

# 2021 Health Risk Assessment for MM San Diego LLC – Miramar & Miramar Energy

MM San Diego LLC  
5087 Junction Road  
Lockport, NY 14094

**SCS ENGINEERS**

File No. 04225035 | March 2026

3117 Fite Circle, Suite 108  
Sacramento, CA 95827

## Table of Contents

|                                           |          |
|-------------------------------------------|----------|
| <b>Table of Contents</b>                  | <b>2</b> |
| EXECUTIVE SUMMARY                         | 5        |
| 1.0 INTRODUCTION                          | 7        |
| 1.1 General Information of AB2588 Program | 7        |
| 1.2 HRA Overview Process                  | 7        |
| 2.0 FACILITY INFORMATION                  | 8        |
| 2.1 Location                              | 8        |
| 2.2 Facility Description                  | 10       |
| 3.0 EMISSION INFORMATION                  | 10       |
| 3.1 Facility Emission Sources             | 10       |
| 3.2 Emission Inventory                    | 11       |
| 4.0 HAZARD IDENTIFICATION                 | 14       |
| 5.0 DOSE-RESPONSE ASSESSMENT              | 16       |
| 6.0 EXPOSURE ASSESSMENT                   | 21       |
| 6.1 Air Dispersion Model                  | 21       |
| 6.1.1 Point Sources                       | 21       |
| 6.1.2 Receptors                           | 22       |
| 6.1.3 Model Options and Parameters        | 25       |
| 6.2 Ground Level Concentration            | 26       |
| 7.0 RISK CHARACTERIZATION                 | 27       |
| 7.1 HRA Methodology                       | 27       |
| 7.2 Risk Analysis                         | 28       |
| 7.2.1 Cancer Risk                         | 29       |
| 7.2.2 Chronic Hazard Index                | 30       |
| 7.2.3 Acute Hazard Risk                   | 30       |
| 7.2.4 Cancer Burden                       | 30       |
| 7.3 AB 2588 Thresholds                    | 30       |
| 7.4 HRA Results                           | 31       |
| 7.4.1 Cancer Risk                         | 31       |
| 7.4.2 Chronic Hazard Index                | 33       |
| 7.4.3 Acute Hazard Risk                   | 35       |
| 7.4.4 Cancer Burden                       | 37       |
| 8.0 CLOSING                               | 39       |

Tables

**Table 1: Facility 2021 Emission Sources .....9**

**Table 2: 2021 Emission Inventory..... 12**

**Table 3: Summary of Potential Health Risks and Exposure Routes ..... 15**

**Table 4: Target Organ Systems by Substance for Acute ..... 17**

**Table 5: Target Organ Systems by Substance for Annual Chronic ..... 18**

**Table 6: Target Organs for 8-hour Chronic..... 19**

**Table 7: RELs ..... 20**

**Table 8: Point Source Parameters ..... 22**

**Table 9: Model Options and Parameters ..... 25**

**Table 10: HARP2 Model Options and Parameters..... 28**

**Table 11: Cancer Risk Results ..... 31**

**Table 12: Chronic Hazard Index Results ..... 29**

**Table 13: Acute Hazard Index Results..... 35**

FIGURES

- Figure 1: Site Vicinity Map
- Figure 2: Model Sources for Facility and Landfill
- Figure 3: Receptor Locations for Facility and Landfill
- Figure 4: Cancer Isopleths (Worker and Residential) and Locations for PMI, MEIR, MEIW and Maximum Sensitive Receptor
- Figure 5: Annual Chronic Hazard Isopleths (hazard index) and Locations for PMI, MEIR, MEIW and Maximum Sensitive Receptor
- Figure 6: Acute Hazard Isopleths (hazard index) and Location of PMI, MEIR, MEIW, and Maximum Sensitive Receptor

APPENDICES

- APPENDIX A
- Cancer Burden and Lead Modeling (submitted electronically)
- APPENDIX B
- Electronic Modeling Files (submitted electronically)

## DEFINITIONS AND ABBREVIATIONS

- **8-Hour Chronic Health Impact:** Health impact associated with non-cancer risk due to an 8-hour exposure.
- **Acute Health Impact:** Health impact associated with non-cancer risk due to a short-term exposure.
- **ADMRT:** Air Dispersion Modeling and Risk Tool
- **AERMOD:** American Meteorological Society/Environmental Protection Agency Regulatory Model
- **BPIP:** Building profile input file.
- **CAS Number:** A unique numerical identifier assigned by Chemical Abstracts Service to every chemical.
- **CARB:** California Air Resources Board
- **Chronic Health Impact:** Health impact associated with non-cancer risk due to a long-term exposure.
- **Cancer Health Impact:** Health impact associated with cancer risk. This is determined using a long-term exposure period, which varies depending on the receptor type being evaluated.
- **GLC:** Ground-Level Concentration
- **HARP:** Hotspots Analysis and Reporting Program
- **Hazard Index:** This is the total of all the hazard quotients summed up to represent the health risk for acute and chronic non-cancer health effects.
- **Hazard Quotient:** Method of determining the chronic or acute non-cancer health risk for a compound by dividing the dose by the appropriate REL.
- **LFG:** Landfill Gas
- **MEIR:** Maximum exposed individual resident. This is defined as the receptor point(s) with the highest acute, chronic or cancer health impacts at an existing off-site residence.
- **MEIW:** Maximum exposed individual worker. This is defined as the receptor point(s) with the highest acute, chronic or cancer health impacts at an existing off-site workplace.
- **Met data:** Meteorological data usually represented by hourly readings.
- **PMI:** Point of maximum impact. This is defined as the receptor point(s) with the highest acute, chronic or cancer health impacts outside the Facility boundary.
- **OEHHA:** Office of Environmental Health Hazard Assessment
- **RELs:** Reference exposure levels
- **UTM:** Universal Transverse Mercator
- **TAC:** Toxic Air Contaminants

## EXECUTIVE SUMMARY

In accordance with the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill 2588 (AB 2588), this report presents the Health Risk Assessment (HRA) for the MM San Diego LLC – Miramar & Miramar Energy Facility (ID #96387) located at 5244 Convoy Street, San Diego, CA (herein referenced as Facility).

The Facility comprised of the following emission sources in 2021 and all emission sources were considered in this HRA:

- 1) Eight engines that are permitted by Permit to Operate (PTO) No. 950731.
- 2) Two engines permitted by PTO No. 001632/001633.
- 3) All sources from the City of San Diego’s Miramar Landfill (Herein referenced as Landfill).

This HRA was prepared by SCS Engineers (SCS) on behalf of MM San Diego LLC in accordance with the California Office of Environmental Health Hazard Assessment (OEHHA) Hotspot guidance document (OEHHA 2015) and the County of San Diego Air Pollution Control District (SDAPCD) supplemental HRA guidelines (SDAPCD 2022).

The HRA was prepared considering the following:

- The emission rates of the substances for the Facility from the approved 2021 Emission Inventory Reports, for both the Facility and Landfill.
- Air dispersion coefficients developed as part of site-specific air dispersion modeling using AERMOD presented herein to predict off-site ground level chemical concentrations.
- The Hotspots Analysis and Reporting Program (HARP2) model developed by the California Air Resources Board (CARB) to perform the calculations for health impacts: cancer risks, chronic and acute non-cancer health effects.

For HRA purposes, 26 substances with health data found in the 2021 Emission Inventory Report were identified as being emitted from 10 sources at the Facility. Fifty (50) sources were added from the Landfill with 59 different substances being emitted. The total annual and hourly emissions were considered in the analysis.

Six types of receptors were used to cover an area of 13 km in all directions of the Facility. This domain includes both the cancer risk and non-cancer risk Zone of Impact (ZOI). A total of 22,154 receptors were included consisting of fenceline, Cartesian grid, sensitive, residential, fine grid, coarse grid, and population (Census) receptors. Census receptors for Cancer Burden were taken from HARP in a 13 kilometer radius around the site.

This HRA includes a comprehensive analysis of the dispersion of the compounds into the environment, the potential for human exposure, and a quantitative assessment of individual health risks associated with the predicted levels of exposure. The four major components of the HRA include: Hazard identification, Exposure assessment, Dose-response assessment; and Risk characterization.

The purpose of dispersion modeling in the HRA process is to generate plot files that are used in assessing hazard and risk. Data used to create plot files include meteorological data, building information, stack information, unit emission rates (1 g/s), terrain data, and a receptor grid. AERMOD

was used to create plot files and imported into HARP2 for calculating the ground level concentration (GLC) for each pollutant and each receptor. The HRA included a multi-pathway assessment. The relevant multi-pathway components of all substances with multi-pathway effects were included in the health risk calculations.

The following table presents a summary of the predicted health risk impacts for 2021. The calculated risks were identified at receptors such as: Point of Maximum Impact (PMI), Maximally Exposed Individual Resident (MEIR), Maximally Exposed Individual Worker (MEIW), and maximum impact at a sensitive receptor.

| Health Risk                     | PMI  | MEIR | Sensitive Receptor | MEIW |
|---------------------------------|------|------|--------------------|------|
| 2021 Cancer Risk (in a million) | 155  | 5.79 | 6.64               | 1.36 |
| 2021 Chronic Hazard Index       | 3.23 | 0.09 | 0.11               | 0.19 |
| 2021 Acute Hazard Index         | 2.31 | 0.51 | 0.54               | 0.96 |

SDAPCD Rule 1210 establishes that any risks above the significant risk threshold requires public notice. The significant risk threshold for cancer risk is 10 per million and for chronic or acute risk is a hazard index (HI) of 1.0 and for cancer burden is 1. Additionally, if cancer risk exceeds 10 per million or chronic or acute risk exceed a hazard index of 1.0, risk reduction is required. These triggers do not apply to the PMI unless the PMI also represents a worker, residential or sensitive receptor.

Total population within the zone of impact for cancer risk is 259,394 people and the estimated cancer burden within the zone of impact is estimated to be 0.50; therefore, no public notice or risk reduction is required due to estimated cancer burden.

All cancer, acute, and chronic risks are below levels that trigger public notice or risk reduction except the PMI. All residential, worker, and sensitive acute risks are below levels that trigger public notice or risk reduction.

The pollutants contributing most significantly to acute risk are arsenic, formaldehyde and nickel. Source testing at the facility has provided site-specific concentrations of these pollutants. Using these results in the HRA provides a more accurate determination of risk from this facility.

## 1.0 INTRODUCTION

A Health Risk Assessment (HRA) addresses a potential impact to people exposed to toxic air contaminants (TACs) anticipated to be released. Potential impacts to human health may include cancer risk and chronic hazard (long term) and acute (short term).

This report presents the HRA conducted for the MM San Diego LLC – Miramar & Miramar Energy Facility (ID #96387) located at 5244 Convoy Street, San Diego, CA (herein referenced as Facility), for reporting year 2021.

This HRA combines sources from the facility as well as all sources from the City of San Diego's Miramar Landfill (Herein referenced as Landfill). Combining both sources allows the property boundary for risk assessment to be expanded to include land owned by both the Landfill and Facility individually.

Air dispersion modeling and risk calculation files are provided electronically to the SDAPCD in Appendix A and B.

### 1.1 General Information of AB2588 Program

The purpose of Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) program is to identify, and rank facilities based on their estimated emissions of TACs, to evaluate the potential health risks to the surrounding community exposed to these releases, to notify communities if health risks exceed a specified level, and to mitigate emissions sources exceeding specified regulatory notification levels. The emission inventory reports provide the data necessary to evaluate potential human health risks related to Facility emissions using a prioritization score or a detailed HRA.

