South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

HEALTH RISK ASSESSMENT SUMMARY FORM

(Required in Executive Summary of HRA)

Facility Name : MM West Covina
Facility Address: 2210 South Azusa Avenue
West Covina, CA 91792
Type of Business: Electric Generation
SCAQMD ID No.: 113873

A. Cancer Risk

(One in a million means one chance in a million of getting cancer from being constantly exposed to a certain level of a chemical over a period of time)

1. Inventory Reporting Year : 2014
2. Maximum Cancer Risk to Receptors : *(Offsite and residence = 30-year exposure, worker = 25-year exposure)*
   a. Offsite 284.2 in a million Location: 416500,3766300
   b. Residence 67.2 in a million Location: 416205.7, 3766041
   c. Worker 8.7 in a million Location: 416500, 3766300
3. Substances Accounting for 90% of Cancer Risk: Dioxins, Furans, Hexavalent Chromium, Arsenic
   Processes Accounting for 90% of Cancer Risk: Boiler Stack
4. Cancer Burden for a 70-yr exposure: *(Cancer Burden = [cancer risk] x [# of people exposed to specific cancer risk])*
   a. Cancer Burden 6.11
   b. Number of people exposed to >1 per million cancer risk for a 70-yr exposure 2,736,887
   c. Maximum distance to edge of 70-year, 1 x 10^{-6} cancer risk isopleth (meters) ~41,000

B. Hazard Indices

[Long Term Effects (chronic) and Short Term Effects (acute)]
(non-carcinogenic impacts are estimated by comparing calculated concentration to identified Reference Exposure Levels, and expressing this comparison in terms of a "Hazard Index")

1. Maximum Chronic Hazard Indices:
   a. Residence HI: 0.64 Location: 416205.7, 3766041 toxicological endpoint: Respiratory
   b. Worker HI : 0.99 Location: 416500, 3766300 toxicological endpoint: Respiratory
2. Substances Accounting for 90% of Chronic Hazard Index: Nickel and Arsenic
3. Maximum 8-hour Chronic Hazard Index:
   8-Hour Chronic HI: 0.15 Location: 416500, 3766300 toxicological endpoint: Central Nervous System
4. Substances Accounting for 90% of 8-hour Chronic Hazard Index: Nickel, Arsenic, Dioxins
5. Maximum Acute Hazard Index:
   PMI: 1.70 Location: 416319,3766205 toxicological endpoint: Immune
6. Substances Accounting for 90% of Acute Hazard Index: Nickel

C. Public Notification and Risk Reduction

1. Public Notification Required? X Yes ____ No
   a. If 'Yes', estimated population exposed to risks > 10 in a million for a 30-year exposure, or an HI >1
   _____
2. Risk Reduction Required? X Yes ____ No

REPORT

Health Risk Assessment Study

MM West Covina Energy LLC.

Submitted to:

MM West Covina LLC
2210 S Azusa Ave.
West Covina, CA 91792

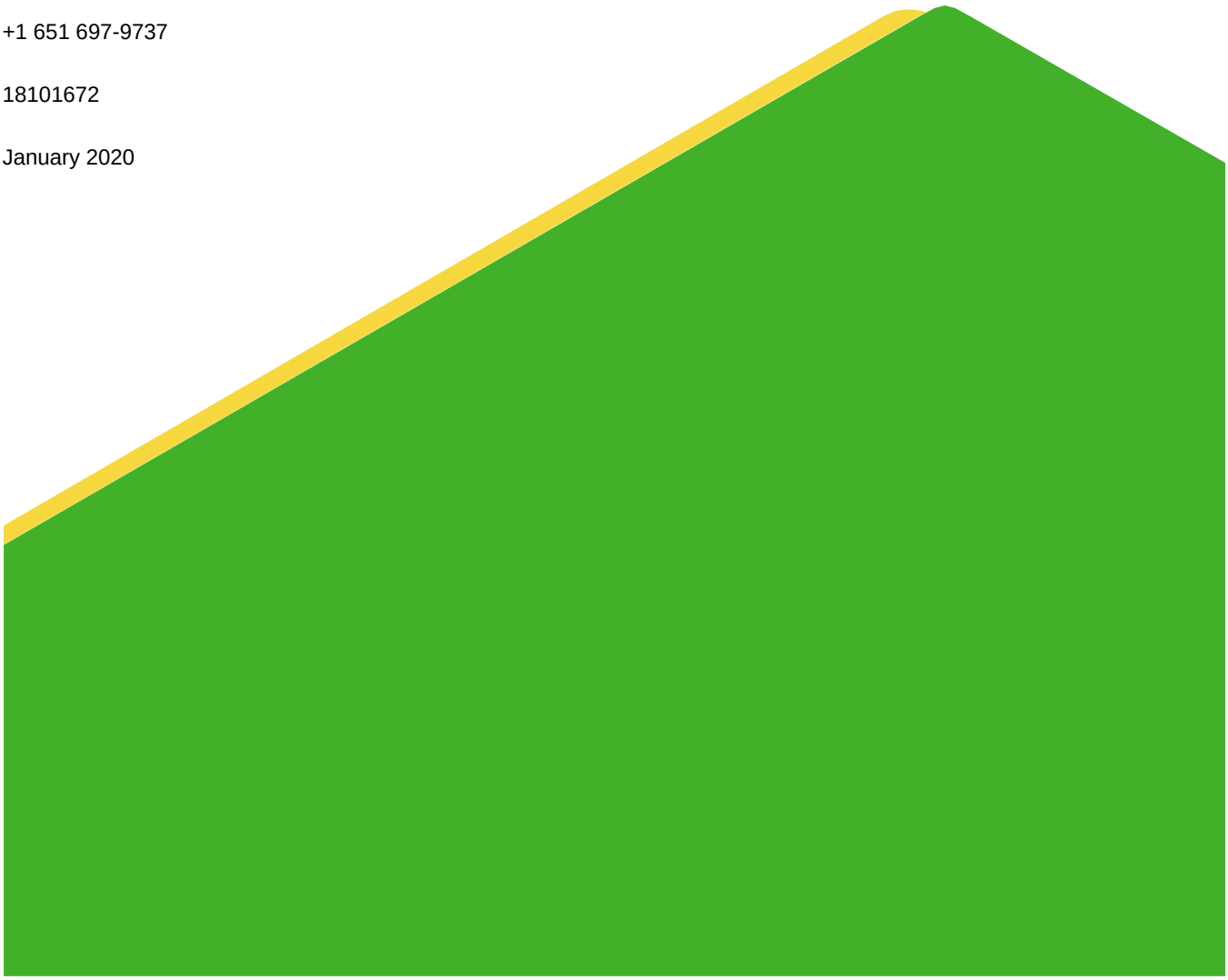
Submitted by:

Golder Associates Inc.
1751 West County Road B, Suite 105 Roseville, Minnesota, USA 55113

+1 651 697-9737

18101672

January 2020



Distribution List

South Coast Air Quality Management District (electronic)

Suparna Chakladar, MM West Covina LLC (electronic)

Table of Contents

TABLES

APPENDICES

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.
- **BPIP**: Building profile input file.
- **CAS Number**: A unique numerical identifier assigned by Chemical Abstracts Service to every chemical.
- **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.
- **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

1.0 EXECUTIVE SUMMARY

This Health Risk Assessment (HRA) has been conducted to characterize the nature and magnitude of health effects that could potentially be caused by air pollutants emitted by the MM West Covina LLC (Facility).

1.1 History and Overall Summary of Results

This HRA has been prepared following the South Coast Air Quality Management District (SCAQMD) "AB2588 and Rule 1402 Supplemental Guidelines". Section 1.1 provides history, a summary of results, conclusions, and major assumptions made while preparing this report.

1.1.1 History – 2006 HRA

An HRA report was prepared in 2006 for this Facility. In the 2006 HRA, the BKK landfill property line was used as the ambient boundary because the Facility is located on, and completely surrounded by land occupied by the landfill and because MM West Covina LLC owns the wells at the landfill. Dioxin and furan compounds were not included in the Air Toxics Emission Inventory for 2006, as the facility uses equipment designed for complete combustion. Emissions and risks were evaluated from two sources (boiler and combustion turbine) for the 2006 HRA. The HRA indicated that cancer risk captured at the maximum exposed individual resident (MEIR) was at a level that required public notice but did not require risk reduction. For reference, the estimated cancer risk, chronic hazard index, and acute hazard index at the MEIR was 18.7 in-a-million, 0.31, and 0.004 in the 2006 HRA.

1.1.2 History – 2018 HRA

An HRA report was prepared to be submitted to SCAQMD on July 2, 2018. After reviewing the July HRA, SCAQMD requested that the HRA be revised and resubmitted to include dioxin and furan compounds from the ATIR that was approved by SCAQMD in 2012. On August 10, 2018, the Facility conducted a stack test for dioxin and furan compounds. The results showed that the emission rates in pounds per hour for these compounds were in the order of 1E-10 to 1E-14. This indicated that the emissions of these compounds were insignificant from the Facility. The Facility submitted a revised HRA on the basis of the stack test, including the stack test results. This HRA was submitted in October, 2018. After reviewing the October HRA, SCAQMD rejected it on the basis that emission rates of dioxin and furan compounds included in the HRA did not exactly match the approved ATIR, as they were based on the stack test results. This initiated another request for a revised version of HRA to include all the compounds exactly matching emission rates of the approved ATIR for the Facility.

1.1.3 History- 2019 HRA

The Facility submitted a revised HRA to SCAQMD in August, 2019. After reviewing the submitted HRA, SCAQMD communicated with the Facility in December 2019 to incorporate a finer grid which resulted in different risk results. SCAQMD prepared a dispersion and risk model for the Facility and provided an option to either incorporate results obtained by SCAQMD in the revised HRA or re-run the model with the finer grid to arrive at the results obtained at SCAQMD. After being provided with all information necessary for review, including modeling files and health risk calculations, the Facility chose to accept the results provided by SCAQMD and to incorporate them into this report.

1.1.4 Results – 2020 HRA

As discussed in Section 1.1.3, the Facility has chosen to accept modeled risk provided by SCAQMD and has incorporated them into this revised report. The numbers contained in this report (January 2020) were provided by SCAQMD and have not been independently verified by Golder but we have reviewed the results provided by

SCAQMD and have not been independently verified by Golder but we have reviewed the results provided by SCAQMD and agree that they are reasonable based on the results Golder obtained to prepare the August 2019 report.

This health risk assessment evaluates cancer risk, chronic non-cancer hazard and acute non-cancer hazard at various receptors and includes emissions from all the compounds exactly as specified in the approved ATIR for the Facility. The approved ATIR includes emissions of dioxin and furan compounds at a significantly higher emission rate than what has subsequently been demonstrated to be emitted by stack test results. The higher dioxin and furan emission rates are the primary reason why cancer risks are estimated to be so high in this HRA. An estimate of cancer risk based on stack tested dioxin and furan emission rates is presented in the "Alternate HRA" and is attached with this HRA as Appendix C. SCAQMD has provided an option for the Facility not to revise or present certain tables in this "Main HRA" report. However, the Facility has attached the tables required by SCAQMD's guidelines as Appendix A with this report.

