 10 Microns	58.03	10.59
	Total Suspended Particulates	117.92	21.52
	Hazardous Air Pollutants	3.75E-02	6.85E-03
Future Material Handling - Earthmoving Activities	Particulate Matter < 2.5 Microns	7.22	1.30
	Particulate Matter < 10 Microns	7.22	1.30
	Total Suspended Particulates	17.18	3.09
	Hazardous Air Pollutants	4.67E-03	8.40E-04
Future Material Handling - Travel	Particulate Matter < 2.5 Microns	0.41	0.07
	Particulate Matter < 10 Microns	4.08	0.73
	Total Suspended Particulates	9.06	1.63
	Hazardous Air Pollutants	2.64E-04	4.75E-05
Future Total From All Emission Points	Volatile Organic Compounds	--	--
(Fugitive and Non-Fugitive)	Non-Methane Organic Compounds	--	--
	Sulfur Oxides	--	--
	Carbon Monoxide	--	--
	Nitrogen Oxides	--	--
	Particulate Matter < 2.5 Microns	181.45	32.76
	Particulate Matter < 10 Microns	978.77	175.90
	Total Suspended Particulates	2,662.59	478.62
	Total Hazardous Air Pollutants	0.12	0.02

Appendix F

LFG Analyses

Atmospheric Analysis & Consulting, Inc.

CLIENT	: San Diego APCD
PROJECT NAME	: Fortistar – Sycamore Canyon
AAC PROJECT NO.	: 191953
REPORT DATE	: 11/25/2019

On November 13, Atmospheric Analysis & Consulting, Inc. received one (1) Tedlar Bag for BTU analysis by ASTM D-1945/3588/5504. Upon receipt, the sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab No.
SYCGT3-11122019	191953-3342

This analysis is performed in accordance with AAC's Quality Manual. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at www.aaclab.com.

I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of this sample.

The Technical Director or his/her designee, as verified by the following signature, has authorized release of the data contained in this hardcopy report.

If you have any questions or require further explanation of data results, please contact the undersigned.

Sucha Parmar, Ph.D.
Technical Director

This report consists of 77 pages.

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Atmospheric Analysis & Consulting, Inc.

SAMPLE RECEIPT / LOG-IN REPORT

Client Name: San Diego APCD
Project Name: Fortistar - Sycamore Canyon
AAC Project No.: 191953

Received By: G. Ruelas
Turn Around Time: Normal (10days)
Lab Due Date: 11/20/2019
Sampled By: Client

Sample Receipt Date Time	Clients ID	Sampling Date/Time	Sample #	Matrix	Analysis Requested
11/13/2019 1200	SYCGT3-11122019	11/12/2019 1200	3342	Tedlar Bag	BTU ASTM D5504

REMARKS:
Total Samples: 1

"Landfill gas analysis for fixed gases (O2, CO2, N2, etc.), C1-C6, F-Factor and heat value calculations using ASTM 3588
Total reduced sulfur compounds using ASTM D-5504"

SAN DIEGO AIR POLLUTION CONTROL DISTRICT
10124 Old Grove Road
San Diego CA 92131

191953

CHAIN OF CUSTODY RECORD
Phone : (858) 586-2600
Fax: (858) 586-2601

SITE INFORMATION

Facility Name:	Fortistar - Sycamore Canyon	**APCD Contact:**	Anthony Fry	**PO/APP No.**	APCD2005-PTO-980112
Address:	GT3	**Phone No.**	(858) 586-2766		
	San Diego	**E-mail**	Anthony.Fry@sdcounty.ca.gov		

Sample ID	Sample Date	Sample Time	Sample Type	Sample Container	Preservation	Analysis Description/ Method No.
3342 SYCGT3-~~11132019~~ 11122019 (AN)	~~13-Nov-19~~ 11/12/19 (AN)	12:00	Landfill Gas	Tedlar Bag	N/A	ASTM D-5504 and ASTM 1945/3588

Comments: Landfill gas analysis for fixed gases (O2, CO2, N2 etc.), C1-C6, F-Factor and heat value calculations using ASTM 3588
Total reduced sulfur compounds using ASTM D-5504

LABORATORY INFORMATION

Lab Name:	Atmospheric Analysis & Consulting Inc.	**Lab Contact:**	Jon Yokoyama/Eric Grosjean	**Phone No.**	(805) 650-1642
Report Turnaround:		**Holding Time:**			
Comments:	Full data packages required				

SIGNATURES

Relinquished by:	Anthony Fry 11/12/2019	**Received by:**	Fedex	**Date:**	11/12/19
Company:	San Diego Air Pollution Control District	**Company:**		**Time:**	13:00
Relinquished by:		**Received by:**	Rudy	**Date:**	11/13/19
Company:		**Company:**		**Time:**	1200

FX

Results

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report
ASTM-D3588 (BTU and F-Factor)

CLIENT : San Diego APCD
PROJECT NO. : 191953
SAMPLING DATE : 11/12/2019
ANALYSIS DATE : 11/13-14/2019

	Client ID:	SYCGT3-11122019	
	AAC ID:	191953-3342	
	Component	Mole %	Weight %
FIXED GASES	H_2	0.71	0.05
	O_2	1.20	1.35
	N_2	16.86	16.68
	CO	0.00	0.00
	CO_2	35.90	55.78
	CH_4	45.01	25.50
	He	NM	NM
	Ar	0.1903	0.2685
HYDROCARBONS	C_2 (as Ethane)	0.0000	0.0000
	C_3 (as Propane)	0.0053	0.0082
	C_4 (as Butane)	0.0038	0.0078
	C_5 (as Pentane)	0.0183	0.0467
	C_6 (as Hexane)	0.0177	0.0538
	C_{6+} (as Hexane)	0.0760	0.2314
TRS	TRS as H2S	0.0162	0.0195
H2O	Moisture content	NM	NM

All results have been normalized to 100% on a dry basis.

Fuel Gas Specifications				
Atomic Breakdown - (scf/lb) / %			*HHV Btu/lb*	6196
Carbon (C)	34.6		*LHV Btu/lb*	5579
Hydrogen (H)	6.5		*HHV Btu/dscf*	462
Oxygen (O)	41.9		*LHV Btu/dscf*	416
Nitrogen (N)	16.7		*F-Factor*	9639
Helium (He)	0.00		*Relative Density*	0.9779
Argon (Ar)	0.27		*C2-C6+ Weight %*	0.3479
Sulfur (S)	0.02		*MW lb/lb-mole*	28.320
Motor Octane Number	87.90		*Methane Number*	23.65

Sucha Parmar, Ph.D.
Technical Director

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Atmospheric Analysis & Consulting, Inc.

LABORATORY ANALYSIS REPORT

CLIENT : **San Diego APCD**
PROJECT NO. : **191953**
MATRIX : **AIR**
UNITS : **ppmV**

SAMPLING DATE : **11/12/2019**
ANALYSIS DATE : **11/13/2019**

Total Reduced Sulfur Compounds Analysis by ASTM D-5504

Client ID	SYCGT3-11122019
AAC ID	191953-3342
Analyte	Result
Hydrogen Sulfide	128
COS / SO2	0.419
Methyl Mercaptan	7.64
Ethyl Mercaptan	0.125
Dimethyl Sulfide	18.7
Carbon Disulfide	0.060
Isopropyl Mercaptan	0.777
tert-Butyl Mercaptan	0.138
n-Propyl Mercaptan	< 0.050
Methylethylsulfide	< 0.050
sec-Butyl Mercaptan / Thiophene	1.00
iso-Butyl Mercaptan	0.099
Diethyl Sulfide	< 0.050
n-Butyl Mercaptan	0.051
Dimethyl Disulfide	< 0.050
2-Methylthiophene	0.446
3-Methylthiophene	0.076
Tetrahydrothiophene	< 0.050
Bromothiophene	< 0.050
Thiophenol	< 0.050
Diethyl Disulfide	< 0.050
Total Unidentified Sulfur	0.722
Total Reduced Sulfurs	158

All unidentified compound's concentrations expressed in terms of H_2S (TRS does not include COS and SO_2)
Sample Reporting Limit (SRL) is equal to Reporting Limit x Canister Dil. Fac. x Analysis Dil. Fac.

Sucha Parmar, Ph.D.
Technical Director

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QA/QC Summary

Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

Date Analyzed : 11/14/2019
Analyst : CH
Units : %

Instrument ID : TCD #1
Calb Date : 09/27/19
Reporting Limit : 0.1%

I - Opening Continuing Calibration Verification - BTU/ASTM D-1945

AAC ID	Analyte	H_2	O_2	N_2	CH_4	CO	CO_2
CCV	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	Result	9.9	10.5	21.2	9.9	9.9	9.7
	% Rec *	99.5	100.7	105.0	99.6	98.9	97.7

II - Method Blank - BTU/ASTM D-1945

AAC ID	Analyte	H_2	O_2	N_2	CH_4	CO	CO_2
MB	Concentration	ND	ND	ND	ND	ND	ND

III - Laboratory Control Spike & Duplicate - BTU/ASTM D-1945

AAC ID	Analyte	H_2	O_2	N_2	CH_4	CO	CO_2
Lab Control Standards	Sample Conc	0.0	0.0	0.0	0.0	0.0	0.0
	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	LCS Result	9.7	10.3	20.6	9.8	9.8	9.7
	LCSD Result	9.8	10.4	20.7	10.0	10.0	9.8
	LCS % Rec *	98.0	98.6	102.0	98.6	98.1	97.3
	LCSD % Rec *	99.3	99.7	102.7	99.9	99.5	98.7
	% RPD ***	1.3	1.1	0.7	1.4	1.5	1.4

IV -Sample & Sample Duplicate - BTU/ASTM D-1945

AAC ID	Analyte	H_2	O_2	N_2	CH_4	CO	CO_2
191934-3256	Sample	0.0	10.2	39.1	0.0	0.0	0.1
	Sample Dup	0.0	10.2	38.9	0.0	0.0	0.1
	Mean	0.0	10.2	39.0	0.0	0.0	0.1
	% RPD ***	0.0	0.4	0.5	0.0	0.0	2.5

V - Matrix Spike & Duplicate- BTU/ASTM D-1945

AAC ID	Analyte	H_2	N_2	CH_4	CO	CO_2
191934-3256	Sample Conc	0.0	19.5	0.0	0.0	0.1
	Spike Conc	9.9	10.1	10.0	10.0	10.0
	MS Result	10.0	29.9	10.1	10.1	9.8
	MSD Result	9.8	29.7	10.3	10.3	10.0
	MS % Rec **	100.7	103.2	100.9	100.7	97.2
	MSD % Rec **	99.3	101.4	102.8	102.8	99.6
	% RPD ***	1.4	1.7	1.9	2.1	2.4

VI - Closing Continuing Calibration Verification - BTU/ASTM D-1945

AAC ID	Analyte	H_2	O_2	N_2	CH_4	CO	CO_2
CCV	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	Result	9.9	10.4	20.2	10.0	10.0	9.9
	% Rec *	100.0	100.2	100.1	99.9	99.5	98.9

** Must be 85-115%*
*** Must be 75-125%*
**** Must be < 25%*
ND = Not Detected
<RL = less than Reporting Limit

Sucha Parmar, Ph.D.
Technical Director

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

Date Analyzed : 11/14/2019
Analyst : DL/CH
Units : ppmv

Instrument ID : FID #3
Calb Date : 08/13/19
Reporting Limit : 0.5 ppmv

I - Opening Continuing Calibration Verification - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
CCV	Spike Conc	99.7	100.1	99.9	99.8	100.0	100.2
	Result	103.8	107.4	104.9	103.4	103.8	99.8
	% Rec *	104.1	107.2	105.0	103.6	103.9	99.6

II - Method Blank - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
MB	Concentration	ND	ND	ND	ND	ND	ND

III - Laboratory Control Spike & Duplicate - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
Lab Control Standards	Sample Conc	0.0	0.0	0.0	0.0	0.0	0.0
	Spike Conc	99.7	100.1	99.9	99.8	100.0	100.2
	LCS Result	100.6	103.5	101.2	100.6	100.6	96.6
	LCSD Result	102.4	105.4	103.3	102.3	102.3	98.8
	LCS % Rec *	100.9	103.4	101.3	100.8	100.6	96.4
	LCSD % Rec *	102.7	105.3	103.4	102.5	102.3	98.6
	% RPD ***	1.8	1.8	2.0	1.7	1.7	2.3

IV - Sample & Sample Duplicate - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
191944-3297	Sample	1.1	0.0	0.0	0.0	0.0	0.0
	Sample Dup	1.0	0.0	0.0	0.0	0.0	0.0
	Mean	1.0	0.0	0.0	0.0	0.0	0.0
	% RPD ***	3.8	0.0	0.0	0.0	0.0	0.0

V - Matrix Spike & Duplicate - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
191944-3297	Sample Conc	0.5	0.0	0.0	0.0	0.0	0.0
	Spike Conc	49.8	50.1	50.0	49.9	50.0	50.1
	MS Result	57.9	58.0	56.3	55.8	56.4	55.8
	MSD Result	57.2	57.6	55.9	55.1	55.8	54.8
	MS % Rec **	115.1	115.9	112.7	111.8	112.8	111.3
	MSD % Rec **	113.8	115.1	111.9	110.5	111.6	109.4
	% RPD ***	1.1	0.6	0.7	1.2	1.1	1.8

VI - Closing Continuing Calibration Verification - BTU/ASTM D-1945

AAC ID	Analyte	Methane	Ethane	Propane	Butane	Pentane	Hexane
CCV	Spike Conc	99.7	100.1	99.9	99.8	100.0	100.2
	Result	97.4	99.4	97.2	96.2	95.7	91.9
	% Rec *	97.7	99.3	97.3	96.3	95.7	91.7

** Must be 85-115%*

*** Must be 75-125%*

**** Must be < 25%*

ND = Not Detected

<RL = less than Reporting Limit

Sucha Parmar, Ph.D.
Technical Director

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report
ASTM D-5504

Date Analyzed: 11/13/2019
Analyst: DL
Units: ppbV

Instrument ID: SCD#10
Calb. Date: 11/11/2019

Opening Calibration Verification Standard

523.0 ppbV H2S (SS1192)

H_2S	Resp. (area)	Result	% Rec *	% RPD ****
Initial	4322	526	100.7	0.6
Duplicate	4323	527	100.7	0.6
Triplicate	4241	517	98.8	1.3

547.5 ppbV H2S (SS1192)

MeSH	Resp. (area)	Result	% Rec *	% RPD ****
Initial	5087	544	99.4	0.9
Duplicate	5258	563	102.7	2.4
Triplicate	5052	540	98.7	1.6

535.8 ppbV H2S (SS1192)

DMS	Resp. (area)	Result	% Rec *	% RPD ****
Initial	5594	531	99.1	0.2
Duplicate	5679	539	100.6	1.8
Triplicate	5468	519	96.9	2.0

Method Blank

Analyte	Result
H_2S	<PQL
MeSH	<PQL
DMS	<PQL

Duplicate Analysis **Sample ID** 191712-2270

Analyte	Sample Result	Duplicate Result	Mean	% RPD ***
H_2S	<PQL	<PQL	0.0	0.0
MeSH	<PQL	<PQL	0.0	0.0
DMS	<PQL	<PQL	0.0	0.0

Matrix Spike & Duplicate **Sample ID** 191712-2270 x10

Analyte	Sample Conc.	Spike Added	MS Result	MSD Result	MS % Rec **	MSD % Rec **	% RPD ***
H_2S	<PQL	261.5	255.6	255.2	97.8	97.6	0.1
MeSH	<PQL	273.8	275.2	275.1	100.5	100.5	0.0
DMS	<PQL	267.9	277.5	281.0	103.6	104.9	1.2

Closing Calibration Verification Standard

Analyte	Std. Conc.	Result	% Rec **
H_2S	523.0	559.4	107.0
MeSH	547.5	552.6	100.9
DMS	535.8	527.1	98.4

** Must be 95-105%, ** Must be 90-110%, *** Must be < 5% RPD from Mean result.*

H2S: PQL = 10.0 ppbV, MDL = 0.95 ppbV
MeSH: PQL = 10.0 ppbV, MDL = 1.40 ppbV
DMS: PQL = 10.0 ppbV, MDL = 1.46 ppbV

Sucha Parmar, Ph.D.
Technical Director

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Atmospheric Analysis & Consulting, Inc.

CLIENT : San Diego APCD
PROJECT NAME : Sycamore Canyon GT3
AAC PROJECT NO. : 151378
REPORT DATE : 10/14/2015

On October 8, 2015, Atmospheric Analysis & Consulting, Inc. received one (1) Six-Liter Summa Canister for Siloxanes, TIC's and Volatile Organic Compounds analysis by EPA method TO-15. Upon receipt the sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab ID	Return Pressure (mmHga)
SYC100715-2	151378-83662	375.1

An initial reading of the canister's vacuum was taken and recorded. Subsequently, the canister was brought to positive pressure using UHP-He and the final pressure was recorded.

TO-15 Analysis - Up to a 500 mL aliquot of sample is concentrated, put through a water and CO_2 management system, cryofocused and injected into the GC/MS (full scan mode) for analysis following EPA Method TO-15 as specified in the SOW.

No problems were encountered during receiving, preparation and/ or analysis of these samples. The test results included in this report meet all requirements of the NELAC Standards and/or AAC SOP# TO.15.10.

I certify that this data is technically accurate, complete and in compliance with the terms and conditions of the contract. The Laboratory Director or his designee, as verified by the following signature, has authorized the release of the data contained in this hardcopy data package.

If you have any questions or require further explanation of data results, please contact the undersigned.

Marcus Hueppe
Laboratory Director

This report consists of 59 pages.

ACCREDITED IN ACCORDANCE WITH nelac Certificate #E87837

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Atmospheric Analysis & Consulting, Inc

SAMPLE RECEIPT / LOG-IN REPORT

AAC Project: 151378 **Received by:** T. DiCeglie

Sample Receipt Date	Project Desc	Clients ID	Matrix	Sampling Date/Time	Sampled By	Sample #	Analysis Requested
10/08/2015 1235	San Deigo APCD Sycamore Canyon GT3	SYC100715-2	Summa Canister	10/07/2015 1115-1130	Client	83662	TO15 Tics Siloxanes EPA 3C BTU ASTM D5504

TURN AROUND TIME: Normal (10 Days)

Total Samples: 1

Lab Due Date: 10/15/2015

REMARKS:
Client returned 1x can + 1x manifold.

CANISTER PRESSURE LOG

Client: San Deigo APCD

Project No: 151378

Date: 10/08/2015

Canister #	Sample #	Received Pressure (mmHg)	Final Pressure (mmHg)
727	83662	375.1	1026.1

ATMOSPHERIC ANALYSIS & CONSULTING, INC.
1534 Eastman Avenue, Suite A
Ventura, California 93003
Phone (805) 650-1642 Fax (805) 650-1644
E-mail: info@aaclab.com

AAC Project No. 151378 Page ____ of ____

CHAIN OF CUSTODY/ ANALYSIS REQUEST FORM

Client Name: San Diego APCD
Project Name: Sycamore Canyon GT3
Project Mgr (Print Name): Steve Moore
Project Number:
Sampler's Name (Print Name): John S. Swett
Sampler's Signature: 10/7/15

AAC Sample No.	Date Sampled	Time Sampled	Sample Type	Client Sample ID/Description	Type/No. of Containers	Analysis Requested
000727	10/7/15	11:15-	Landfill Gas	SYC100715-2	can 1	Per Email 83662
		11:30am				

Send report:
Attn: _____
Phone#: _____
Fax# _____

Send invoice to:
Attn: _____
P.O. # _____

Turnaround Time
24-Hr ____ 48-Hr ____
5 Day ____ Normal ____
Other (Specify) _____

Special Instructions/remarks:

Relinquished by (Signature):	Print Name: John S Swett	Date/Time	Received by (signature): Print Name
Relinquished by (Signature):	Print Name:	Date/Time 1235 10/8/15	Received by (signature): Print Name Tony DiCeglie

FedEx 1x can + 1x manifold

Marcus Hueppe

From: Moore, Steve [Steve.Moore@sdcounty.ca.gov]
Sent: Wednesday, October 07, 2015 9:14 AM
To: Porter, Lara E
Cc: Blackburn, Suzanne; Such, John; Marcus Hueppe (mhueppe@aaclab.com)
Subject: RE: Additional Landfill Gas Sampling

Lara,

I just talked to Heidi and Penny regarding the sulfur issue at Sycamore. The conclusion was that we should analyze the raw gas sample we are collecting in the can for sulfur as well as the other compounds on the list. The complete test list for the can sample is now:

GC/MS with the TO-15 list plus the supplemental list and siloxanes;
TIC list including searching for epichlorohydrin as a TIC;
Method 3C for the O2, N2, etc. ; Argon, if available, as part of the 3C; Btu content; sulfur compounds;
And full data package.

Also, If you haven't collected the samples already, to the extent feasible collect the raw gas can sample simultaneously with the bag sample of the turbine fuel.

Thanks.

Steve

AAC#151378

83669

From: Moore, Steve
Sent: Friday, October 02, 2015 5:59 PM
To: Marcus Hueppe (mhueppe@aaclab.com) <mhueppe@aaclab.com>
Cc: Porter, Lara E <Lara.Porter@sdcounty.ca.gov>; Blackburn, Suzanne <Suzanne.Blackburn@sdcounty.ca.gov>
Subject: RE: Additional Landfill Gas Sampling

Marcus,

I should have made clear that we are only grabbing one sample this time so only need one can. It should be shipped directly to our offices. We probably should have some flow reduction with a relatively short fill time—say 15 minutes. I'm not sure what orifices you have available? Filling to about 50% of atmospheric seemed to work well last time.

Thanks.

Steven Moore
Senior Air Pollution Control Engineer
San Diego County Air Pollution Control District
10124 Old Grove Road, San Diego, CA 92131

858-586-2750

Steve

From: Moore, Steve
Sent: Friday, October 02, 2015 3:45 PM
To: Marcus Hueppe (mhueppe@aaclab.com) <mhueppe@aaclab.com>
Cc: Porter, Lara E <Lara.Porter@sdcounty.ca.gov>
Subject: Additional Landfill Gas Sampling

Marcus,

We are going to go ahead with the additional landfill gas sampling we discussed on the phone today. So go ahead and mail us the summa canister and manifold (same specifications as before—we used a ¼ in swagelok fitting) on Monday as we discussed.

The test list is:

GC/MS with the TO-15 list plus the supplemental list and siloxanes;
TIC list including searching for epichlorohydrin as a TIC;
And full data package.

Thanks.