### 1.2 HRA Overview Process

The HRA process is comprised of the following four major items:

- Hazard Identification (see Section 4.0): identifies the specific hazards associated with the compounds included in the HRA.
- Dose-Response Assessment (see Section 5.0): identifies the specific cancer potency and non-cancer reference exposure levels to compare estimated concentrations.
- Exposure Assessment (see Section 6.0): estimates the ground level concentration for each substance at each receptor and each averaging time.
- Risk Characterization (see Section 7.0): Uses the GLCs from the Exposure Assessment and the cancer potency and non-cancer RELs from the Dose-Response step to estimate risk.

Each of these steps is discussed in greater detail in the noted section number.

This HRA was conducted using the HARP2 Air Dispersion Modeling and Risk Tool (ADMRT) software package. The ADMRT is used to complete the Exposure Assessment and Risk Characterization steps. It also includes the Dose-Response information. The ADMRT performs the following functions:

- Air Dispersion: Performs air dispersion modeling and outputs a 1-hr, monthly, and PERIOD plot file for each source that contains dispersion factors. This function is part of the Exposure Assessment step of

the HRA. Air dispersion was completed using AERMOD outside of the ADMRT.

- Ground Level Concentration (GLC) calculation: Uses the emission rates from the approved 2021 Emission Inventory Reports and the plot files generated using dispersion modeling to calculate ground level concentrations at each receptor for each pollutant. This function is part of the Exposure Assessment step of the HRA.
- Risk Analysis: Uses the GLC calculations and compares to various cancer, chronic, and acute risk thresholds to estimate risk at each receptor. This function is part of the Risk Characterization step of the HRA.

## **2.0 FACILITY INFORMATION**

### **2.1 Location**

Name of the Facility: MM San Diego LLC - Miramar & Miramar Energy

Address: 5244 Convoy Street, San Diego, CA 92111

Facility ID number: 96387

The location and general vicinity of the Facility is shown on Figure 1. The Facility is located to the southeast of the intersection of State Highway 52 and Interstate Highway 805 in San Diego, CA, with residential neighborhoods to the south and southwest of the Facility. The topography of the area is generally elevated.

Figure 1: Facility Map



## 2.2 Facility Description

This HRA Report is prepared for MM San Diego LLC located at the address mentioned above. The Facility generates electricity by routing landfill gas (LFG) generated at Miramar Landfill (Landfill) to 10 engines combusting LFG to drive electrical generators. The Facility includes the following equipment:

- Four generators each driven by tandem LFG fired reciprocating engines, eight engines total (Inventory Devices 1, 2, 3, 4, 5, 6, 7, 8) - Caterpillar Engines, each engine rated at 1,138 bhp
- Two generators each driven by a single LFG fired reciprocating engine (Inventory Devices 1632 and 1633) - Caterpillar Engines 3520, each engine rated at 2,233 bhp

In addition, all sources included in the Landfill's approved HRA from 2021 were included in the model.

## 3.0 EMISSION INFORMATION

The emission inventory includes all sources that emitted TACs at the Facility and Landfill, which reflects the actual emissions of TACs in calendar year 2021, based on actual equipment fuel usage or throughput of each identified emission source.

### 3.1 Facility Emission Sources

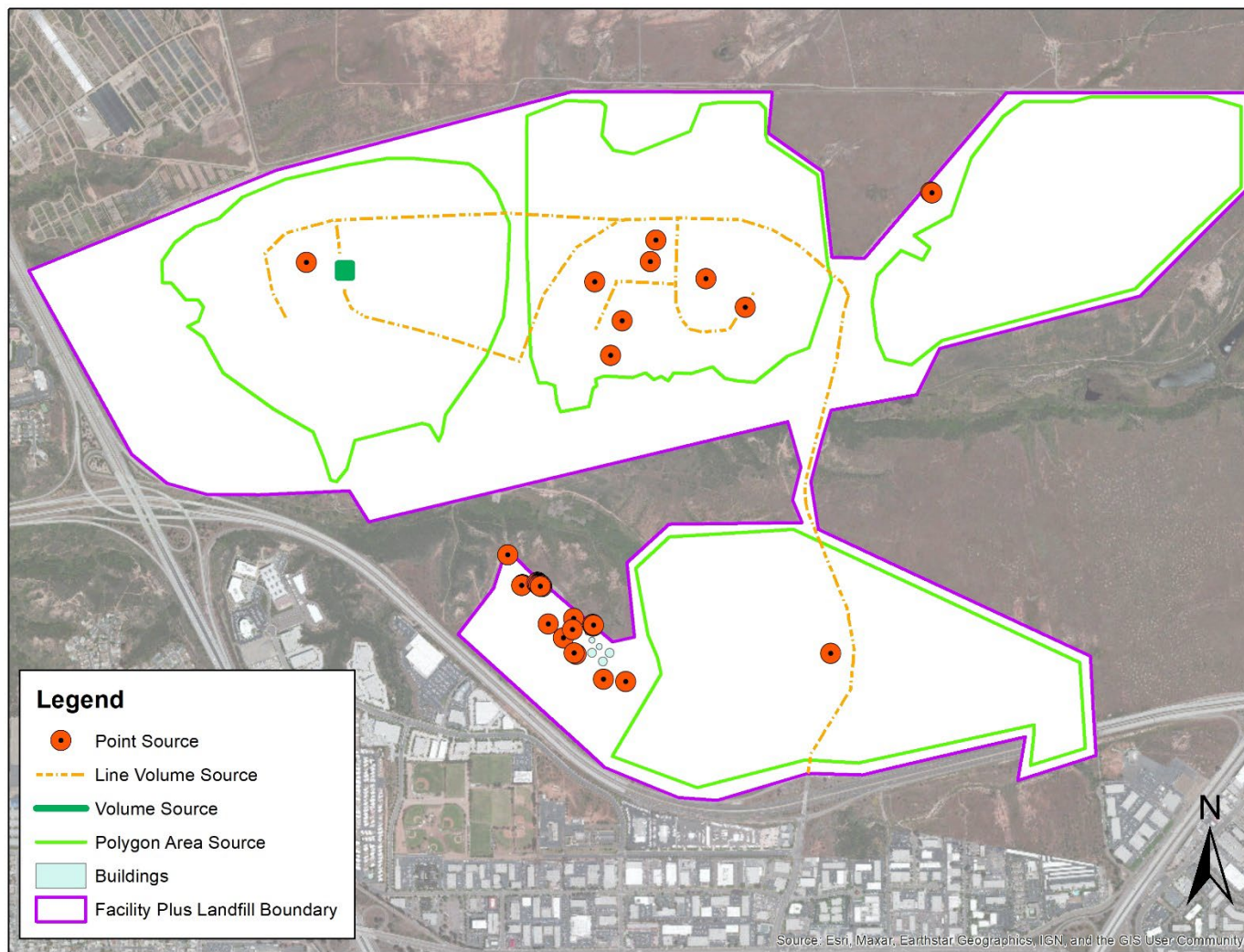
The emissions sources evaluated in the HRA and the location of each source was specified in Universal Transverse Mercator (UTM) coordinates measured in meters (NAD 1983 Datum) and are shown in Table 1.

**Table 1: Facility 2021 Emission Sources**

| Source ID | Description            | Permit No.          | UTM Easting Coordinate (m) | UTM Northing Coordinate (m) |
|-----------|------------------------|---------------------|----------------------------|-----------------------------|
| TAND1A    | Generator 1 - Engine 1 | APCD2006-PTO-950731 | 484,793.48                 | 3,634,100.65                |
| TAND1B    | Generator 1 - Engine 2 | APCD2006-PTO-950731 | 484,791.06                 | 3,634,097.79                |
| TAND2A    | Generator 2 - Engine 1 | APCD2006-PTO-950731 | 484,797.62                 | 3,634,097.21                |
| TAND2B    | Generator 2 - Engine 2 | APCD2006-PTO-950731 | 484,795.33                 | 3,634,094.35                |
| TAND3A    | Generator 3 - Engine 1 | APCD2006-PTO-950731 | 484,801.95                 | 3,634,093.78                |
| TAND3B    | Generator 3 - Engine 2 | APCD2006-PTO-950731 | 484,799.53                 | 3,634,090.79                |
| TAND4A    | Generator 4 - Engine 1 | APCD2006-PTO-950731 | 484,806.21                 | 3,634,090.21                |
| TAND4B    | Generator 4 - Engine 2 | APCD2006-PTO-950731 | 484,803.79                 | 3,634,087.29                |
| ENG1632   | Engine 1 CAT 3520      | APCD2013-PTO-001632 | 484,807.15                 | 3,634,088.22                |
| ENG1633   | Engine 2 CAT 3520      | APCD2013-PTO-001633 | 484,809.98                 | 3,634,085.94                |

Figure 2 shows the Facility property boundary, and location of the 10 Facility emission sources that are evaluated for this HRA, combined with all Landfill sources.

**Figure 2: Model Sources for Facility and Landfill**



### 3.2 Emission Inventory

The emission rates for the Facility and Landfill are from the 2021 Emission Inventory Reports approved by SDAPCD on March 21, 2023. All substances in the approved inventory were included in this HRA except for dimethyl sulfide (CAS# 75183), which does not have health data, and criteria pollutants, which SCAPCD indicated can be excluded.

Table 2 provides a summary of the 59 substances and the total emission rates of 60 emissions sources identified for the Facility and Landfill together. This summary includes the mentioned changes above. Emission rates have been expressed in the units of pounds/hour and pounds/year.

**Table 2: 2021 Emission Inventory**

| #  | CAS     | Toxic Air Contaminant | 2021 Emission Inventory |                 |
|----|---------|-----------------------|-------------------------|-----------------|
|    |         |                       | Annual<br>lb/yr         | Hourly<br>lb/hr |
| 1  | 7429905 | Aluminum              | 1.81E-01                | 1.89E-03        |
| 2  | 7440393 | Barium                | 2.60E-03                | 0.00E+00        |
| 3  | 7440473 | Chromium              | 4.74E+00                | 1.04E-03        |
| 4  | 7440666 | Zinc                  | 1.90E+01                | 6.99E-03        |
| 5  | 7440382 | Arsenic               | 3.98E+00                | 5.42E-04        |
| 6  | 7440417 | Beryllium             | 9.49E-02                | 0.00E+00        |
| 7  | 7440439 | Cadmium               | 9.49E-02                | 0.00E+00        |
| 8  | 7440484 | Cobalt                | 1.21E-04                | 0.00E+00        |
| 9  | 7440508 | Copper                | 9.49E+00                | 6.51E-03        |
| 10 | 7439921 | Lead                  | 4.74E+00                | 1.70E-03        |
| 11 | 7439965 | Manganese             | 4.74E+01                | 1.50E-02        |
| 12 | 7440020 | Nickel                | 1.90E+00                | 5.33E-04        |
| 13 | 7782492 | Selenium              | 4.74E-01                | 0.00E+00        |
| 14 | 1175    | Silica, Crystln       | 1.48E+04                | 4.72E+00        |
| 15 | 67641   | Acetone               | 4.88E+01                | 8.09E-03        |
| 16 | 1104    | Fluorocarb(Cl)        | 3.76E+02                | 4.37E-02        |
| 17 | 108101  | MIBK                  | 2.82E+02                | 3.27E-02        |
| 18 | 71556   | 1,1,1-TCA             | 3.36E+01                | 3.63E-03        |
| 19 | 107131  | Acrylonitrile         | 4.23E+01                | 4.76E-03        |
| 20 | 71432   | Benzene               | 2.60E+02                | 4.89E-02        |
| 21 | 75150   | CS2                   | 7.70E+00                | 7.46E-04        |
| 22 | 463581  | CarbonylSulfide       | 8.27E+01                | 9.59E-03        |
| 23 | 108907  | Chlorobenzn           | 2.65E+01                | 2.89E-03        |
| 24 | 67663   | Chloroform            | 2.80E+01                | 3.11E-03        |
| 25 | 100414  | Ethyl Benzene         | 1.19E+03                | 1.41E-01        |
| 26 | 107062  | EDC                   | 6.81E+01                | 9.35E-03        |
| 27 | 50000   | Formaldehyde          | 5.26E+04                | 8.74E+00        |
| 28 | 110543  | Hexane                | 3.18E+02                | 7.43E-02        |
| 29 | 7647010 | HCl                   | 1.70E+04                | 2.82E+00        |
| 30 | 7783064 | H2S                   | 3.44E+03                | 4.07E-01        |
| 31 | 78933   | MEK                   | 2.49E+03                | 2.89E-01        |