The Facility no longer operates the combustion turbine that was included in the 2006 HRA; only the boiler is operated. Emissions and dispersion factors used are for the boiler.

Cancer risk at the point of maximum impact (PMI) is estimated to be 284.3 in-a-million. Since there is no residence at the PMI, even though the cancer risk is greater than 100 in-a-million, MEIR value will be considered for determining public notification and risk reduction level determination.

Cancer risk at the MEIR is estimated to be 67.2 in-a-million at a receptor placed at the closest residence from the source. Because cancer risk at the MEIR is more than 25 in-a-million, a risk reduction plan is required as per the rules mentioned in Table 4 of the guidance document by SCAQMD

Cancer risk at the location representing the maximum exposed individual worker (MEIW) is estimated to be 8.74 in-a-million at a receptor representing the lease line.

The maximum chronic hazard index at the MEIR is estimated to be 0.64. The maximum chronic hazard index at the MEIW is estimated to be 0.99. The maximum 8-hour chronic hazard index is estimated to be 0.15. Because the chronic hazard index does not exceed 1.0 at the MEIR, no public notification is required.

The maximum acute hazard index at the PMI is estimated to be 1.70, located on the lease line. There is no residential area at this point. The acute hazard index at the MEIR is estimated to be 0.22.

The bullet points below summarize the above paragraphs:

- This HRA uses emission rates for dioxin and furan compounds exactly as specified in the approved ATIR by SCAQMD in 2012. Those emission rates were calculated using an emission factor and not with stack testing.
- Estimated cancer risk at the MEIR is greater than 25 in-a-million, so a risk reduction plan is required.
- Estimated chronic and acute hazard index at the MEIR is less than 1.0, so no public notice is required and no risk reduction plan is required for this Facility.
- The landfill stopped accepting waste in 1996. Landfill gas generation typically peaks the year after waste acceptance ceases and continues to decline. Based on that assumption, landfill gas generation at the

landfill and LFG combustion at the Facility has decreased from 2006 and therefore the emissions and risk are also reduced.

- Operations at this Facility have significantly reduced compared to 2006 since the Facility now only operates one source.

1.2 Facility Information:

Name of the Facility: MM West Covina LLC

Address: 2210 S. Azusa Avenue, West Covina, CA 91792

Facility ID number: 113873

This Health Risk Assessment Report is prepared for MM West Covina LLC located at the address mentioned above. The Facility generates electricity by routing landfill gas (LFG) generated at the BKK Landfill (Landfill) to a boiler. The boiler generates steam which drives a turbine to generate electricity. BKK Landfill is not owned by MM West Covina LLC. The Facility is located completely within the Landfill property line. The Facility occupies approximately 1.2 acres which is delineated by the lease line. This Facility has one emission source, SV001: Boiler Stack.

Emission rates of the substances from the 2014 Air Toxics Emission Inventory (ATIR) approved by South Coast Air Quality Management District (SCAQMD) on August 29, 2017 are presented in Table 1. Emission rates have been expressed in the units of pounds/hour, pounds/year and grams/second. The list of substances and emission rates identified in Table 1 were used for this HRA.

Table 1: Air Toxics Emission Inventory for MM West Covina for the year of 2014

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
Methane	74828	4.64E+03	6.67E-02	5.30E-01	6.68E-02
Hexane	110543	9.64E+02	1.39E-02	1.10E-01	1.39E-02
Benzene	71432	1.10E+02	1.59E-03	1.26E-02	1.59E-03
Toluene	108883	6.14E+00	8.84E-05	7.02E-04	8.85E-05
Benzyl Chloride	100447	2.62E+02	3.77E-03	3.00E-02	3.78E-03
Beryllium	7440417	2.92E+00	4.20E-05	3.34E-04	4.21E-05
Cadmium	7440439	1.78E+01	2.57E-04	2.04E-03	2.57E-04
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	3.86E-03	5.55E-08	4.41E-07	5.56E-08
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	3.86E-03	5.55E-08	4.41E-07	5.56E-08

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	3.86E-03	5.55E-08	4.41E-07	5.56E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	3.86E-03	5.55E-08	4.41E-07	5.56E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	1.94E-03	2.78E-08	2.21E-07	2.78E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	1.94E-03	2.78E-08	2.21E-07	2.78E-08
1,2,3,7,8-Pentachlorodibenzofuran	57117416	1.94E-03	2.78E-08	2.21E-07	2.78E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	1.94E-03	2.78E-08	2.21E-07	2.78E-08
2,3,7,8-Tetrachlorodibenzofuran	51207319	1.94E-03	2.78E-08	2.21E-07	2.78E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	1.94E-03	2.78E-08	2.21E-07	2.78E-08
Formaldehyde	50000	3.56E+02	5.12E-03	4.07E-02	5.13E-03
Hexavalent Chromium	18540299	1.90E+00	2.73E-05	2.17E-04	2.73E-05
Arsenic	7440382	1.05E+01	1.51E-04	1.20E-03	1.51E-04
Lead	7439921	1.82E+01	2.62E-04	2.08E-03	2.62E-04
Nickel	7440020	3.06E+02	4.40E-03	3.49E-02	4.40E-03
Acenaphthene	83329	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Acenaphthylene	208968	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Anthracene	120127	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(a)anthracene	56553	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(a)pyrene	50328	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(b)fluoranthene	205992	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(g,h,I)perylene	191242	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(k)Fluoranthene	207089	1.12E+00	1.61E-05	1.27E-04	1.60E-05

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
Chrysene	218019	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Dibenz(a,h)anthracene	53703	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Fluoranthene	206440	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Fluorene	86737	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Indeno(1,2,3-cd)pyrene	193395	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Naphthalene	91203	6.90E+02	9.92E-03	7.87E-02	9.91E-03
Phenanthrene	85018	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Pyrene	129000	1.18E+00	1.69E-05	1.34E-04	1.69E-05
Ammonia	7664417	6.27E+03	9.02E-02	7.15E-01	9.01E-02
Copper	7440508	2.96E+01	4.26E-04	3.37E-03	4.25E-04
Manganese	7439965	1.01E+03	1.45E-02	1.15E-01	1.45E-02
Mercury	7439976	2.10E-01	3.02E-06	2.39E-05	3.01E-06
Selenium	7782492	1.35E+00	1.94E-05	1.54E-04	1.94E-05
Total PAHs (excluding Naphthalene)	1151	4.34E-05	6.24E-10	4.96E-09	6.25E-10
Acetaldehyde	75070	3.92E-04	5.64E-09	4.47E-08	5.63E-09
Acrolein	107028	3.48E-04	5.01E-09	3.97E-08	5.00E-09
Ethyl Benzene	100414	8.70E-04	1.25E-08	9.93E-08	1.25E-08
Xylene	1330207	2.52E-03	3.62E-08	2.88E-07	3.63E-08

1.3 Multi-pathway Substances and Pathways:

Multi-pathway substances are the chemicals or substances that can target human organs through multiple pathways. Not all chemicals in the emission inventory are multi-pathway substances. The list of multi-pathway substances and their target pathways can be found in Table 2. They are multi-pathway substances for the types of risk/hazard mentioned.

Table 2: Multi-Pathway Substances and Pathways

Substance	Type of Risk/ Hazard	INHAL	DERM	SOIL	MOTHER	VEG
Hexavalent Chromium	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Arsenic	Cancer, Chronic non-cancer	X	X	X	No	X
Lead	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(a)anthracene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(a)pyrene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(b)fluoranthene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(k)Fluoranthene	Cancer, Chronic non-cancer	X	X	X	X	X
Chrysene	Cancer, Chronic non-cancer	X	X	X	X	X
Dibenz(a,h)anthracene	Cancer, Chronic non-cancer	X	X	X	X	X
Indeno(1,2,3-cd)pyrene	Cancer, Chronic non-cancer	X	X	X	X	X
Total PAHs (excluding Naphthalene)	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Beryllium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Cadmium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	INHAL	DERM	SOIL	MOTHER	VEG
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Nickel	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Mercury	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Selenium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X

1.4 Overview of Dispersion Modeling:

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 is used to create plot files, which show the maximum 1-hr, 8-hr and average annual ground level concentration at each receptor. The Hotspots Analysis and Reporting Program Version 2 (HARP2) is the recommended program for the HRA study by SCAQMD. 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.

1.5 Summary of Dose- Response Assessment:

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.

Results for chronic non-cancer health impact and acute non-cancer health impact contributions by target organs are summarized in Appendix A, Tables A8, A9, A10, A11 and A12. Table 3 lists the organs targeted by each of the substances released for Acute Non-Cancer (ANC) and Chronic Non-Cancer (CNC) impact.

Table 3: Target Organ Systems by Substance for Non-Cancer Chronic Impacts

Substance	CV	CNS	IMMUN	KIDNEY	GI/V	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Methane	No	No	No	No	No	No	No	No	No	No	No	No	No
Hexane	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzene	No	No	X	No	No	X	No	No	No	No	No	X	No
Toluene	No	X	No	No	No	X	X	No	X	No	No	No	No
Benzyl Chloride	No	No	No	No	No	No	X	No	X	No	No	No	No
Beryllium	No	No	No	No	No	No	No	No	No	No	No	No	No
Cadmium	No	No	No	No	No	No	No	No	No	No	No	No	No
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
Formaldehyde	No	No	No	No	No	No	No	No	X	No	No	No	No
Hexavalent Chromium	No	No	No	No	No	No	No	No	No	No	No	No	No
Arsenic	X	X	No	No	No	X	No	No	No	No	No	No	X
Lead	No	No	No	No	No	No	No	No	No	No	No	No	No
Nickel	No	No	X	No	No	No	No	No	No	No	No	No	No
Acenaphthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Acenaphthylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(b)fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(g,h,I)perylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(k)Fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Chrysene	No	No	No	No	No	No	No	No	No	No	No	No	No
Dibenz(a,h)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Fluoranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluorene	No	No	No	No	No	No	No	No	No	No	No	No	No
Indeno(1,2,3-cd)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Naphthalene	No	No	No	No	No	No	No	No	No	No	No	No	No
Phenanthrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Ammonia	No	No	No	No	No	No	X	No	X	No	No	No	No
Copper	No	No	No	No	No	No	X	No	No	No	No	No	No
Manganese	No	No	No	No	No	No	No	No	No	No	No	No	No
Mercury	No	X	No	No	No	X	No	No	No	No	No	No	No
Selenium	No	No	No	No	No	No	No	No	No	No	No	No	No
Total PAHs (excluding Naphthalene)	No	No	No	No	No	No	No	No	No	No	No	No	No
Acetaldehyde	No	No	No	No	No	No	X	No	X	No	No	No	No
Acrolein	No	No	No	No	No	No	X	No	X	No	No	No	No
Ethyl Benzene	No	No	No	No	No	No	No	No	No	No	No	No	No
Xylene	No	X	No	No	No	No	X	No	X	No	No	No	No

Table 4: Target Organs Systems by Substance for Non-Cancer Acute Impacts

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Methane	No	No	No	No	No	No	No	No	No	No	No	No	No