AAC # 151378
8366

Steven Moore
Senior Air Pollution Control Engineer
San Diego County Air Pollution Control District
10124 Old Grove Road, San Diego, CA 92131

858-586-2750

TO-15 REPORTS

Laboratory Analysis Report

CLIENT	**: San Diego APCD**	**DATE RECEIVED**	**: 10/08/2015**
PROJECT NO	**: 151378**	**DATE REPORTED**	**: 10/14/2015**
MATRIX	**: AIR**		
UNITS	**: PPB (v/v)**		

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	SYC100715-2			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	151378-83662				
Date Sampled	10/07/2015				
Date Analyzed	10/13/2015				
Can Dilution Factor	2.74				
	Result	Qualifier	Analysis DF		
Chlorodifluoromethane	534		100	137	0.5
Propene	15700		2000	5471	1.0
Dichlorodifluoromethane	597		100	137	0.5
Chloromethane	<SRL	U	100	137	0.5
Dichlorotetrafluoroethane	<SRL	U	100	137	0.5
Vinyl Chloride	<SRL	U	100	137	0.5
Acetaldehyde	6680		100	547	2.0
Methanol	180000		10000	136777	5.0
1,3-Butadiene	<SRL	U	100	137	0.5
Bromomethane	<SRL	U	100	137	0.5
Chloroethane	<SRL	U	100	137	0.5
Dichlorofluoromethane	311		100	137	0.5
Ethanol	462000		10000	54711	2.0
Vinyl Bromide	<SRL	U	100	137	0.5
Acrolein	<SRL	U	100	274	1.0
Acetone	39200		2000	10942	2.0
Trichlorofluoromethane	<SRL	U	100	137	0.5
2-Propanol (IPA)	89300		2000	10942	2.0
Acrylonitrile	<SRL	U	100	274	1.0
1,1-Dichloroethene	<SRL	U	100	137	0.5
Methylene Chloride (DCM)	864		100	137	0.5
Tert Butanol (TBA)	1070		100	274	1.0
Allyl Chloride	<SRL	U	100	137	0.5
Carbon Disulfide	170		100	137	0.5
Trichlorotrifluoroethane	<SRL	U	100	137	0.5
trans-1,2-Dichloroethene	<SRL	U	100	137	0.5
1,1-Dichloroethane	<SRL	U	100	137	0.5
Methyl Tert Butyl Ether (MTBE)	<SRL	U	100	137	0.5
Vinyl Acetate	<SRL	U	100	274	1.0
2-Butanone (MEK)	35100		2000	5471	1.0
cis-1,2-Dichloroethene	274		100	137	0.5
Hexane	1020		100	137	0.5
Chloroform	<SRL	U	100	137	0.5
Ethyl Acetate	27900		10000	13678	0.5
Tetrahydrofuran	12900		2000	2736	0.5
1,2-Dichloroethane	493		100	137	0.5
1,1,1-Trichloroethane	<SRL	U	100	137	0.5

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Laboratory Analysis Report

CLIENT : San Diego APCD
PROJECT NO : 151378
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 10/08/2015
DATE REPORTED : 10/14/2015

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	SYC100715-2			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	151378-83662				
Date Sampled	10/07/2015				
Date Analyzed	10/13/2015				
Can Dilution Factor	2.74				
	Result	Qualifier	Analysis DF		
Benzene	1550		100	137	0.5
Carbon Tetrachloride	<SRL	U	100	137	0.5
Cyclohexane	844		100	137	0.5
1,2-Dichloropropane	<SRL	U	100	137	0.5
Bromodichloromethane	<SRL	U	100	137	0.5
1,4-Dioxane	<SRL	U	100	137	0.5
Trichloroethene (TCE)	221		100	137	0.5
2,2,4-Trimethylpentane	562		100	137	0.5
Methyl Methacrylate	<SRL	U	100	137	0.5
Heptane	3000		2000	2736	0.5
cis-1,3-Dichloropropene	<SRL	U	100	137	0.5
4-Methyl-2-pentanone (MiBK)	2850		2000	2736	0.5
trans-1,3-Dichloropropene	<SRL	U	100	137	0.5
1,1,2-Trichloroethane	<SRL	U	100	137	0.5
Toluene	27000		2000	2736	0.5
2-Hexanone (MBK)	246		100	137	0.5
Dibromochloromethane	<SRL	U	100	137	0.5
1,2-Dibromoethane	<SRL	U	100	137	0.5
Tetrachloroethene (PCE)	504		100	137	0.5
Chlorobenzene	<SRL	U	100	137	0.5
Ethylbenzene	6320		2000	2736	0.5
m & p-Xylenes	12500		2000	5471	1.0
Bromoform	<SRL	U	100	137	0.5
Styrene	889		100	137	0.5
1,1,2,2-Tetrachloroethane	<SRL	U	100	137	0.5
o-Xylene	3670		2000	2736	0.5
Isopropylbenzene (Cumene)	563		100	137	0.5
2-Chlorotoluene	<SRL	U	100	137	0.5
4-Ethyltoluene	584		100	137	0.5
1,3,5-Trimethylbenzene	667		100	137	0.5
1,2,4-Trimethylbenzene	1520		100	137	0.5
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	100	137	0.5
1,3-Dichlorobenzene	<SRL	U	100	137	0.5
1,4-Dichlorobenzene	429		100	137	0.5
1,2-Dichlorobenzene	<SRL	U	100	137	0.5
1,2,4-Trichlorobenzene	<SRL	U	100	137	0.5
Naphthalene	<SRL	U	100	137	0.5
Hexachlorobutadiene	<SRL	U	100	137	0.5
BFB-Surrogate Std. % Recovery	111%				70-130%

U - Compound was analyzed for, but was not detected at or above the SRL.

Marcus Hueppe
Laboratory Director

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Laboratory Analysis Report

CLIENT	**: San Diego APCD**	**DATE RECEIVED**	**: 10/08/2015**
PROJECT NO	**: 151378**	**DATE REPORTED**	**: 10/14/2015**
MATRIX	**: AIR**		
UNITS	**: PPB (v/v)**		

Client ID	SYC100715-2	
AAC ID	151378-83662	
Date Sampled	10/07/2015	
Date Analyzed	10/13/2015	
Can Dilution Factor	2.74	
SILOXANES		
Compound	*PPB(V/V)*	*Sample Reporting Limit*
Hexamethyldisiloxane (L2)	548	54.7
Hexamethylcyclotrisiloxane (D3)	134	54.7
Octamethyltrisiloxane (L3)	43.6	54.7
Octamethylcyclotetrasiloxane (D4)	1260	54.7
Decamethyltetrasiloxane (L4)	<SRL	54.7
Decamethylcyclopentasiloxane (D5)	347	54.7
Dodecamethylpentasiloxane (L5)	<SRL	54.7
TENTATIVELY IDENTIFIED COMPOUNDS		
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	5160	91
Isobutane	12400	64
2-Methylbutane	11900	91
1-Propanol	124000	91
Trimethylsilanol	7740	91
2-Butanol	70500	83
1-Butanol	62400	91
Ethyl ester propanoic acid	4420	91
n-Propyl acetate	8240	83
Methyl ester butanoic acid	16100	91
Ethyl ester butanoic acid	27400	91
Butyl ester acetic acid	5120	78
Propyl ester butanoic acid	16800	90
Nonane	6160	97
C9H18 Hydrocarbon	4380	38
C9H16O2 Hydrocarbon	4730	64
.alpha.-Pinene	23000	97
Camphene	12300	97
Butyl ester butanoic acid	15200	90
Decane	8480	95
3-Carene	4320	95
4-Carene	4710	97
1-Methyl-(1-methylethyl)-benzene	11000	97
D-Limonene	27700	95
Eucalyptol	6700	99
1-Methyl-4-(1-methylethylidene)-cyclohexene	4300	96
Epichlorohydrin	ND	NA
BFB-Surrogate Std. % Recovery	111%	

Marcus Hueppe
Laboratory Director

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TO-15 QC REPORT

ANALYSIS DATE : 10/13/2015 **INSTRUMENT ID** : GC/MS-03
ANALYST : JJG **CALIBRATION STD ID** : PS071315-01

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15
Continuing Calibration Verification of the 06/17/2015 Calibration

Compounds	*Conc*	*Daily Conc*	*%REC**
4-BFB (surrogate standard)	10.00	10.24	102
Chlorodifluoromethane	10.40	9.47	91
Propene	10.60	8.71	82
Dichlorodifluoromethane	10.10	9.77	97
Chloromethane	10.20	8.62	85
Dichlorotetrafluoroethane	10.40	10.74	103
Vinyl Chloride	10.40	10.18	98
Acetaldehyde	21.60	16.01	74
Methanol	18.00	14.58	81
1,3-Butadiene	10.30	7.79	76
Bromomethane	10.10	8.47	84
Chloroethane	10.10	9.42	93
Dichlorofluoromethane	10.40	10.45	100
Ethanol	10.10	8.41	83
Vinyl Bromide	10.10	10.95	108
Acrolein	9.20	7.84	85
Acetone	10.60	10.25	97
Trichlorofluoromethane	10.60	10.28	97
2-Propanol (IPA)	10.90	9.77	90
Acrylonitrile	11.70	10.64	91
1,1-Dichloroethene	10.30	11.02	107
Methylene Chloride (DCM)	10.30	8.08	78
Tert Butanol (TBA)	11.70	9.70	83
Allyl Chloride	10.50	8.09	77
Carbon Disulfide	10.20	8.05	79
Trichlorotrifluoroethane	10.00	9.97	100
trans-1,2-Dichloroethene	10.00	11.01	110
1,1-Dichloroethane	10.20	10.04	98
Methyl Tert Butyl Ether (MTBE)	10.20	10.24	100
Vinyl Acetate	10.50	9.40	90
2-Butanone (MEK)	10.30	10.23	99
cis-1,2-Dichloroethene	10.50	10.73	102
Hexane	10.20	10.17	100
Chloroform	10.20	10.39	102
Ethyl Acetate	10.20	9.33	91
Tetrahydrofuran	10.20	9.93	97
1,2-Dichloroethane	10.40	10.24	98
1,1,1-Trichloroethane	10.30	10.24	99

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ANALYSIS DATE : 10/13/2015
ANALYST : JJG
INSTRUMENT ID : GC/MS-03
CALIBRATION STD ID : PS071315-01

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15
Continuing Calibration Verification of the 06/17/2015 Calibration

Compounds	*Conc*	*Daily Conc*	*%REC**
Benzene	10.50	9.66	92
Carbon Tetrachloride	10.20	10.27	101
Cyclohexane	10.30	9.21	89
1,2-Dichloropropane	10.50	9.90	94
Bromodichloromethane	10.60	10.38	98
1,4-Dioxane	10.60	10.15	96
Trichloroethene (TCE)	10.60	10.51	99
2,2,4-Trimethylpentane	10.40	9.76	94
Methyl Methacrylate	10.10	10.02	99
Heptane	10.50	10.10	96
cis-1,3-Dichloropropene	10.80	10.66	99
4-Methyl-2-pentanone (MiBK)	10.10	9.61	95
trans-1,3-Dichloropropene	10.80	10.90	101
1,1,2-Trichloroethane	10.50	10.34	98
Toluene	10.60	10.07	95
2-Hexanone (MBK)	10.60	10.29	97
Dibromochloromethane	10.60	11.87	112
1,2-Dibromoethane	10.40	10.63	102
Tetrachloroethene (PCE)	10.30	10.68	104
Chlorobenzene	10.70	10.80	101
Ethylbenzene	10.60	10.31	97
m & p-Xylenes	20.60	20.83	101
Bromoform	10.30	12.11	118
Styrene	10.50	11.00	105
1,1,2,2-Tetrachloroethane	10.50	10.91	104
o-Xylene	10.50	10.03	96
Isopropylbenzene (Cumene)	9.80	9.89	101
2-Chlorotoluene	10.30	9.87	96
4-Ethyltoluene	10.30	11.29	110
1,3,5-Trimethylbenzene	10.40	10.90	105
1,2,4-Trimethylbenzene	10.40	11.29	109
Benzyl Chloride (a-Chlorotoluene)	10.20	9.85	97
1,3-Dichlorobenzene	10.20	11.11	109
1,4-Dichlorobenzene	10.40	11.21	108
1,2-Dichlorobenzene	10.30	11.33	110
1,2,4-Trichlorobenzene	9.80	10.78	110
Naphthalene	10.50	11.26	107
Hexachlorobutadiene	9.80	11.28	115

* - %REC should be 70-130%

Marcus Hueppe
Laboratory Director

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Quality Control/Quality Assurance Report

CLIENT ID	**: Laboratory Control Spike**	**DATE ANALYZED**	**: 10/13/2015**
AAC ID	**: LCS/LCSD**	**DATE REPORTED**	**: 10/13/2015**
MEDIA	**: Air**	**UNITS**	**: ppbv**

TO-15 Laboratory Control Spike Recovery

Compound	Sample Conc.	Spike Added	Spike Res	Dup Spike Res	Spike % Rec *	Spike Dup % Rec *	RPD** %
1,1-Dichloroethene	0.0	10.30	11.02	10.89	107	106	1.2
Methylene Chloride (DCM)	0.0	10.30	8.08	8.36	78	81	3.4
Benzene	0.0	10.50	9.66	9.80	92	93	1.4
Trichloroethene (TCE)	0.0	10.60	10.51	10.76	99	101	2.4
Toluene	0.0	10.60	10.07	10.14	95	96	0.7
Tetrachloroethene (PCE)	0.0	10.30	10.68	10.76	104	104	0.7
Chlorobenzene	0.0	10.70	10.80	10.84	101	101	0.4
Ethylbenzene	0.0	10.60	10.31	10.42	97	98	1.1
m & p-Xylenes	0.0	20.60	20.83	20.86	101	101	0.1
o-Xylene	0.0	10.50	10.03	10.06	96	96	0.3

* Must be 70-130%

** Must be < 25%

Marcus Hueppe
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Method Blank Analysis Report

MATRIX	**: AIR**	**ANALYSIS DATE**	**: 10/13/2015**
UNITS	**: ppbv**	**REPORT DATE**	**: 10/13/2015**

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / *AAC ID*	Method Blank MB 101315	RL
Chlorodifluoromethane	<RL	0.5
Propene	<RL	1.0
Dichlorodifluoromethane	<RL	0.5
Chloromethane	<RL	0.5
Dichlorotetrafluoroethane	<RL	0.5
Vinyl Chloride	<RL	0.5
Acetaldehyde	<RL	2.0
Methanol	<RL	5.0
1,3-Butadiene	<RL	0.5
Bromomethane	<RL	0.5
Chloroethane	<RL	0.5
Dichlorofluoromethane	<RL	0.5
Ethanol	<RL	2.0
Vinyl Bromide	<RL	0.5
Acrolein	<RL	1.0
Acetone	<RL	2.0
Trichlorofluoromethane	<RL	0.5
2-Propanol (IPA)	<RL	2.0
Acrylonitrile	<RL	1.0
1,1-Dichloroethene	<RL	0.5
Methylene Chloride (DCM)	<RL	0.5
Tert Butanol (TBA)	<RL	1.0
Allyl Chloride	<RL	0.5
Carbon Disulfide	<RL	0.5
Trichlorotrifluoroethane	<RL	0.5
trans-1,2-Dichloroethene	<RL	0.5
1,1-Dichloroethane	<RL	0.5
Methyl Tert Butyl Ether (MTBE)	<RL	0.5
Vinyl Acetate	<RL	1.0
2-Butanone (MEK)	<RL	1.0
cis-1,2-Dichloroethene	<RL	0.5
Hexane	<RL	0.5
Chloroform	<RL	0.5
Ethyl Acetate	<RL	0.5
Tetrahydrofuran	<RL	0.5
1,2-Dichloroethane	<RL	0.5
1,1,1-Trichloroethane	<RL	0.5
Benzene	<RL	0.5
Carbon Tetrachloride	<RL	0.5
Cyclohexane	<RL	0.5
1,2-Dichloropropane	<RL	0.5
Bromodichloromethane	<RL	0.5
1,4-Dioxane	<RL	0.5
Trichloroethene (TCE)	<RL	0.5
2,2,4-Trimethylpentane	<RL	0.5
Methyl Methacrylate	<RL	0.5
Heptane	<RL	0.5

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Method Blank Analysis Report

MATRIX	**: AIR**	**ANALYSIS DATE**	**: 10/13/2015**
UNITS	**: ppbv**	**REPORT DATE**	**: 10/13/2015**

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / *AAC ID*	Method Blank MB 101315	RL
cis-1,3-Dichloropropene	<RL	0.5
4-Methyl-2-pentanone (MiBK)	<RL	0.5
trans-1,3-Dichloropropene	<RL	0.5
1,1,2-Trichloroethane	<RL	0.5
Toluene	<RL	0.5
2-Hexanone (MBK)	<RL	0.5
Dibromochloromethane	<RL	0.5
1,2-Dibromoethane	<RL	0.5
Tetrachloroethene (PCE)	<RL	0.5
Chlorobenzene	<RL	0.5
Ethylbenzene	<RL	0.5
m & p-Xylenes	<RL	1.0
Bromoform	<RL	0.5
Styrene	<RL	0.5
1,1,2,2-Tetrachloroethane	<RL	0.5
o-Xylene	<RL	0.5
Isopropylbenzene (Cumene)	<RL	0.5
2-Chlorotoluene	<RL	0.5
4-Ethyltoluene	<RL	0.5
1,3,5-Trimethylbenzene	<RL	0.5
1,2,4-Trimethylbenzene	<RL	0.5
Benzyl Chloride (a-Chlorotoluene)	<RL	0.5
1,3-Dichlorobenzene	<RL	0.5
1,4-Dichlorobenzene	<RL	0.5
1,2-Dichlorobenzene	<RL	0.5
1,2,4-Trichlorobenzene	<RL	0.5
Naphthalene	<RL	0.5
Hexachlorobutadiene	<RL	0.5
System Monitoring Compounds		
BFB-Surrogate Std. % Recovery	104%	--

RL - Reporting Limit

Marcus Hueppe
Laboratory Director

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Quality Control/Quality Assurance Report

AAC ID	**: 151378-83662**	**DATE ANALYZED**	**: 10/13/2015**
MATRIX	**: Air**	**DATE REPORTED**	**: 10/13/2015**
		UNITS	**: ppbv**

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Chlorodifluoromethane	<SRL	<SRL	0.0
Propene	<SRL	<SRL	0.0
Dichlorodifluoromethane	<SRL	<SRL	0.0
Chloromethane	<SRL	<SRL	0.0
Dichlorotetrafluoroethane	<SRL	<SRL	0.0
Vinyl Chloride	<SRL	<SRL	0.0
Acetaldehyde	<SRL	<SRL	0.0
Methanol	180000	177000	1.7
1,3-Butadiene	<SRL	<SRL	0.0
Bromomethane	<SRL	<SRL	0.0
Chloroethane	<SRL	<SRL	0.0
Dichlorofluoromethane	<SRL	<SRL	0.0
Ethanol	462000	465000	0.6
Vinyl Bromide	<SRL	<SRL	0.0
Acrolein	<SRL	<SRL	0.0
Acetone	<SRL	<SRL	0.0
Trichlorofluoromethane	<SRL	<SRL	0.0
2-Propanol (IPA)	<SRL	<SRL	0.0
Acrylonitrile	<SRL	<SRL	0.0
1,1-Dichloroethene	<SRL	<SRL	0.0
Methylene Chloride (DCM)	<SRL	<SRL	0.0
Tert Butanol (TBA)	<SRL	<SRL	0.0
Allyl Chloride	<SRL	<SRL	0.0
Carbon Disulfide	<SRL	<SRL	0.0
Trichlorotrifluoroethane	<SRL	<SRL	0.0
trans-1,2-Dichloroethene	<SRL	<SRL	0.0
1,1-Dichloroethane	<SRL	<SRL	0.0
Methyl Tert Butyl Ether (MTBE)	<SRL	<SRL	0.0
Vinyl Acetate	<SRL	<SRL	0.0
2-Butanone (MEK)	<SRL	<SRL	0.0
cis-1,2-Dichloroethene	<SRL	<SRL	0.0
Hexane	<SRL	<SRL	0.0
Chloroform	<SRL	<SRL	0.0
Ethyl Acetate	27900	28100	0.7
Tetrahydrofuran	<SRL	<SRL	0.0
1,2-Dichloroethane	<SRL	<SRL	0.0
1,1,1-Trichloroethane	<SRL	<SRL	0.0
Benzene	<SRL	<SRL	0.0
Carbon Tetrachloride	<SRL	<SRL	0.0

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Quality Control/Quality Assurance Report

AAC ID	**: 151378-83662**	**DATE ANALYZED**	**: 10/13/2015**
MATRIX	**: Air**	**DATE REPORTED**	**: 10/13/2015**
		UNITS	**: ppbv**

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Cyclohexane	<SRL	<SRL	0.0
1,2-Dichloropropane	<SRL	<SRL	0.0
Bromodichloromethane	<SRL	<SRL	0.0
1,4-Dioxane	<SRL	<SRL	0.0
Trichloroethene (TCE)	<SRL	<SRL	0.0
2,2,4-Trimethylpentane	<SRL	<SRL	0.0
Methyl Methacrylate	<SRL	<SRL	0.0
Heptane	<SRL	<SRL	0.0
cis-1,3-Dichloropropene	<SRL	<SRL	0.0
4-Methyl-2-pentanone (MiBK)	<SRL	<SRL	0.0
trans-1,3-Dichloropropene	<SRL	<SRL	0.0
1,1,2-Trichloroethane	<SRL	<SRL	0.0
Toluene	<SRL	<SRL	0.0
2-Hexanone (MBK)	<SRL	<SRL	0.0
Dibromochloromethane	<SRL	<SRL	0.0
1,2-Dibromoethane	<SRL	<SRL	0.0
Tetrachloroethene (PCE)	<SRL	<SRL	0.0
Chlorobenzene	<SRL	<SRL	0.0
Ethylbenzene	<SRL	<SRL	0.0
m & p-Xylenes	<SRL	<SRL	0.0
Bromoform	<SRL	<SRL	0.0
Styrene	<SRL	<SRL	0.0
1,1,2,2-Tetrachloroethane	<SRL	<SRL	0.0
o-Xylene	<SRL	<SRL	0.0
Isopropylbenzene (Cumene)	<SRL	<SRL	0.0
2-Chlorotoluene	<SRL	<SRL	0.0
4-Ethyltoluene	<SRL	<SRL	0.0
1,3,5-Trimethylbenzene	<SRL	<SRL	0.0
1,2,4-Trimethylbenzene	<SRL	<SRL	0.0
Benzyl Chloride (a-Chlorotoluene)	<SRL	<SRL	0.0
1,3-Dichlorobenzene	<SRL	<SRL	0.0
1,4-Dichlorobenzene	<SRL	<SRL	0.0
1,2-Dichlorobenzene	<SRL	<SRL	0.0
1,2,4-Trichlorobenzene	<SRL	<SRL	0.0
Naphthalene	<SRL	<SRL	0.0
Hexachlorobutadiene	<SRL	<SRL	0.0
System Monitoring Compounds			
BFB-Surrogate Std. % Recovery	106%	106%	0.6

SRL - Sample Reporting Limit

Marcus Hueppe
Laboratory Director

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TO-15 RAW DATA

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131509.D
Acq On : 13 Oct 2015 13:55
Operator : JJG
Sample : 151378-83662 x100
Misc : IS/Surr: PS081415-02 + 500mL x100
ALS Vial : 4 Sample Multiplier: 100

Quant Time: Oct 13 14:47:16 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Bromochloromethane	12.206	128	2410070	10.00 ppbv	0.02
39) 1,4-Difluorobenzene	14.435	114	1290894	10.00 ppbv	0.02
59) Chlorobenzene-d5	20.123	117	1159135	10.00 ppbv	0.00
System Monitoring Compounds					
69) 4-Bromofluorobenzene(BFB)	22.566	174	769901	11.11 ppbv	0.00
Spiked Amount 10.000			Recovery =	111.10%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	4.673	51	105069	195.17 ppbv	99
3) Propene	4.636	42	991497m	5385.12 ppbv	
4) Dichlorodifluoromethane	4.745	85	166577	218.22 ppbv	99
5) Chloromethane	5.125	52	3103	N.D.	
6) Dichlorotetrafluoroethane	5.179	135	12267	N.D.	
7) VinylChloride	5.505	62	10399	N.D.	
8) Acetaldehyde	5.541	44	279160	2443.52 ppbv #	1
9) Methanol	5.614	31	4972114m	Below Cal	
10) 1,3-Butadiene	5.686	54	9996	N.D.	
11) Bromomethane	6.265	96	3597	N.D.	
12) Chloroethane	6.555	66	2048	N.D.	
13) Dichlorofluoromethane	6.862	67	65842	113.75 ppbv #	79
14) Ethanol	7.043	45	10793790m	72796.89 ppbv	
15) VinylBromide	0.000		0	N.D.	
16) Acrolein	0.000		0	N.D. d	
17) Acetone	7.785	58	1824768m	11,942.97 ppbv	
18) Trichlorofluoromethane	7.496	103	18679	N.D.	
19) 2-Propanol(IPA)	8.111	45	9286692m	19,059.51 ppbv	
20) Acrylonitrile	8.817	52	1347	N.D.	
21) 1,1-Dichloroethene	8.545	96	2952	N.D.	
22) MethyleneChloride(DCM)	9.161	84	76583m	315.91 ppbv	
23) TertButanol(TBA)	9.016	59	214830m	392.00 ppbv	
24) AllylChloride	9.197	39	1708	N.D.	
25) CarbonDisulfide	9.305	76	51422m	62.25 ppbv	
26) Trichlorotrifluoroethane	8.817	103	534	N.D.	
27) trans-1,2-Dichloroethene	10.262	96	2898	N.D.	
28) 1,1-Dichloroethane	10.744	63	18002	N.D.	
29) MethylTertButylEther(M...	10.298	73	12997	N.D.	
30) VinylAcetate	0.000		0	N.D. d	
31) 2-Butanone(MEK)	11.279	72	1683861m	10277.56 ppbv	
32) cis-1,2-Dichloroethene	11.742	96	32120	100.04 ppbv	95
33) Hexane	11.297	86	26647	372.29 ppbv #	12
34) Chloroform	12.349	83	1054	N.D.	
35) EthylAcetate	11.867	43	5262942	6508.75 ppbv #	92
36) Tetrahydrofuran	12.509	72	572412	3560.97 ppbv #	60
37) 1,2-Dichloroethane	13.436	62	78115	180.39 ppbv	98
38) 1,1,1-Trichloroethane	13.169	97	352	N.D.	
40) Benzene	13.775	78	629324m	567.05 ppbv	
41) CarbonTetrachloride	13.757	117	799	N.D.	
42) Cyclohexane	13.847	69	50840	308.54 ppbv #	1
43) 1,2-Dichloropropane	15.237	63	13867	N.D.	
44) Bromodichloromethane	15.737	85	1972	N.D.	