| #  | CAS      | Toxic Air Contaminant | 2021 Emission Inventory |                 |
|----|----------|-----------------------|-------------------------|-----------------|
|    |          |                       | Annual<br>lb/yr         | Hourly<br>lb/hr |
| 32 | 75092    | Methylene Chlor       | 2.30E+02                | 2.83E-02        |
| 33 | 127184   | Perc                  | 2.69E+02                | 3.12E-02        |
| 34 | 108883   | Toluene               | 4.73E+03                | 5.76E-01        |
| 35 | 79016    | TCE                   | 1.26E+02                | 1.46E-02        |
| 36 | 75014    | Vinyl Chloride        | 1.85E+02                | 2.16E-02        |
| 37 | 75354    | Vinylid Chlorid       | 2.25E+01                | 2.46E-03        |
| 38 | 1330207  | Xylenes               | 2.61E+03                | 3.09E-01        |
| 39 | 106990   | 1,3-Butadiene         | 0.00E+00                | 1.93E-02        |
| 40 | 75070    | Acetaldehyde          | 0.00E+00                | 6.98E-02        |
| 41 | 107028   | Acrolein              | 0.00E+00                | 2.58E-03        |
| 42 | 18540299 | Cr(VI)                | 3.78E-04                | 0.00E+00        |
| 43 | 9901     | DieselExhPM           | 6.09E+01                | 0.00E+00        |
| 44 | 7439976  | Mercury               | 5.17E-02                | 0.00E+00        |
| 45 | 91203    | Naphthalene           | 6.44E-03                | 1.30E-03        |
| 46 | 1151     | PAHs-w/o              | 0.00E+00                | 2.76E-03        |
| 47 | 115071   | Propylene             | 0.00E+00                | 4.16E-02        |
| 48 | 25321226 | DiClBenzenes          | 1.39E-02                | 0.00E+00        |
| 49 | 75274    | BromoDiClMethan       | 1.40E-03                | 0.00E+00        |
| 50 | 75252    | Bromoform             | 9.78E-04                | 0.00E+00        |
| 51 | 74828    | CH4                   | 8.61E+00                | 1.21E-03        |
| 52 | 7664417  | NH3                   | 2.87E+03                | 1.08E+00        |
| 53 | 100447   | Benzyl Chloride       | 4.47E-03                | 0.00E+00        |
| 54 | 56235    | CCl4                  | 2.32E-01                | 0.00E+00        |
| 55 | 106467   | p-DiClBenzene         | 4.15E-01                | 0.00E+00        |
| 56 | 123911   | 1,4-Dioxane           | 3.54E+00                | 4.95E-04        |
| 57 | 100425   | Styrene               | 3.13E-04                | 0.00E+00        |
| 58 | 25551137 | TriMeBenzns           | 2.57E-03                | 0.00E+00        |
| 59 | 1310732  | Sodium Hydroxid       | 3.11E+00                | 1.17E-03        |

## 4.0 HAZARD IDENTIFICATION

The objective of Hazard Identification is to determine if the substance can cause or increase adverse health effects in humans.

The Facility emits TAC's from 10 point sources which are listed in Table 1. Emissions are generated from the combustion of treated LFG. Numerous additional sources and TACs are emitted from the landfill and also included in this HRA.

Some substances are multi-pathways substances which affect the human body through more than one route. Table 3 shows each substance and what type of risk it is to the human body. Chronic and Cancer risk can be via inhalation or non-inhalation. Non-inhalation pathways include dermal absorption (Dermal), soil ingestion (Soil), mother's milk (Mother) and homegrown produce (Veg). While evaluating risks for residents, all of these pathways are assessed. However, for evaluating hazards and risk for an offsite worker, only inhalation, dermal absorption and soil ingestion should be assessed. Acute risk only looks at the inhalation pathway.

**Table 3: Summary of Potential Health Risks and Exposure Routes**

| CAS      | Name               | Cancer     |                | Chronic Noncancer |                | Acute Noncancer |
|----------|--------------------|------------|----------------|-------------------|----------------|-----------------|
|          |                    | Inhalation | Non-Inhalation | Inhalation        | Non-Inhalation |                 |
| 7440382  | Arsenic            | x          | x              | x                 | x              | x               |
| 7440417  | Beryllium          | x          |                | x                 | x              |                 |
| 7440439  | Cadmium            | x          |                | x                 | x              |                 |
| 7440508  | Copper             |            |                |                   |                | x               |
| 7439921  | Lead               | x          | x              |                   |                |                 |
| 7439965  | Manganese          |            |                | x                 |                |                 |
| 7440020  | Nickel             | x          |                | x                 | x              | x               |
| 7782492  | Selenium           |            |                | x                 | x              |                 |
| 1175     | Silica, Crystln    |            |                | x                 |                |                 |
| 106990   | 1,3-Butadiene      | x          |                | x                 |                | x               |
| 75070    | Acetaldehyde       | x          |                | x                 |                | x               |
| 107028   | Acrolein           |            |                | x                 |                | x               |
| 71432    | Benzene            | x          |                | x                 |                | x               |
| 108907   | Chlorobenzene      |            |                | x                 |                |                 |
| 18540299 | Cr(VI)             | x          | x              | x                 | x              |                 |
| 100414   | Ethyl Benzene      | x          |                | x                 |                |                 |
| 50000    | Formaldehyde       | x          |                | x                 |                | x               |
| 110543   | Hexane             |            |                | x                 |                |                 |
| 7647010  | HCl                |            |                | x                 |                | x               |
| 7439976  | Mercury            |            |                | x                 | x              | x               |
| 91203    | Naphthalene        | x          |                | x                 |                |                 |
| 1151     | PAHs-w/o           | x          | x              |                   |                |                 |
| 115071   | Propylene          |            |                | x                 |                |                 |
| 108883   | Toluene            |            |                | x                 |                | x               |
| 1330207  | Xylenes            |            |                | x                 |                | x               |
| 9901     | DieselExhPM        | x          |                | x                 |                |                 |
| 107131   | Acrylonitrile      | x          |                | x                 |                |                 |
| 75150    | CS2                |            |                | x                 |                | x               |
| 463581   | Carbonyl Sulfide   |            |                | x                 |                | x               |
| 67663    | Chloroform         | x          |                | x                 |                | x               |
| 107062   | EDC                | x          |                | x                 |                |                 |
| 7783064  | H2S                |            |                | x                 |                | x               |
| 75092    | Methylene Chloride | x          |                | x                 |                | x               |
| 78933    | MEK                |            |                |                   |                | x               |
| 127184   | Perchloroethylene  | x          |                | x                 |                | x               |
| 71556    | 1,1,1-TCA          |            |                | x                 |                | x               |
| 79016    | TCE                | x          |                | x                 |                |                 |
| 75014    | Vinyl Chloride     | x          |                |                   |                | x               |
| 75354    | Vinylide Chloride  |            |                | x                 |                |                 |
| 75003    | Ethyl Chloride     |            |                | x                 |                |                 |
| 123911   | 1,4-Dioxane        | x          |                | x                 |                | x               |
| 100425   | Styrene            |            |                | x                 |                | x               |

## 5.0 DOSE-RESPONSE ASSESSMENT

Dose-response assessment is the process of characterizing the relationship between exposure to a substance and incidence of an adverse health effect in exposed populations.

Dose-response assessment for cancer risk is expressed in terms of a potency slope that is used to calculate the probability or risk of cancer associated with an estimated exposure. Cancer potency factors are expressed as the 95th percentile upper confidence limit of the slope of the dose-response curve. It is assumed that cancer risk is directly proportional to dose and there is no threshold for carcinogenesis.

Cancer risk was evaluated using a multi-pathway analysis. Cancer risk for each pollutant is derived for each pathway and summed to arrive at a total cancer risk. The point of maximum impact (PMI) and maximum exposed individual resident (MEIR) could be exposed to the pollutants through inhalation, homegrown produce, dermal absorption, soil ingestion, and to a baby through its mother's milk. The maximum exposed individual worker (MEIW) could be exposed through inhalation, soil ingestion and dermal absorption.

Dose-response assessment for non-cancer risk is expressed in Reference Exposure Levels (RELs). There are different RELs for acute and chronic non-cancer health risks. This approach is used for non-cancer risk because it is generally assumed that non-cancer risks have thresholds. The acute and chronic RELs are intended to be below the threshold for health effects for the general population. The dose-response assessment and corresponding cancer potency factors and non-cancer RELs used for this HRA are contained within HARP2.

Dose-response assessment was carried out for prediction of cancer risk and non-cancer chronic and acute risk. Cancer and non-cancer chronic risk assessment was conducted to find MEIR, MEIW and PMI. Acute risk does not differentiate between the MEIR, MEIW and PMI because the hazard does not depend on long term average exposure. Dose-response assessment was carried out through multi-pathway substances and for different target organs.

Table 4, Table 5, and Table 6 present the target organs by pollutant for acute, annual chronic, and 8-hour chronic non-cancer impacts quantified in this HRA, respectively. Only the pollutants with RELs for each category are shown.

Table 7 presents the cancer potency factors for acute, 8-hour and chronic inhalation RELs, and chronic oral RELs for each substance that was quantified for this HRA.

**Table 4: Target Organ Systems by Substance for Acute**

| CAS     | Pollutants         | Target Organs |     |       |        |      |                |      |      |     |            |      |       |
|---------|--------------------|---------------|-----|-------|--------|------|----------------|------|------|-----|------------|------|-------|
|         |                    | CV            | CNS | IMMUN | KIDNEY | GILV | REPRO<br>DEVEL | RESP | SKIN | EYE | BONE TEETH | ENDO | BLOOD |
| 71556   | 1,1,1-TCA          |               | X   |       |        |      |                |      |      |     |            |      |       |
| 106990  | 1,3-Butadiene      |               |     |       |        |      | X              |      |      |     |            |      |       |
| 75070   | Acetaldehyde       |               |     |       |        |      |                | X    |      | X   |            |      |       |
| 107028  | Acrolein           |               |     |       |        |      |                | X    |      | X   |            |      |       |
| 1016    | Arsenic            | X             | X   |       |        |      | X              |      |      |     |            |      |       |
| 71432   | Benzene            |               |     | X     |        |      | X              |      |      |     |            |      | X     |
| 463581  | Carbonyl Sulfide   |               | X   |       |        |      |                |      |      |     |            |      |       |
| 67663   | Chloroform         |               | X   |       |        |      | X              | X    |      |     |            |      |       |
| 7440508 | Copper             |               |     |       |        |      |                | X    |      |     |            |      |       |
| 75150   | CS <sub>2</sub>    |               | X   |       |        |      | X              |      |      |     |            |      |       |
| 50000   | Formaldehyde       |               |     |       |        |      |                |      |      | X   |            |      |       |
| 7783064 | H <sub>2</sub> S   |               | X   |       |        |      |                |      |      |     |            |      |       |
| 7647010 | HCl                |               |     |       |        |      |                | X    |      | X   |            |      |       |
| 78933   | MEK                |               |     |       |        |      |                | X    |      | X   |            |      |       |
| 7439976 | Mercury            |               | X   |       |        |      | X              |      |      |     |            |      |       |
| 75092   | Methylene Chloride | X             | X   |       |        |      |                |      |      |     |            |      |       |
| 7440020 | Nickel             |               |     | X     |        |      |                |      |      |     |            |      |       |
| 127184  | Perchloroethylene  |               | X   |       |        |      |                | X    |      | X   |            |      |       |
| 108883  | Toluene            |               | X   |       |        |      |                | X    |      | X   |            |      |       |
| 75014   | Vinyl Chloride     |               | X   |       |        |      |                | X    |      | X   |            |      |       |
| 1330207 | Xylenes            |               | X   |       |        |      |                | X    |      | X   |            |      |       |