Hexane	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzene	No	No	X	No	No	X	No	No	No	No	No	X	No
Toluene	No	X	No	No	No	X	X	No	X	No	No	No	No
Benzyl Chloride	No	No	No	No	No	No	X	No	X	No	No	No	No
Beryllium	No	No	No	No	No	No	No	No	No	No	No	No	No
Cadmium	No	No	No	No	No	No	No	No	No	No	No	No	No
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
Formaldehyde	No	No	No	No	No	No	No	No	X	No	No	No	No
Hexavalent Chromium	No	No	No	No	No	No	No	No	No	No	No	No	No
Arsenic	X	X	No	No	No	X	No	No	No	No	No	No	No
Lead	No	No	No	No	No	No	No	No	No	No	No	No	No
Nickel	No	No	X	No	No	No	No	No	No	No	No	No	No

Acenaphthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Acenaphthylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(b)fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(g,h,I)perylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(k)Fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Chrysene	No	No	No	No	No	No	No	No	No	No	No	No	No
Dibenz(a,h)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluoranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluorene	No	No	No	No	No	No	No	No	No	No	No	No	No
Indeno(1,2,3-cd)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Naphthalene	No	No	No	No	No	No	No	No	No	No	No	No	No
Phenanthrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Ammonia	No	No	No	No	No	No	X	No	X	No	No	No	No
Copper	No	No	No	No	No	No	X	No	No	No	No	No	No
Manganese	No	No	No	No	No	No	No	No	No	No	No	No	No
Mercury	No	X	No	No	No	X	No	No	No	No	No	No	No
Selenium	No	No	No	No	No	No	No	No	No	No	No	No	No
Total PAHs (excluding Naphthalene)	No	No	No	No	No	No	No	No	No	No	No	No	No
Acetaldehyde	No	No	No	No	No	No	X	No	X	No	No	No	No
Acrolein	No	No	No	No	No	No	X	No	X	No	No	No	No
Ethyl Benzene	No	No	No	No	No	No	No	No	No	No	No	No	No

Xylene	No	X	No	No	No	No	X	No	X	No	No	No	No

1.6 Summary of Results:

Risk prediction results were based on a study conducted with following specifications for MEIW, PMI, MEIR and cancer burden:

- MEIR/PMI: Potential cancer risk was based on Tier-1 analysis for 30-year exposure.
- MEIW: Potential cancer risk was based on Tier-1 analysis for 25-year exposure.
- Cancer Burden: Cancer burden calculation was based on the MEIR analysis assuming a 70-year exposure.

Table 5, Table 6, and Table 7 summarize the cancer risks and maximum acute and chronic non-cancer hazard indices for MEIR, MEIW, PMI. The tables include the location coordinates, risk sums and hazard indices.

Table 5: Point of Maximum Impact (PMI)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416500	3766300	284.3 At a Cartesian receptor	Not applicable
Chronic Hazard	416500	3766300	Not applicable	2.7 At a Cartesian receptor
Acute Hazard	416319	3766205	Not applicable	1.7 At a Fenceline receptor

Table 6: Maximum Exposed Individual Resident (MEIR)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416205.7	3766041	67.2 At a Cartesian receptor at the closest residence from the source.	Not applicable
Chronic Hazard	416205.7	3766041	Not applicable	0.64 At a Cartesian receptor at a closest residence from the source.
Acute Hazard	416251.5	3766005.4	Not applicable	0.22 At a Cartesian receptor at a closest residence from the source.

Table 7: Maximum Exposed Individual Worker (MEIW)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416500	3766300	8.74: At a Cartesian receptor	Not applicable
Chronic Hazard	416500	3766300	Not applicable	0.99: At a Cartesian receptor

Sensitive receptors were placed at locations where exposed population could be more susceptible to exposure to emitted pollutants. The receptors were placed to cover sensitive locations within 10 KM radius from the source.

Sensitive receptors include:

- Day care centers for children and adults
- Senior living/ assisted living centers and nursing homes
- Schools
- Public parks and playgrounds
- Open recreational centers like ballfields
- Hospitals and clinics

None of the sensitive receptors in the zone of impact are at or above the cancer risk of 25 in a million or at a non-cancer hazard index of one or above. Table 8 summarizes cancer risk and non-cancer hazard for sensitive receptors.

Table 8: Sensitive Receptor Risk for Cancer and Non-Cancer Risk

SENSITIVE Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416985	3767166	14.2	Not applicable
Chronic Hazard	416985	3767166	Not applicable	0.135
Acute Hazard	416985	3767166	Not applicable	0.046

The total potential multi-pathway cancer risk at the MEIR is 67.2 per million assuming individual is in the same location for 30 years. The pathways included in the analysis are: inhalation (INHAL), soil ingestion (SOIL), dermal absorption (DERM), and mother's milk (MOTHER), homegrown produce (VEG). Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodiabenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachloridibenzo-p-dioxin, arsenic and hexavalent chromium. Major pathways for these substances are mother's milk, soil and inhalation.

Table 9: Cancer Risk by Substance for MEIR

See Appendix A for this information.

The total potential multi-pathway cancer risk at MEIW is 8.74 in a million assuming individual is in the same location for 25 years. The pathways included in the analysis are: inhalation (INHAL), soil ingestion (SOIL) and dermal absorption (DERM). Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodiabenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachloridibenzo-p-dioxin, arsenic and hexavalent chromium. The major pathways for these substances are soil and dermal.

Table 10: Cancer Risk by Substance for MEIW

See Appendix A for this information.

A map of the Facility and surrounding area extended to a 10 miles radius with locations of the MEIR, MEIW and PMI for cancer risk is provided in Appendix B, Figure 5.

A map of 30-year exposure cancer risk zone of impact shows the 10, 25 and 100 in one million risk contour. The cancer burden is 6.11. This number is greater than 0.5, hence a map showing 1 in one million risk contour based on a 70-year exposure is also presented.

The following guidance was used to prepare this HRA report:

- Appendix C “Outline for the Health Risk Assessment Report”, a part of- South Coast Air Quality Management District- “Supplemental Guidelines for Preparing Risk Assessments and Risk Reduction Plan for the Air Toxics Hot Spots Information and Assessment Act”- November 4, 2016.

2.0 OVERVIEW OF HRA PROCESS

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

- Hazard Identification (see Section 3.0): identifies the specific hazards associated with the compounds included in the HRA.
- Dose-Response Assessment (see Section 4.0): identifies the specific cancer potency and non-cancer reference exposure levels to compare estimated concentrations.
- Exposure Assessment (see Section 5.0): estimates the ground level concentration for each substance at each receptor and each averaging time.
- Risk Characterization (see Section 6.0): 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 and PERIOD plot file for each source that contains dispersion factors. This function is part of the Exposure Assessment step of the HRA.

- Ground Level Concentration (GLC) calculation: Uses the emission inventory from the ATIR 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.

3.0 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 toxic air contaminants (TAC's) from one point source (SV001). Source SV001 is a boiler exhaust located at the UTM coordinate 416343mE, 3766232mN (NAD83 Zone 11N). Emissions are from the combustion of treated LFG. The following table lists substances emitted from the Facility that are listed on the ATIR. These substances have been evaluated for cancer risk and non-cancer acute and chronic health hazard. Included in Table 11 are the chemical names, CAS numbers and physical state of each substance.

Table 11: Substances emitted from the Facility

Substance	CAS	Physical state
Methane	74828	Vapor
Hexane	110543	Vapor
Benzene	71432	Vapor
Toluene	108883	Vapor
Benzyl Chloride	100447	Vapor
Beryllium	7440417	Solid
Cadmium	7440439	Solid
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	Solid
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	Solid
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	Solid
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	Solid
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	Solid
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	Solid
1,2,3,7,8-Pentachlorodibenzofuran	57117416	Solid

1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	Solid
2,3,7,8-Tetrachlorodibenzofuran	51207319	Solid
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	Solid
Formaldehyde	50000	Vapor
Hexavalent Chromium	18540299	Solid
Arsenic	7440382	Solid
Lead	7439921	Solid
Nickel	7440020	Solid
Acenaphthene	83329	Vapor
Acenaphthylene	208968	Vapor
Anthracene	120127	Solid
Benzo(a)anthracene	56553	Vapor
Benzo(a)pyrene	50328	Vapor
Benzo(b)fluoranthene	205992	Vapor
Benzo(g,h,I)perylene	191242	Vapor
Benzo(k)Fluoranthene	207089	Vapor
Chrysene	218019	Solid
Dibenz(a,h)anthracene	53703	Solid
Fluoranthene	206440	Solid
Fluorene	86737	Solid
Indeno(1,2,3-cd)pyrene	193395	Solid
Naphthalene	91203	Solid
Phenanthrene	85018	Solid
Pyrene	129000	Solid
Ammonia	7664417	Vapor

Copper	7440508	Solid
Manganese	7439965	Solid
Mercury	7439976	Solid
Selenium	7782492	Solid
Total PAHs (excluding Naphthalene)	1151	Vapor
Acetaldehyde	75070	Vapor
Acrolein	107028	Vapor
Ethyl Benzene	100414	Vapor
Xylene	1330207	Vapor

Some substances are multi-pathways substances which affect the human body through more than one pathway. Table 12 shows multi-pathway substances that can affect human organs through more than just inhalation including: dermal absorption (Dermal), soil ingestion (Soil), mother's milk (Mother) and homegrown produce (Veg). While evaluating risks for residents, all these pathways are assessed. However, for evaluating hazards and risk for an offsite worker, only inhalation, dermal absorption and soil ingestion should be assessed as per the guidance by SCAQMD.

Table 12: Multi-pathway substances and pathways

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
Hexavalent Chromium	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Arsenic	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Lead	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(a)anthracene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(a)pyrene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(b)fluoranthene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
Benzo(k)Fluoranthene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Chrysene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Dibenz(a,h)anthracene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Indeno(1,2,3-cd)pyrene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Total PAHs (excluding Naphthalene)	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Beryllium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Cadmium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
2,3,7,8-Tetrachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Nickel	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Mercury	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Selenium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X

4.0 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 PMI and 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 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.

5.0 EXPOSURE ASSESSMENT

5.1 Facility Description

The Facility, SCAQMD ID 113873, is located at 2210 South Azusa Avenue in West Covina, California, 91792. The Facility is an electrical generating plant consisting of: one emission source (boiler), a steam turbine, and a landfill gas (LFG) treatment system. There are several buildings on the property to house generation and maintenance equipment. A site location map showing source location and surrounding buildings is shown in Figure 2. Figure 1 and Figure 2 shows the property line.

The Facility is bounded on all sides by property owned by the Landfill. The Landfill is bounded by: Azusa Avenue and retail shopping centers and ballfields on the west; by residential properties to the north and south; and by vacant foothills to the east. The Facility is located at approximately 600 feet above mean sea level. The landfill to the northeast of the Facility rises to approximately 1,200 feet above mean sea level. The terrain to the immediate north, south and west are relatively flat and at about the same elevation as the Facility. The terrain to the immediate east to northeast consists of elevated terrain.

The Facility generates electricity by routing landfill gas (LFG) being generated at the Landfill to a boiler. The boiler generates steam which drives a turbine to generate electricity. The Landfill is not owned by MM West Covina LLC. The Facility is located completely within the Landfill property line. The Facility occupies approximately 1.2 acres which is delineated by the lease line.