10/13/15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131509.D
Acq On : 13 Oct 2015 13:55
Operator : JJG
Sample : 151378-83662 x100
Misc : IS/Surr: PS081415-02 + 500mL x100
ALS Vial : 4 Sample Multiplier: 100

Quant Time: Oct 13 14:47:16 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
45) 1,4-Dioxane	15.434	88	8704	N.D.	
46) Trichloroethene(TCE)	15.130	130	41635	80.88 ppbv	97
47) 2,2,4-Trimethylpentane	14.613	57	382445	205.52 ppbv	94
48) MethylMethacrylate	15.344	69	7025	N.D.	
49) Heptane	14.952	71	360652	996.04 ppbv	92
50) cis-1,3-Dichloropropene	16.575	75	18019	N.D.	
51) 4-Methyl-2-pentanone(M...	16.379	58	345727	890.57 ppbv	87
52) trans-1,3-Dichloropropene	17.395	75	1520	N.D.	
53) 1,1,2-Trichloroethane	0.000		0	N.D. d	
54) Toluene	17.520	91	6937782m	5395.75 ppbv	
55) 2-Hexanone(MBK)	18.001	58	42396	89.96 ppbv	82
56) Dibromochloromethane	0.000		0	N.D. d	
57) 1,2-Dibromoethane	0.000		0	N.D.	
58) Tetrachloroethene(PCE)	18.857	166	115718	184.39 ppbv	98
60) Chlorobenzene	20.213	114	9550	N.D.	
61) Ethylbenzene	20.551	91	2914672	1946.58 ppbv	97
62) m&p-Xylene	20.801	106	2554263	4137.97 ppbv	95
63) Bromoform	0.000		0	N.D.	
64) Styrene	21.496	104	310245	324.87 ppbv	98
65) 1,1,2,2-Tetrachloroethane	22.156	83	6706	N.D.	
66) o-Xylene	21.550	91	1396993	1182.89 ppbv	97
67) Isopropylbenzene(Cumene)	22.388	105	367361	205.73 ppbv #	90
68) 2-Chlorotoluene	0.000		0	N.D. d	
70) 4-Ethyltoluene	23.529	120	107978	213.31 ppbv	98
71) 1,3,5-Trimethylbenzene	23.636	120	173181	243.91 ppbv #	94
72) 1,2,4-Trimethylbenzene	24.385	120	383919	557.29 ppbv	99
73) BenzylChloride(a-Chlor...	0.000		0	N.D. d	
74) 1,3-Dichlorobenzene	24.902	146	1547	N.D.	
75) 1,4-Dichlorobenzene	25.116	146	147357m	156.81 ppbv	
76) 1,2-Dichlorobenzene	25.705	146	6448	N.D.	
77) 1,2,4-Trichlorobenzene	29.307	180	2102	N.D.	
78) Naphthalene	29.681	128	63894	N.D.	
79) Hexachlorobutadiene	29.931	225	274	N.D.	

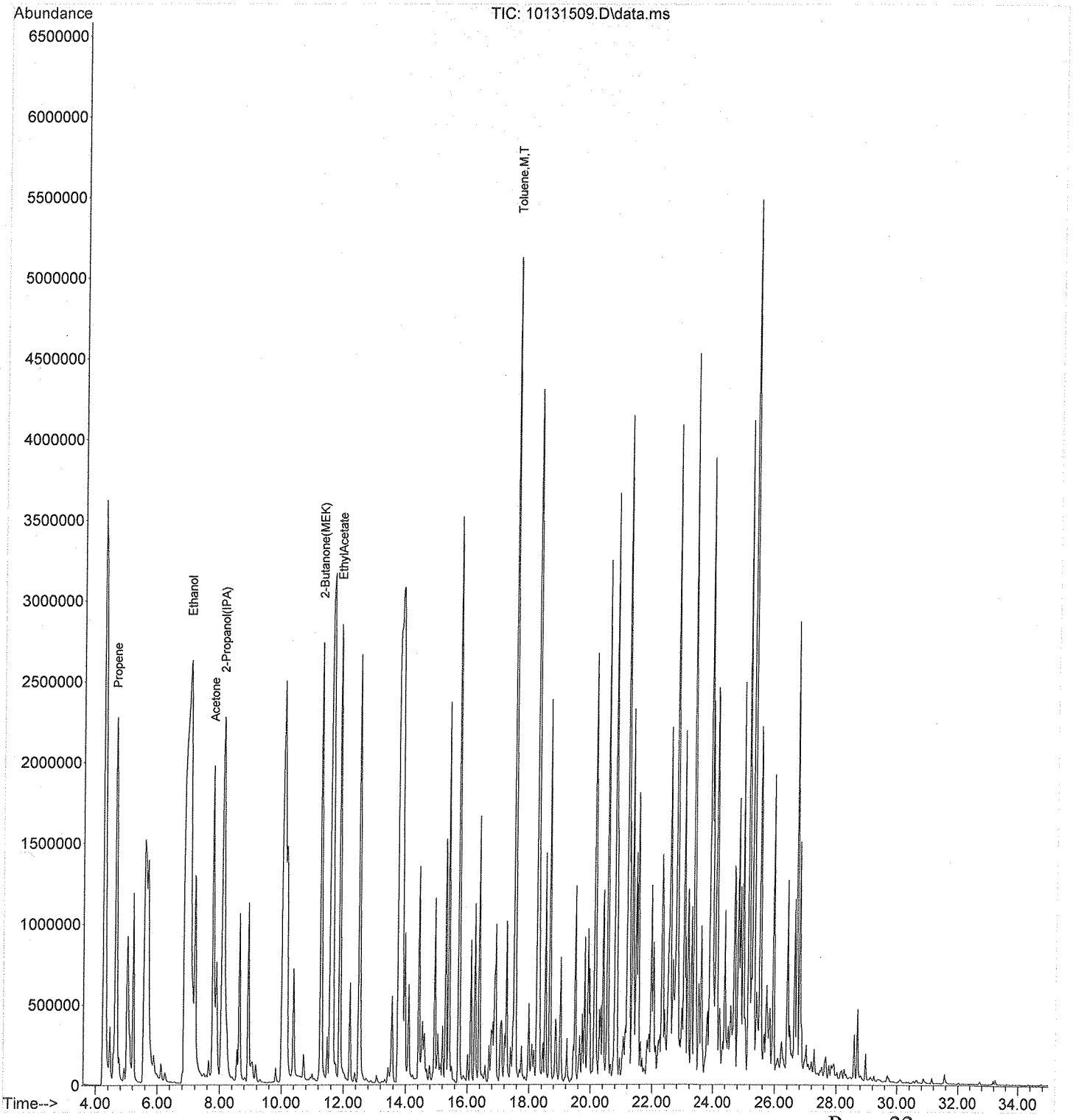
(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/12/15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131509.D
Acq On : 13 Oct 2015 13:55
Operator : JJG
Sample : 151378-83662 x100
Misc : IS/Surr: PS081415-02 + 500mL x100
ALS Vial : 4 Sample Multiplier: 100

Quant Time: Oct 13 14:47:16 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131508.D
Acq On : 13 Oct 2015 13:06
Operator : JJG
Sample : 151378-83662 x2000
Misc : IS/Surr: PS081415-02 + 25mL x100
ALS Vial : 4 Sample Multiplier: 2000

Quant Time: Oct 13 14:12:47 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.188	128	256555m	10.00	ppbv	0.00
39) 1,4-Difluorobenzene	14.417	114	1269854	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1215217	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	765983	10.55	ppbv	0.00
Spiked Amount 10.000			Recovery = 105.50%			
Target Compounds						Qvalue
2) Chlorodifluoromethane	4.691	51	7687	N.D.		
3) Propene	4.654	42	56199m	5734.71	ppbv	
4) Dichlorodifluoromethane	4.763	85	9296	N.D.		
5) Chloromethane	5.161	52	375	N.D.		
6) Dichlorotetrafluoroethane	5.179	135	630	N.D.		
7) VinylChloride	5.505	62	354	N.D.		
8) Acetaldehyde	0.000		0	N.D.	d	
9) Methanol	5.614	31	375063m	67073.25	ppbv	
10) 1,3-Butadiene	5.704	54	773	N.D.		
11) Bromomethane	6.265	96	1686	N.D.		
12) Chloroethane	6.591	66	395	N.D.		
13) Dichlorofluoromethane	6.844	67	3753	N.D.		
14) Ethanol	6.862	45	1311795m	166220.27	ppbv	
15) VinylBromide	0.000		0	N.D.		
16) Acrolein	7.695	56	309	N.D.		
17) Acetone	7.803	58	116411m	14314.55	ppbv	
18) Trichlorofluoromethane	7.477	103	1088	N.D.		
19) 2-Propanol(IPA)	8.002	45	846662m	32646.75	ppbv	
20) Acrylonitrile	0.000		0	N.D.		
21) 1,1-Dichloroethene	0.000		0	N.D.		
22) MethyleneChloride(DCM)	9.142	84	7257	N.D.		
23) TertButanol(TBA)	8.961	59	33028	1132.28	ppbv #	1
24) AllylChloride	9.052	39	678	N.D.		
25) CarbonDisulfide	9.305	76	19703	N.D.		
26) Trichlorotrifluoroethane	0.000		0	N.D.		
27) trans-1,2-Dichloroethene	0.000		0	N.D.		
28) 1,1-Dichloroethane	10.726	63	871	N.D.		
29) MethylTertButylEther(M...	10.298	73	1838	N.D.		
30) VinylAcetate	10.726	43	1991	N.D.		
31) 2-Butanone(MEK)	11.261	72	111758m	12815.68	ppbv	
32) cis-1,2-Dichloroethene	11.724	96	1419	N.D.		
33) Hexane	11.296	86	1577	N.D.		
34) Chloroform	0.000		0	N.D.		
35) EthylAcetate	11.867	43	438205m	10181.82	ppbv	
36) Tetrahydrofuran	12.527	72	40313m	4711.77	ppbv	
37) 1,2-Dichloroethane	13.436	62	3831	N.D.		
38) 1,1,1-Trichloroethane	0.000		0	N.D.		
40) Benzene	0.000		0	N.D.	d	
41) CarbonTetrachloride	0.000		0	N.D.		
42) Cyclohexane	13.846	69	4083	N.D.		
43) 1,2-Dichloropropane	15.237	63	1177	N.D.		
44) Bromodichloromethane	0.000		0	N.D.		

10/13/15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131508.D
Acq On : 13 Oct 2015 13:06
Operator : JJG
Sample : 151378-83662 x2000
Misc : IS/Surr: PS081415-02 + 25mL x100
ALS Vial : 4 Sample Multiplier: 2000

Quant Time: Oct 13 14:12:47 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
45) 1,4-Dioxane	15.487	88	374	N.D.	
46) Trichloroethene(TCE)	15.130	130	2208	N.D.	
47) 2,2,4-Trimethylpentane	14.595	57	21225	N.D.	
48) MethylMethacrylate	15.344	69	285	N.D.	
49) Heptane	14.952	71	19507	1095.33 ppbv	98
50) cis-1,3-Dichloropropene	16.557	75	407	N.D.	
51) 4-Methyl-2-pentanone(M...	16.378	58	19902	1042.32 ppbv	93
52) trans-1,3-Dichloropropene	17.520	75	4022	N.D.	
53) 1,1,2-Trichloroethane	17.698	97	3298	N.D.	
54) Toluene	17.520	91	624424m	9873.65 ppbv	
55) 2-Hexanone(MBK)	18.055	58	2079	N.D.	
56) Dibromochloromethane	18.857	129	4343	N.D.	
57) 1,2-Dibromoethane	0.000		0	N.D.	
58) Tetrachloroethene(PCE)	18.857	166	5459	N.D.	
60) Chlorobenzene	20.195	114	709	N.D.	
61) Ethylbenzene	20.551	91	181407	2311.25 ppbv	99
62) m&p-Xylene	20.801	106	148034	4575.02 ppbv	93
63) Bromoform	0.000		0	N.D.	
64) Styrene	21.496	104	16258	N.D.	
65) 1,1,2,2-Tetrachloroethane	22.156	83	536	N.D.	
66) o-Xylene	21.532	91	83023	1341.09 ppbv	94
67) Isopropylbenzene(Cumene)	22.388	105	20492	N.D.	
68) 2-Chlorotoluene	23.351	91	40107	N.D.	
70) 4-Ethyltoluene	23.529	120	5609	N.D.	
71) 1,3,5-Trimethylbenzene	23.636	120	9010	N.D.	
72) 1,2,4-Trimethylbenzene	24.385	120	18174	N.D.	
73) BenzylChloride(a-Chlor...	24.956	91	15600	N.D.	
74) 1,3-Dichlorobenzene	24.920	146	494	N.D.	
75) 1,4-Dichlorobenzene	25.134	146	7186	N.D.	
76) 1,2-Dichlorobenzene	25.705	146	577	N.D.	
77) 1,2,4-Trichlorobenzene	29.307	180	696	N.D.	
78) Naphthalene	29.735	128	3801	N.D.	
79) Hexachlorobutadiene	0.000		0	N.D.	

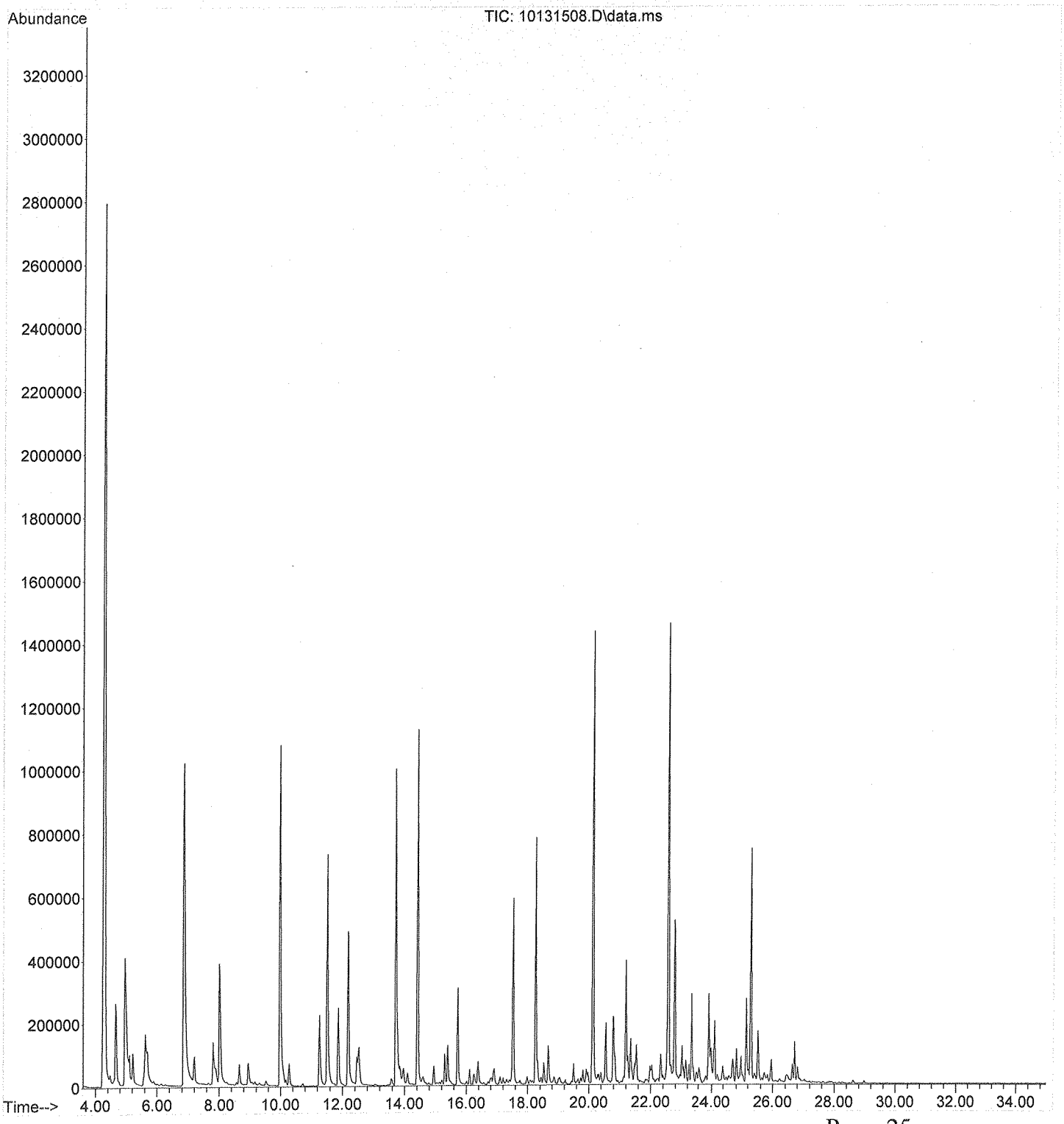
(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/13/15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131508.D
Acq On : 13 Oct 2015 13:06
Operator : JJG
Sample : 151378-83662 x2000
Misc : IS/Surr: PS081415-02 + 25mL x100
ALS Vial : 4 Sample Multiplier: 2000

Quant Time: Oct 13 14:12:47 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



10/13/15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Bromochloromethane	12.170	128	244870m	10.00 ppbv	-0.02
39) 1,4-Difluorobenzene	14.417	114	1293023	10.00 ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1216871	10.00 ppbv	0.00
System Monitoring Compounds					
69) 4-Bromofluorobenzene(BFB)	22.566	174	767693	10.56 ppbv	0.00
Spiked Amount 10.000			Recovery = 105.60%		
Target Compounds					Qvalue
2) Chlorodifluoromethane	4.691	51	1880	N.D.	
3) Propene	4.654	42	16857	N.D.	
4) Dichlorodifluoromethane	4.763	85	1791	N.D.	
5) Chloromethane	5.143	52	308	N.D.	
6) Dichlorotetrafluoroethane	0.000		0	N.D.	
7) VinylChloride	0.000		0	N.D.	
8) Acetaldehyde	0.000		0	N.D. d	
9) Methanol	5.668	31	75473m	65699.69 ppbv	
10) 1,3-Butadiene	5.722	54	275	N.D.	
11) Bromomethane	6.265	96	3064	N.D.	
12) Chloroethane	6.537	66	824	N.D.	
13) Dichlorofluoromethane	6.844	67	761	N.D.	
14) Ethanol	6.880	45	254664m	169044.28 ppbv	
15) VinylBromide	0.000		0	N.D.	
16) Acrolein	7.713	56	827	N.D.	
17) Acetone	0.000		0	N.D. d	
18) Trichlorofluoromethane	7.496	103	119	N.D.	
19) 2-Propanol(IPA)	0.000		0	N.D. d	
20) Acrylonitrile	0.000		0	N.D.	
21) 1,1-Dichloroethene	0.000		0	N.D.	
22) MethyleneChloride(DCM)	9.160	84	2308	N.D.	
23) TertButanol(TBA)	8.998	59	5337	N.D.	
24) AllylChloride	9.160	39	56	N.D.	
25) CarbonDisulfide	9.305	76	16078	N.D.	
26) Trichlorotrifluoroethane	0.000		0	N.D.	
27) trans-1,2-Dichloroethene	0.000		0	N.D.	
28) 1,1-Dichloroethane	10.726	63	132	N.D.	
29) MethylTertButylEther(M...	10.316	73	111	N.D.	
30) VinylAcetate	10.726	43	1176	N.D.	
31) 2-Butanone(MEK)	0.000		0	N.D. d	
32) cis-1,2-Dichloroethene	11.724	96	148	N.D.	
33) Hexane	11.297	86	364	N.D.	
34) Chloroform	0.000		0	N.D.	
35) EthylAcetate	11.885	43	83680	10185.56 ppbv	100
36) Tetrahydrofuran	12.563	72	8536	N.D.	
37) 1,2-Dichloroethane	13.436	62	609	N.D.	
38) 1,1,1-Trichloroethane	0.000		0	N.D.	
40) Benzene	13.775	78	54049	N.D.	
41) CarbonTetrachloride	0.000		0	N.D.	
42) Cyclohexane	13.864	69	830	N.D.	
43) 1,2-Dichloropropane	15.220	63	1770	N.D.	
44) Bromodichloromethane	0.000		0	N.D.	