**Table 5: Target Organ Systems by Substance for Annual Chronic**

| CAS      | Pollutants         | Target Organs |     |       |        |      |                |      |      |     |            |      |       |
|----------|--------------------|---------------|-----|-------|--------|------|----------------|------|------|-----|------------|------|-------|
|          |                    | CV            | CNS | IMMUN | KIDNEY | GILV | REPRO<br>DEVEL | RESP | SKIN | EYE | BONE TEETH | ENDO | BLOOD |
| 71556    | 1,1,1-TCA          |               | X   |       |        |      |                |      |      |     |            |      |       |
| 106990   | 1,3-Butadiene      |               |     |       |        |      | X              |      |      |     |            |      |       |
| 75070    | Acetaldehyde       |               |     |       |        |      |                | X    |      |     |            |      |       |
| 107028   | Acrolein           |               |     |       |        |      |                | X    |      |     |            |      |       |
| 107131   | Acrylonitrile      |               |     |       |        |      |                | X    |      |     |            |      |       |
| 1016     | As compd(inorg)    | X             | X   |       |        |      | X              | X    | X    |     |            |      |       |
| 71432    | Benzene            |               |     |       |        |      |                |      |      |     |            |      | X     |
| 7440439  | Cadmium            |               |     |       | X      |      |                | X    |      |     |            |      |       |
| 463581   | Carbonyl Sulfide   |               | X   |       |        |      |                |      |      |     |            |      |       |
| 108907   | Chlorobenzene      |               |     |       | X      | X    | X              |      |      |     |            |      |       |
| 67663    | Chloroform         |               |     |       | X      | X    | X              |      |      |     |            |      |       |
| 18540299 | Cr(VI)             |               |     |       |        |      |                | X    |      |     |            |      | X     |
| 75150    | CS2                |               | X   |       |        |      | X              |      |      |     |            |      |       |
| 9901     | DieselExhPM        |               |     |       |        |      |                | X    |      |     |            |      |       |
| 107062   | EDC                |               |     |       |        | X    |                |      |      |     |            |      |       |
| 100414   | Ethyl Benzene      |               |     |       | X      | X    | X              |      |      |     |            | X    |       |
| 50000    | Formaldehyde       |               |     |       |        |      |                | X    |      |     |            |      |       |
| 7783064  | H2S                |               |     |       |        |      |                | X    |      |     |            |      |       |
| 7647010  | HCl                |               |     |       |        |      |                | X    |      |     |            |      |       |
| 110543   | Hexane             |               | X   |       |        |      |                |      |      |     |            |      |       |
| 7439965  | Manganese          |               | X   |       |        |      |                |      |      |     |            |      |       |
| 7439976  | Mercury            |               | X   |       | X      |      | X              |      |      |     |            |      |       |
| 75092    | Methylene Chloride | X             | X   |       |        |      |                |      |      |     |            |      |       |
| 91203    | Naphthalene        |               |     |       |        |      |                | X    |      |     |            |      |       |
| 7440020  | Nickel             |               |     |       |        |      | X              | X    |      |     |            |      | X     |
| 127184   | Perchloroethylene  |               |     |       | X      | X    |                |      |      |     |            |      |       |
| 115071   | Propylene          |               |     |       |        |      |                | X    |      |     |            |      |       |
| 7782492  | Selenium           | X             | X   |       |        | X    |                |      |      |     |            |      |       |

| CAS     | Pollutants          | Target Organs |     |       |        |      |                |      |      |     |            |      |       |
|---------|---------------------|---------------|-----|-------|--------|------|----------------|------|------|-----|------------|------|-------|
|         |                     | CV            | CNS | IMMUN | KIDNEY | GILV | REPRO<br>DEVEL | RESP | SKIN | EYE | BONE TEETH | ENDO | BLOOD |
| 79016   | TCE                 |               | X   |       |        |      |                |      |      | X   |            |      |       |
| 108883  | Toluene             |               |     |       |        |      |                |      |      | X   |            |      |       |
| 75354   | Vinylidene Chloride |               |     |       |        | X    |                |      |      |     |            |      |       |
| 1330207 | Xylenes             |               | X   |       |        |      |                | X    |      | X   |            |      |       |

**Table 6: Target Organs for 8-hour Chronic**

| CAS     | Pollutants       | Target Organs |     |       |        |      |                |      |      |     |            |      |       |
|---------|------------------|---------------|-----|-------|--------|------|----------------|------|------|-----|------------|------|-------|
|         |                  | CV            | CNS | IMMUN | KIDNEY | GILV | REPRO<br>DEVEL | RESP | SKIN | EYE | BONE TEETH | ENDO | BLOOD |
| 106990  | 1,3-Butadiene    |               |     |       |        |      | X              |      |      |     |            |      |       |
| 75070   | Acetaldehyde     |               |     |       |        |      |                | X    |      |     |            |      |       |
| 107028  | Acrolein         |               |     |       |        |      |                | X    |      |     |            |      |       |
| 71432   | Benzene          |               |     |       |        |      |                |      |      |     |            |      | X     |
| 463581  | Carbonyl Sulfide |               | X   |       |        |      |                |      |      |     |            |      |       |
| 50000   | Formaldehyde     |               |     |       |        |      |                | X    |      |     |            |      |       |
| 7439965 | Manganese        |               | X   |       |        |      |                |      |      |     |            |      |       |
| 7439976 | Mercury          |               | X   |       | X      |      | X              |      |      |     |            |      |       |
| 7440020 | Nickel           |               |     | X     |        |      |                | X    |      |     |            |      |       |
| 108883  | Toluene          |               |     |       |        |      |                |      |      | X   |            |      |       |

**Table 7: RELs**

| CAS      | Pollutant          | Inhalation Cancer Slope Factor (mg/kg-d)-1 | Oral Cancer Slope Factor (mg/kg-d)-1 | Inhalation Acute REL (µg/m3) | Inhalation Chronic REL (µg/m3) | Oral Chronic REL (µg/m3) |
|----------|--------------------|--------------------------------------------|--------------------------------------|------------------------------|--------------------------------|--------------------------|
| 71556    | 1,1,1-TCA          |                                            |                                      | 68,000                       | 1,000                          |                          |
| 106990   | 1,3-Butadiene      | 0.6                                        |                                      | 660                          | 2                              |                          |
| 75070    | Acetaldehyde       | 0.01                                       |                                      | 470                          | 140                            |                          |
| 107028   | Acrolein           |                                            |                                      | 2.5                          | 0.35                           |                          |
| 107131   | Acrylonitrile      | 1                                          |                                      |                              | 5                              |                          |
| 1016     | As compd(inorg)    | 12                                         | 1.5                                  | 0.2                          | 0.015                          | 3.50E-06                 |
| 71432    | Benzene            | 0.1                                        |                                      | 27                           | 3                              |                          |
| 7440439  | Cadmium            | 15                                         |                                      |                              | 0.02                           | 0.0005                   |
| 463581   | Carbonyl Sulfide   |                                            |                                      | 660                          | 10                             |                          |
| 108907   | Chlorobenzene      |                                            |                                      |                              | 1,000                          |                          |
| 67663    | Chloroform         | 0.019                                      |                                      | 150                          | 300                            |                          |
| 7440508  | Copper             |                                            |                                      | 100                          |                                |                          |
| 18540299 | Cr(VI)             | 510                                        | 0.5                                  |                              | 0.2                            | 0.02                     |
| 75150    | CS2                |                                            |                                      | 6,200                        | 800                            |                          |
| 9901     | DieselExhPM        | 1.1                                        |                                      |                              | 5                              |                          |
| 107062   | EDC                | 0.072                                      |                                      |                              | 400                            |                          |
| 100414   | Ethyl Benzene      | 0.0087                                     |                                      |                              | 2,000                          |                          |
| 50000    | Formaldehyde       | 0.021                                      |                                      | 55                           | 9                              |                          |
| 7783064  | H2S                |                                            |                                      | 42                           | 10                             |                          |
| 7647010  | HCl                |                                            |                                      | 2,100                        | 9                              |                          |
| 110543   | Hexane             |                                            |                                      |                              | 7,000                          |                          |
| 1128     | Lead comp(inorg)   | 0.042                                      | 0.0085                               |                              |                                |                          |
| 7439965  | Manganese          |                                            |                                      |                              | 0.09                           |                          |
| 78933    | MEK                |                                            |                                      | 13,000                       |                                |                          |
| 7439976  | Mercury            |                                            |                                      | 0.6                          | 0.03                           | 0.00016                  |
| 75092    | Methylene Chloride | 0.0035                                     |                                      | 14,000                       | 400                            |                          |
| 91203    | Naphthalene        | 0.12                                       |                                      |                              | 9                              |                          |
| 7440020  | Nickel             | 0.91                                       |                                      | 0.2                          | 0.014                          | 0.011                    |
| 1151     | PAHs-w/o           | 3.9                                        | 12                                   |                              |                                |                          |

| CAS     | Pollutant           | Inhalation Cancer Slope Factor (mg/kg-d)-1 | Oral Cancer Slope Factor (mg/kg-d)-1 | Inhalation Acute REL (µg/m3) | Inhalation Chronic REL (µg/m3) | Oral Chronic REL (µg/m3) |
|---------|---------------------|--------------------------------------------|--------------------------------------|------------------------------|--------------------------------|--------------------------|
| 127184  | Perchloroethylene   | 0.021                                      |                                      | 20,000                       | 35                             |                          |
| 115071  | Propylene           |                                            |                                      |                              | 3,000                          |                          |
| 7782492 | Selenium            |                                            |                                      |                              | 20                             | 0.005                    |
| 79016   | TCE                 | 0.007                                      |                                      |                              | 600                            |                          |
| 108883  | Toluene             |                                            |                                      | 5,000                        | 420                            |                          |
| 75014   | Vinyl Chloride      | 0.27                                       |                                      | 180,000                      |                                |                          |
| 75354   | Vinylidene Chloride |                                            |                                      |                              | 70                             |                          |
| 1330207 | Xylenes             |                                            |                                      | 22,000                       | 700                            |                          |

## 6.0 EXPOSURE ASSESSMENT

The exposure assessment estimates the extent of public exposure to Facility TAC emissions. Public exposure is quantified based on the predicted maximum short-term and long-term ground-level concentrations (GLCs) resulting from the TAC emissions, the exposure pathway(s), and the duration of exposure to those emissions. Air dispersion modeling is used to predict maximum short-term and long-term unitized concentrations for input into HARP2.

This section describes the air dispersion model and risk assessment methodology that were used in preparing the HRA for the Facility.

### 6.1 Air Dispersion Model

The purpose of dispersion modeling in the HRA process is to generate plot files that are used in assessing hazard and risk. Data used to create plot files include meteorological data, building information, stack information, unit emission rates (1 g/s), terrain data, and a receptor locations. AERMOD is used to create plot files, which show the maximum 1-hr, monthly, and average annual ground level concentration (GLC) at each receptor. The Hotspots Analysis and Reporting Program Version 2 (HARP2) is the recommended program for the HRA study by SDAPCD. HARP2 has the capability to conduct dispersion modeling but also can import externally created plot files. For this HRA study, AERMOD was used to generate the plot files externally and they were imported into HARP2 for calculating GLCs.