5.2 Emission Inventory

Table 1: “Air Toxics Emission Inventory Table” contains a complete list of emitted substances and emission rates expressed in Annual (lb/yr), Annual (g/s), 1-Hour Max (lb/hr) and 1-Hour Max (g/s) provided by MM West Covina for the Facility.

- Source: SV001, Boiler Stack
- Source location: 416343 (m)E, 3766232(m)N
- Source base elevation: 581.59 ft
- Source height: 45 feet (provided by MM West Covina LLC)
- Source dimensions: 3.96 ft inside diameter (provided by MM West Covina LLC)
- Stack exit gas velocity: 63.003 ft/s
- Stack gas volumetric flow rate: 46558 ACFM (from 2006 HRA)
- Stack gas exit temperature: 520 F (from stack test conducted on October 3, 2017)
- Number of operating hours per day : 24
- Number of operating hours per year: 8760
- Number of operating days per week: 7
- Number of operating weeks per year: 52

Emission inventory method includes estimated emissions. Emission rates have already been reported in Table 1 in the Executive Summary section.

5.3 Air Dispersion

Although HARP2 can run air dispersion modeling, HARP2 is also capable of importing plot files using air dispersion modeling software such as AERMOD. For this HRA study, plot files were generated using AERMOD and imported into HARP2 for calculating GLCs.

5.3.1 Point Source

The Facility has only one source, SV001, which is evaluated for emissions. The source parameters are section 5.2 above.

5.3.2 Receptors

For this HRA study, four types of receptors were used. The total receptor grid was created to cover the area of 50,000 (m) x 50,000 (m), centered approximately on SV001, but the entire receptor grid was reduced to the shape that would encompass 1 in a million isopleth (70 year exposure) retaining 62,556 receptors with maximum coverage of 43,500 (m).

- Cartesian Grid: Cartesian grid receptors were centered approximately on SV001 and adjusted so that receptors end in hundreds (e.g. 100, 200). The receptors were placed 100 meters apart out to a distance of 6600 meters then at 200 meter spacing out to 10,000 meters and finally at 1000 meter spacing out to the zone of impact. In addition, SCAQMD generated a “fine” receptor grid consisting of 26 receptors near the MEIR to refine the MEIR risk.
- 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.
- Sensitive Receptors: Sensitive receptors are placed where the population is potentially more susceptible to adverse effects from emitted pollutants. Some of these locations are hospitals, day care centers, schools and senior living.
- Fenceline Receptors: Receptors are placed on the lease line of the facility. SCAQMD has guidance on spacing of these receptors as mentioned in 3.11.4 “Receptor Grid” in SCAQMD Supplemental Guidelines. Adhering to that guidance, the receptors were placed 20 meters apart.

The zone of impact extends approximately 41 km to the northeast, 34 km to the southwest, 15 km to the northwest and 11 km to the southeast.

Dispersion from the Facility was modeled using the latest version of AERMOD.

Parameters used in AERMOD are summarized in Table 13.

Table 13: Model Options and Parameters

Parameter	Value/Notes
Model Versions	AERMOD = 18081; AERMAP=18081; BPIP=04274
Model Options	Default, Concentration
Averaging Times	1-hr, 8-hr, PERIOD
Dispersion Coefficient	Urban option used.

Parameter	Value/Notes
Point Source	Emission Rate = 1 g/s; Height = 45 ft; Temperature = 544K, Velocity = 19.2 m/s; Diameter = 3.96 ft. Emission rate is used to generate dispersion factors; height and diameter provided by MM West Covina LLC; temperature from recent stack test; velocity from 2006 HRA.
Downwash	Numerous buildings are included in the BPIP model to estimate downwash. Building data obtained from 2006 HRA and from Google Earth.
Urban Group	ALL source group assigned to the group using a population of 12,828,837 for the Los Angeles Mean Statistical Area (2010 census).
Receptors	Ambient Air Boundary: Facility lease line used Sensitive Receptors: Included for suggested receptors Population Receptors: Included for the zone of impact Grid Receptors: Included with 100 meter spacing out to encompass the 10 in a million risk contour and at 1,000 meter spacing from that point out to 43.5 km. Fine Receptors: Consists of 26 receptors located near the MEIR to further refine the risk.
Elevations	All point source, building, and receptor elevations assigned from 1 arc second terrain data downloaded from the National Elevation Dataset (NED). AERMAP was used to assign elevations.
MET Data	Azusa MET data obtained from SCAQMD used for this analysis. Justification is that it is the closest MET station (~6.9 miles from the Facility). The MET data includes the years 2012-2016.

5.4 Ground Level Concentration

The HARP2 software multiplies the ATIR 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.

6.0 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:

6.1 Risk Analysis

HARP2 compares the GLCs to established cancer, chronic, and acute risk thresholds to estimate risk. Table 14 provides risk scenario parameters used in HARP2.

Table 14: Risk Scenario Parameters for HARP2

Risk Type	Receptor Type	Exposure Duration	Method	Pathways
Cancer PMI and MEIR	Individual Resident	30 year	RMP using Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Cancer MEIW	Worker	25 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil Deposition rate = 0.02 m/s
Cancer Burden	Individual Resident	70 year	RMP using Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Chronic PMI and MEIR	Individual Resident	30 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Chronic MEIW	Worker	25 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil Deposition rate = 0.02 m/s
Chronic 8 hour	Individual Resident	30 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Acute	Automatic	Automatic	OEHHA Derived Method	Inhalation

6.2 Receptors

Receptors are the points where the model estimates concentration due to dispersion. There are different types of receptors that are used in this model. See Section 5.3.2 for receptor details.

6.3 Site/Route Dependent Pathways

Site/ Route dependent pathways are the pathways that indirectly introduce the chemicals to human body. These pathways include:

- Water: The water pathway may be evaluated if a standing water body is contaminated by facility emissions and is used as a source for human drinking water.
- Fish: The fish pathway calculations assume that pollutants deposited into the water remain suspended or dissolved in the water column and are available for bioaccumulation in fish. The fish, if caught for human consumption, acts as a site/route dependent pathway.
- Pasture: The pollutants deposit in pasture, consumed by cattle. If the meat of this cattle is consumed by humans, this acts as a site/route dependent pathway.

The site/route dependent pathways were evaluated for of pollutants considered in this HRA. Appendix A, Table A13 shows these pollutant concentrations at MEIR.

6.4 Cancer Risk Estimates

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 5, Table 6, Table 7, and Table 8. Cancer risk contribution by substance can be found in Appendix A, Tables A1, A2 and A3. Since there is only one source of interest on this Facility, there is no separate table for the cancer risk by source.

6.4.1 MEIR Cancer Risk:

The MEIR Cancer Risk is predicted to be 67.2 per million at UTM coordinate 416205.7mE, 3766041mN which corresponds to a Cartesian grid receptor located at the nearest residence. This risk assumes that the resident is present/residing at the location for 30 years continuously. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. Major pathways for these substances are mother's milk, soil ingestion and inhalation.

6.4.2 MEIW Cancer Risk:

The MEIW Cancer Risk is predicted to be 8.74 per million at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes that the worker is employed at the location of the receptor for 25 years. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. The major pathways for these substances are soil ingestion and dermal.

6.4.3 PMI Cancer Risk:

The PMI Cancer Risk is predicted to be 284.3 per million at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes 30-years of continuous exposure. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. Major pathways for these substances are mother's milk, soil ingestion and inhalation.

6.4.4 Sensitive Receptors Cancer Risk:

For the sensitive receptors that were placed around the Facility, the highest cancer risk was predicted to be 14.2 per million at the UTM coordinate of 416985mE and 3767166mN.

6.5 Chronic, Non-Cancer Risk Estimates:

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 5, Table 6, Table 7, and Table 8.. Since there is only one source of interest at this Facility, there is no separate table for the cancer risk by source.

6.5.1 MEIR Chronic, Non-Cancer Risk:

The MEIR chronic, non-cancer risk is predicted to be 0.64 at UTM coordinate 416205.7 mE, 3766041 mN which corresponds to a Cartesian grid receptor at the nearest residence. This risk assumes that the resident is present/residing at the location for 30 years continuously. Over half of the risk is due to Methane and Ammonia. Major contributors of the remaining risk are Manganese, Hexane and Naphthalene. The pathway for maximum exposure and contribution is Inhalation.

6.5.2 MEIW Chronic, Non-Cancer Risk:

The MEIR chronic, non-cancer risk is predicted to be 0.99 at UTM coordinate 416500mE, 3766300mN which corresponds to a fenceline receptor. This risk assumes that the worker is employed at the location of the receptor for 25 years. Over half of the risk is from Ammonia. Major contributors of the remaining risk are Methane, Manganese and Hexane. The pathway for maximum exposure and contribution is Inhalation.

6.5.3 PMI Chronic, Non-Cancer Risk:

The PMI chronic, non-cancer risk is predicted to be 2.7 at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes 30-years of continuous exposure. Over half of the risk is from Methane and Ammonia. Major contributors of the remaining risk are Manganese, Hexane and Naphthalene. The pathway for maximum exposure and contribution is Inhalation.

6.5.4 Sensitive Receptors Chronic, Non-Cancer Risk:

Chronic, non-cancer risk is predicted to be below 0.15 HI for sensitive receptors included in this HRA. Over half of the risk is from Ammonia. The pathway for maximum exposure and contribution is inhalation.

6.6 Acute, Non-Cancer Risk Estimates:

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. The highest acute hazard index is predicted to be 1.70 at UTM coordinate 416319mE, 3766205mN which corresponds to a fence line receptor. Most of the risk is from Nickel. The pathway for maximum exposure and contribution is inhalation.

The chronic hazard estimates for PMI, MEIR and sensitive receptors are listed in Table 5, Table 6, and Table 8. Since there is only one source of interest at this Facility, there is no separate table for the cancer risk by source.

6.7 Estimates of Population Exposure.

As defined in SCAQMD Rule 1402, cancer burden is the “estimated increase in the occurrence of cancer cases in a population subject to a Maximum Individual Cancer Risk of greater than or equal to one in one million (1×10^{-6}) resulting from exposure to toxic air contaminants.”

Cancer burden is calculated with the following equation as given in the question # 5 of Summary Table found in Attachment A to Appendix C for HRA SCAQMD AB2588 and Rule 1402 Supplemental Guidelines.

Cancer Burden = Cancer Risk X No. of People Exposed to Specific Cancer Risk

With current predicted results for the Facility, estimated cancer burden for this impact zone is 6.11. The number of people estimated to be exposed to a cancer risk of more than 1 in a million is 2,736,887.

6.8 Maps

Appendix B contains the required maps/figures. These maps are prepared to reflect results from the HRA.