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

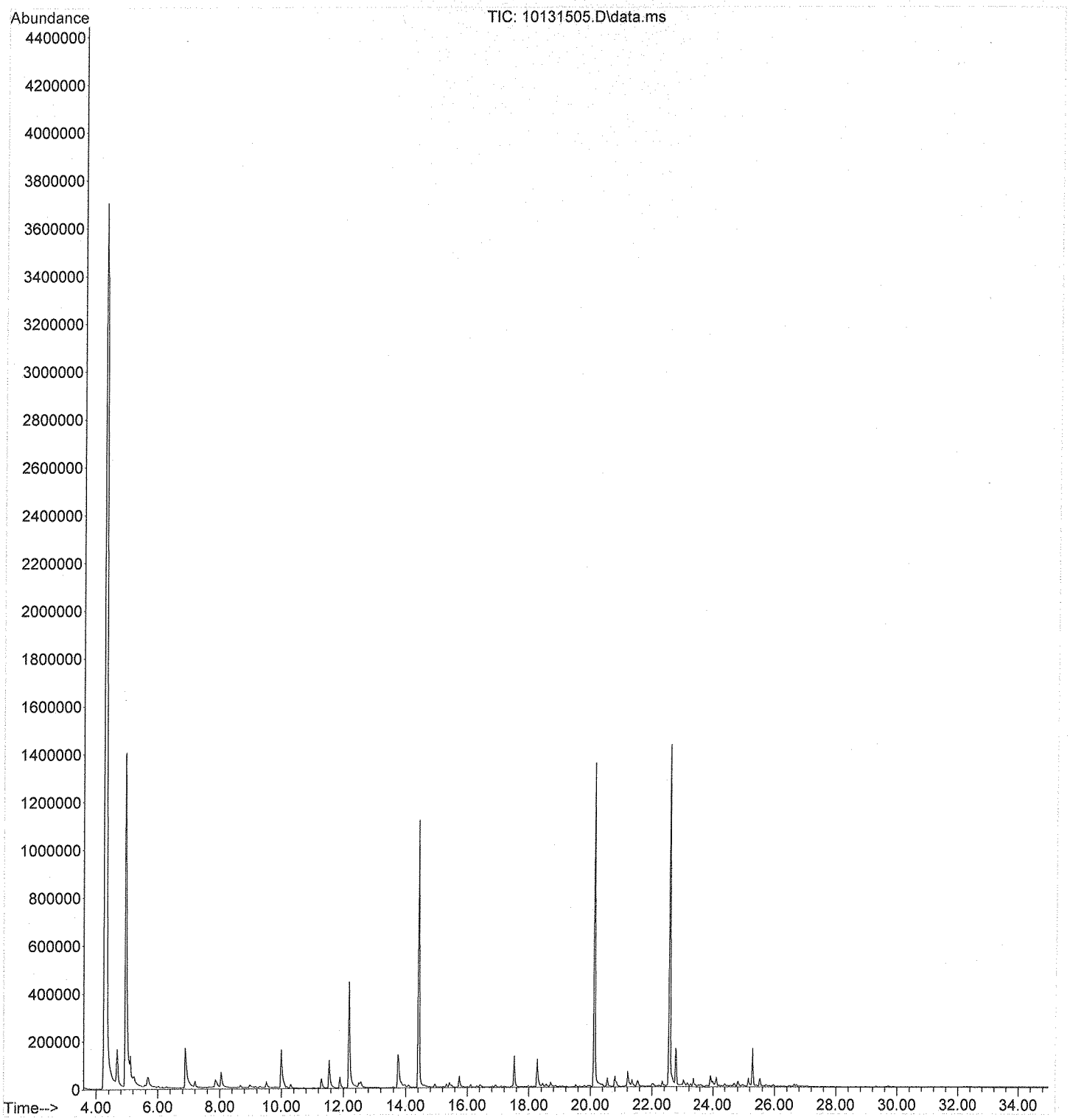
Compound	R.T.	QIon	Response	Conc Units Dev(Min)
45) 1,4-Dioxane	15.451	88	108	N.D.
46) Trichloroethene(TCE)	15.130	130	351	N.D.
47) 2,2,4-Trimethylpentane	14.595	57	5627	N.D.
48) MethylMethacrylate	15.487	69	431	N.D.
49) Heptane	14.952	71	4136	N.D.
50) cis-1,3-Dichloropropene	0.000		0	N.D.
51) 4-Methyl-2-pentanone(M...	16.414	58	3656	N.D.
52) trans-1,3-Dichloropropene	17.520	75	1020	N.D.
53) 1,1,2-Trichloroethane	17.698	97	608	N.D.
54) Toluene	0.000		0	N.D. d
55) 2-Hexanone(MBK)	18.162	58	883	N.D.
56) Dibromochloromethane	18.857	129	900	N.D.
57) 1,2-Dibromoethane	0.000		0	N.D.
58) Tetrachloroethene(PCE)	18.857	166	1093	N.D.
60) Chlorobenzene	20.212	114	449	N.D.
61) Ethylbenzene	20.551	91	35600	N.D.
62) m&p-Xylene	20.801	106	30017	N.D.
63) Bromoform	0.000		0	N.D.
64) Styrene	21.514	104	3878	N.D.
65) 1,1,2,2-Tetrachloroethane	22.210	83	730	N.D.
66) o-Xylene	21.550	91	17576	N.D.
67) Isopropylbenzene(Cumene)	22.388	105	4266	N.D.
68) 2-Chlorotoluene	23.351	91	6463	N.D.
70) 4-Ethyltoluene	23.529	120	1486	N.D.
71) 1,3,5-Trimethylbenzene	23.636	120	1892	N.D.
72) 1,2,4-Trimethylbenzene	24.385	120	4016	N.D.
73) BenzylChloride(a-Chlor...	0.000		0	N.D. d
74) 1,3-Dichlorobenzene	24.920	146	1619	N.D.
75) 1,4-Dichlorobenzene	25.134	146	3532	N.D.
76) 1,2-Dichlorobenzene	25.705	146	1492	N.D.
77) 1,2,4-Trichlorobenzene	29.307	180	2951	N.D.
78) Naphthalene	29.699	128	9631	N.D.
79) Hexachlorobutadiene	29.913	225	423	N.D.

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



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Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131510.D
Acq On : 13 Oct 2015 14:42
Operator : JJG
Sample : 151378-83662 x20
Misc : IS/Surr: PS081415-02 + 25mL
ALS Vial : 13 Sample Multiplier: 20

Quant Time: Oct 13 15:23:14 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715-SIL.M
Quant Title : Siloxane
QLast Update : Thu Jun 18 08:04:26 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.259	128	276160m	10.00	ppbv	0.00
2) 1,4-Difluorobenzene	14.453	114	1328968m	10.00	ppbv	0.00
11) Chlorobenzene d-5	20.141	117	1065129m	10.00	ppbv	-0.04
System Monitoring Compounds						
6) BFB	22.602	174	768582m	10.04	ppbv	0.00
Spiked Amount 10.000			Recovery =	100.40%		
Target Compounds						Qvalue
3) (L2) Hexamethyldisiloxane	13.989	131	267360m	200.39	ppbv	
4) (D3) Hexamethylcyclotr...	18.483	191	177174m	48.95	ppbv	
5) (L3) Octamethyltrisilo...	20.105	205	17445m	15.93	ppbv	
7) (D4) Octamethylcyclote...	23.030	265	602398m	460.84	ppbv	
8) (L4) Decamethyltetrasi...	24.849	191	1395	N.D.		
9) (D5) Decamethylcyclope...	26.864	323	33016m	127.00	ppbv	
10) (L5) Dodecamethylpenta...	0.000		0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

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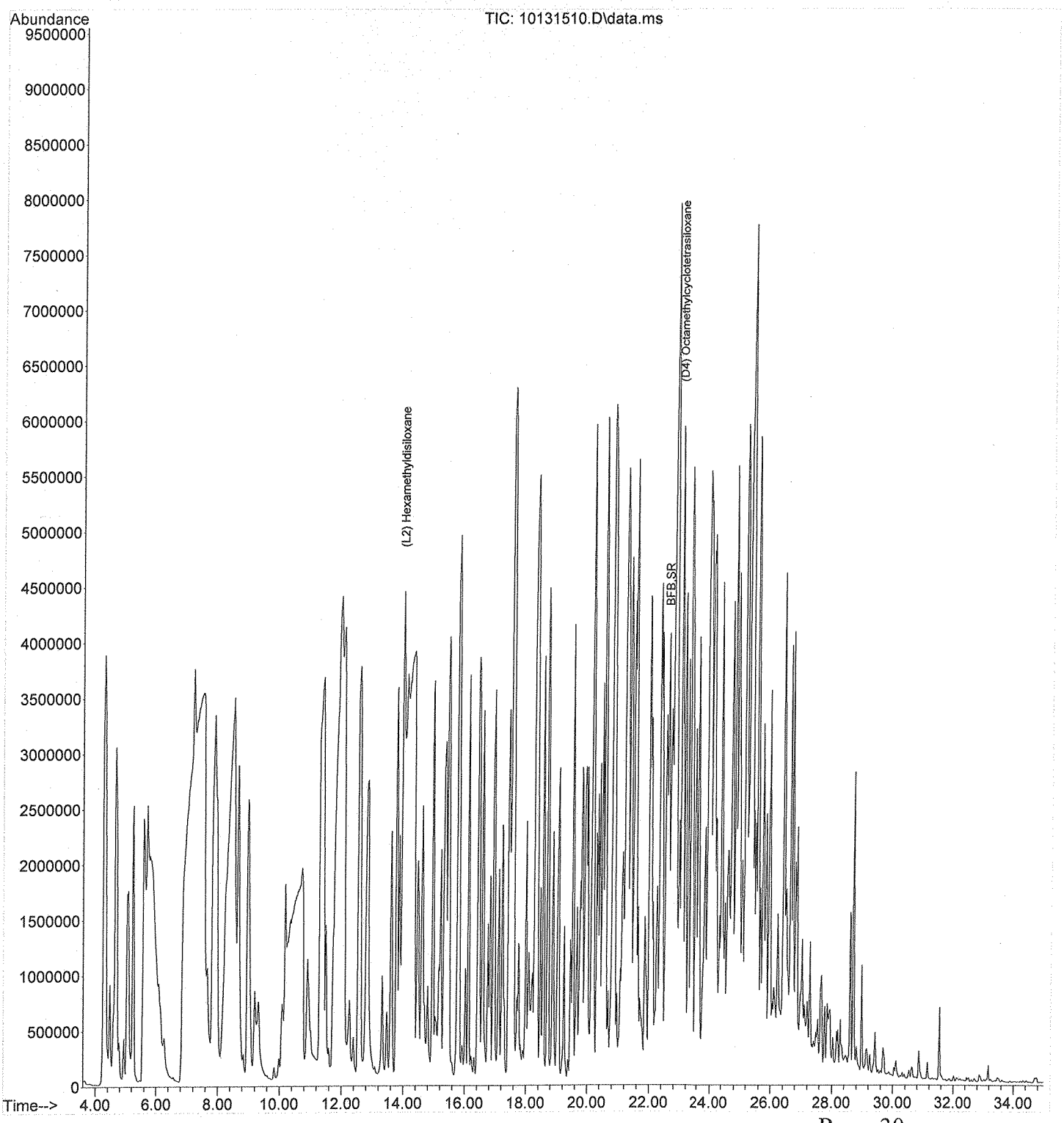
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131510.D
Acq On : 13 Oct 2015 14:42
Operator : JJG
Sample : 151378-83662 x20
Misc : IS/Surr: PS081415-02 + 25mL
ALS Vial : 13 Sample Multiplier: 20

Quant Time: Oct 13 15:23:14 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715-SIL.M
Quant Title : Siloxane
QLast Update : Thu Jun 18 08:04:26 2015
Response via : Initial Calibration



10/13/15

Library Search Compound Report

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131508.D
Acq On : 13 Oct 2015 1:06 pm
Operator : JJG
Sample : 151378-83662 x2000
Misc : IS/Surr: PS081415-02 + 25mL x100
ALS Vial : 4 Sample Multiplier: 2000

Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14

TIC Library : C:\Database\NIST05.L
TIC Integration Parameters: PAMS.P

****
Peak Number 1 Norflurane Concentration Rank 23

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.473	1886.02 ppbv	154834	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	91
2	Norflurane	102	C2H2F4	000811-97-2	83
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	5
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	5
5	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	3

****
Peak Number 2 Isobutane Concentration Rank 12

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.215	4514.66 ppbv	370634	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	64
2	Isobutane	58	C4H10	000075-28-5	64
3	Isobutane	58	C4H10	000075-28-5	58
4	Isobutane	58	C4H10	000075-28-5	43
5	Cyclobutylamine	71	C4H9N	002516-34-9	9

****
Peak Number 3 Butane, 2-methyl- Concentration Rank 14

R.T.	EstConc	Area	Relative to ISTD	R.T.
7.206	4364.88 ppbv	358338	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	91
2	Butane, 2-methyl-	72	C5H12	000078-78-4	83
3	Butane, 2-methyl-	72	C5H12	000078-78-4	80
4	Pentane	72	C5H12	000109-66-0	64
5	Pentane	72	C5H12	000109-66-0	42

****
Peak Number 4 Dimethyl sulfide Concentration Rank 20

R.T.	EstConc	Area	Relative to ISTD	R.T.

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R.T.	EstConc	Area	Relative to ISTD	R.T.
8.654	2440.88 ppbv	200386	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Dimethyl sulfide	62	C2H6S	000075-18-3	96
2	Dimethyl sulfide	62	C2H6S	000075-18-3	95
3	Dimethyl sulfide	62	C2H6S	000075-18-3	95
4	Dimethyl sulfide	62	C2H6S	000075-18-3	95
5	Borane-methyl sulfide complex	76	C2H9BS	013292-87-0	91

****

Peak Number 5 1-Propanol — Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
9.975	45420.80 ppbv	3728850	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	1-Propanol	60	C3H8O	000071-23-8	91
2	1-Propanol	60	C3H8O	000071-23-8	86
3	1-Propanol	60	C3H8O	000071-23-8	83
4	1-Propanol	60	C3H8O	000071-23-8	72
5	Acetaldehyde, hydroxy-	60	C2H4O2	000141-46-8	9

****

Peak Number 6 Silanol, trimethyl- — Concentration Rank 18

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.280	2827.72 ppbv	232144	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Silanol, trimethyl-	90	C3H10OSi	001066-40-6	91
2	tert-Butyldimethylsilanol	132	C6H16OSi	018173-64-3	83
3	Silanol, trimethyl-	90	C3H10OSi	001066-40-6	78
4	Silanol, dimethyl(1,1,2-trimethy...	160	C8H20OSi	055644-10-5	56
5	Ethanol, 2-(trimethylsilyl)-	118	C5H14OSi	002916-68-9	43

****

Peak Number 7 2-Butanol, (R)- — Concentration Rank 4

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.510	25768.10 ppbv	2115450	Bromochloromethane	12.188

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	2-Butanol, (R)-	74	C4H10O	014898-79-4	83
2	2-Butanol, (.+/-.)-	74	C4H10O	015892-23-6	83
3	2-Butanol	74	C4H10O	000078-92-2	83
4	2-Butanol	74	C4H10O	000078-92-2	78
5	2-Butanol	74	C4H10O	000078-92-2	74

****

Peak Number 8 1-Butanol — Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
13.704	22792.60 ppbv	3129230	1,4-Difluorobenzene	14.417

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual

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1	1-Butanol	74	C4H10O	000071-36-3	91
2	1-Butanol	74	C4H10O	000071-36-3	90
3	1-Butanol	74	C4H10O	000071-36-3	86
4	1-Butanol	74	C4H10O	000071-36-3	83
5	1-Butanol	74	C4H10O	000071-36-3	47

****

Peak Number 9 Propanoic acid, ethyl ester Concentration Rank 27

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.291	1615.42 ppbv	221783	1,4-Difluorobenzene	14.417

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Propanoic acid, ethyl ester	102	C5H10O2	000105-37-3	91
2	Propanoic acid, ethyl ester	102	C5H10O2	000105-37-3	90
3	Propanoic acid, ethyl ester	102	C5H10O2	000105-37-3	72
4	Propanoic acid, ethyl ester	102	C5H10O2	000105-37-3	59
5	1,2-Dibutoxyethane	174	C10H22O2	000112-48-1	9

****

Peak Number 10 n-Propyl acetate Concentration Rank 17

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.398	3010.51 ppbv	413317	1,4-Difluorobenzene	14.417

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	n-Propyl acetate	102	C5H10O2	000109-60-4	83
2	n-Propyl acetate	102	C5H10O2	000109-60-4	78
3	Acetic acid, 1-methylethyl ester	102	C5H10O2	000108-21-4	38
4	Pentane	72	C5H12	000109-66-0	5
5	Isobutylamine	73	C4H11N	000078-81-9	5

****

Peak Number 11 Butanoic acid, methyl ester Concentration Rank 10

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.719	5880.73 ppbv	807374	1,4-Difluorobenzene	14.417

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butanoic acid, methyl ester	102	C5H10O2	000623-42-7	91
2	Butanoic acid, methyl ester	102	C5H10O2	000623-42-7	90
3	Butanoic acid, methyl ester	102	C5H10O2	000623-42-7	83
4	Propanoic acid, 2-methyl-, methy...	102	C5H10O2	000547-63-7	37
5	3-Buten-2-ol, 2-methyl-	86	C5H10O	000115-18-4	27

****

Peak Number 12 Butanoic acid, ethyl ester Concentration Rank 7

R.T.	EstConc	Area	Relative to ISTD	R.T.
18.251	10010.60 ppbv	1860370	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butanoic acid, ethyl ester	116	C6H12O2	000105-54-4	91
2	Butanoic acid, ethyl ester	116	C6H12O2	000105-54-4	85
3	Butanoic acid, ethyl ester	116	C6H12O2	000105-54-4	81

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4 3-Mercaptohexyl butanoate	204	C10H20O2S	136954-21-7	59
5 Butanoic acid, ethyl ester	116	C6H12O2	000105-54-4	49

****

Peak Number 13 Acetic acid, butyl ester Concentration Rank 24

R.T.	EstConc	Area	Relative to ISTD	R.T.
18.661	1870.35 ppbv	347587	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Acetic acid, butyl ester	116	C6H12O2	000123-86-4	78
2	Acetic acid, butyl ester	116	C6H12O2	000123-86-4	72
3	Acetic acid, butyl ester	116	C6H12O2	000123-86-4	72
4	Acetic acid, butyl ester	116	C6H12O2	000123-86-4	64
5	Acetic acid, butyl ester	116	C6H12O2	000123-86-4	45

****

Peak Number 14 Butanoic acid, propyl ester Concentration Rank 9

R.T.	EstConc	Area	Relative to ISTD	R.T.
21.193	6124.11 ppbv	1138110	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butanoic acid, propyl ester	130	C7H14O2	000105-66-8	90
2	Butanoic acid, propyl ester	130	C7H14O2	000105-66-8	90
3	Butanoic acid, propyl ester	130	C7H14O2	000105-66-8	90
4	Butanoic acid, propyl ester	130	C7H14O2	000105-66-8	86
5	Propanoic acid, 2-methyl-, propy...	130	C7H14O2	000644-49-5	78

****

Peak Number 15 Nonane Concentration Rank 22

R.T.	EstConc	Area	Relative to ISTD	R.T.
21.354	2253.05 ppbv	418707	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Nonane	128	C9H20	000111-84-2	97
2	Nonane	128	C9H20	000111-84-2	94
3	Octane	114	C8H18	000111-65-9	72
4	Nonane	128	C9H20	000111-84-2	58
5	Hexane, 2,4-dimethyl-	114	C8H18	000589-43-5	53

****

Peak Number 16 ~~2-Hexene, 3,4,4-trimethyl-~~ C9H18 HC Concentration Rank 28

R.T.	EstConc	Area	Relative to ISTD	R.T.
22.031	1602.30 ppbv	297771	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	2-Hexene, 3,4,4-trimethyl-	126	C9H18	053941-19-8	38
2	Cyclohexane, 1-ethyl-2-methyl-	126	C9H18	003728-54-9	38
3	Cyclohexane, 1-ethyl-2-methyl-, ...	126	C9H18	004923-78-8	38
4	Cyclohexane, 1,3-dimethyl-, cis-	112	C8H16	000638-04-0	38
5	Cyclohexane, 1,4-dimethyl-	112	C8H16	000589-90-2	38

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****

Peak Number 17 Butanoic acid, 1-methylprop... Concentration Rank 25

C8H16O2 HC

R.T.	EstConc	Area	Relative to ISTD	R.T.
22.317	1728.88 ppbv	321295	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butanoic acid, 1-methylpropyl ester	144	C8H16O2	000819-97-6	64
2	Propanoic acid, 2-methyl-, 2-met...	144	C8H16O2	000097-85-8	64
3	Butanoic acid, 2-octyl ester	200	C12H24O2	020286-44-6	64
4	Butanoic acid, 2-methylpropyl ester	144	C8H16O2	000539-90-2	64
5	Butane, 2,2-dimethyl-	86	C6H14	000075-83-2	59

****

Peak Number 18 .alpha.-Pinene Concentration Rank 8

R.T.	EstConc	Area	Relative to ISTD	R.T.
22.762	8418.25 ppbv	1564450	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	.alpha.-Pinene	136	C10H16	000080-56-8	97
2	1S-.alpha.-Pinene	136	C10H16	007785-26-4	96
3	1R-.alpha.-Pinene	136	C10H16	007785-70-8	95
4	1R-.alpha.-Pinene	136	C10H16	007785-70-8	95
5	Bicyclo[3.1.1]hept-2-ene, 3,6,6-...	136	C10H16	004889-83-2	94

****

Peak Number 19 Cyclotetrasiloxane, octamet... Concentration Rank 21

R.T.	EstConc	Area	Relative to ISTD	R.T.
23.012	2393.58 ppbv	444824	Chlorobenzene-d5	20.123

NR.

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclotetrasiloxane, octamethyl-	296	C8H24O4Si4	000556-67-2	91
2	Benzoic acid, 3-methyl-2-trimeth...	296	C14H24O3Si2	1000153-57-1	64
3	7H-Dibenzo[b,g]carbazole, 7-methyl-	281	C21H15N	003557-49-1	64
4	4H-1,2,4-Triazole-3-thiol, 4-all...	281	C16H15N3S	031803-13-1	49
5	Cyclotetrasiloxane, octamethyl-	296	C8H24O4Si4	000556-67-2	47

****

Peak Number 20 Camphene Concentration Rank 13

R.T.	EstConc	Area	Relative to ISTD	R.T.
23.351	4481.43 ppbv	832830	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Camphene	136	C10H16	000079-92-5	97
2	Camphene	136	C10H16	000079-92-5	97
3	Camphene	136	C10H16	000079-92-5	95
4	Bicyclo[2.2.1]heptane, 2,2-dimet...	136	C10H16	005794-04-7	94
5	Camphene	136	C10H16	000079-92-5	91

****

Peak Number 21 Butanoic acid, butyl ester Concentration Rank 11

R.T.	EstConc	Area	Relative to ISTD	R.T.