#### 6.1.1 Point Sources

Table 8 provides the source characteristics for each Facility emission source included in the HRA and Figure 2 shows the locations of these 10 sources as well as the Landfill sources. The LFG engines were modeled as point sources. The stack heights of all Facility point sources are proposed to be increased by 20 feet to meet all health risk requirements. All Landfill sources have already been approved in a separate HRA report so they will not be individually identified here.

**Table 8: Point Source Parameters**

| Source ID | Description            | Stack Height from grade (ft) | Stack Inside Diameter (ft) | Stack Elevation (m) | Exhaust Gas Temperature (° F) | Exhaust Gas Flowrate (actual cfm) | Stack Velocity (m/s) |
|-----------|------------------------|------------------------------|----------------------------|---------------------|-------------------------------|-----------------------------------|----------------------|
| TAND1A    | Generator 1 - Engine 1 | 50.25                        | 1.00                       | 126.66              | 814.80                        | 2544                              | 16.45                |
| TAND1B    | Generator 1 - Engine 2 | 50.25                        | 1.00                       | 126.67              | 803.00                        | 2273                              | 14.70                |
| TAND2A    | Generator 2 - Engine 1 | 50.25                        | 1.00                       | 126.70              | 781.00                        | 2491                              | 16.11                |
| TAND2B    | Generator 2 - Engine 2 | 50.25                        | 1.00                       | 126.70              | 796.00                        | 2345                              | 15.17                |
| TAND3A    | Generator 3 - Engine 1 | 50.25                        | 1.00                       | 126.69              | 808.00                        | 2445                              | 15.81                |
| TAND3B    | Generator 3 - Engine 2 | 50.25                        | 1.00                       | 126.71              | 800.00                        | 2501                              | 16.18                |
| TAND4A    | Generator 4 - Engine 1 | 50.25                        | 1.00                       | 126.69              | 792.00                        | 2389                              | 15.45                |
| TAND4B    | Generator 4 - Engine 2 | 50.25                        | 1.00                       | 126.69              | 774.00                        | 2310                              | 14.94                |
| ENG1632   | Engine 1 CAT 3520      | 52.33                        | 1.13                       | 126.69              | 892.00                        | 4562                              | 23.30                |
| ENG1633   | Engine 2 CAT 3520      | 52.33                        | 1.13                       | 126.68              | 899.00                        | 4770                              | 24.36                |

AERMOD was run with a unit emission rate [1 gram per second (g/s)] for each source to calculate the concentration of TACs from each source per unit emission rate, known as X/Q, for 1-hour and period (annual) averaging time options per receptor. The modeled X/Q concentration was calculated for each source, at each receptor, for each averaging time.

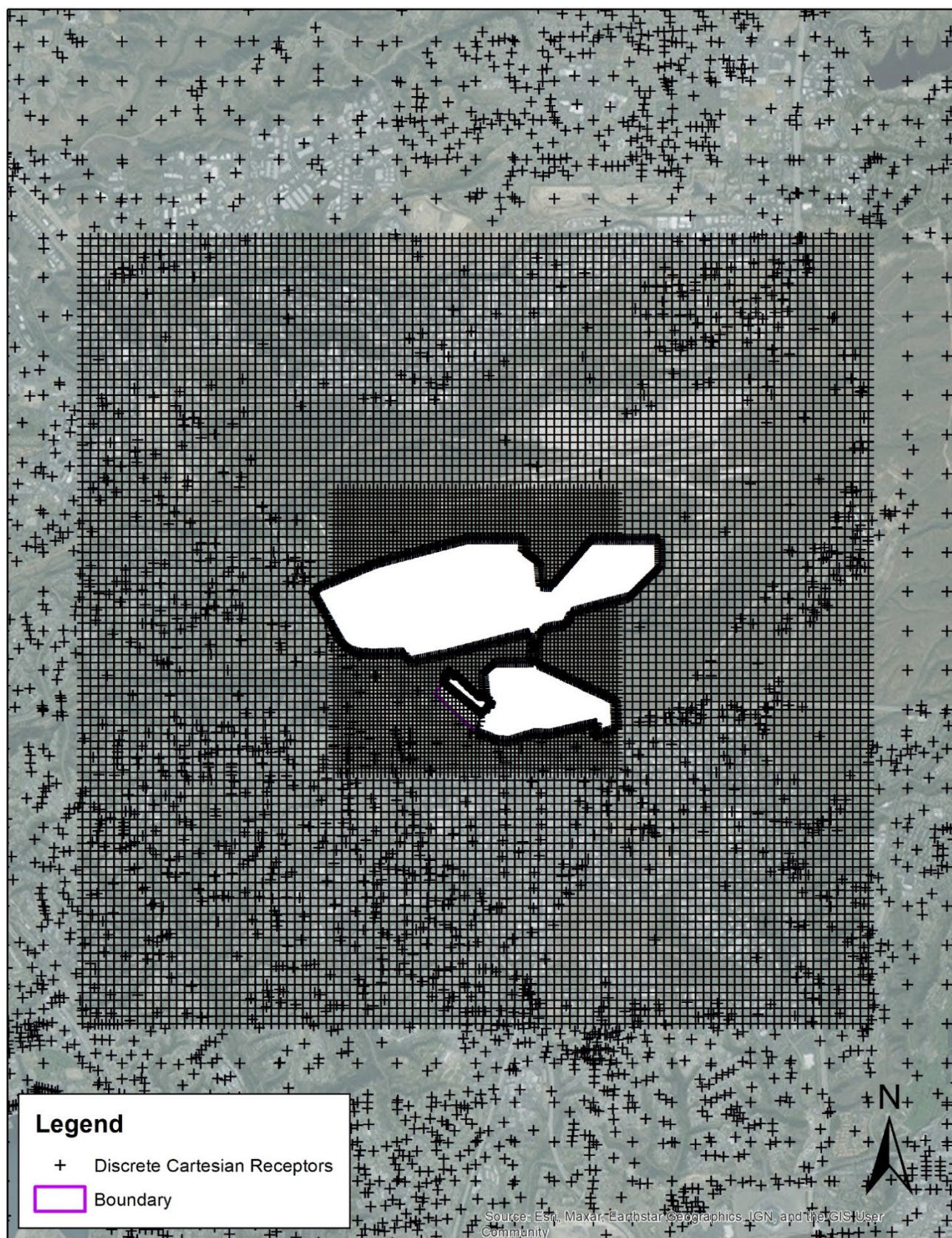
### 6.1.2 Receptors

For this HRA study, six types of receptors were used. The receptor grid was created to cover an area of 10 km in each direction and was sufficiently large to include both the cancer risk and non-cancer risk Zone of Impact (ZOI). The ZOI for cancer risk assumed to be all receptors within 1 in a million isopleth (70-year exposure).

- Fenceline Receptors: Receptors are placed on the lease line of the Facility. The receptors were placed 25 meters apart.
- Cartesian Grid: Cartesian grid receptors were centered approximately on the reference point (UTM coordinates 484800 mE, 3634100 mN) and adjusted so that receptors end in hundreds (e.g., 100, 200). The gridded receptors included:
  - 50 m spacing from fence line out to 2,000 m
  - 100 m spacing from 2,000 m to 5,000 m
  - 250 m spacing from 5,000 m to 10,000 m
- Sensitive Receptors: Sensitive receptors were placed where the population is potentially more susceptible to adverse effects from emitted pollutants. Based on the SDAPCD's HRA guidance, sensitive receptor locations include schools [kindergarten through grade 12 (K-12)], daycare centers, nursing homes, retirement homes, health clinics, hospitals, playgrounds, and athletic facilities within 2 km of the Facility. 35 sensitive receptors were identified within 2 km of the Facility: schools, daycare centers, hospitals, nursing homes, libraries and care facilities.
- Residential Receptors: Discrete receptors were also located at the nearest residences. Google Maps and the San Diego County zoning map were used to identify the locations of the closest residential receptors.
- Worker Receptors: Discrete receptors were also located at the nearest Businesses. Google Maps and the San Diego County zoning map were used to identify the locations of the closest worker receptors.
- Population (census) Receptors: These receptors are placed to represent population centroids. HARP has a database that can export population centroid receptors and their corresponding populations to a csv file. Population receptors exported from HARP were imported into AERMOD as discrete receptors.

A total of 22,154 receptors were included in one combined AERMOD run and HARP run. Figure 3 shows the location of the fenceline, grid, sensitive, residential receptors.

Figure 3: Receptor Locations for Facility and Landfill



### 6.1.3 Model Options and Parameters

The air dispersion model used for this HRA is the AMS/EPA Regulatory Model (AERMOD version 24142). AERMOD is a steady-state plume dispersion model that incorporates air dispersion calculations based on planetary boundary layer turbulence structure and scaling concepts. AERMOD is recognized by many regulatory agencies, such as EPA and SDAPCD, for stationary source air dispersion modeling projects as containing the latest scientific algorithms for simulating plume behavior in all types of terrain. AERMOD calculates hourly concentrations based on hourly meteorological data and is applicable for most of studies.

AERMOD calculates downwind pollutant concentrations at specified receptor locations. For this Facility, results from the AERMOD runs were imported into the HARP2 program for further processing and analysis. The air dispersion modeling methodology was based extensively on the SDAPCD's HRA guidelines. Table 9 shows the model options and parameters used in AERMOD modeling.

**Table 9: Model Options and Parameters**

| Parameter              | Value/Notes                                                                                                                                                                                                                                                                                                              |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model Versions         | AERMOD = 24142; AERMAP=18081; BPIP=04274, AERMET= 22112                                                                                                                                                                                                                                                                  |
| Model Options          | Default, Concentration                                                                                                                                                                                                                                                                                                   |
| Averaging Times        | 1-hr, Month, PERIOD                                                                                                                                                                                                                                                                                                      |
| Dispersion Coefficient | Rural option used.                                                                                                                                                                                                                                                                                                       |
| Point Source           | Emission Rate = 1 g/s; Emission rate is used to generate dispersion factors; height, diameter, exhaust gas temperature, and exhaust flowrate were provided by MM San Diego LLC. Table 8 shows the point sources parameters for the 10 sources.                                                                           |
| Downwash               | 16 buildings are included in the BPIP model to estimate downwash. Building data from Google Earth and MM San Diego LLC's height information.                                                                                                                                                                             |
| Receptors              | Discussed in Section 6.1.2                                                                                                                                                                                                                                                                                               |
| Elevations             | All point source, building, and receptor elevations assigned from 1/3 arc second terrain data downloaded from the National Elevation Dataset (NED). AERMAP was used to assign elevations.                                                                                                                                |
| MET Data               | Miramar Marine Corps Air Station (MCAS) MET data obtained from SDAPCD used for this analysis. The base elevation provided by the agency of 127 meters above sea level.<br><br>Justification is that it is the closest MET station (~4 km to the northeast from the Facility). The MET data includes the years 2019-2021. |

## 6.2 Ground Level Concentration

The HARP2 software multiplies the emission rates by the dispersion factors generated in the 1-hr and PERIOD plot files from AERMOD and calculates the GLCs for each pollutant at each receptor. The GLCs are used in the risk analysis portion of HARP2 to estimate risk.

## 7.0 RISK CHARACTERIZATION

The Risk Characterization step quantifies the health risks associated with emissions from a source being evaluated. For the purpose of this HRA, risk characterization has been conducted for cancer risks and non-cancer risks. The inputs and results are specified in detail below:

### 7.1 HRA Methodology

The HRA process involves a number of steps with the goal of estimating the extent of cancer and non-cancer health effects associated with compounds in air emissions on both a population and specific receptor basis. The four major components of a HRA include:

- Hazard identification
- Exposure assessment
- Dose-response assessment
- Risk characterization

Hazard identification generally involves the determination of potential health effects that may be associated with a particular compound. Dose-response assessment is the process of characterizing the relationship between the exposure to a compound and the incidence of an adverse health effect.