- Figure 1, “Site Vicinity Map”: This map shows the site location, and surrounding area.
- Figure 2, “Plot Plan”: This map shows the Facility property boundary, and location of the emission sources within the Facility that are evaluated for this HRA.
- Figure 3, “Sensitive Receptors”: This map shows the locations of the sensitive receptors on the map within the zone of impact around the emission source. Sensitive receptors were placed at schools, day care centers, hospitals, playgrounds/parks and elderly care centers, where the occupants could be more susceptible to the potential adverse effects due to exposure to pollutants.
- Figure 4, “Population Receptors”: This map shows the locations of the population receptors on the map within the zone of impact around the emission source. Population receptors and their locations were taken from the HARP database.
- Figure 5, “Locations of MEIR, MEIW, and PMI for Cancer Risk”: This map shows locations of the receptors that are at the maximum cancer risk for a resident, a worker and for the maximum impact.
- Figure 6, “Locations of MEIR, MEIW and PMI for Chronic Hazard Risk”: This map shows locations of the receptors that are at the maximum chronic, non-cancer risk for a resident, a worker and for the maximum impact.
- Figure 7, “Locations of MEIR, MEIW and PMI for Acute Hazard Risk”: This map shows locations of the receptors that are at the maximum acute, non-cancer risk for a resident, a worker and for the maximum impact.
- Figure 8, “Cancer Risk Contours 30 yr”: This map shows the property boundary, and cancer risk contours for receptors exposed to a cancer risk of more than or equal to 1,10, 25 and 100-in-a-million. This assumes residential exposure for a 30-year period.
- Figure 9, “Chronic Hazard Index Contours (Residential Exposure)”: This map shows property boundary, and chronic, non-cancer risk contours for residential exposure for receptors exposed to a hazard index of 0.5, 1, 3, 5.

- Figure 10, “Acute Hazard Index Contours (Residential Exposure)”: This map shows property boundary, and acute hazard risk contours for the residential exposure for the scenarios for 0.5, 1, 3, 5 in a million risk thresholds.
- Figure 11, ““Cancer Risk Contours 70 yr”: This map shows the property boundary, and cancer risk contours for receptors exposed to a cancer risk of more than or equal to 1 in-a-million. This assumes residential exposure for a 70-year period.

7.0 REFERENCES

- SCAQMD. Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act – September 2018
- California Office of Environmental Hazard Assessment, Air Toxics Hotspots Program Risk Assessment Guidelines - February 2015
- California Environmental Protection Agency- User Manual for the Hotspots Analysis and Reporting Programs Air Dispersion Modeling and Risk Assessment Tool, Version 2

Signature Page

Golder Associates Inc.

Nena Damlé
Staff Engineer

Ryan Birkenholz
Associate and Senior Consultant

ND/RB/ND

APPENDIX A

Tables

Table A1: Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	1.69E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	6.83E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	3.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	4.10E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	1.62E-09	2.12E-08	1.20E-09	1.64E-08	1.42E-09
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	1.62E-09	2.12E-08	1.20E-09	3.38E-08	1.42E-09
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	5.41E-08	7.06E-07	4.00E-08	5.48E-07	4.74E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	5.41E-08	7.06E-07	4.00E-08	1.13E-06	4.74E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	2.72E-07	3.55E-06	2.01E-07	2.75E-06	2.38E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	2.72E-07	3.55E-06	2.01E-07	5.66E-06	2.38E-07
1,2,3,7,8-Pentachlorodibenzofuran	57117416	8.16E-08	1.07E-06	6.03E-08	8.26E-07	7.15E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	2.72E-06	3.55E-05	2.01E-06	5.66E-05	2.38E-06
2,3,7,8-Tetrachlorodibenzofuran	51207319	2.72E-07	3.55E-06	2.01E-07	2.75E-06	2.38E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	2.72E-06	3.55E-05	2.01E-06	5.66E-05	2.38E-06
Formaldehyde	50000	1.15E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	1.48E-05	2.62E-07	1.00E-08	0.00E+00	8.58E-06
Arsenic	7440382	1.36E-06	1.03E-05	5.00E-07	0.00E+00	6.61E-06
Lead	7439921	8.26E-09	1.01E-07	2.45E-09	1.83E-09	2.02E-08
Nickel	7440020	4.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	4.68E-09	1.74E-08	4.34E-09	4.15E-08	8.54E-08
Benzo(a)pyrene	50328	4.68E-08	1.74E-07	4.34E-08	4.15E-07	8.54E-07
Benzo(b)fluranthene	205992	4.68E-09	1.74E-08	4.34E-09	4.15E-08	8.54E-08
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	4.68E-09	1.74E-08	4.34E-09	4.15E-08	8.54E-08

Table A1: Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	4.68E-10	1.74E-09	4.34E-10	4.15E-09	8.54E-09
Dibenz(a,h)anthracene	53703	4.92E-08	5.96E-08	1.48E-08	1.42E-07	2.92E-07
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	4.68E-09	1.74E-08	4.34E-09	4.15E-08	8.54E-08
Naphthalene	91203	1.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	1.83E-12	6.80E-12	1.70E-12	1.62E-11	3.33E-11
Acetaldehyde	75070	5.99E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.16E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A2 : Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	3.99E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	1.62E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	8.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	9.69E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	3.84E-10	5.01E-09	2.84E-10	3.88E-09	3.36E-10
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	3.84E-10	5.01E-09	2.84E-10	7.98E-09	3.36E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	1.28E-08	1.67E-07	9.46E-09	1.29E-07	1.12E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.28E-08	1.67E-07	9.46E-09	2.66E-07	1.12E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	6.43E-08	8.39E-07	4.75E-08	6.51E-07	5.63E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	6.43E-08	8.39E-07	4.75E-08	1.34E-06	5.63E-08
1,2,3,7,8-Pentachlorodibenzofuran	57117416	1.93E-08	2.52E-07	1.43E-08	1.95E-07	1.69E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	6.43E-07	8.39E-06	4.75E-07	1.34E-05	5.63E-07
2,3,7,8-Tetrachlorodibenzofuran	51207319	6.43E-08	8.39E-07	4.75E-08	6.51E-07	5.63E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	6.43E-07	8.39E-06	4.75E-07	1.34E-05	5.63E-07
Formaldehyde	50000	2.71E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	3.51E-06	6.19E-08	2.37E-09	0.00E+00	2.03E-06
Arsenic	7440382	3.22E-07	2.43E-06	1.18E-07	0.00E+00	1.56E-06
Lead	7439921	1.95E-09	2.38E-08	5.80E-10	4.33E-10	4.79E-09
Nickel	7440020	1.01E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	1.11E-09	4.12E-09	1.03E-09	9.81E-09	2.02E-08
Benzo(a)pyrene	50328	1.11E-08	4.12E-08	1.03E-08	9.81E-08	2.02E-07
Benzo(b)fluranthene	205992	1.11E-09	4.12E-09	1.03E-09	9.81E-09	2.02E-08
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	1.11E-09	4.12E-09	1.03E-09	9.81E-09	2.02E-08

Table A2 : Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	1.11E-10	4.12E-10	1.03E-10	9.81E-10	2.02E-09
Dibenz(a,h)anthracene	53703	1.16E-08	1.41E-08	3.51E-09	3.35E-08	6.90E-08
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	9.35E-10	3.48E-09	8.68E-10	8.28E-09	1.71E-08
Naphthalene	91203	2.50E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	3.65E-13	1.36E-12	3.39E-13	3.23E-12	6.66E-12
Acetaldehyde	75070	1.20E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	2.31E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A3: Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
Methane	74828	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	1.40E-08	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.68E-08	0.00E+00	0.00E+00
Beryllium	7440417	3.13E-08	0.00E+00	0.00E+00
Cadmium	7440439	3.41E-07	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	1.41E-10	8.94E-10	4.16E-10
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	1.41E-10	8.94E-10	4.16E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	4.72E-09	2.98E-08	1.39E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	4.72E-09	2.98E-08	1.39E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	2.37E-08	1.50E-07	6.97E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	2.37E-08	1.50E-07	6.97E-08
1,2,3,7,8-Pentachlorodibenzofuran	57117416	7.11E-09	4.50E-08	2.09E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	2.37E-07	1.50E-06	6.97E-07
2,3,7,8-Tetrachlorodibenzofuran	51207319	2.37E-08	1.50E-07	6.97E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	2.37E-07	1.50E-06	6.97E-07
Formaldehyde	50000	9.52E-09	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	1.23E-06	2.61E-08	1.81E-09
Arsenic	7440382	1.19E-07	4.33E-07	1.73E-07
Lead	7439921	9.73E-10	4.25E-09	4.42E-10
Nickel	7440020	3.54E-07	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	4.08E-10	1.74E-09	1.51E-09
Benzo(a)pyrene	50328	4.08E-09	1.74E-08	1.51E-08
Benzo(b)fluranthene	205992	4.08E-10	1.74E-09	1.51E-09
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	4.08E-10	1.74E-09	1.51E-09
Chrysene	218019	4.08E-11	1.74E-10	1.51E-10
Dibenz(a,h)anthracene	53703	5.80E-09	5.94E-09	2.68E-09
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	4.08E-10	1.74E-09	1.51E-09
Naphthalene	91203	1.04E-07	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	1.59E-13	6.78E-13	5.88E-13
Acetaldehyde	75070	4.98E-15	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	9.62E-15	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00

Table A4: Chronic, Non-Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	1.05E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	2.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	2.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	1.39E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.94E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	6.61E-05	5.98E-07	2.17E-08	0.00E+00	1.81E-07
Cadmium	7440439	4.04E-04	3.65E-06	8.82E-09	0.00E+00	6.19E-06
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	8.72E-08	1.71E-10	1.44E-11	3.27E-09	1.93E-11
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	8.72E-08	1.71E-10	1.44E-11	6.72E-09	1.93E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	8.72E-08	1.71E-10	1.44E-11	3.27E-09	1.93E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	8.72E-08	1.71E-10	1.44E-11	6.72E-09	1.93E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	4.38E-08	8.57E-11	7.23E-12	1.64E-09	9.71E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	4.38E-08	8.57E-11	7.23E-12	3.38E-09	9.71E-12
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.38E-08	8.57E-11	7.23E-12	1.64E-09	9.71E-12
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	4.38E-08	8.57E-11	7.23E-12	3.38E-09	9.71E-12
2,3,7,8-Tetrachlorodibenzofuran	51207319	4.38E-08	8.57E-11	7.23E-12	1.64E-09	9.71E-12
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	4.38E-08	8.57E-11	7.23E-12	3.38E-09	9.71E-12
Formaldehyde	50000	8.06E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	4.30E-05	3.88E-07	9.39E-09	0.00E+00	1.01E-05
Arsenic	7440382	2.38E-04	2.15E-06	1.56E-07	0.00E+00	2.52E-06
Lead	7439921	4.12E-04	3.72E-06	1.35E-07	2.19E-06	4.34E-07
Nickel	7440020	6.91E-03	6.24E-05	1.51E-06	0.00E+00	3.74E-05
Acenaphthene	83329	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Benzo(a)pyrene	50328	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Benzo(b)fluranthene	205992	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Benzo(g,h,I)perylene	191242	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08