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23.904	5561.50 ppbv	1033550	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butanoic acid, butyl ester	144	C8H16O2	000109-21-7	90
2	Butanoic acid, butyl ester	144	C8H16O2	000109-21-7	78
3	Butanoic acid, butyl ester	144	C8H16O2	000109-21-7	78
4	Propanoic acid, 2-methyl-, butyl...	144	C8H16O2	000097-87-0	78
5	Butanoic acid, hexyl ester	172	C10H20O2	002639-63-6	78

****

Peak Number 22 Decane — Concentration Rank 16

R.T.	EstConc	Area	Relative to ISTD	R.T.
24.100	3098.57 ppbv	575839	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Decane	142	C10H22	000124-18-5	95
2	Eicosane	282	C20H42	000112-95-8	72
3	Undecane	156	C11H24	001120-21-4	72
4	Undecane, 2,7-dimethyl-	184	C13H28	017301-24-5	59
5	Oxalic acid, heptyl isohexyl ester	272	C15H28O4	1000309-33-1	59

****

Peak Number 23 3-Carene — Concentration Rank 29

R.T.	EstConc	Area	Relative to ISTD	R.T.
24.795	1579.26 ppbv	293490	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Bicyclo[4.1.0]hept-3-ene, 3,7,7-...	136	C10H16	000498-15-7	96
2	3-Carene	136	C10H16	013466-78-9	95
3	3-Carene	136	C10H16	013466-78-9	94
4	3-Carene	136	C10H16	013466-78-9	94
5	1,4-Cyclohexadiene, 1-methyl-4-(...	136	C10H16	000099-85-4	93

****

Peak Number 24 (+)-4-Carene — Concentration Rank 26

R.T.	EstConc	Area	Relative to ISTD	R.T.
24.956	1721.54 ppbv	319931	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	(+)-4-Carene	136	C10H16	029050-33-7	97
2	1,3-Cyclohexadiene, 1-methyl-4-(...	136	C10H16	000099-86-5	97
3	1,3-Cyclohexadiene, 1-methyl-4-(...	136	C10H16	000099-86-5	96
4	Bicyclo[4.1.0]hept-2-ene, 3,7,7-...	136	C10H16	000554-61-0	95
5	Bicyclo[4.1.0]hept-2-ene, 3,7,7-...	136	C10H16	000554-61-0	95

****

Peak Number 25 Benzene, 1-methyl-2-(1-meth... — Concentration Rank 15

R.T.	EstConc	Area	Relative to ISTD	R.T.
25.134	4005.36 ppbv	744357	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual

10/12/15

1	Benzene, 1-methyl-2-(1-methyleth...	134	C10H14	000527-84-4 97
2	Benzene, 1-methyl-2-(1-methyleth...	134	C10H14	000527-84-4 97
3	Benzene, 1-methyl-4-(1-methyleth...	134	C10H14	000099-87-6 97
4	Benzene, 1-methyl-3-(1-methyleth...	134	C10H14	000535-77-3 95
5	Benzene, 1-methyl-2-(1-methyleth...	134	C10H14	000527-84-4 95

****

Peak Number 26 D-Limonene Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
25.294	10136.40 ppbv	1883750	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	D-Limonene	136	C10H16	005989-27-5	95
2	D-Limonene	136	C10H16	005989-27-5	94
3	D-Limonene	136	C10H16	005989-27-5	93
4	Limonene	136	C10H16	000138-86-3	91
5	Limonene	136	C10H16	000138-86-3	90

****

Peak Number 27 Eucalyptol Concentration Rank 19

R.T.	EstConc	Area	Relative to ISTD	R.T.
25.508	2449.17 ppbv	455154	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Eucalyptol	154	C10H18O	000470-82-6	99
2	Eucalyptol	154	C10H18O	000470-82-6	97
3	Eucalyptol	154	C10H18O	000470-82-6	94
4	Eucalyptol	154	C10H18O	000470-82-6	87
5	Eucalyptol	154	C10H18O	000470-82-6	76

****

Peak Number 28 (+)-4-Carene Concentration Rank 30

R.T.	EstConc	Area	Relative to ISTD	R.T.
26.703	1573.44 ppbv	292409	Chlorobenzene-d5	20.123

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	(+)-4-Carene	136	C10H16	029050-33-7	97
2	Cyclohexene, 1-methyl-4-(1-methy...	136	C10H16	000586-62-9	96
3	Cyclohexene, 1-methyl-4-(1-methy...	136	C10H16	000586-62-9	95
4	Bicyclo[4.1.0]hept-2-ene, 3,7,7-...	136	C10H16	000554-61-0	95
5	Cyclohexene, 1-methyl-4-(1-methy...	136	C10H16	000586-62-9	95

061715.M Tue Oct 13 15:32:22 2015

10/13/15

TO-15 RAW QC & ICAL SUMMARY

MS #3 Instrument Logbook

Sequence Name: C:\msdchem\1\sequence\2015\101315.S
Comment: GCMS-03
Operator: JJG
Data Path: C:\MSDCHEM\1\MS03\2015\101315\
Instrument Control Pre-Seq Cmd:
Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:
Data Analysis Post-Seq Cmd:

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line			Sample Name/Misc Info
1)	Sample	1	10131501 TO15-5MS TO15 BFB 101315
2)	Sample	1	10131502 TO15-5MS TO15 CCV 101315
3)	Sample	1	10131503 TO15-5MS TO15 LCSD 101315
4)	Sample	1	10131504 TO15-5MS TO15 MB 101315
5)	Sample	2	10131505 TO15-5MS 151378-83662 x10,000
6)	Sample	2	10131506 TO15-5MS 151378-83662 x10,000 dp
7)	Sample	1	10131507 TO15-5MS TO15 MB 101315
8)	Sample	4	10131508 TO15-5MS 151378-83662 x2000
9)	Sample	4	10131509 TO15-5MS 151378-83662 x100
10)	Sample	13	10131510 TO15-5MS 151378-83662 x20
11)	Sample	4	10131511 TO15-5MS Lab Air 101315 x1
12)	Sample	13	10131512 TO15-5MS Lab Air 101315 x1
13)	Sample	13	10131513 TO15-5MS Lab Air 101315 x1

10/13/15

Comments: _____

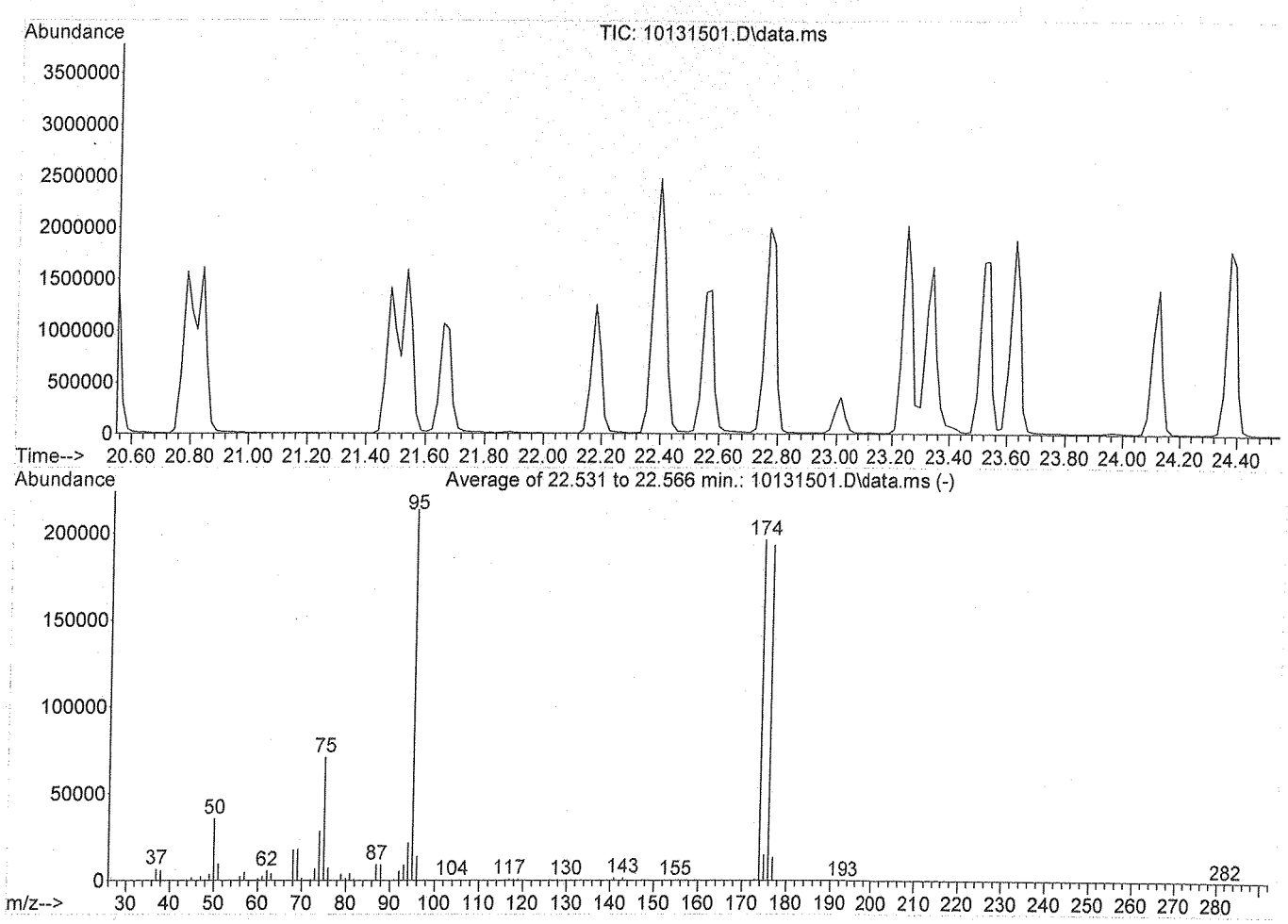
Analyst: _____ **Date:** 10/13/15

Page: 1/6 of _____

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131501.D
Acq On : 13 Oct 2015 7:26 am
Operator : JJG
Sample : TO15 BFB 101315
Misc : IS/Surr: PS081415-02 + 200mL
ALS Vial : 1 Sample Multiplier: 1

Integration File: PAMS.P

Method : C:\msdchem\1\METHODS\2015\061715.M
Title : TO-15/TO-14
Last Update : Thu Jun 18 11:31:03 2015



AutoFind: Scans 1055, 1056, 1057; Background Corrected with Scan 1050

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	16.7	35698	PASS
75	95	30	60	33.3	71139	PASS
95	95	100	100	100.0	213506	PASS
96	95	5	9	6.6	14071	PASS
173	174	0.00	2	0.6	1122	PASS
174	95	50	100	92.1	196693	PASS
175	174	5	9	7.5	14717	PASS
176	174	95	101	98.4	193549	PASS
177	176	5	9	6.9	13450	PASS

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131502.D
Acq On : 13 Oct 2015 8:14
Operator : JJG
Sample : TO15 CCV 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 10:43:37 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.188	128	253554m	10.00	ppbv	0.00
39) 1,4-Difluorobenzene	14.417	114	1319230	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1253090	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	766967	10.24	ppbv	0.00
Spiked Amount 10.000			Recovery =	102.40%		
Target Compounds						Qvalue
2) Chlorodifluoromethane	4.655	51	536445m	9.47	ppbv	
3) Propene	4.636	42	168796m	8.71	ppbv	
4) Dichlorodifluoromethane	4.745	85	784893m	9.77	ppbv	
5) Chloromethane	5.125	52	92228m	8.62	ppbv	
6) Dichlorotetrafluoroethane	5.179	135	601101	10.74	ppbv	85
7) VinylChloride	5.487	62	333430m	10.18	ppbv	
8) Acetaldehyde	5.577	44	199217m	16.01	ppbv	
9) Methanol	5.614	31	170416m	14.58	ppbv	
10) 1,3-Butadiene	5.686	54	183773m	7.79	ppbv	
11) Bromomethane	6.265	96	190866m	8.47	ppbv	
12) Chloroethane	6.555	66	51385	9.42	ppbv	97
13) Dichlorofluoromethane	6.844	67	636261	10.45	ppbv	99
14) Ethanol	6.880	45	131256m	8.41	ppbv	
15) VinylBromide	7.079	108	276753m	10.95	ppbv	
16) Acrolein	7.640	56	102591m	7.84	ppbv	
17) Acetone	7.803	58	164731m	10.25	ppbv	
18) Trichlorofluoromethane	7.496	103	482035	10.28	ppbv	98
19) 2-Propanol(IPA)	8.002	45	500799m	9.77	ppbv	
20) Acrylonitrile	8.781	52	205941m	10.64	ppbv	
21) 1,1-Dichloroethene	8.545	96	268109m	11.02	ppbv	
22) MethyleneChloride(DCM)	9.142	84	206146m	8.08	ppbv	
23) TertButanol(TBA)	8.925	59	559329m	9.70	ppbv	
24) AllylChloride	9.124	39	181115m	8.09	ppbv	
25) CarbonDisulfide	9.305	76	699623m	8.05	ppbv	
26) Trichlorotrifluoroethane	8.817	103	342217	9.97	ppbv	97
27) trans-1,2-Dichloroethene	10.244	96	363616m	11.01	ppbv	
28) 1,1-Dichloroethane	10.726	63	635182	10.04	ppbv	99
29) MethylTertButylEther(M...	10.280	73	832737	10.24	ppbv	97
30) VinylAcetate	10.708	43	830536	9.40	ppbv	99
31) 2-Butanone(MEK)	11.243	72	176262	10.23	ppbv #	92
32) cis-1,2-Dichloroethene	11.725	96	362387	10.73	ppbv	95
33) Hexane	11.297	86	76555	10.17	ppbv	85
34) Chloroform	12.331	83	659370	10.39	ppbv	98
35) EthylAcetate	11.849	43	793725	9.33	ppbv	99
36) Tetrahydrofuran	12.509	72	167937m	9.93	ppbv	
37) 1,2-Dichloroethane	13.419	62	466620m	10.24	ppbv	
38) 1,1,1-Trichloroethane	13.151	97	690860	10.24	ppbv	97
40) Benzene	13.757	78	1095538m	9.66	ppbv	
41) CarbonTetrachloride	13.793	117	713822	10.27	ppbv	98
42) Cyclohexane	13.847	69	155172	9.21	ppbv	99
43) 1,2-Dichloropropane	15.220	63	419941	9.90	ppbv	98
44) Bromodichloromethane	15.594	85	487143	10.38	ppbv	98

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131502.D
Acq On : 13 Oct 2015 8:14
Operator : JJG
Sample : TO15 CCV 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 10:43:37 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

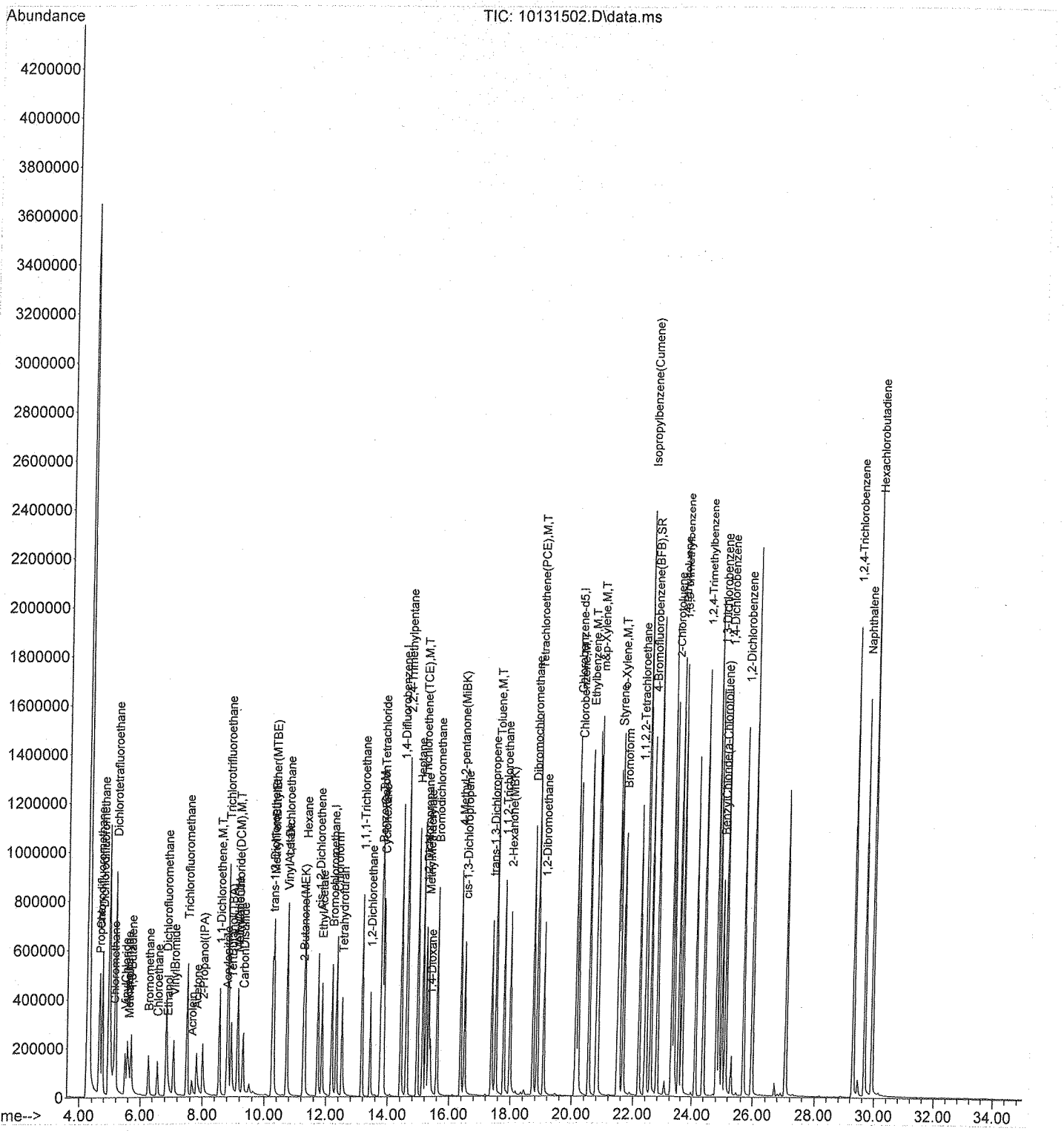
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
45) 1,4-Dioxane	15.380	88	255557m	10.15	ppbv		
46) Trichloroethene(TCE)	15.130	130	553031	10.51	ppbv		96
47) 2,2,4-Trimethylpentane	14.595	57	1856188	9.76	ppbv		99
48) MethylMethacrylate	15.309	69	370071m	10.02	ppbv		
49) Heptane	14.952	71	373591	10.10	ppbv		90
50) cis-1,3-Dichloropropene	16.503	75	598684	10.66	ppbv		93
51) 4-Methyl-2-pentanone(M...	16.361	58	381300	9.61	ppbv		98
52) trans-1,3-Dichloropropene	17.377	75	608492	10.90	ppbv		92
53) 1,1,2-Trichloroethane	17.770	97	462694m	10.34	ppbv		
54) Toluene	17.520	91	1323610	10.07	ppbv		99
55) 2-Hexanone(MBK)	17.966	58	495699m	10.29	ppbv		
56) Dibromochloromethane	18.715	129	869731	11.87	ppbv		100
57) 1,2-Dibromoethane	19.071	107	733983m	10.63	ppbv		
58) Tetrachloroethene(PCE)	18.857	166	684713	10.68	ppbv		94
60) Chlorobenzene	20.195	114	347262	10.80	ppbv	#	92
61) Ethylbenzene	20.551	91	1669508	10.31	ppbv		98
62) m&p-Xylene	20.837	106	1389938	20.83	ppbv		99
63) Bromoform	21.675	173	875111	12.11	ppbv	#	95
64) Styrene	21.479	104	1136015	11.00	ppbv		99
65) 1,1,2,2-Tetrachloroethane	22.174	83	907424	10.91	ppbv		99
66) o-Xylene	21.532	91	1281076	10.03	ppbv		99
67) Isopropylbenzene(Cumene)	22.388	105	1909039m	9.89	ppbv		
68) 2-Chlorotoluene	23.333	91	1337594m	9.87	ppbv		
70) 4-Ethyltoluene	23.529	120	617954	11.29	ppbv		95
71) 1,3,5-Trimethylbenzene	23.618	120	836656	10.90	ppbv		98
72) 1,2,4-Trimethylbenzene	24.385	120	840480	11.29	ppbv		96
73) BenzylChloride(a-Chlor...	24.991	91	1096670m	9.85	ppbv		
74) 1,3-Dichlorobenzene	24.884	146	1123003	11.11	ppbv		98
75) 1,4-Dichlorobenzene	25.116	146	1139263	11.21	ppbv		96
76) 1,2-Dichlorobenzene	25.687	146	1171511	11.33	ppbv	#	95
77) 1,2,4-Trichlorobenzene	29.289	180	1055740	10.78	ppbv	#	97
78) Naphthalene	29.663	128	2232824m	11.26	ppbv		
79) Hexachlorobutadiene	29.931	225	880942	11.28	ppbv	#	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131502.D
Acq On : 13 Oct 2015 8:14
Operator : JJG
Sample : TO15 CCV 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 10:43:37 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