The purpose of the exposure assessment is to estimate the extent of public exposure to a compound for which health risks will be quantified. This involves emissions quantification, modeling of compound dispersion, evaluation of environmental fate, identification of exposure routes, identification of exposed population, and estimations of short-term (acute) and long-term (chronic) exposure levels.

Risk characterization, which is the final step in the risk assessment process, is the integration of the health effects and the public exposure information. These two risk assessment components are generally performed by experienced engineers and consultants for the purpose of a health risk assessment.

HARP2 was used to conduct the dose-response assessment and risk characterization. The dose-response assessment is the relationship between pollutant exposure and potential incidence of an adverse health effect in the exposed populations. Dose-response is determined for each chemical using the most current OEHHA potency factors for cancer risk and Reference Exposure Levels (RELs) for acute and chronic non-cancer risks, which are incorporated into HARP2. Human doses were calculated for the modeled environmental exposures over specified time periods via multiple environmental pathways using the AERMOD dispersion modeling results. The risk characterization integrates the health effects and public exposure information and provides quantitative estimates of health risks resulting from Facility TAC emissions.

The HRA followed SDAPCD HRA guidelines (SDAPCD 2022), which are based on the OEHHA's (OEHHA 2015) Tier-1 technique with the exceptions noted in the following sections and based on guidance from SDAPCD HRA staff.

The health risk calculations were performed using HARP2's Air Dispersion Modeling and Risk Tool (ADMRT, version 22118). The HARP2 model uses OEHHA equations and algorithms to calculate health risks based on

input parameters, such as emissions, X/Q concentrations, and toxicological data, as presented in the OEHHA risk assessment guidelines.

The X/Q values determined for each source using AERMOD were imported into the HARP2 ADMRT module and combined with hourly and annual emissions to determine the GLCs for each pollutant. The GLCs were then used to estimate the long-term cancer health risk to an individual and non-cancer chronic and acute hazard indices.

The assessment of cancer risk and chronic non-cancer health indices used the long-term period (annual) average emissions, while the assessment of acute non-cancer health effects used the maximum short-term 1-hour emissions. The acute analysis conservatively assumes that all maximum short-term emissions occur in the same hour.

The PMI, MEIR, MEIW, and maximum impact at a sensitive receptor were calculated for cancer risk and non-cancer chronic and acute health indices. The PMI is a location within the modeling grid where the model calculates the highest (worst-case) health risk. The PMI may or may not be a habitable location.

Electronic modeling files will be provided to the SDAPCD with this report. These include the HARP2 input and output files. Appendix B shows the list of the modeling files.

## 7.2 Risk Analysis

HARP2 compares the GLCs to established cancer, chronic, and acute risk thresholds to estimate risk. The HRA included a multi-pathway assessment. The relevant multi-pathway components of all substances with multi-pathway effects were included in the health risk calculations as shown in Table 10 for the different receptor types. Table 10 also provides the parameters and options used in HARP2.

**Table 10: HARP2 Model Options and Parameters**

| Risk Type                                | Receptor Type       | Exposure Duration | Method                                                                             | Pathways                                                                                              |
|------------------------------------------|---------------------|-------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Cancer Burden                            | Individual Resident | 70-year           | RMP using Derived Method<br>Fraction of time at home:<br>16 years to 30 years = ON | Inhalation, Dermal (warm),<br>Soil, Homegrown produce,<br>Mother's milk<br>Deposition rate = 0.02 m/s |
| Cancer PMI, MEIR, and Sensitive Receptor | Individual Resident | 30-year           | RMP using Derived Method<br>Fraction of time at home:<br>16 years to 30 years = ON | Inhalation, Dermal (warm),<br>Soil, Homegrown produce,<br>Mother's milk<br>Deposition rate = 0.02 m/s |
| Cancer MEIW                              | Worker              | 25-year           | OEHHA Derived Method 8-hr breathing rates = moderate intensity                     | Inhalation, Dermal (warm), Soil<br>Deposition rate = 0.02 m/s                                         |

| Risk Type                                       | Receptor Type                     | Exposure Duration | Method                                                    | Pathways                                                                                              |
|-------------------------------------------------|-----------------------------------|-------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Chronic<br>PMI, MEIR, and Sensitive<br>Receptor | Individual Resident               | Annual            | OEHHA Derived Method<br>Long-term 24-hr<br>breathing rate | Inhalation, Dermal (warm),<br>Soil, Homegrown produce,<br>Mother's milk<br>Deposition rate = 0.02 m/s |
| Chronic<br>MEIW                                 | Worker                            | Annual            | OEHHA Derived Method                                      | Inhalation, Dermal (warm),<br>Soil<br>Deposition rate = 0.02 m/s                                      |
| Chronic<br>MEIW                                 | Worker                            | 8-hour            | OEHHA Derived Method                                      | Inhalation, Dermal (warm),<br>Soil<br>Deposition rate = 0.02 m/s                                      |
| Acute                                           | Individual Resident<br>and Worker | 1-hour            | OEHHA Derived Method                                      | Inhalation                                                                                            |

### **Selection Of Receptor Types**

There are four kind of receptors that were estimated risk:

- The PMI represents the location of the highest risk for all receptors.
- The MEIR represents the location of the highest risk that occurs at the location of a known residential receptor based on aerial imagery.  
SCAPCD and OEHHA directed us to locate the MEIR at the receptors we have chosen which is generally over the closest residential neighborhood to the south/west of the Facility.
- The MIEW for cancer and chronic risk was chosen by identifying which nearby buildings to the Facility routinely are occupied by workers. The buildings to the South of the Facility and Landfill routinely house workers and are the closest for risk level issues.
- The MEIW for acute risk is identified as the maximum risk at each of the buildings that contain workers.
- The risk described as the sensitive receptor is the highest risk of all sensitive receptors assessed.

#### **7.2.1 Cancer Risk**

Cancer risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to TACs over an extended period of time. According to the guidance (SDAPCD 2022), this HRA estimated cancer risk over a 30-year period for residential, sensitive, and PMI grid receptor locations and 25 years for off-site worker receptor locations.

Residential/sensitive/grid receptor cancer risk estimates were calculated using the California Air Resources

Board's (ARB's) Risk Management Policy (RMP), "RMP Using the Derived Method," and off-site workplace cancer risk estimates used the "OEHHA Derived" calculation method. The RMP uses high-end breathing rates (95<sup>th</sup> percentile) for children from the 3<sup>rd</sup> trimester through age 2 and 80<sup>th</sup> percentile breathing rates for all other ages for residential exposures (ARB/CAPCOA 2015). The "OEHHA Derived" method uses high-end exposure parameters for the top two exposure pathways and mean exposure parameters for the remaining pathways for cancer risk estimates. The "RMP Using the Derived Method" combines the two approaches.

## **7.2.2 Chronic Hazard Index**

Some TACs may have non-cancer health risk due to a long-term (chronic) exposure. The Chronic Hazard Index is the sum of the individual substance HICs for all TACs affecting the same target organ system. Chronic risk was calculated using the "OEHHA Derived" Method at all receptors for an annual exposure duration.

An 8-hour HIC was estimated in a similar manner to the annual HIC. The 8-hour RELs were developed principally for exposure of individuals during 8-hour work schedules. OEHHA recommends estimating the 8-hour HIC based on daily average 8-hour exposure for those chemicals with 8-hour RELs at worker receptors. The annual GLCs are scaled within HARP2 to estimate 8-hour GLCs, then compared to the RELs and summed per target organ. SCS believes the 8-hour HIC should be used to determine compliance, as 99% of the risk comes from arsenic and formaldehyde, which have 8-hour RELs. This is discussed further in the executive summary and the introduction.

## **7.2.3 Acute Hazard Risk**

Some TACs may have non-cancer health risk due to short-term (acute) exposures. Acute Hazard Index (HIA) is the sum of the individual substance HIAs for all TACs affecting the same target organ system. Acute risk was calculated at all receptors for an exposure duration of 1 hour.

## **7.2.4 Cancer Burden**

Cancer burden is the estimated increase in the occurrence of cancer cases in a population subject to a cancer risk of greater than or equal to one in one million ( $1.0 \times 10^{-6}$ ) based on a 70-year exposure to TACs. The cancer burden is determined for the population located within the ZOI, which is defined as the area within the one in one million cancer risk isopleth for a 70-year exposure.

## **7.3 AB 2588 Thresholds**

Facilities with elevated risks are required to notify all exposed persons and if the risks are considered significant, risk reduction may be required.

The risks predicted in the HRA are compared to the following SDAPCD levels:

- a) Public Notification Threshold - required to notify the public if:
  - The cancer risk is greater than or equal to 10 in one million; or
  - The non-cancer chronic or acute hazard index is greater than 1.0; or
  - The cancer burden is greater than 1.0.

b) Significant Risk Threshold - required to notify the public and prepare a risk reduction audit plan if:

- The cancer risk is greater than or equal to 100 in one million; or
- The non-cancer chronic or acute hazard index is greater than 1.0; or
- The cancer burden is greater than 1.0.

## 7.4 HRA Results

This Section shows the HARP2 modeling results for each health risk, at each receptor type. A discussion of the HRA results is provided below for each health risk analysis.

### 7.4.1 Cancer Risk

Cancer risk is predicted by placing receptors representing the MEIR, MEIW and PMI within the zone of impact. Cancer risk estimates for the MEIR, MEIW, PMI, and sensitive receptors are listed in Table 11.