Table A4: Chronic, Non-Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Dibenz(a,h)anthracene	53703	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Fluoranthene	206440	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Naphthalene	91203	1.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	2.65E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	1.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	6.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	2.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	4.73E-06	4.28E-08	2.07E-09	0.00E+00	2.74E-08
Selenium	7782492	3.05E-05	2.76E-07	9.99E-09	0.00E+00	1.20E-06
Total PAHs (excluding Naphthalene)	1151	9.81E-10	1.26E-13	6.60E-14	1.16E-11	1.56E-12
Acetaldehyde	75070	8.85E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	7.86E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.97E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	5.70E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A5 :Chronic, Non-Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	2.48E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	5.15E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	5.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	3.29E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	1.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	1.56E-05	1.41E-07	5.12E-09	0.00E+00	4.29E-08
Cadmium	7440439	9.55E-05	8.63E-07	2.09E-09	0.00E+00	1.46E-06
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	2.06E-08	4.03E-11	3.40E-12	7.73E-10	4.57E-12
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	2.06E-08	4.03E-11	3.40E-12	1.59E-09	4.57E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	2.06E-08	4.03E-11	3.40E-12	7.73E-10	4.57E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	2.06E-08	4.03E-11	3.40E-12	1.59E-09	4.57E-12
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	1.04E-08	2.03E-11	1.71E-12	3.88E-10	2.30E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	1.04E-08	2.03E-11	1.71E-12	7.98E-10	2.30E-12
1,2,3,7,8-Pentachlorodibenzofuran	57117416	1.04E-08	2.03E-11	1.71E-12	3.88E-10	2.30E-12
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	1.04E-08	2.03E-11	1.71E-12	7.98E-10	2.30E-12
2,3,7,8-Tetrachlorodibenzofuran	51207319	1.04E-08	2.03E-11	1.71E-12	3.88E-10	2.30E-12
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	1.04E-08	2.03E-11	1.71E-12	7.98E-10	2.30E-12
Formaldehyde	50000	1.91E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	1.02E-05	9.18E-08	2.22E-09	0.00E+00	2.38E-06
Arsenic	7440382	5.62E-05	5.08E-07	3.68E-08	0.00E+00	5.96E-07
Lead	7439921	9.74E-05	8.80E-07	3.19E-08	5.19E-07	1.03E-07
Nickel	7440020	1.63E-03	1.48E-05	3.57E-07	0.00E+00	8.84E-06
Acenaphthene	83329	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09
Benzo(a)pyrene	50328	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09
Benzo(b)fluranthene	205992	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09
Benzo(g,h,I)perylene	191242	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09

Table A5 :Chronic, Non-Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09
Dibenz(a,h)anthracene	53703	5.94E-06	7.63E-10	4.00E-10	7.06E-08	9.45E-09
Fluoranthene	206440	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	5.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	2.51E-05	3.23E-09	1.69E-09	2.99E-07	4.00E-08
Naphthalene	91203	1.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	2.65E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	1.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	6.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	2.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	4.73E-06	4.28E-08	2.07E-09	0.00E+00	2.74E-08
Selenium	7782492	3.05E-05	2.76E-07	9.99E-09	0.00E+00	1.20E-06
Total PAHs (excluding Naphthalene)	1151	9.81E-10	1.26E-13	6.60E-14	1.16E-11	1.56E-12
Acetaldehyde	75070	8.85E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	7.86E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.97E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	5.70E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A6: Chronic, Non-Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
Methane	74828	1.05E-01	0.00E+00	0.00E+00
Hexane	110543	2.18E-02	0.00E+00	0.00E+00
Benzene	71432	2.49E-03	0.00E+00	0.00E+00
Toluene	108883	1.39E-04	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.94E-03	0.00E+00	0.00E+00
Beryllium	7440417	6.61E-05	3.29E-07	4.69E-08
Cadmium	7440439	4.04E-04	2.01E-06	1.91E-08
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	8.72E-08	9.38E-11	3.11E-11
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	8.72E-08	9.38E-11	3.11E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	8.72E-08	9.38E-11	3.11E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	8.72E-08	9.38E-11	3.11E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	4.38E-08	4.71E-11	1.57E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	4.38E-08	4.71E-11	1.57E-11
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.38E-08	4.71E-11	1.57E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	4.38E-08	4.71E-11	1.57E-11
2,3,7,8-Tetrachlorodibenzofuran	51207319	4.38E-08	4.71E-11	1.57E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	4.38E-08	4.71E-11	1.57E-11
Formaldehyde	50000	8.06E-03	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	4.30E-05	2.13E-07	2.03E-08
Arsenic	7440382	2.38E-04	1.18E-06	3.37E-07
Lead	7439921	4.12E-04	2.05E-06	2.92E-07
Nickel	7440020	6.91E-03	3.43E-05	3.27E-06
Acenaphthene	83329	2.51E-05	0.00E+00	0.00E+00
Acenaphthylene	208968	2.51E-05	0.00E+00	0.00E+00
Anthracene	120127	2.51E-05	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	2.51E-05	5.92E-09	3.67E-09
Benzo(a)pyrene	50328	2.51E-05	5.92E-09	3.67E-09
Benzo(b)fluranthene	205992	2.51E-05	5.92E-09	3.67E-09
Benzo(g,h,I)perylene	191242	2.51E-05	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	2.51E-05	5.92E-09	3.67E-09
Chrysene	218019	2.51E-05	5.92E-09	3.67E-09
Dibenz(a,h)anthracene	53703	2.51E-05	5.92E-09	3.67E-09
Fluoranthene	206440	2.51E-05	0.00E+00	0.00E+00
Fluorene	86737	2.51E-05	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	2.51E-05	5.92E-09	3.67E-09
Naphthalene	91203	1.54E-02	0.00E+00	0.00E+00
Phenanthrene	85018	2.51E-05	0.00E+00	0.00E+00
Pyrene	129000	2.65E-05	0.00E+00	0.00E+00
Ammonia	7664417	1.42E-01	0.00E+00	0.00E+00
Copper	7440508	6.67E-04	0.00E+00	0.00E+00
Manganese	7439965	2.28E-02	0.00E+00	0.00E+00
Mercury	7439976	4.73E-06	2.35E-08	4.48E-09
Selenium	7782492	3.05E-05	1.51E-07	2.16E-08
Total PAHs (excluding Naphthalene)	1151	9.81E-10	2.31E-13	1.43E-13
Acetaldehyde	75070	8.85E-09	0.00E+00	0.00E+00
Acrolein	107028	7.86E-09	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.97E-08	0.00E+00	0.00E+00
Xylene	1330207	5.70E-08	0.00E+00	0.00E+00

Table A7: Acute, Non-Cancer Risk Contribution by Substance

Compound	CAS	Hazard Index
Methane	74828	0.00E+00
Hexane	110543	0.00E+00
Benzene	71432	1.36E-02
Toluene	108883	7.38E-07
Benzyl Chloride	100447	2.43E-03
Beryllium	7440417	0.00E+00
Cadmium	7440439	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00
Formaldehyde	50000	7.19E-03
Hexavalent Chromium	18540299	0.00E+00
Arsenic	7440382	1.75E-01
Lead	7439921	0.00E+00
Nickel	7440020	1.70E+00
Acenaphthene	83329	0.00E+00
Acenaphthylene	208968	0.00E+00
Anthracene	120127	0.00E+00
Benzo(a)anthracene	56553	0.00E+00
Benzo(a)pyrene	50328	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00
Chrysene	218019	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00
Fluoranthene	206440	0.00E+00
Fluorene	86737	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00
Naphthalene	91203	0.00E+00
Phenanthrene	85018	0.00E+00
Pyrene	129000	0.00E+00
Ammonia	7664417	4.34E-03
Copper	7440508	3.28E-04
Manganese	7439965	0.00E+00
Mercury	7439976	7.74E-04
Selenium	7782492	0.00E+00

Table A7: Acute, Non-Cancer Risk Contribution by Substance

Compound	CAS	Hazard Index
Total PAHs (excluding Naphthalene)	1151	0.00E+00
Acetaldehyde	75070	1.85E-09
Acrolein	107028	3.09E-07
Ethyl Benzene	100414	0.00E+00
Xylene	1330207	3.82E-10

Table A8 : Chronic, Non-Cancer Risk Contribution by Organs for PMI

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	3.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	4.63E-07	0.00E+00	0.00E+00	0.00E+00	4.63E-07	4.63E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	9.45E-03	0.00E+00	4.00E-04	0.00E+00	9.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	3.99E-02	0.00E+00	0.00E+00	2.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-04	1.06E-04	1.06E-04	0.00E+00	0.00E+00	0.00E+00	1.06E-04	1.06E-04	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-04	2.10E-04	2.10E-04	0.00E+00	0.00E+00	0.00E+00	2.10E-04	2.10E-04	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-03	3.49E-03	3.49E-03	0.00E+00	0.00E+00	0.00E+00	3.49E-03	3.49E-03	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.94E-03	6.94E-03	6.94E-03	0.00E+00	0.00E+00	0.00E+00	6.94E-03	6.94E-03	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-02	3.49E-02	3.49E-02	0.00E+00	0.00E+00	0.00E+00	3.49E-02	3.49E-02	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-03	5.32E-03	5.32E-03	0.00E+00	0.00E+00	0.00E+00	5.32E-03	5.32E-03	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	3.49E-01	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	3.49E-01	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.95E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.23E-04	0.00E+00	0.00E+00
Arsenic	7440382	1.39E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+00	1.39E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-03	4.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-01	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	2.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	6.09E-04	0.00E+00	6.09E-04	0.00E+00	6.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	2.98E-04	2.98E-04	0.00E+00	0.00E+00	2.98E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.32E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	9.83E-12	9.83E-12	9.83E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.83E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.15E-11	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A9: Chronic, Non-Cancer Risk Contribution by Target Organs for MEIR

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	3.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	4.63E-07	0.00E+00	0.00E+00	0.00E+00	4.63E-07	4.63E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	9.45E-03	0.00E+00	4.00E-04	0.00E+00	9.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	3.99E-02	0.00E+00	0.00E+00	2.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-04	1.06E-04	1.06E-04	0.00E+00	0.00E+00	0.00E+00	1.06E-04	1.06E-04	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-04	2.10E-04	2.10E-04	0.00E+00	0.00E+00	0.00E+00	2.10E-04	2.10E-04	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-03	3.49E-03	3.49E-03	0.00E+00	0.00E+00	0.00E+00	3.49E-03	3.49E-03	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.94E-03	6.94E-03	6.94E-03	0.00E+00	0.00E+00	0.00E+00	6.94E-03	6.94E-03	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-02	3.49E-02	3.49E-02	0.00E+00	0.00E+00	0.00E+00	3.49E-02	3.49E-02	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-03	5.32E-03	5.32E-03	0.00E+00	0.00E+00	0.00E+00	5.32E-03	5.32E-03	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	3.49E-01	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.76E-02	1.76E-02	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	3.49E-01	0.00E+00	0.00E+00	0.00E+00	3.49E-01	3.49E-01	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.95E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.23E-04	0.00E+00	0.00E+00
Arsenic	7440382	1.39E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+00	1.39E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-03	4.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-01	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	2.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	6.09E-04	0.00E+00	6.09E-04	0.00E+00	6.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	2.98E-04	2.98E-04	0.00E+00	0.00E+00	2.98E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.32E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	9.83E-12	9.83E-12	9.83E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.83E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.15E-11	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A10: Chronic, Non-Cancer Risk Contribution by Target Organs for MEIW