Page: 3

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131503.D
Acq On : 13 Oct 2015 9:03
Operator : JJG
Sample : TO15 LCSD 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 10:48:29 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.188	128	251488	10.00	ppbv	0.00
39) 1,4-Difluorobenzene	14.417	114	1296426	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1247895	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	763082	10.23	ppbv	0.00
Spiked Amount 10.000			Recovery = 102.30%			
Target Compounds						Qvalue
2) Chlorodifluoromethane	4.673	51	535456m	9.53	ppbv	
3) Propene	4.636	42	169785m	8.84	ppbv	
4) Dichlorodifluoromethane	4.745	85	788821	9.90	ppbv	99
5) Chloromethane	5.143	52	92089m	8.67	ppbv	
6) Dichlorotetrafluoroethane	5.179	135	594615	10.72	ppbv	89
7) VinylChloride	5.505	62	328905m	10.13	ppbv	
8) Acetaldehyde	5.577	44	200428m	16.26	ppbv	
9) Methanol	5.614	31	167594m	14.45	ppbv	
10) 1,3-Butadiene	5.704	54	185250m	7.91	ppbv	
11) Bromomethane	6.265	96	194541m	8.70	ppbv	
12) Chloroethane	6.573	66	51088	9.45	ppbv	97
13) Dichlorofluoromethane	6.844	67	627131	10.38	ppbv	99
14) Ethanol	6.880	45	130551m	8.44	ppbv	
15) VinylBromide	7.079	108	277974m	11.09	ppbv	
16) Acrolein	7.659	56	102626m	7.90	ppbv	
17) Acetone	7.803	58	160950m	10.10	ppbv	
18) Trichlorofluoromethane	7.496	103	477844	10.27	ppbv	98
19) 2-Propanol(IPA)	8.002	45	484175m	9.52	ppbv	
20) Acrylonitrile	8.781	52	198753m	10.35	ppbv	
21) 1,1-Dichloroethene	8.545	96	262615	10.89	ppbv	97
22) MethyleneChloride(DCM)	9.142	84	211582m	8.36	ppbv	
23) TertButanol(TBA)	8.925	59	572487m	10.01	ppbv	
24) AllylChloride	9.124	39	178999m	8.06	ppbv	
25) CarbonDisulfide	9.305	76	701631m	8.14	ppbv	
26) Trichlorotrifluoroethane	8.817	103	340509	10.00	ppbv	98
27) trans-1,2-Dichloroethene	10.245	96	336316m	10.27	ppbv	
28) 1,1-Dichloroethane	10.726	63	635351	10.12	ppbv	100
29) MethylTertButylEther(M...	10.280	73	826098	10.24	ppbv	97
30) VinylAcetate	10.726	43	849097m	9.68	ppbv	
31) 2-Butanone(MEK)	11.261	72	175778	10.28	ppbv	87
32) cis-1,2-Dichloroethene	11.725	96	359887	10.74	ppbv	96
33) Hexane	11.297	86	78556	10.52	ppbv	84
34) Chloroform	12.331	83	655228	10.41	ppbv	98
35) EthylAcetate	11.867	43	811125m	9.61	ppbv	
36) Tetrahydrofuran	12.509	72	167375m	9.98	ppbv	
37) 1,2-Dichloroethane	13.419	62	451798	10.00	ppbv	98
38) 1,1,1-Trichloroethane	13.151	97	698862	10.44	ppbv	97
40) Benzene	13.775	78	1092006m	9.80	ppbv	
41) CarbonTetrachloride	13.793	117	709136	10.38	ppbv	98
42) Cyclohexane	13.864	69	156477	9.46	ppbv	93
43) 1,2-Dichloropropane	15.237	63	416276	9.99	ppbv	97
44) Bromodichloromethane	15.594	85	485509	10.53	ppbv	98

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131503.D
Acq On : 13 Oct 2015 9:03
Operator : JJG
Sample : TO15 LCSD 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

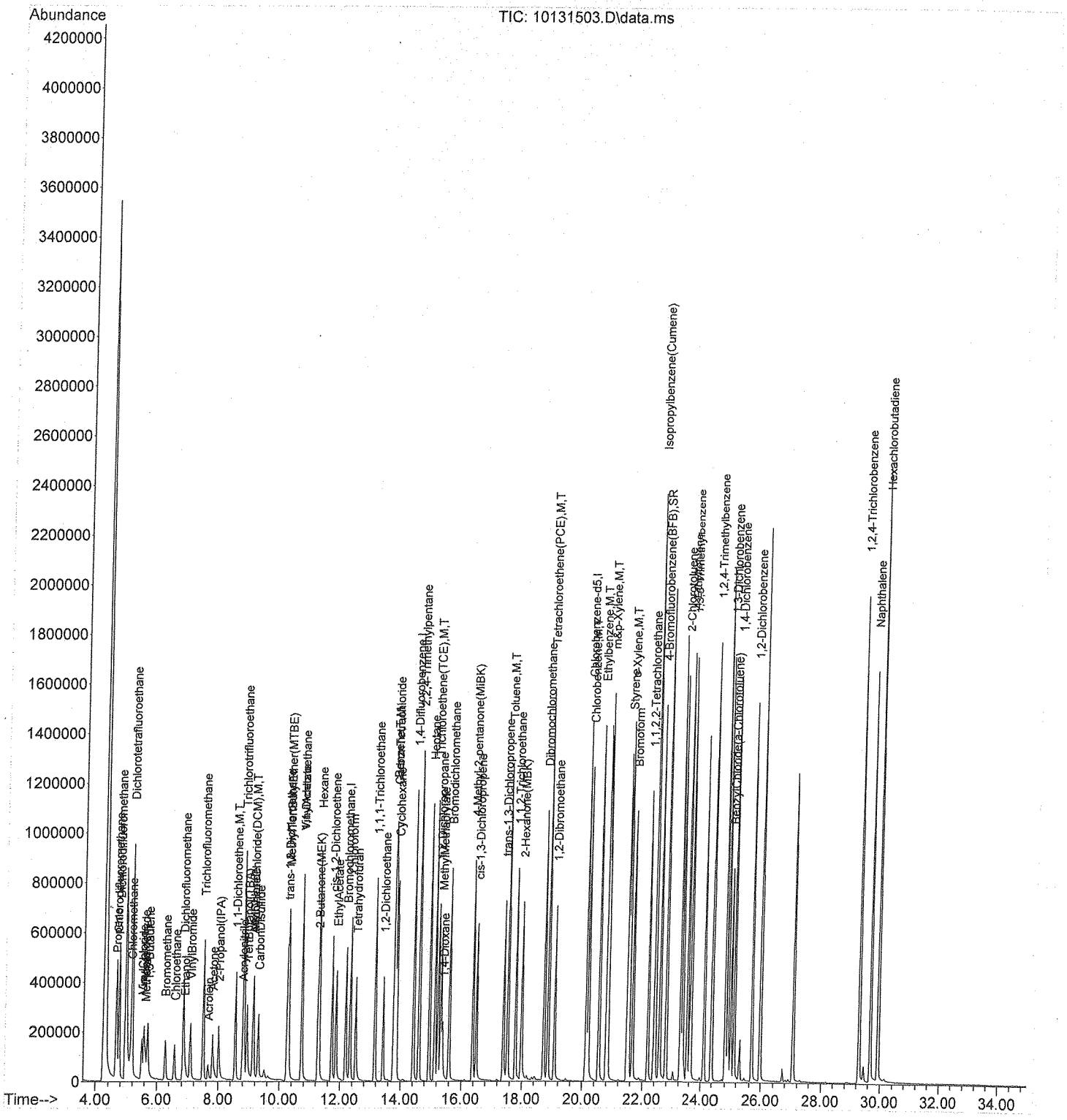
Quant Time: Oct 13 10:48:29 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
45) 1,4-Dioxane	15.380	88	253370m	10.24	ppbv		
46) Trichloroethene(TCE)	15.130	130	556170	10.76	ppbv		96
47) 2,2,4-Trimethylpentane	14.595	57	1845997	9.88	ppbv		99
48) MethylMethacrylate	15.327	69	365777m	10.08	ppbv		
49) Heptane	14.952	71	367495	10.11	ppbv		92
50) cis-1,3-Dichloropropene	16.503	75	588446	10.66	ppbv		93
51) 4-Methyl-2-pentanone(M...	16.361	58	377360	9.68	ppbv		99
52) trans-1,3-Dichloropropene	17.377	75	603049	11.00	ppbv		93
53) 1,1,2-Trichloroethane	17.770	97	453961	10.32	ppbv		98
54) Toluene	17.520	91	1309708	10.14	ppbv		98
55) 2-Hexanone(MBK)	17.966	58	485218	10.25	ppbv		98
56) Dibromochloromethane	18.715	129	865470	12.02	ppbv		100
57) 1,2-Dibromoethane	19.071	107	723203	10.66	ppbv	#	100
58) Tetrachloroethene(PCE)	18.857	166	678239	10.76	ppbv		95
60) Chlorobenzene	20.195	114	346925	10.84	ppbv	#	91
61) Ethylbenzene	20.551	91	1678921	10.42	ppbv		98
62) m&p-Xylene	20.837	106	1386374	20.86	ppbv		99
63) Bromoform	21.675	173	872440	12.12	ppbv	#	94
64) Styrene	21.479	104	1144306	11.13	ppbv		99
65) 1,1,2,2-Tetrachloroethane	22.174	83	902322	10.90	ppbv		98
66) o-Xylene	21.532	91	1279220	10.06	ppbv		99
67) Isopropylbenzene(Cumene)	22.388	105	1909920	9.94	ppbv		99
68) 2-Chlorotoluene	23.333	91	1328602m	9.84	ppbv		
70) 4-Ethyltoluene	23.529	120	598517	10.98	ppbv		96
71) 1,3,5-Trimethylbenzene	23.618	120	839753	10.99	ppbv		98
72) 1,2,4-Trimethylbenzene	24.385	120	829327	11.18	ppbv		96
73) BenzylChloride(a-Chlor...	24.991	91	1086259	9.80	ppbv		100
74) 1,3-Dichlorobenzene	24.884	146	1141486	11.34	ppbv		99
75) 1,4-Dichlorobenzene	25.116	146	1113321	11.00	ppbv		96
76) 1,2-Dichlorobenzene	25.687	146	1148074	11.15	ppbv	#	95
77) 1,2,4-Trichlorobenzene	29.289	180	1057559	10.84	ppbv	#	97
78) Naphthalene	29.663	128	2115393	10.71	ppbv		100
79) Hexachlorobutadiene	29.931	225	871231	11.21	ppbv	#	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131503.D
Acq On : 13 Oct 2015 9:03
Operator : JJG
Sample : TO15 LCSD 101315
Misc : IS/Surr: PS081415-02 + Cal: PS071315-01
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 10:48:29 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131507.D
Acq On : 13 Oct 2015 12:18
Operator : JJG
Sample : TO15 MB 101315
Misc : IS/Surr: PS081415-02 + 500mL cc#000746
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 12:59:10 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715x1.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.170	128	257658	10.00	ppbv	-0.02
39) 1,4-Difluorobenzene	14.417	114	1270575	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1200576	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	748827	10.44	ppbv	0.00
Spiked Amount 10.000			Recovery =	104.40%		
Target Compounds						Qvalue
2) Chlorodifluoromethane	0.000		0	N.D.		
3) Propene	4.673	42	5212	N.D.		
4) Dichlorodifluoromethane	0.000		0	N.D.		
5) Chloromethane	5.161	52	220	N.D.		
6) Dichlorotetrafluoroethane	0.000		0	N.D.		
7) VinylChloride	0.000		0	N.D.		
8) Acetaldehyde	5.686	44	5699	N.D.		
9) Methanol	5.704	31	5000	N.D.		
10) 1,3-Butadiene	0.000		0	N.D.		
11) Bromomethane	6.283	96	2043	N.D.		
12) Chloroethane	6.591	66	109	N.D.		
13) Dichlorofluoromethane	0.000		0	N.D.		
14) Ethanol	7.025	45	2778	N.D.		
15) VinylBromide	0.000		0	N.D.		
16) Acrolein	0.000		0	N.D.		
17) Acetone	7.948	58	7057	N.D.		
18) Trichlorofluoromethane	0.000		0	N.D.		
19) 2-Propanol(IPA)	8.165	45	1661	N.D.		
20) Acrylonitrile	0.000		0	N.D.		
21) 1,1-Dichloroethene	0.000		0	N.D.		
22) MethyleneChloride(DCM)	9.161	84	2124	N.D.		
23) TertButanol(TBA)	0.000		0	N.D.		
24) AllylChloride	9.124	39	248	N.D.		
25) CarbonDisulfide	9.323	76	18655	N.D.		
26) Trichlorotrifluoroethane	0.000		0	N.D.		
27) trans-1,2-Dichloroethene	0.000		0	N.D.		
28) 1,1-Dichloroethane	0.000		0	N.D.		
29) MethylTertButylEther(M...	0.000		0	N.D.		
30) VinylAcetate	0.000		0	N.D.		
31) 2-Butanone(MEK)	11.404	72	1386	N.D.		
32) cis-1,2-Dichloroethene	0.000		0	N.D.		
33) Hexane	0.000		0	N.D.		
34) Chloroform	0.000		0	N.D.		
35) EthylAcetate	11.992	43	1969	N.D.		
36) Tetrahydrofuran	12.652	72	837	N.D.		
37) 1,2-Dichloroethane	0.000		0	N.D.		
38) 1,1,1-Trichloroethane	0.000		0	N.D.		
40) Benzene	13.775	78	20335	N.D.		
41) CarbonTetrachloride	0.000		0	N.D.		
42) Cyclohexane	0.000		0	N.D.		
43) 1,2-Dichloropropane	15.220	63	244	N.D.		
44) Bromodichloromethane	0.000		0	N.D.		

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131507.D
Acq On : 13 Oct 2015 12:18
Operator : JJG
Sample : TO15 MB 101315
Misc : IS/Surr: PS081415-02 + 500mL cc#000746
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 12:59:10 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

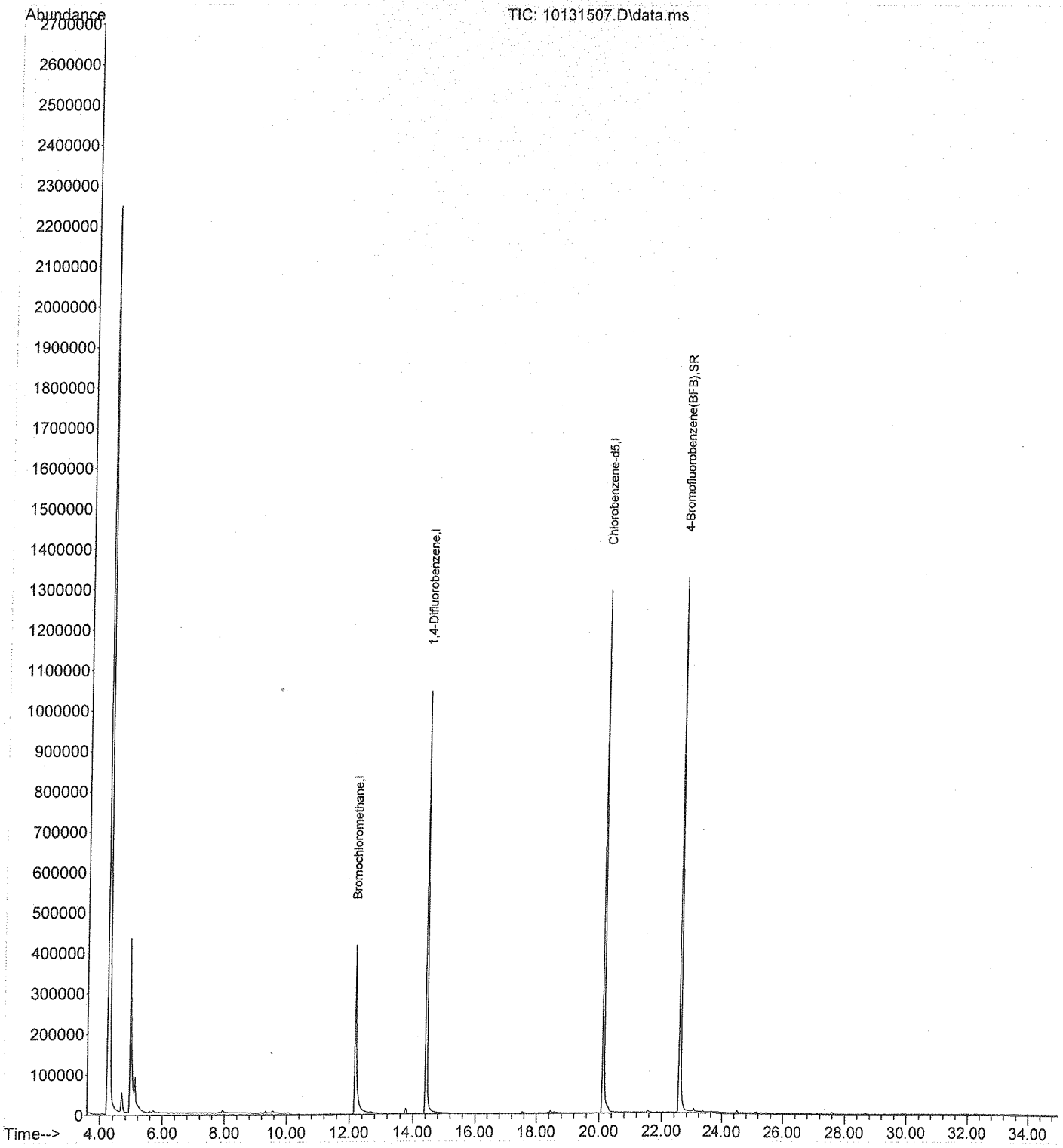
Compound	R.T.	QIon	Response	Conc Units Dev(Min)
45) 1,4-Dioxane	0.000		0	N.D.
46) Trichloroethene(TCE)	0.000		0	N.D.
47) 2,2,4-Trimethylpentane	0.000		0	N.D.
48) MethylMethacrylate	0.000		0	N.D.
49) Heptane	0.000		0	N.D.
50) cis-1,3-Dichloropropene	0.000		0	N.D.
51) 4-Methyl-2-pentanone(M...	0.000		0	N.D.
52) trans-1,3-Dichloropropene	0.000		0	N.D.
53) 1,1,2-Trichloroethane	0.000		0	N.D.
54) Toluene	17.538	91	6585	N.D.
55) 2-Hexanone(MBK)	0.000		0	N.D.
56) Dibromochloromethane	0.000		0	N.D.
57) 1,2-Dibromoethane	0.000		0	N.D.
58) Tetrachloroethene(PCE)	0.000		0	N.D.
60) Chlorobenzene	20.195	114	801	N.D.
61) Ethylbenzene	20.569	91	1278	N.D.
62) m&p-Xylene	20.819	106	1238	N.D.
63) Bromoform	0.000		0	N.D.
64) Styrene	21.603	104	109	N.D.
65) 1,1,2,2-Tetrachloroethane	0.000		0	N.D.
66) o-Xylene	21.568	91	895	N.D.
67) Isopropylbenzene(Cumene)	22.406	105	107	N.D.
68) 2-Chlorotoluene	23.369	91	1102	N.D.
70) 4-Ethyltoluene	0.000		0	N.D.
71) 1,3,5-Trimethylbenzene	0.000		0	N.D.
72) 1,2,4-Trimethylbenzene	24.421	120	126	N.D.
73) BenzylChloride(a-Chlor...	0.000		0	N.D. d
74) 1,3-Dichlorobenzene	24.956	146	404	N.D.
75) 1,4-Dichlorobenzene	25.152	146	934	N.D.
76) 1,2-Dichlorobenzene	25.723	146	265	N.D.
77) 1,2,4-Trichlorobenzene	29.325	180	563	N.D.
78) Naphthalene	0.000		0	N.D.
79) Hexachlorobutadiene	0.000		0	N.D.

(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131507.D
Acq On : 13 Oct 2015 12:18
Operator : JJG
Sample : TO15 MB 101315
Misc : IS/Surr: PS081415-02 + 500mL cc#000746
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Oct 13 12:59:10 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.170	128	244870m	10.00	ppbv	-0.02
39) 1,4-Difluorobenzene	14.417	114	1293023	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1216871	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	767693	10.56	ppbv	0.00
Spiked Amount 10.000			Recovery = 105.60%			
Target Compounds						Qvalue
2) Chlorodifluoromethane	4.691	51	1880	N.D.		
3) Propene	4.654	42	16857	N.D.		
4) Dichlorodifluoromethane	4.763	85	1791	N.D.		
5) Chloromethane	5.143	52	308	N.D.		
6) Dichlorotetrafluoroethane	0.000		0	N.D.		
7) VinylChloride	0.000		0	N.D.		
8) Acetaldehyde	0.000		0	N.D. d		
9) Methanol	5.668	31	754736	65699.69	ppbv	
10) 1,3-Butadiene	5.722	54	275	N.D.		
11) Bromomethane	6.265	96	3064	N.D.		
12) Chloroethane	6.537	66	824	N.D.		
13) Dichlorofluoromethane	6.844	67	761	N.D.		
14) Ethanol	6.880	45	254664m	169044.28	ppbv	
15) VinylBromide	0.000		0	N.D.		
16) Acrolein	7.713	56	827	N.D.		
17) Acetone	0.000		0	N.D. d		
18) Trichlorofluoromethane	7.496	103	119	N.D.		
19) 2-Propanol(IPA)	0.000		0	N.D. d		
20) Acrylonitrile	0.000		0	N.D.		
21) 1,1-Dichloroethene	0.000		0	N.D.		
22) MethyleneChloride(DCM)	9.160	84	2308	N.D.		
23) TertButanol(TBA)	8.998	59	5337	N.D.		
24) AllylChloride	9.160	39	56	N.D.		
25) CarbonDisulfide	9.305	76	16078	N.D.		
26) Trichlorotrifluoroethane	0.000		0	N.D.		
27) trans-1,2-Dichloroethene	0.000		0	N.D.		
28) 1,1-Dichloroethane	10.726	63	132	N.D.		
29) MethylTertButylEther(M...	10.316	73	111	N.D.		
30) VinylAcetate	10.726	43	1176	N.D.		
31) 2-Butanone(MEK)	0.000		0	N.D. d		
32) cis-1,2-Dichloroethene	11.724	96	148	N.D.		
33) Hexane	11.297	86	364	N.D.		
34) Chloroform	0.000		0	N.D.		
35) EthylAcetate	11.885	43	83680	10185.56	ppbv	100
36) Tetrahydrofuran	12.563	72	8536	N.D.		
37) 1,2-Dichloroethane	13.436	62	609	N.D.		
38) 1,1,1-Trichloroethane	0.000		0	N.D.		
40) Benzene	13.775	78	54049	N.D.		
41) CarbonTetrachloride	0.000		0	N.D.		
42) Cyclohexane	13.864	69	830	N.D.		
43) 1,2-Dichloropropane	15.220	63	1770	N.D.		
44) Bromodichloromethane	0.000		0	N.D.		