**Table 11: Cancer Risk Results**

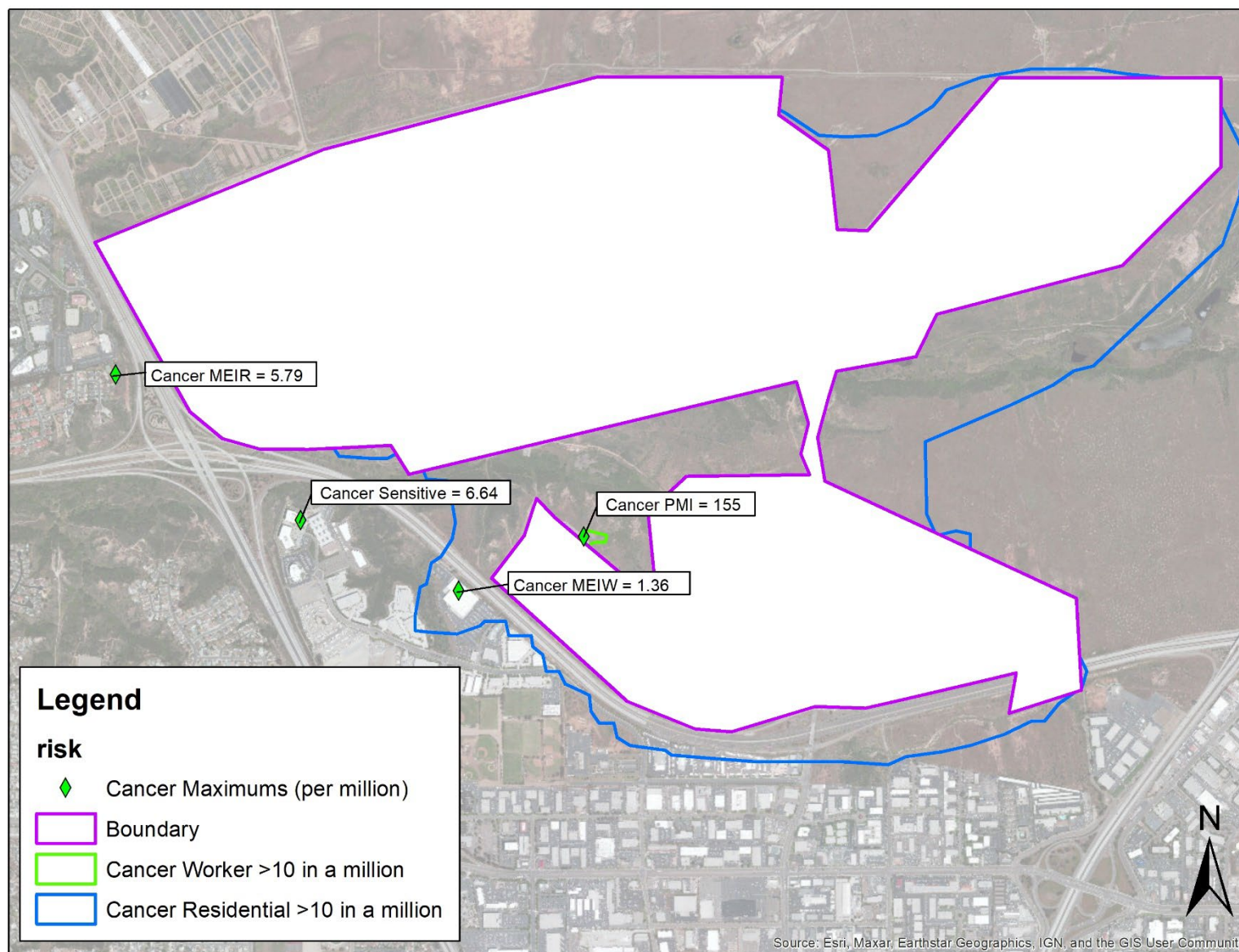
| Receptor  | Exposure Duration | Cancer Risk (in a million) | Receptor # | UTM Easting Coordinate (m) | UTM Northing Coordinate (m) |
|-----------|-------------------|----------------------------|------------|----------------------------|-----------------------------|
| PMI       | 30 - Years        | 155                        | 8,885      | 484,868.11                 | 3,634,076.05                |
| MEIR      |                   | 5.79                       | 18,785     | 483,025.56                 | 3,634,713.25                |
| Sensitive |                   | 6.64                       | 24         | 483754.00                  | 3634140.00                  |
| MEIW      | 25 - Years        | 1.36                       | 10,113     | 484375.60                  | 3633863.00                  |

The PMI was predicted to occur to the North of the Southern property section of the Facility at the property line which corresponds to a fenceline receptor (# 8,885). At this location there are no offsite workers, residences or sensitive receptors. This risk assumes 30-years of continuous exposure. Most of the risk is from formaldehyde and arsenic. The pathway for maximum exposure and contribution is Inhalation. The Facility engines are the main contributor source.

The MEIR was predicted to occur at receptor # 18,785 which is located approximately 200 m West of the Facility. The location of the sensitive receptor with a maximum cancer risk was predicted to occur at Kaiser Permanente (Receptor # 24) which is located approximately 800 m southwest of the Facility. The MEIW 25-year cancer risk is predicted to occur at a building to the southwest of the Facility.

Figure 4 shows the 30-year cancer risk isopleths and the locations for PMI, MEIR, MEIW and maximum sensitive receptors.

Figure 4: 30-Year Cancer Isopleths (Worker and Residential) and Locations for PMI, MEIR, MEIW and Maximum Sensitive Receptor



## 7.4.2 Chronic Hazard Index

Chronic, non-cancer risk is predicted by placing receptors representing the MEIR, MEIW and PMI within the zone of impact. The chronic hazard estimates for MEIR, MEIW, PMI, and sensitive receptors are listed in Table 12.

**Table 12: Chronic Hazard Index Results**

| Receptor  | Exposure Duration | Chronic Hazard Index | Receptor # | UTM Easting Coordinate (m) | UTM Northing Coordinate (m) |
|-----------|-------------------|----------------------|------------|----------------------------|-----------------------------|
| PMI       | Annual            | 3.23                 | 8885       | 484868.1                   | 3634076                     |
| MEIR      |                   | 0.09                 | 18,785     | 483025.6                   | 3634713                     |
| Sensitive |                   | 0.11                 | 14         | 487522                     | 3633270                     |
| MEIW      |                   | 0.19                 | 10,113     | 484375.6                   | 3633863                     |
| MEIW      | 8 - Hour          | 0.08                 | 10,113     | 484375.6                   | 3633863                     |

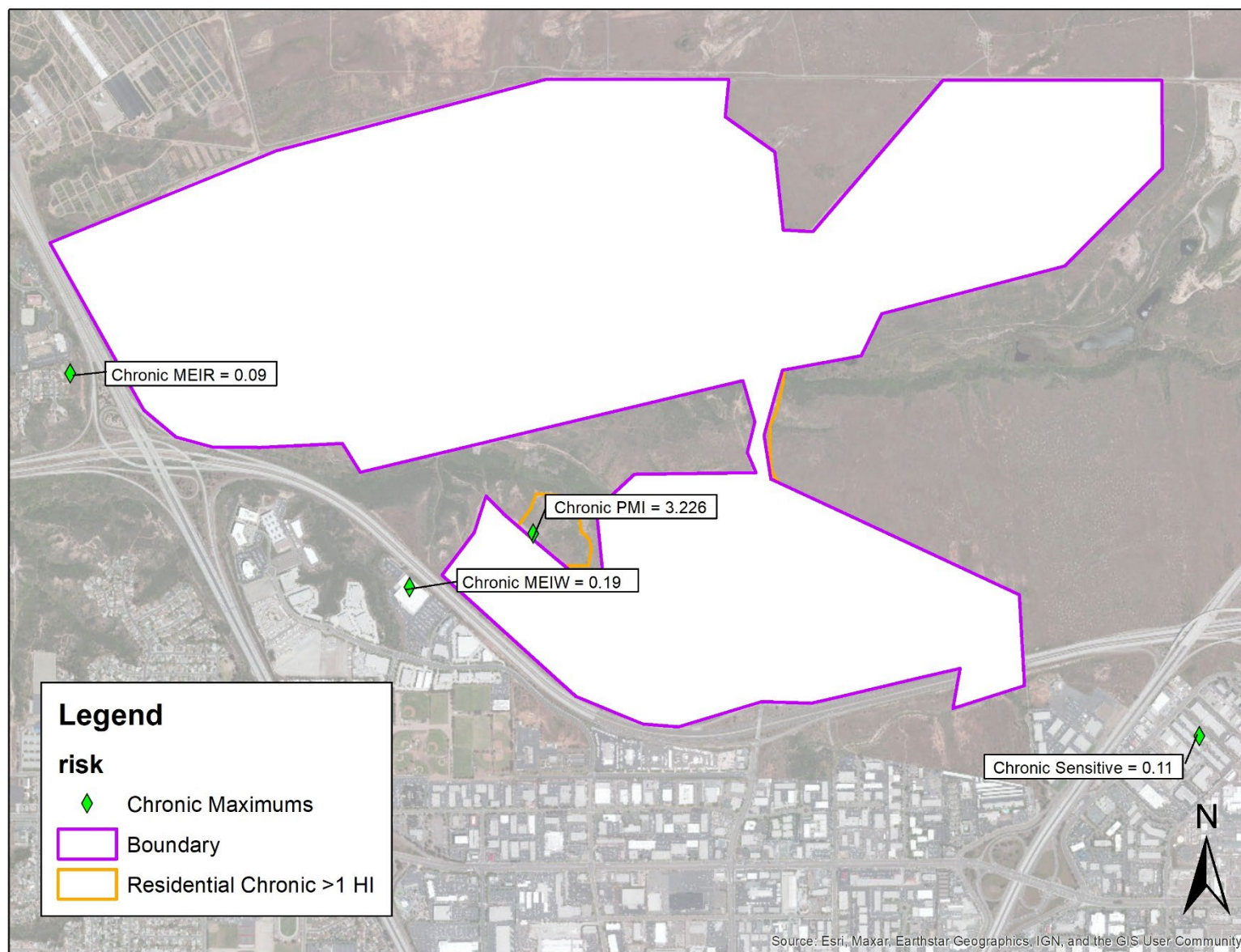
\*OEHHA guidelines state that Tier 1 results at a single point must be reported even if spatial averaging is used. This single point is not identified as the MEIW.

The PMI chronic, non-cancer risk was predicted to be at receptor #8885 which is located at the fenceline of the Facility. The pollutant contributing most significantly to predicted risk is arsenic. The pathway for maximum exposure and contribution is Inhalation. The sources associated with chronic hazard index are the Facility engines.

The MEIR was predicted to occur at receptor # 18,785 which is located approximately 200 m West of the Facility. The location of the maximum sensitive receptor was predicted to occur at Heritage Christian School (Receptor #14) approximately 700 m Southeast of the Facility. The MEIW chronic risk is predicted to occur at a building 200 m West of the Facility. The maximum risk at the building is 0.19 per million based on a single point. For the 8-hour exposure duration, the MEIW was predicted to occur at the same receptor as the standard MEIW.

Figure 5 shows the annual chronic hazard isopleths (no worker isopleth over 1.0) and the locations for PMI, MEIR, MEIW, and maximum sensitive receptors.

Figure 5: Annual Chronic Hazard Isopleths (hazard index) and Locations for PMI, MEIR, MEIW and Maximum Sensitive Receptor



### 7.4.3 Acute Hazard Risk

Acute, non-cancer risk is predicted by placing receptors within the zone of impact. Acute, non-cancer hazard analysis does not differentiate between the type of receptors (MEIR, MEIW, PMI), exposure duration (25 years vs 30 years) or intake rate percentile method used (OEHHA/RMP derived method). Since acute hazard is assumed to be for a much shorter duration, it calculates a common hazard result for all the parameters. Table 13 shows the acute hazard for all the type of receptors.