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	3.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	4.63E-07	0.00E+00	0.00E+00	0.00E+00	4.63E-07	4.63E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	9.45E-03	0.00E+00	1.88E-04	0.00E+00	9.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	2.42E-02	0.00E+00	0.00E+00	2.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.95E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-05	0.00E+00	0.00E+00
Arsenic	7440382	4.49E-01	4.49E-01	0.00E+00	0.00E+00	0.00E+00	4.49E-01	4.49E-01	4.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03	4.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-01	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	2.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	3.33E-04	0.00E+00	3.33E-04	0.00E+00	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	3.61E-05	3.61E-05	0.00E+00	0.00E+00	3.61E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.32E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	9.83E-12	9.83E-12	9.83E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.83E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.15E-11	0.00E+00	8.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A11: Acute, Non-Cancer Risk Contribution by Target Organs- PMI

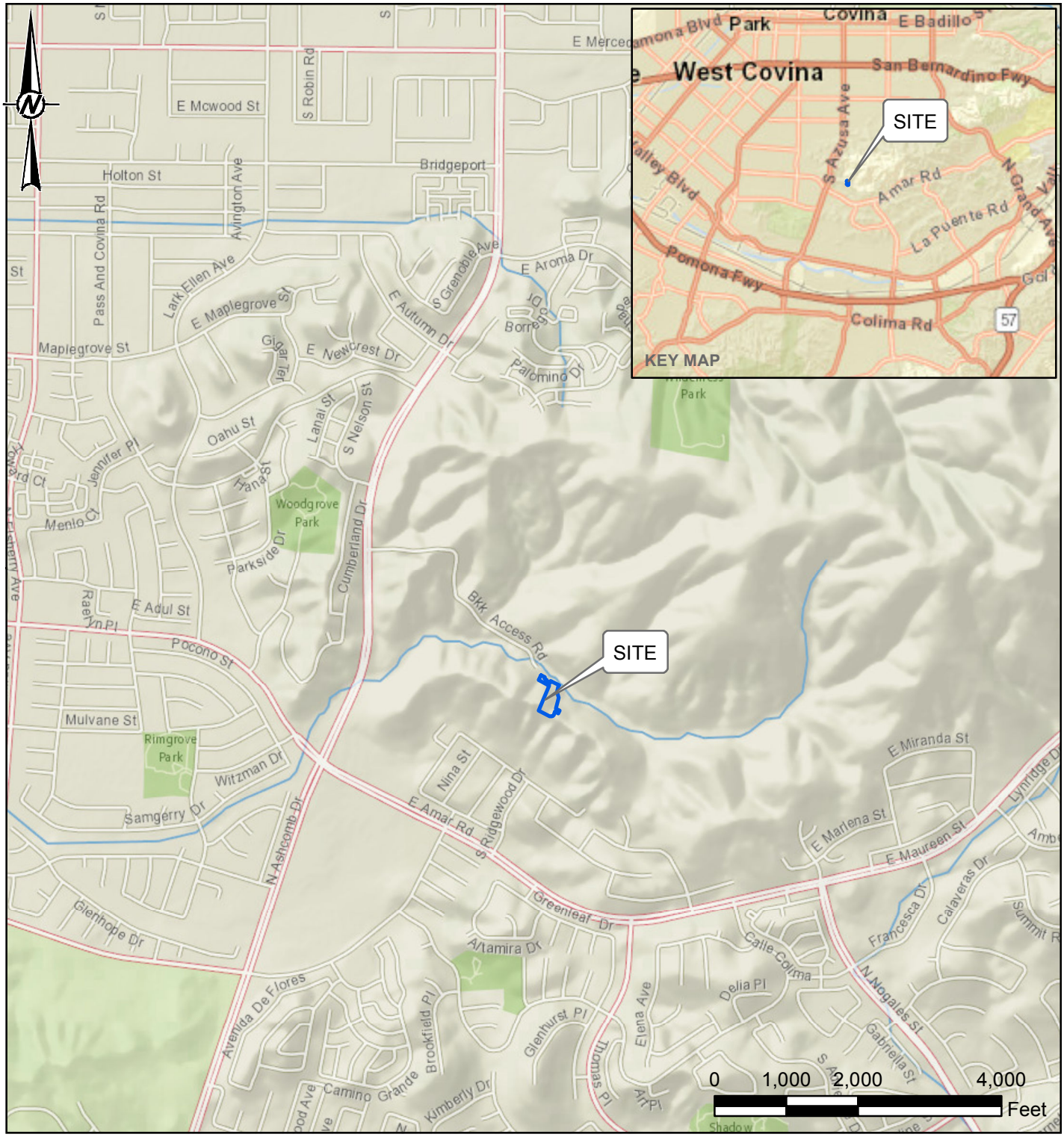
Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	4.54E-03	0.00E+00	0.00E+00	4.54E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-03	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	1.84E-07	0.00E+00	0.00E+00	0.00E+00	1.84E-07	1.84E-07	0.00E+00	1.84E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-03	0.00E+00	1.21E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440382	5.83E-02	5.83E-02	0.00E+00	0.00E+00	0.00E+00	5.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	1.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-03	0.00E+00	2.17E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	3.87E-04	0.00E+00	0.00E+00	0.00E+00	3.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.24E-10	0.00E+00	9.24E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-07	0.00E+00	1.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	1.27E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-10	0.00E+00	1.27E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A12: Acute, Non-Cancer Risk Contribution by Target Organs- MEIR

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	4.50E-04	0.00E+00	0.00E+00	4.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	1.83E-08	0.00E+00	0.00E+00	0.00E+00	1.83E-08	1.83E-08	0.00E+00	1.83E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-04	0.00E+00	1.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440382	5.78E-03	5.78E-03	0.00E+00	0.00E+00	0.00E+00	5.78E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	1.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-04	0.00E+00	2.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	3.84E-05	0.00E+00	0.00E+00	0.00E+00	3.84E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.16E-11	0.00E+00	9.16E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-08	0.00E+00	1.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	1.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-11	0.00E+00	1.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

APPENDIX B

Figures



LEGEND

PROPERTY BOUNDARY

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
SITE VICINITY MAP

CONSULTANT
GOLDER

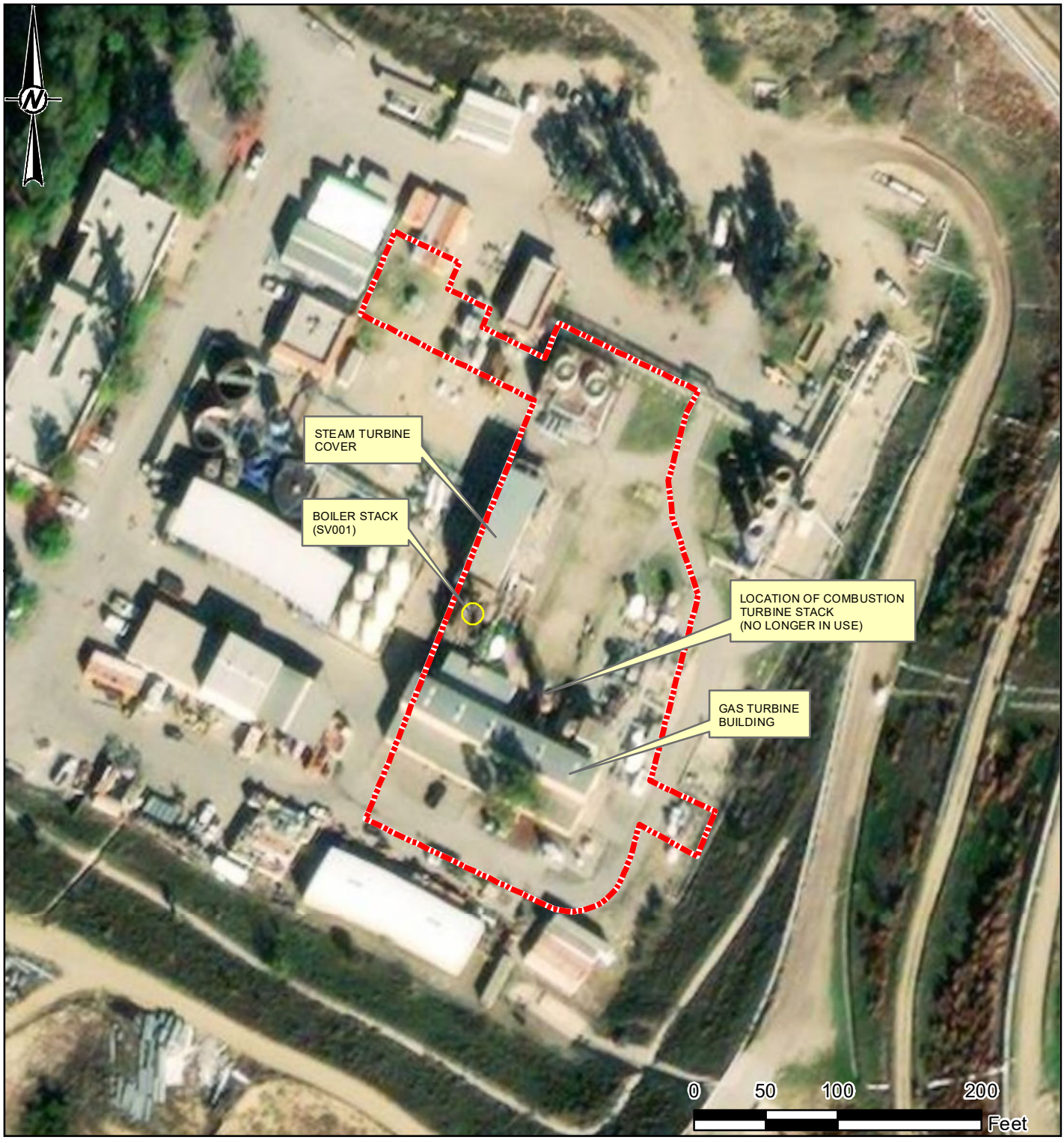
YYYY-MM-DD	2019-08-13
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B001-GIS.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\B-1\18101672B001-GIS.mxd



LEGEND

PROPERTY BOUNDARY

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
PLOT PLAN

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No. 18101672 | CONTROL 18101672B002-GIS.mxd | Rev. 0 | FIGURE **2**