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

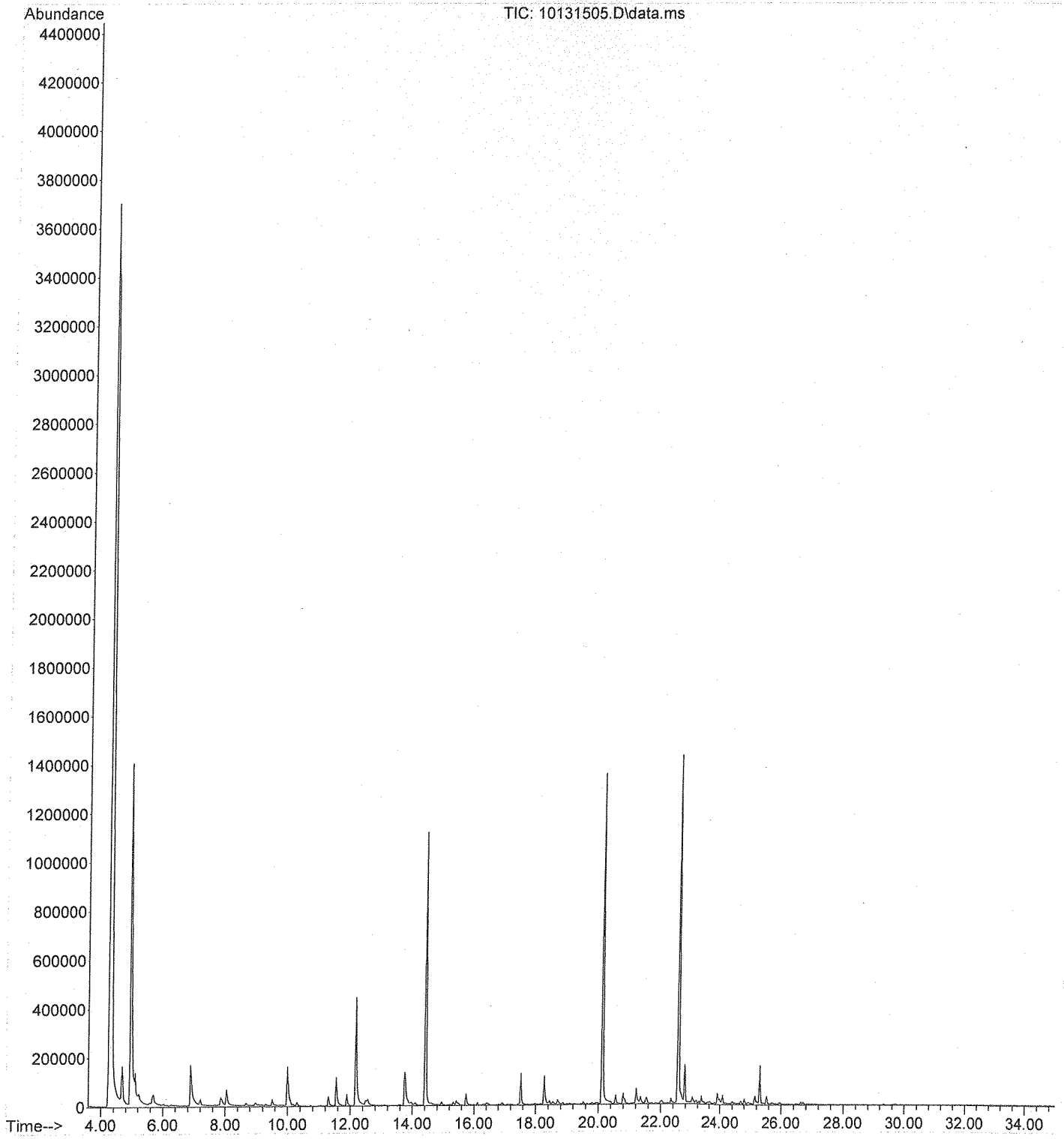
Compound	R.T.	QIon	Response	Conc Units Dev(Min)
45) 1,4-Dioxane	15.451	88	108	N.D.
46) Trichloroethene(TCE)	15.130	130	351	N.D.
47) 2,2,4-Trimethylpentane	14.595	57	5627	N.D.
48) MethylMethacrylate	15.487	69	431	N.D.
49) Heptane	14.952	71	4136	N.D.
50) cis-1,3-Dichloropropene	0.000		0	N.D.
51) 4-Methyl-2-pentanone(M...	16.414	58	3656	N.D.
52) trans-1,3-Dichloropropene	17.520	75	1020	N.D.
53) 1,1,2-Trichloroethane	17.698	97	608	N.D.
54) Toluene	0.000		0	N.D. d
55) 2-Hexanone(MBK)	18.162	58	883	N.D.
56) Dibromochloromethane	18.857	129	900	N.D.
57) 1,2-Dibromoethane	0.000		0	N.D.
58) Tetrachloroethene(PCE)	18.857	166	1093	N.D.
60) Chlorobenzene	20.212	114	449	N.D.
61) Ethylbenzene	20.551	91	35600	N.D.
62) m&p-Xylene	20.801	106	30017	N.D.
63) Bromoform	0.000		0	N.D.
64) Styrene	21.514	104	3878	N.D.
65) 1,1,2,2-Tetrachloroethane	22.210	83	730	N.D.
66) o-Xylene	21.550	91	17576	N.D.
67) Isopropylbenzene(Cumene)	22.388	105	4266	N.D.
68) 2-Chlorotoluene	23.351	91	6463	N.D.
70) 4-Ethyltoluene	23.529	120	1486	N.D.
71) 1,3,5-Trimethylbenzene	23.636	120	1892	N.D.
72) 1,2,4-Trimethylbenzene	24.385	120	4016	N.D.
73) BenzylChloride(a-Chlor...	0.000		0	N.D. d
74) 1,3-Dichlorobenzene	24.920	146	1619	N.D.
75) 1,4-Dichlorobenzene	25.134	146	3532	N.D.
76) 1,2-Dichlorobenzene	25.705	146	1492	N.D.
77) 1,2,4-Trichlorobenzene	29.307	180	2951	N.D.
78) Naphthalene	29.699	128	9631	N.D.
79) Hexachlorobutadiene	29.913	225	423	N.D.

(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/19/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131505.D
Acq On : 13 Oct 2015 10:41
Operator : JJG
Sample : 151378-83662 x10,000
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:04:21 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131506.D
Acq On : 13 Oct 2015 11:29
Operator : JJG
Sample : 151378-83662 x10,000 dp
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:11:44 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	12.170	128	241702m	10.00	ppbv	-0.02
39) 1,4-Difluorobenzene	14.417	114	1286582	10.00	ppbv	0.00
59) Chlorobenzene-d5	20.123	117	1210054	10.00	ppbv	0.00
System Monitoring Compounds						
69) 4-Bromofluorobenzene(BFB)	22.566	174	768026	10.62	ppbv	0.00
Spiked Amount 10.000			Recovery = 106.20%			
Target Compounds						Qvalue
2) Chlorodifluoromethane	4.691	51	1753	N.D.		
3) Propene	4.673	42	16666	N.D.		
4) Dichlorodifluoromethane	4.763	85	1814	N.D.		
5) Chloromethane	5.143	52	371	N.D.		
6) Dichlorotetrafluoroethane	0.000		0	N.D.		
7) VinylChloride	0.000		0	N.D.		
8) Acetaldehyde	0.000		0	N.D.	d	
9) Methanol	5.668	31	73572m	64878.39	ppbv	
10) 1,3-Butadiene	0.000		0	N.D.		
11) Bromomethane	6.265	96	2522	N.D.		
12) Chloroethane	6.536	66	115	N.D.		
13) Dichlorofluoromethane	6.844	67	727	N.D.		
14) Ethanol	6.880	45	252559m	169844.35	ppbv	
15) VinylBromide	0.000		0	N.D.		
16) Acrolein	7.713	56	911	N.D.		
17) Acetone	0.000		0	N.D.	d	
18) Trichlorofluoromethane	0.000		0	N.D.		
19) 2-Propanol(IPA)	0.000		0	N.D.	d	
20) Acrylonitrile	0.000		0	N.D.		
21) 1,1-Dichloroethene	0.000		0	N.D.		
22) MethyleneChloride(DCM)	9.160	84	2319	N.D.		
23) TertButanol(TBA)	8.998	59	5208	N.D.		
24) AllylChloride	9.106	39	490	N.D.		
25) CarbonDisulfide	9.305	76	14065	N.D.		
26) Trichlorotrifluoroethane	0.000		0	N.D.		
27) trans-1,2-Dichloroethene	0.000		0	N.D.		
28) 1,1-Dichloroethane	10.726	63	112	N.D.		
29) MethylTertButylEther(M...	10.334	73	136	N.D.		
30) VinylAcetate	10.726	43	1229	N.D.		
31) 2-Butanone(MEK)	0.000		0	N.D.	d	
32) cis-1,2-Dichloroethene	11.724	96	141	N.D.		
33) Hexane	11.296	86	423	N.D.		
34) Chloroform	0.000		0	N.D.		
35) EthylAcetate	11.885	43	83159m	210254.81	ppbv	
36) Tetrahydrofuran	12.562	72	8174	N.D.		
37) 1,2-Dichloroethane	13.436	62	680	N.D.		
38) 1,1,1-Trichloroethane	0.000		0	N.D.		
40) Benzene	13.775	78	51905	N.D.		
41) CarbonTetrachloride	0.000		0	N.D.		
42) Cyclohexane	13.846	69	983	N.D.		
43) 1,2-Dichloropropane	15.237	63	1302	N.D.		
44) Bromodichloromethane	0.000		0	N.D.		

10/26/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131506.D
Acq On : 13 Oct 2015 11:29
Operator : JJG
Sample : 151378-83662 x10,000 dp
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:11:44 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration

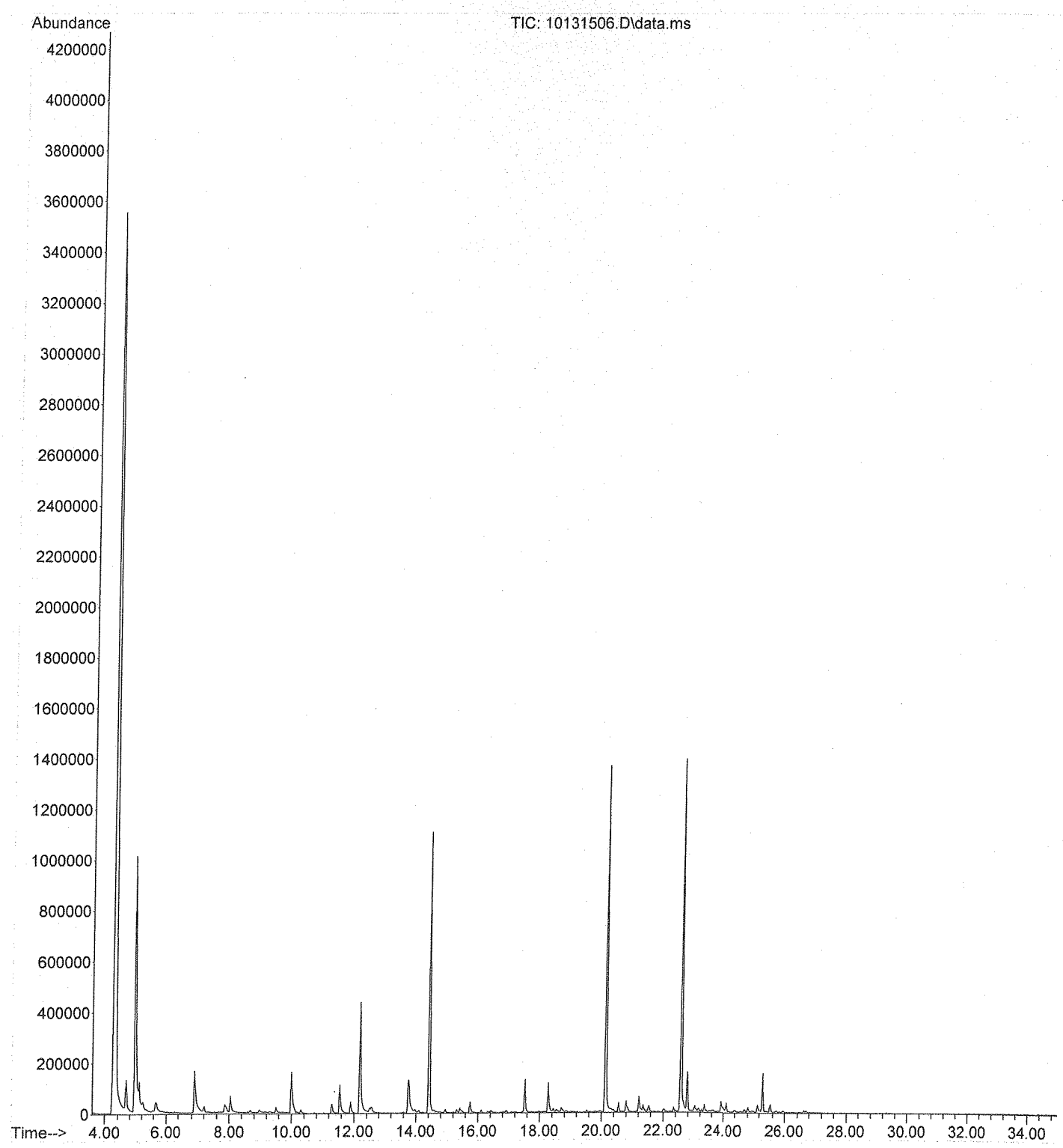
Compound	R.T.	QIon	Response	Conc Units Dev(Min)
45) 1,4-Dioxane	15.326	88	127	N.D.
46) Trichloroethene(TCE)	15.130	130	337	N.D.
47) 2,2,4-Trimethylpentane	14.595	57	5387	N.D.
48) MethylMethacrylate	15.487	69	324	N.D.
49) Heptane	14.952	71	4205	N.D.
50) cis-1,3-Dichloropropene	0.000		0	N.D.
51) 4-Methyl-2-pentanone(M...	16.414	58	2917	N.D.
52) trans-1,3-Dichloropropene	17.520	75	965	N.D.
53) 1,1,2-Trichloroethane	17.698	97	735	N.D.
54) Toluene	0.000		0	N.D. d
55) 2-Hexanone(MBK)	18.162	58	271	N.D.
56) Dibromochloromethane	18.857	129	817	N.D.
57) 1,2-Dibromoethane	0.000		0	N.D.
58) Tetrachloroethene(PCE)	18.857	166	1119	N.D.
60) Chlorobenzene	20.177	114	523	N.D.
61) Ethylbenzene	20.551	91	36274	N.D.
62) m&p-Xylene	20.801	106	29305	N.D.
63) Bromoform	0.000		0	N.D.
64) Styrene	21.514	104	3296	N.D.
65) 1,1,2,2-Tetrachloroethane	22.192	83	117	N.D.
66) o-Xylene	21.550	91	17410	N.D.
67) Isopropylbenzene(Cumene)	22.388	105	3815	N.D.
68) 2-Chlorotoluene	23.351	91	5684	N.D.
70) 4-Ethyltoluene	23.547	120	939	N.D.
71) 1,3,5-Trimethylbenzene	23.636	120	1809	N.D.
72) 1,2,4-Trimethylbenzene	24.385	120	3449	N.D.
73) BenzylChloride(a-Chlor...	0.000		0	N.D. d
74) 1,3-Dichlorobenzene	24.920	146	722	N.D.
75) 1,4-Dichlorobenzene	25.152	146	2521	N.D.
76) 1,2-Dichlorobenzene	25.705	146	965	N.D.
77) 1,2,4-Trichlorobenzene	29.324	180	1503	N.D.
78) Naphthalene	29.717	128	4887	N.D.
79) Hexachlorobutadiene	29.931	225	136	N.D.

(#) = qualifier out of range (m) = manual integration (+) = signals summed

10/13/15

Data Path : C:\msdchem\1\MS03\2015\101315\
Data File : 10131506.D
Acq On : 13 Oct 2015 11:29
Operator : JJG
Sample : 151378-83662 x10,000 dp
Misc : IS/Surr: PS081415-02 + 500mL x10,000
ALS Vial : 2 Sample Multiplier: 10000

Quant Time: Oct 13 12:11:44 2015
Quant Method : C:\msdchem\1\METHODS\2015\061715xl.M
Quant Title : TO-15/TO-14
QLast Update : Thu Jun 18 10:36:58 2015
Response via : Initial Calibration



10/13/15

Calibration Status Report MS03 Enhanced

Method Path : C:\msdchem\1\METHODS\2015\
Method File : 061715xl.M
Title : TO-15/TO-14
Last Update : Thu Jun 18 10:36:58 2015
Response Via : Initial Calibration

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2	1.0	1	10	C:\msdchem\1\MS03\2015\061715\06171526.D
3	2.0	2	10	C:\msdchem\1\MS03\2015\061715\06171525.D
4	5.0	5	10	C:\msdchem\1\MS03\2015\061715\06171524.D
5	10	10	10	C:\msdchem\1\MS03\2015\061715\06171523.D
6	20	21	10	C:\msdchem\1\MS03\2015\061715\06171522.D
7	50	52	10	C:\msdchem\1\MS03\2015\061715\06171521.D
8	0.25	0	10	C:\msdchem\1\MS03\2015\061715\06171529.D

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1	0.5	Jun 18 10:35 2015	Jun 18 10:31 2015	18 Jun 2015 4:33
2	1.0	Jun 18 10:36 2015	Jun 18 10:25 2015	18 Jun 2015 3:43
3	2.0	Jun 18 10:36 2015	Jun 18 10:06 2015	18 Jun 2015 2:54
4	5.0	Jun 18 10:36 2015	Jun 18 09:37 2015	18 Jun 2015 2:04
5	10	Jun 18 10:36 2015	Jun 18 09:33 2015	18 Jun 2015 1:15
6	20	Jun 18 10:36 2015	Jun 18 09:27 2015	18 Jun 2015 00:26
7	50	Jun 18 10:35 2015	Jun 18 09:20 2015	17 Jun 2015 23:36
8	0.25	Jun 18 10:35 2015	Jun 18 09:16 2015	18 Jun 2015 6:11

061715xl.M Thu Jun 18 10:42:52 2015

6/18/15

Response Factor Report MS03 Enhanced

Method Path : C:\msdchem\1\METHODS\2015\
Method File : 061715xl.M
Title : TO-15/TO-14
Last Update : Thu Jun 18 10:36:58 2015
Response Via : Initial Calibration

Calibration Files
0.5 =06171527.D 1.0 =06171526.D 2.0 =06171525.D 5.0 =06171524.D 10 =06171523.D 20 =06171522.D
50 =06171521.D 0.25=06171529.D

		Compound	0.5	1.0	2.0	5.0	10	20	50	0.25	Avg	%RSD
1)	I	Bromochloromethane	ISTD									
2)		Chlorodifluoro...	2.309	2.316	2.305	2.285	2.262	2.148	1.980	2.264	2.234	5.17
3)		Propene	0.743	0.790	0.780	0.785	0.772	0.765	0.713		0.764	3.59
4)		Dichlorodifluo...	3.118	3.384	3.342	3.275	3.216	3.005	2.717	3.282	3.167	6.91
5)		Chloromethane	0.451	0.457	0.440	0.438	0.422	0.398	0.320	0.452	0.422	10.82
6)		Dichlorotetraf...	2.134	2.345	2.347	2.305	2.279	2.143	1.869	2.232	2.207	7.22
7)		VinylChloride	1.173	1.308	1.351	1.357	1.368	1.347	1.224	1.204	1.292	6.09
8)		Acetaldehyde	0.636	0.557	0.499	0.489	0.480	0.439	0.315		0.488	20.41
9)		Methanol	0.573	0.493	0.486	0.452	0.438	0.440	0.357		0.463	14.26
10)		1,3-Butadiene	0.923	1.002	1.052	1.010	0.944	0.896	0.780	0.840	0.931	9.80
11)		Bromomethane	1.033	0.915	0.896	0.876	0.885	0.846	0.708	0.953	0.889	10.46
12)		Chloroethane	0.221	0.236	0.215	0.204	0.205	0.204	0.185	0.250	0.215	9.47
13)		Dichlorofluoro...	2.324	2.482	2.514	2.508	2.490	2.398	2.043	2.455	2.402	6.60
14)		Ethanol	0.493	0.839	0.722	0.623	0.603	0.572	0.456		0.615	21.40
15)		VinylBromide	0.890	0.995	1.034	1.054	1.085	1.075	0.953	0.888	0.997	7.94
16)		Acrolein	0.498	0.540	0.536	0.526	0.514	0.493	0.438	0.586	0.516	8.35
17)		Acetone	0.711	0.704	0.647	0.615	0.611	0.596	0.554		0.634	9.06
18)		Trichlorofluor...	1.781	1.948	1.954	1.910	1.897	1.821	1.598	1.887	1.850	6.36
19)		2-Propanol(IPA)	1.916	2.057	2.107	2.081	2.101	1.980	1.719	2.213	2.022	7.47
20)		Acrylonitrile	0.864	0.865	0.810	0.732	0.714	0.685	0.582	0.857	0.764	13.43
21)	M,T	1,1-Dichloroet...	0.912	0.972	1.012	1.010	1.021	0.987	0.859	0.899	0.959	6.35
22)	M,T	MethyleneChlor...	1.112	1.135	1.085	1.008	0.919	0.772	0.640	1.375	1.006	22.75
23)		TertButanol(TBA)	2.516	2.722	2.589	2.116	1.998	1.884	1.411	2.957	2.274	22.44
24)		AllylChloride	0.964	1.025	1.022	0.976	0.875	0.712	0.551	0.941	0.883	19.04
25)		CarbonDisulfide	3.381	3.949	3.755	3.543	3.458	3.276	2.289	3.768	3.427	14.93
26)		Trichlorotrifl...	1.561	1.478	1.428	1.358	1.306	1.204	0.953	1.543	1.354	14.92
27)		trans-1,2-Dich...	1.211	1.334	1.382	1.420	1.449	1.349	1.158	1.115	1.302	9.59
28)		1,1-Dichloroet...	2.476	2.713	2.651	2.601	2.606	2.418	1.995	2.508	2.496	8.98

6/18/15

Response Factor Report MS03 Enhanced

Method Path : C:\msdchem\1\METHODS\2015\
Method File : 061715xl.M
Title : TO-15/TO-14