**Table 13: Acute Hazard Index Results**

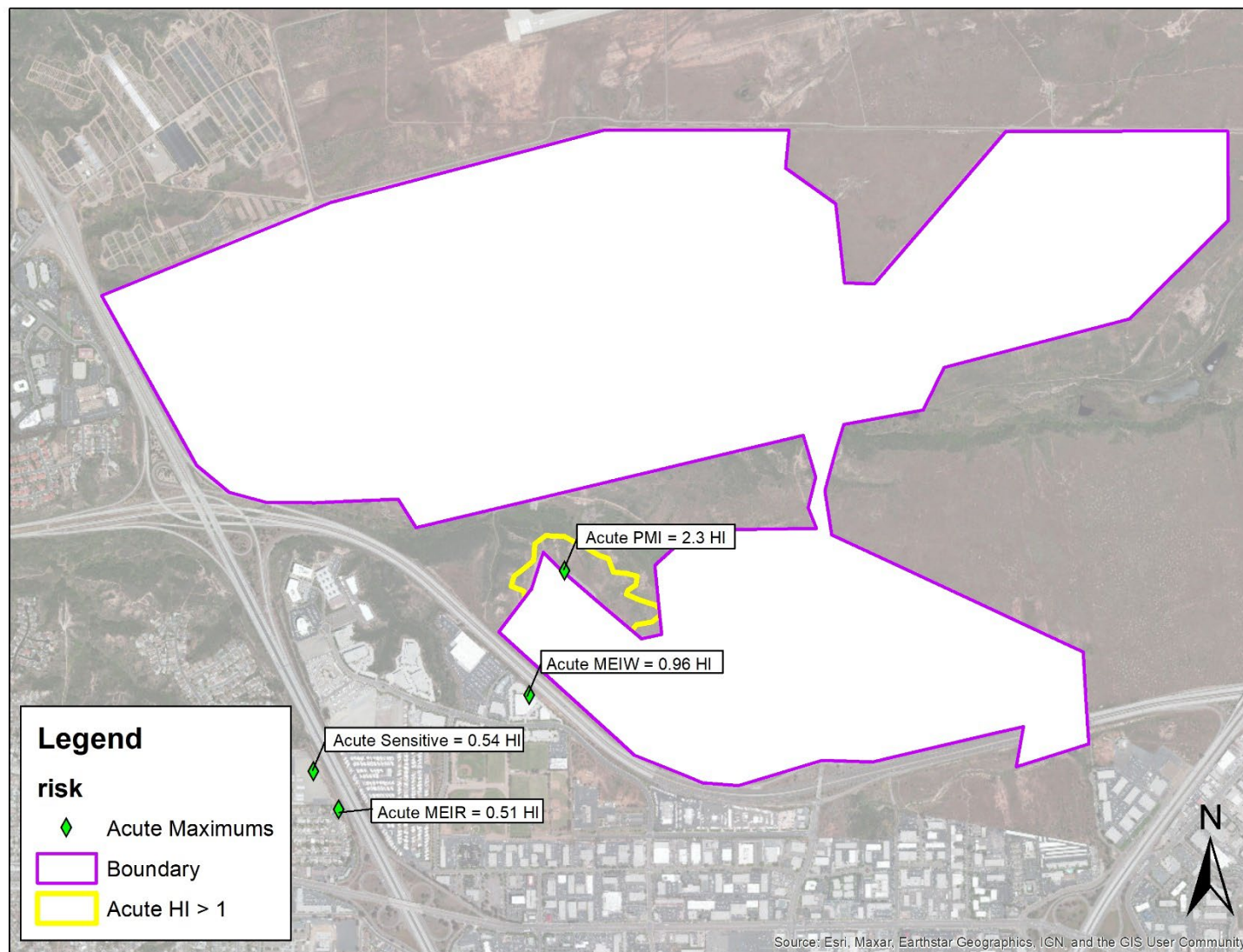
| Receptor  | Exposure Duration | Acute Hazard Index | Receptor # | UTM Easting Coordinate (m) | UTM Northing Coordinate (m) |
|-----------|-------------------|--------------------|------------|----------------------------|-----------------------------|
| PMI       | 1 - Hour          | 2.30               | 8,880      | 484763.2                   | 3634153                     |
| MEIR      |                   | 0.51               | 9,626      | 483875.6                   | 3633213                     |
| Sensitive |                   | 0.54               | 9,529      | 483775.6                   | 3633363                     |
| MEIW      |                   | 0.96               | 10,335     | 484625.6                   | 3633663                     |

The PMI (receptor # 8,880) was predicted to occur on the fence line. The MEIR (receptor # 9,626) was predicted to occur at a location approximately 1,000 m Southwest of the Facility in a residential neighborhood. The maximum sensitive receptor (# 9,529) was located at Innovation Middle School, approximately 1,000 m Southwest of the Facility. The MEIW (receptor # 10,335) was predicted to occur approximately 150 m Southwest of the lease line.

The pollutant contributing most significantly for all the identified receptors was formaldehyde (96%) and arsenic. The sum of the contribution of the four generators with the reciprocating engines was 91% at the PMI receptor.

Figure 6 shows the locations of the acute hazard index PMI, MEIR, MEIW, and maximum sensitive receptor.

Figure 6: Acute Hazard Isopleths (hazard index) and Location of PMI, MEIR, MEIW, and Maximum Sensitive Receptor



#### 7.4.4 Cancer Burden

The cancer burden for the Facility is calculated based on OEHHA (70 years) risks. It is independent of how many people move in or out of the vicinity of an individual Facility. The number of cancer cases is considered independent of the number of people exposed, within some lower limits of exposed population size, and the length of exposure (within reason). For example, if 10,000 people are exposed to a carcinogen at a concentration with a  $1 \times 10^{-5}$  cancer risk for a lifetime, the cancer burden is 0.1, and if 100,000 people are exposed to a  $1 \times 10^{-5}$  risk the cancer burden is 1.

Because the maximum cancer risk exceeds 1 per million at an offsite receptor, cancer burden has been estimated using the following procedure:

- Cancer risk is estimated at each census receptor within 20 kilometers using HARP2.
- For each census receptor that has an estimated cancer risk that equal to or greater than 1 per million ( $1 \times 10^{-6}$  risk), the population at that receptor is multiplied by the risk at that receptor. This estimates the cancer burden at each census receptor.
- All of the cancer burdens calculated in the previous step are summed to estimate the total cancer burden within the zone of impact (area that experiences a risk  $\geq 1 \times 10^{-6}$ ).

The total cancer burden is estimated to be 0.50 with a total population of 259,394 persons within the zone of impact. Effectively what this means is that given the modelled assumptions and risk calculations, operation of the Facility is anticipated to result in a maximum of 0.50 cancer cases. This risk is well within acceptable risk levels given the conservatism in the calculation. See Appendix A for cancer burden calculations (electronic only).

#### 7.4.5 30-day Lead Risk

33 sources at the Landfill emit lead and were included in the lead risk analysis. No sources at the Facility itself emit lead.

Because lead was emitted, the risk due to lead emissions must be considered. The simplified approach for assessing non-cancer risks described in Section IIA of the Risk Management Guidelines for New, Modified, and Existing Sources of Lead was used for this analysis and includes the following steps:

- 1) Lead emissions are explicitly modeled using AERMOD on a monthly averaging period.
- 2) The highest concentration is defined as the maximum offsite concentration (MOC).
- 3) The receptor grid is reduced so that receptors extend at least 500 meters in each direction from the MOC. This area is defined as the maximum exposure area (MEA). The model is re-run with just the receptors in the MEA.
- 4) Because there are no residential receptors with population within the MEA, the MEA does not overlap any census tracts with a high potential for existing exposure and the Facility is eligible to use the simplified approach.
- 5) The MOC is compared to the recommended risk management level of  $0.12 \mu\text{g}/\text{m}^3$ .

After completion of the steps described above, the MOC is estimated to be  $0.021 \mu\text{g}/\text{m}^3$ . Because the MOC is less than the recommended risk management level, the risk due to lead emissions is acceptable.

## 8.0 CLOSING

SDAPCD Rule 1210 establishes that any risks above the significant risk threshold requires public notice. The significant risk threshold for cancer risk is 10 per million and for chronic or acute risk is a hazard index of 1.0 and for cancer burden is 1. Additionally, if cancer risk exceeds 10 per million or chronic or acute risk exceed a hazard index of 1.0, risk reduction is required. These triggers do not apply to the PMI unless the PMI also represents a worker, residential or sensitive receptor.

Total population within the zone of impact for cancer risk is 259,394 people and the estimated cancer burden within the zone of impact is estimated to be 0.50; therefore, no public notice or risk reduction is required due to estimated cancer burden.

All cancer and acute risks are below levels that trigger public notice or risk reduction. The PMI's exceed the health risk thresholds for cancer, chronic and acute; however, no residential, worker, or sensitive receptors are at levels that trigger public notice or risk reduction. The pollutants contributing most significantly to cancer, chronic and acute risk are arsenic and formaldehyde.

This health risk assessment was performed and reviewed by the following.



Jeff Leadford, PE  
Project Manager  
SCS ENGINEERS

Gabrielle F. Stephens  
Project Director  
SCS ENGINEERS

## 9.0 REFERENCES

- California Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments. February 2015.
- California Environmental Protection Agency- User Manual for the Hotspots Analysis and Reporting Programs Air Dispersion Modeling and Risk Assessment Tool, Version 2. November 2, 2017
- California Environmental Protection Agency- Risk Management Guidelines for New, Modified, and Existing Sources of Lead, March 2001.
- San Diego Air Pollution Control District (SDAPCD). 2017. Air Toxics “Hot Spots” Prioritization Procedure. January 2017.
- San Diego Air Pollution Control District (SDAPCD). 2019. Supplemental Guidelines for Submission of Air Toxics “Hot Spots” Program Health Risk Assessments (HRAs). July 2022.

## **APPENDIX A**

# Cancer Burden and Lead Calculations (Electronic Only)

HARP2 Project

AERMOD Project

HARP2 Plotfiles

AERMOD Plotfiles

AERMOD Lead input-output

## **APPENDIX B**

# Electronic Modeling Files (submitted electronically)

HARP2 Project

AERMOD Project

HARP2 Plotfiles

AERMOD Plotfiles

AERMOD Lead input-output

Emission inventory (CSV file)

Met Data

BPIP Input

Receptors (CSV and ROU files)

March 31, 2026

Mr. Mohsen Nazemi, M.S., P.E.  
Engineering Division Chief  
San Diego Air Pollution Control District  
10124 Old Grove Road  
San Diego, California 92131

Subject: Revised 2021 Health Risk Assessment at the Miramar Landfill, San Diego, California

Dear Mr. Nazemi:

In accordance with the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill 2588 (AB 2588), this report presents a joint Health Risk Assessment (HRA) for the MM San Diego LLC – Miramar & Miramar Energy Facility (ID #96387) located at 5244 Convoy Street, San Diego, CA (herein referenced as Facility) and the Miramar Landfill (herein referenced as Landfill) operated by the City of San Diego ("City").

The HRA was completed with the following sources:

- 1) Eight engines that are permitted by Permit to Operate (PTO) No. 950731 at the Facility.
- 2) Two engines permitted by PTO No. 001632/001633 at the Facility.
- 3) All sources from the Landfill.

This HRA was prepared by SCS Engineers (SCS), on behalf of MM San Diego LLC ("MM"), in accordance with the California Office of Environmental Health Hazard Assessment (OEHHA) guidance document (OEHHA 2015) and the County of San Diego Air Pollution Control District ("SDAPCD" or the "District") supplemental HRA guidelines (SDAPCD 2022).

The HRA was prepared considering the following:

- The emission rates of the substances from the approved 2021 Emission Inventory Reports, for both the Facility and Landfill.
- Air dispersion coefficients developed as part of site-specific air dispersion modeling using AERMOD presented herein to predict off-site ground level chemical concentrations.
- The Hotspots Analysis and Reporting Program (HARP2) model developed by the California Air Resources Board (CARB) to perform the calculations for health impacts: cancer risks, chronic and acute non-cancer health effects.



Mr. Mohsen Nazemi

March 31, 2026

Page 2

The HRA was prepared to include the Landfill property with the consent of the City, and at the request of the District. However, MM and the City maintain that the District lacks statutory and regulatory authority to aggregate separate facilities under AB 2588 or other District programs. The parties have no common ownership or control, and the District has historically treated separately owned and operated facilities independently—a precedent upon which both parties have relied in making significant business decisions in San Diego County. By consenting to the submission of this HRA, both MM and the City retain all legal arguments and defenses and maintain their position that the District currently lacks authority to aggregate separate facilities under AB 2588 or other District programs.

As part of the combined HRA, MM incorporated a 20-foot silencer stack extension to each of the current ten (10) landfill gas (LFG) engines after performing a feasibility review. We believe that this extension can be incorporated without a modification to the current Permits to Operate (PTOs) as the height of the engine stacks are not currently noted in the equipment description. With the increased stack height, modeling shows that resulting health risks are below thresholds that would require any risk reduction.

Should you have any questions about the information contained in this submittal, please contact Patrick Sullivan of SCS at (562) 355-6510 or [psullivan@scsengineers.com](mailto:psullivan@scsengineers.com) or Suparna Chakladar at (951) 833-4153 or [Schakladar@opalfuels.com](mailto:Schakladar@opalfuels.com).

Sincerely,



Gabrielle F. Stephens  
Vice President  
SCS Engineers

Patrick S. Sullivan, REPA, CPP, BCES  
Senior Vice President  
SCS Engineers

Enclosure

cc: James Hay, City of San Diego  
Luis Campos, City of San Diego  
Suparna Chakladar, Opal Fuels  
Michael Langelder, Opal Fuels