29)		MethylTertButy...	3.205	3.440	3.457	3.412	3.311	3.023	2.549	3.273	3.209	9.42
30)		VinylAcetate	3.444	3.703	3.795	3.734	3.697	3.557	2.844	3.117	3.486	9.72
31)		2-Butanone(MEK)	0.564	0.663	0.707	0.697	0.752	0.713	0.651	0.691	0.680	8.23
32)		cis-1,2-Dichlo...	1.193	1.378	1.411	1.406	1.424	1.380	1.234	1.232	1.332	7.14
33)		Hexane	0.273	0.307	0.314	0.313	0.313	0.292	0.262	0.303	0.297	6.68
34)		Chloroform	2.374	2.584	2.660	2.597	2.654	2.494	2.215	2.453	2.504	6.13
35)		EthylAcetate	3.116	3.403	3.580	3.521	3.523	3.442	2.982	3.273	3.355	6.37
36)		Tetrahydrofuran	0.661	0.663	0.677	0.678	0.692	0.663	0.592	0.710	0.667	5.18
37)		1,2-Dichloroet...	1.742	1.889	1.932	1.865	1.875	1.791	1.626	1.654	1.797	6.31
38)		1,1,1-Trichlor...	2.493	2.718	2.757	2.767	2.745	2.584	2.251	2.970	2.661	8.14
39)	I	1,4-Difluorobenzene	----------ISTD----------									
40)	T,M	Benzene	1.014	1.000	0.945	0.879	0.815	0.762	0.603		0.860	17.01
41)		CarbonTetrachl...	0.539	0.585	0.587	0.563	0.530	0.496	0.419	0.497	0.527	10.63
42)		Cyclohexane	0.135	0.147	0.140	0.131	0.122	0.114	0.097	0.135	0.128	12.49
43)		1,2-Dichloropr...	0.330	0.351	0.351	0.338	0.319	0.301	0.254	0.329	0.322	9.97
44)		Bromodichlorom...	0.349	0.384	0.383	0.378	0.362	0.350	0.301	0.338	0.356	7.89
45)		1,4-Dioxane	0.197	0.206	0.203	0.195	0.188	0.183	0.173	0.182	0.191	5.93
46)	M,T	Trichloroethen...	0.382	0.412	0.414	0.392	0.385	0.369	0.311	0.525	0.399	15.16
47)		2,2,4-Trimethy...	1.505	1.595	1.564	1.519	1.434	1.343	1.027	1.544	1.442	12.87
48)		MethylMethacry...	0.289	0.305	0.308	0.291	0.282	0.273	0.237	0.255	0.280	8.65
49)		Heptane	0.280	0.308	0.303	0.294	0.283	0.270	0.221	0.285	0.280	9.65
50)		cis-1,3-Dichlo...	0.442	0.463	0.470	0.443	0.428	0.414	0.363	0.381	0.426	8.86
51)		4-Methyl-2-pen...	0.297	0.320	0.329	0.319	0.310	0.304	0.256	0.271	0.301	8.33
52)		trans-1,3-Dich...	0.419	0.455	0.465	0.440	0.461	0.440	0.362	0.344	0.423	10.87
53)		1,1,2-Trichlor...	0.341	0.371	0.367	0.356	0.339	0.324	0.271	0.344	0.339	9.26
54)	M,T	Toluene	1.061	1.107	1.097	1.021	0.954	0.883	0.721	1.124	0.996	13.88
55)		2-Hexanone(MBK)	0.336	0.379	0.399	0.403	0.387	0.380	0.322	0.315	0.365	9.66
56)		Dibromochlorom...	0.525	0.568	0.604	0.615	0.605	0.588	0.471	0.466	0.555	10.89
57)		1,2-Dibromoethane	0.522	0.568	0.572	0.563	0.533	0.517	0.428	0.485	0.524	9.31
58)	M,T	Tetrachloroeth...	0.482	0.514	0.509	0.504	0.480	0.459	0.366	0.575	0.486	12.26
59)	I	Chlorobenzene-d5	----------ISTD----------									
60)	M,T	Chlorobenzene	0.262	0.271	0.263	0.261	0.257	0.253	0.216	0.270	0.257	6.74
61)	M,T	Ethylbenzene	1.342	1.433	1.425	1.375	1.295	1.208	0.937	1.319	1.292	12.44
62)	M,T	m&p-Xylene	0.556	0.572	0.575	0.557	0.540	0.517	0.414	0.530	0.533	9.76
63)		Bromoform	0.534	0.608	0.637	0.635	0.626	0.619	0.495	0.459	0.577	12.20
64)		Styrene	0.786	0.878	0.909	0.888	0.879	0.859	0.718	0.674	0.824	10.62

Response Factor Report MS03 Enhanced

Method Path : C:\msdchem\1\METHODS\2015\
Method File : 061715xl.M
Title : TO-15/TO-14

65)		1,1,2,2-Tetrac...	0.755	0.791	0.786	0.753	0.704	0.655	0.498	0.367	0.664	23.09
66)	M,T	o-Xylene	1.098	1.153	1.134	1.052	0.987	0.905	0.725	1.097	1.019	14.14
67)		Isopropylbenze...	1.658	1.764	1.755	1.641	1.535	1.379	0.965	1.627	1.540	17.09
68)		2-Chlorotoluene	1.130	1.265	1.218	1.156	1.066	0.990	0.753	1.075	1.082	14.69
69)	SR	4-Bromofluorob...	0.606	0.594	0.596	0.590	0.593	0.597	0.607	0.598	0.598	1.01
70)		4-Ethyltoluene	0.409	0.456	0.469	0.471	0.459	0.450	0.367	0.414	0.437	8.38
71)		1,3,5-Trimethy...	0.598	0.663	0.661	0.653	0.634	0.614	0.485	0.592	0.613	9.55
72)		1,2,4-Trimethy...	0.574	0.637	0.637	0.649	0.629	0.608	0.482	0.539	0.594	9.90
73)		BenzylChloride...	0.522	0.639	0.770	0.882	0.922	0.965	0.864	0.434	0.750	26.23
74)		1,3-Dichlorobe...	0.795	0.879	0.882	0.875	0.844	0.823	0.673	0.684	0.807	10.50
75)		1,4-Dichlorobe...	0.805	0.857	0.877	0.882	0.842	0.828	0.662	0.735	0.811	9.41
76)		1,2-Dichlorobe...	0.816	0.903	0.890	0.894	0.856	0.834	0.680	0.730	0.825	9.84
77)		1,2,4-Trichlor...	0.713	0.816	0.848	0.838	0.825	0.793	0.638		0.782	9.92
78)		Naphthalene	1.533	1.610	1.638	1.689	1.653	1.609	1.346		1.583	7.26
79)		Hexachlorobuta...	0.632	0.672	0.677	0.668	0.646	0.617	0.449		0.623	12.79

(#) = Out of Range

Appendix G

Incremental Offsets Permit Example

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PERMIT TO OPERATE

This document does not permit the holder to violate any BAAQMD regulation or any other law.

PERMIT EXPIRATION DATE
FEB 1, 2020

Plant# [redacted]

*** PERMIT CONDITIONS ***

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

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

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

*** PERMIT CONDITIONS ***

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BAAQMD, 375 Beale Street, Suite 600, San Francisco, CA 94105.

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

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

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

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PERMIT TO OPERATE

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PERMIT EXPIRATION DATE
FEB 1, 2020

Plant# [redacted]

*** PERMIT CONDITIONS ***

the fugitive POC emissions conducted in accordance with Parts 17b(ii-iv).

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

ERC Due Date & Effective Date for New Limits	Amount of ERCs Due tons/yr of POC	Fugitive Emission Limit tons/yr of POC	Cumulatv Decomp. Material Placement Limit tons/yr	Annual Decomp. Material Placement Limit tons/yr	NMOC in LFG (3-yr) avg as as C6 at 50% CH4 ppmv
*	11.114	73.654	48.337	1,630,000	600
1/2/15	4.349	77.436	51.557	1,610,000	600
1/2/17	4.167	81.059	54.777	1,610,000	600
1/2/19	4.003	84.540	57.997	1,610,000	600
1/2/21	3.846	87.884	61.217	1,610,000	600
1/2/23	3.695	91.098	64.437	1,610,000	600
1/2/25	3.551	94.185	67.657	1,610,000	600
1/2/27	3.411	97.152	70.877	1,610,000	600
1/2/29	3.278	100.002	74.097	1,610,000	600
1/2/31	3.149	102.740	77.317	1,610,000	600
1/2/33	3.026	105.371	80.537	1,610,000	600
1/2/35	2.907	107.899	83.757	1,610,000	600
1/2/37	4.148	111.506	88.000	1,610,000	600

* These limits and all subsequent limits are effective upon commencement of waste disposal

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PERMIT TO OPERATE

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PERMIT EXPIRATION DATE
FEB 1, 2020

Plant# [redacted]

*** PERMIT CONDITIONS ***

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in Fill Area 2.

b. The Permit Holder shall conduct a fugitive POC emissions reassessment for the [redacted] Landfill in accordance with the schedule and procedures identified below.

i) A reassessment of the annual fugitive POC emission rate from the [redacted] Landfill (Fill Areas 1 and 2 combined) shall be submitted to the District each year by no later than July 1st. The first reassessment is due the first July 1st after waste placement in Fill Area 2 commences. The reassessment shall be addressed to the attention of the District permit engineer assigned to this site, Engineering Division, BAAQMD, 375 Beale Street, Suite 600, San Francisco, CA 94105.

ii) The fugitive POC emissions reassessment shall use the EPA LANDGEM program to determine the projected amount of landfill gas (scfm) and NMOC (tons/year) that will be generated by S-2 (Fill Areas 1 and 2 combined) for each year from 1980 through at least 2080. The Permit Holder shall use the following LANDGEM User Input Data:

methane generation rate (k) = 0.02 year-1, potential methane generation capacity (L0) = 100 m3/Mg, methane content = 50%.

The Permit Holder shall use the best available data for the amount of decomposable materials placed in the landfill from 1980 through 2008. For calendar year 2009 and later, the Permit Holder shall use the annual decomposable material placement data recorded pursuant to Part 22. For the user-specified NMOC concentration in LANDGEM, the Permit Holder shall use the most recent three-year average NMOC concentration data

*** PERMIT CONDITIONS ***

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(ppmv of NMOC expressed as hexane and corrected to 50% methane) recorded pursuant to Part 14b.

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

POCfugitive = NMOCgenerated * 0.25 * 0.98

Where: POCfugitive is the projected amount of fugitive POC emissions (tons/year) for a particular calendar year NMOCgenerated is the projected amount of NMOC generated (tons/year) as determined by LANDGEM using the User-Input Data discussed above. 0.25 is the assumed fugitive emission fraction (75% captured and 25% fugitive) for the total NMOC generated 0.98 is the assumed POC fraction (by weight) of the total NMOC emission rate

iv) The current and projected annual fugitive POC emission rates determined per Part 17b(iii) shall be compared to the fugitive POC emission limits in the table in Part 17a. If the projected peak fugitive POC emission rate for the landfill is less than the maximum POC emissions limit in the table, the Permit Holder may, at his or her discretion, request that the District modify the Part 17a table limits and ERC submittal requirements based on the updated fugitive POC emissions calculations. This condition change request shall be submitted in the form of a District permit application, and the District will handle the request as an administrative permit condition change. If the peak fugitive POC emissions for S-2 are

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PERMIT TO OPERATE

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PERMIT EXPIRATION DATE
FEB 1, 2020

Plant# [redacted]

*** PERMIT CONDITIONS ***

projected to exceed the maximum fugitive POC emission limit of 111.506 tons/year, the Permit Holder must submit a permit application to request an increase of this limit by no later than October 1st of the year in which the fugitive POC emissions reassessment was due. In this latter case, the permit application cannot be handled administratively, but the District will review the circumstances leading to the need to increase the maximum fugitive POC emissions for the landfill to determine if the change constitutes an alteration or a modification of S-2.

18. The Permit Holder shall comply with the following waste acceptance and disposal limits and shall obtain the appropriate New Source Review permit, if one of the following limits is exceeded:
    a. Total waste accepted and placed at the landfill shall not exceed 11,150 tons in any day (except during temporary emergency situations approved by the Local Enforcement Agency).
    (Basis: Regulation 2-1-301)
    b. The amount of non-hazardous sludge accepted and placed at the landfill shall not exceed 5,000 tons in any day.
    (Basis: Regulation 2-1-301)
    c. The maximum design capacity of the landfill (total volume of solid waste placed in the landfill where solid waste has the same meaning as the definition in 40 CFR Part 60.751) shall not exceed 124,400,000 cubic yards.
    (Basis: Regulation 2-1-301)
    d. The total cumulative amount of all decomposable materials placed in Fill Area 1 of the landfill shall not exceed 51,020,000 tons. Exceedance of the cumulative tonnage limit is not a violation of the permit and does not trigger the requirement to obtain a

Appendix H

SDAPCD Application Forms

Internal Use Only
APP ID: APCD -APP/CER-
SITE ID: APCD -SITE-

GENERAL PERMIT OR REGISTRATION APPLICATION FORM

APCD AIR POLLUTION CONTROL DISTRICT COUNTY OF SAN DIEGO

Submittal of this application does not grant permission to construct or to operate equipment except as specified in Rule 24(c).

REASON FOR SUBMITTAL OF APPLICATION:

- ☐ New Installation
- ☐ Amendment to Existing Authority to Construct or Application
- ☐ Change of Permit Conditions
- ☐ Registration of Portable Equipment
- ☐ Existing Unpermitted Equipment or Rule 11 Change
- ☐ Change of Equipment Location
- ☐ Change Permit to Operate Status to Inactive
- ☐ Other (Specify)_____
- ☒ Modification of Existing Permitted Equipment
- ☐ Change of Equipment Ownership ***(please provide proof of ownership)***
- ☐ Banking Emissions

List affected APP/PTO Record ID(s): APCD2008-PTO-971111

APPLICANT INFORMATION

Name of Business (DBA) Sycamore Landfill, Inc.

Does this organization own or operate any other APCD permitted equipment at this or any other adjacent locations? ☐Yes ☒No

If yes, list assigned Site Record IDs listed on your Permits _____

Name of Legal Owner (if different from DBA)

Equipment Owner	**Authority to Construct Mailing Address**
Name: Sycamore Landfill, Inc.	Name: Same as Equipment Owner
Mailing Address: 8514 Mast Boulevard	Mailing Address:
City: San Diego State: CA Zip: 92071	City: State: Zip:
Phone: (619) 733-7525	Phone: ( )
E-Mail Address: nmohr@republicservices.com	E-Mail Address:

Permit To Operate Mailing Address	**Invoice Mailing Address**
Name: Same as Equipment Owner	Name: Same as Equipment Owner
Mailing Address:	Mailing Address:
City: State: Zip:	City: State: Zip:
Phone: ( )	Phone: ( )
E-Mail Address:	E-Mail Address:

EQUIPMENT/PROCESS INFORMATION: Type of Equipment: ☒ Stationary ☐ Portable, *if portable please enter below the equipment storage address*. If portable, will operation exceed 12 consecutive months at the same location ☐ Yes ☐ No

Equipment Location Address 8514 Mast Boulevard City San Diego State: CA

Parcel No. _____ Zip 92071 Phone (657) 243-4335 E-mail:jbjorkman@republicservices.com

Site Contact Jordana Bjorkman Phone (657) 243-4335

General Description of Equipment/Process Municipal Solid Waste Landfill

Application Submitted by ☐ Owner ☐ Operator ☐ Contractor ☒ Consultant Affiliation SCS Engineers

EXPEDITED APPLICATION PROCESSING: ☒ **I hereby request Expedited Application Processing and understand that:**

a) Expedited processing will incur additional fees and permits will not be issued until the additional fees are paid in full (see Rule 40(d)(8)(iv) for details) b) Expedited processing is contingent on the availability of qualified staff c) Once engineering review has begun this request cannot be cancelled d) Expedited processing does not guarantee action by any specific date nor does it guarantee permit approval.

I hereby certify that all information provided on this application is true and correct.

SIGNATURE _____ Date 12/20/2024

Print Name Neil Mohr Company Sycamore Landfill, Inc.

Phone (619) 733-7525 E-mail Address nmohr@republicservices.com

Internal Use Only

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APP ID: APCD -APP/CER-
SITE ID: APCD -SITE-

GENERAL PERMIT OR REGISTRATION APPLICATION FORM

APCD
AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Date _____ Staff Initials: _____ Amt Rec'd $ _____ Fee Schedule _____

RNP: _____ EMF: _____ NBF: _____ TA: _____ *GEN_APP_Form_Rev Date: Aug. 2017*

SAN DIEGO AIR POLLUTION CONTROL DISTRICT

SUPPLEMENTAL APPLICATION INFORMATION
FEE SCHEDULE 48A, B

San Diego APCD Use Only
Appl. No.:
ID No.:

LANDFILL GAS CONTROL SYSTEMS

Company Name: Sycamore Landfill, Inc.

Equipment Address: 3514 Mast Boulevard, San Diego, CA 92071

1. LANDFILL DESCRIPTION

Landfill Owner: Sycamore Landfill, Inc.

Landfill Operator: Sycamore Landfill, Inc.

Operation Status: ☒ Accepting Waste ☐ Closed

Date waste was first accepted: 1967 Closure date: 2082 or later

Describe the type of waste: Municipal Solid Waste

Estimate the volume of landfilled waste: 147.908 MM cu. yds.

Type of cover used (i.e., clay, membrane, etc.): Soil Mixture

Cover Depths: Max. 4 ft Min. 0.5 ft Avg. 1.5 ft

Has the landfill been tested pursuant to the requirements of AD 3323 (Calderon)? ☐ Yes ☒ No

Is the gas collection system being installed to satisfy requirements of AD 3525 (Calderon)? ☐ Yes ☒ No

What will be the end use of collected landfill gas? Landfill gas is currently being collected and either flared and/or sent to a third party landfill gas to energy facility. Landfill expansion will not affect current end use.

Provide the results of any landfill gas testing and ambient monitoring including documentation of sampling and analysis methodology. Also attach a landfill site plan that clearly shows fill boundaries and estimated depths.

2. LANDFILL GAS COLLECTION AND EMISSION CONTROL EQUIPMENT

Number of gas collection wells: N/A

Collection well materials of construction: N/A to landfill expansion. Activities noted in this section will remain the same as current.

Well Depths: Max. _____ ft Min. _____ ft Avg. _____ ft

Will each well be equipped with a shutoff valve? ☐ Yes ☐ No

Describe the materials to be used as packing at the well head/landfill cover interface: _____

_____

Estimated volume of landfill gas to be collected each day: _____ cu. ft.

Describe the method of condensate and leachate collection and disposal: _____

_____

_____

Estimated landfill gas heat content: _____ BTU/SCF

Describe any safety or monitoring devices for ensuring the collection system integrity: _____

_____

_____

Describe the equipment that will condition or process collected landfill gas: (i.e., flare, engine, etc)

Flares and third party LFGTE energy facility (turbines).

_____

_____

Equip. Mfr.: _____ Model: _____ S/N: _____

Describe any backup landfill gas processing equipment: _____

_____

_____

Attach a drawing showing well locations, depths, transfer piping, and process equipment. Also provide a schematic of gas collection well construction and completions and a narrative about maintenance of the collection and processing equipment.

Name of Preparer: Gabrielle Stephens **Title:** Proj Director, SCS Engineers

Phone No.: (562) 355-6510 **Date:** 11-26-24

NOTE TO APPLICANT:

Before acting on an application for Authority to Construct or Permit to Operate, the District may require further information, plans, or specifications. Forms with insufficient information may be returned to the applicant for completion, which will cause a delay in application processing and may increase processing fees. The applicant should correspond with equipment and material manufacturers to obtain the information requested on this supplemental form.

SAN DIEGO AIR POLLUTION CONTROL DISTRICT

SUPPLEMENTAL APPLICATION INFORMATION
RULE 1200 TOXICS EVALUATION

San Diego APCD Use Only
Appl. No.:
ID No.:

(ALL REQUESTED INFORMATION IS IMPORTANT - PLEASE COMPLETE FULLY)

FACILITY NAME: Sycamore Landfill, Inc.

RELEASE POINT DATA (Examples of commonly encountered release points: the tip of an exhaust stack, a roof vent, an open window, an outdoor area or volume)

How are the emissions from this device released into the outdoor air? Check One

☐ Exhaust Stack or Duct ☐ Unducted Vent ☐ Released Through Windows or Doors

☒ Undirected Emissions (Anything other than the above categories)

If emissions are from a stack or a duct, check off the direction of flow. ☐ Vertical (Up)

☐ Horizontal ☒ Other (**Describe**): Undirected

If there is an obstruction to vertical flow, is the obstruction a: ☐ Rain Cap

☐ Flapper-Type Valve (Open when there is flow) ☐ Other (**Describe**): _____

Volume Source: If emissions are from a volume source, describe how the emitted gases, vapors, and/or particles get into the air and either the size of the opening (example - 3 ft x 4 ft window) that results in release or the approximate size of the release zone (example - paint spraying, 2' x 2' x 2' bread boxes): _____

_____

_____

Lateral dimension (ft): _____ Vertical dimension (ft): _____

Please provide the following **STACK** or **RELEASE POINT** information (where applicable):

Parameter	Emission Point #1	Emission Point #2	Emission Point #3
Height of release above ground (ft)			
Stack Diameter (ft)			
Exhaust Gas Temperature* (°F)			
Exhaust Gas Flow (acfm or fps)			
Distance to Property Line (+/- 10 ft)			

* Use "70 °F" or "Ambient" if unknown

FACILITY SITE MAP, PLOT PLAN, and RELEASE POINT INFORMATION

Please provide a map showing the geographic location of your facility.

Please also provide a **facility plot plan** showing the location of emission release point(s) at the facility, property lines, and the location (include approximate distance) and dimensions of buildings (estimated height, width, and length) closer than 100 ft from the release point.

Where is the subject release point located with respect to onsite buildings? Check Any Applicable

☐ On top of a building: Building Height _____ ft Width _____ ft Length _____ ft

☐ On the side of a building: Diameter of Opening _____ ft or Size of Opening _____ ft X _____ ft

☐ Adjacent to a building: Building Height _____ ft Width _____ ft Length _____ ft

Appendix I

Fee Estimate

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

APPLICATION FEE ESTIMATE

Please complete ALL highlighted fields in the upper section

Applicant Site ID/EIF ID:	*APCD1989-SITE-03596*	Reason for Submittal:	Modification
Equipment Type:	[48C] Municipal Waste Storage and Processing (Landfill) - subject to the ARB Methane Emissions Regulation		
Applicant DBA:	*Sycamore Landfill, Inc.*	Existing Site?	Yes
Affected Permit Number:	*APCD2008-PTO-971111*	Estimate Date:	11/25/2024
Equipment Description:	*Sycamore Landfill - Landfill Expansion*		

Special Considerations

Oustanding operating fees may be owed	No	Number of Units (for equipment types indicated as "each")	1
		Request Split Payment	No
		Application is a modification/condition change which does not substantially alter equipment or emissions	No
		HRA Fee not applicable because paid with another application, or application does not increase TACs?	No

APCD Use Only Ref. No. _____ Outstanding Fee Balance _____

ACTIVITY	FEE CLASSIFICATION	QUANTITY	UNIT COST	SUBTOTAL	TRUST (APCD USE)
Initial Evaluation Fee					
Base Engineering Evaluation	T&M Engineering Services	40.0	$315.00	$12,600.00	ETM
	Fixed Fee		N/A		EFX
Additional Evaluation and Processing Fees (Rule 40(d)(5))					
New Source Review	T&M Engineering Services				NSR
	T&M Monitoring Services				AQI
Toxics New Source Review (Health Risk Assessment)	HRA Base Estimate (Engineering & Monitoring Services)	1.0	$3,212.00	$3,212	TNS
NESHAPS/ATCM/NSPS	T&M Engineering Services				HAP
CEQA	T&M Engineering Services				CEQ
Source Testing	Fixed Fee/T&M Monitoring Services				STF
Miscellaneous Fees					
Processing Fee (Rule 40(d)(1)(ii))		1.0	$130	$130.00	EFX/ETM
Annual Operating Fee (Rule 40(e)(2)(ii))				$0.00	REN
Emissions Fee (Rule 40(e)(2)(iv))				$0.00	EMF
Split Payment Fee					

NOTES:

ESTIMATE TOTAL:	$15,942.00
SPLIT PAYMENT 1	
SPLIT PAYMENT 2	

(1) This document must be submitted with your application forms and is subject to review by District staff for accuracy.

(2) The fees contained in this estimate are are based on APCD Rule 40. Final fee may be more or less than this estimate (see Rule 40(d)(1)(iii)).

(3) Emissions determined to be greater than 5 tons per year will be charged a emission fee on a ton per year basis. (see Rule 40 (e)(2)(iv)(A))

(4) Fees paid by credit card will be assessed a 2.19% processing fee (see Rule 40(c)(5))

(5) Federal government payments made through DFAS: Please reference the above liste Site ID Record number in your DFAS submittal.

(6) Fees are typically revised on annual basis. This estimate is valid only for applications received prior to any revisions, anticipated to be June 30, 2025.