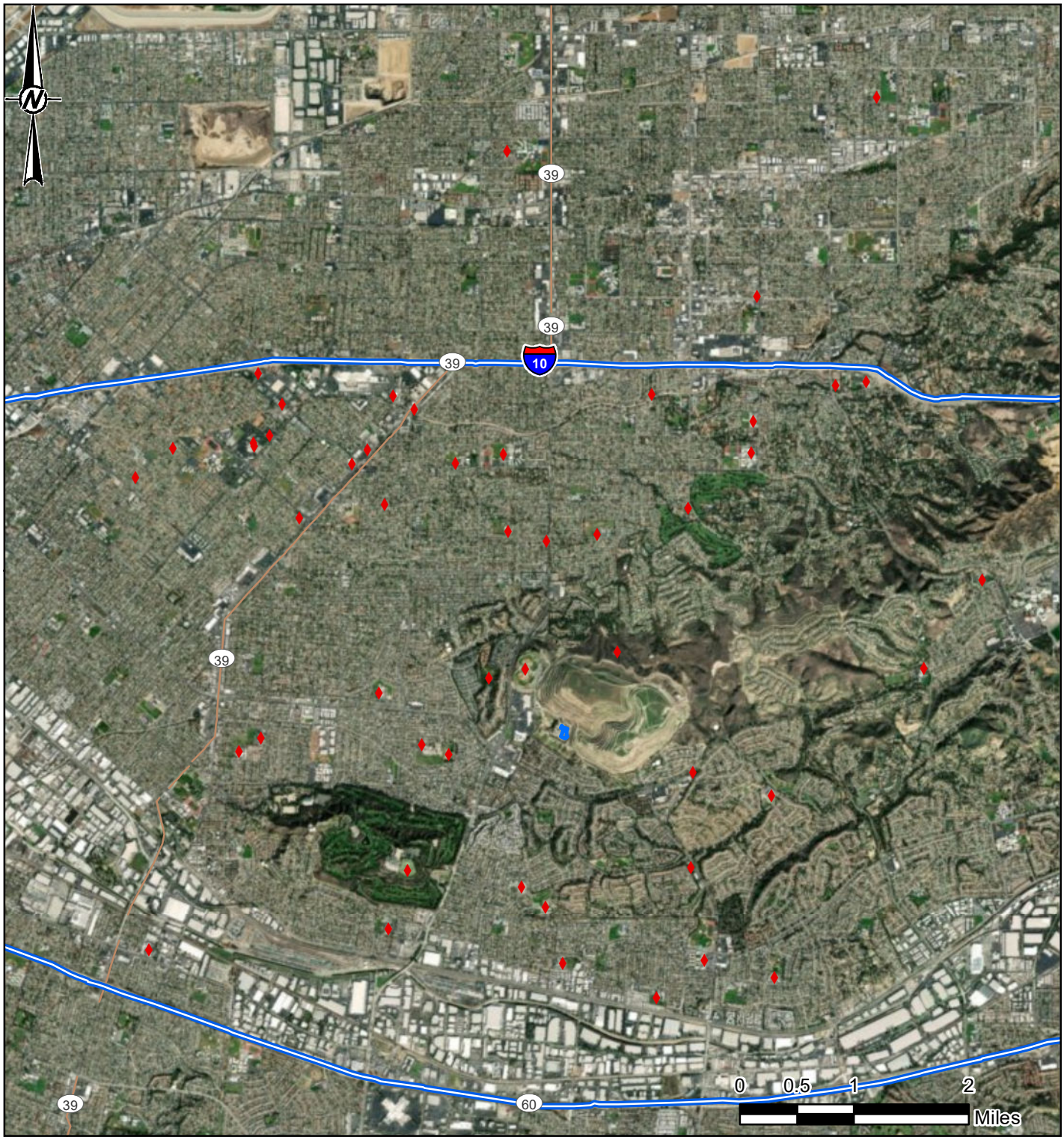
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: C:\TEMP\CAD FILES\MAY 1\gis\18101672-MM West Covina LF\figures\B-18101672B002-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0



LEGEND

- PROPERTY BOUNDARY
- SENSITIVE RECEPTORS

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
SENSITIVE RECEPTORS

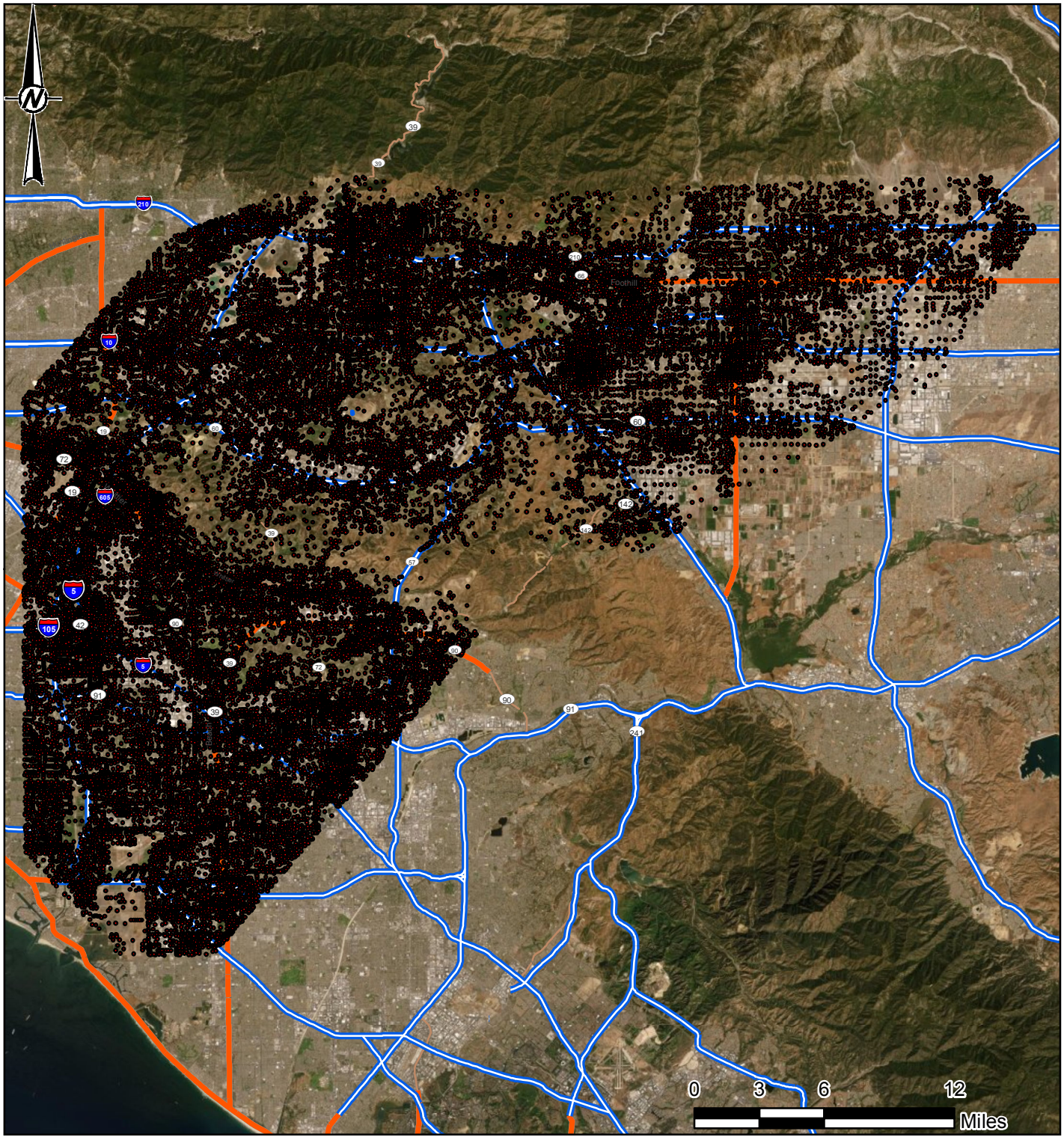
CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B003-GIS.mxd	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANSI A

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\B-1\18101672B003-GIS.mxd



LEGEND

- PROPERTY BOUNDARY
- POPULATION RECEPTORS

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

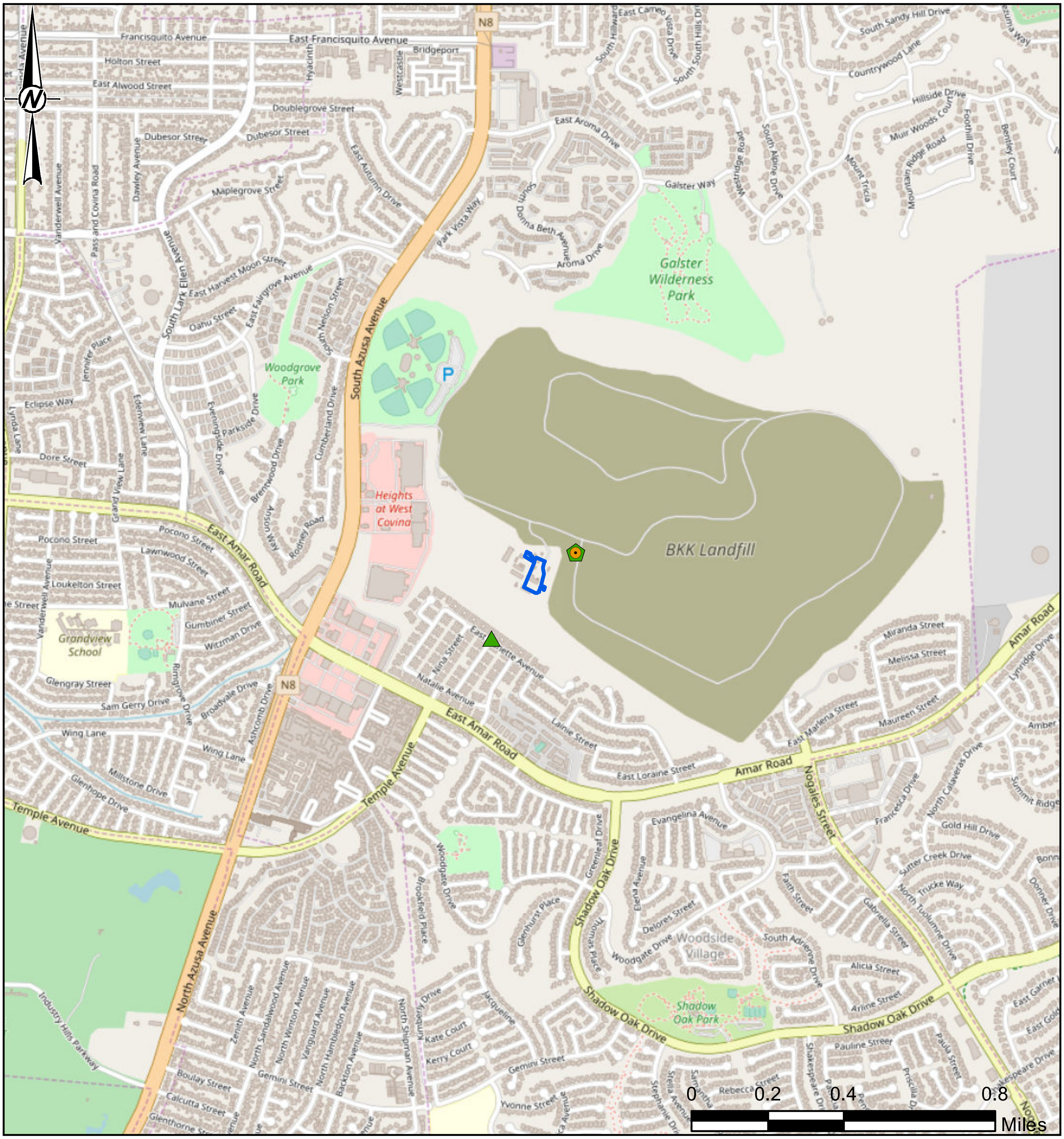
TITLE
POPULATION RECEPTORS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B004-GIS.mxd	0	4

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



LEGEND

PROPERTY BOUNDARY

CANCER RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL WORKER (MEIW)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

NOTE

POINT OF MAXIMUM IMPACT (PMI) AT THE SAME LOCATION AS MEIW.

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR CANCER RISK

CONSULTANT

GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

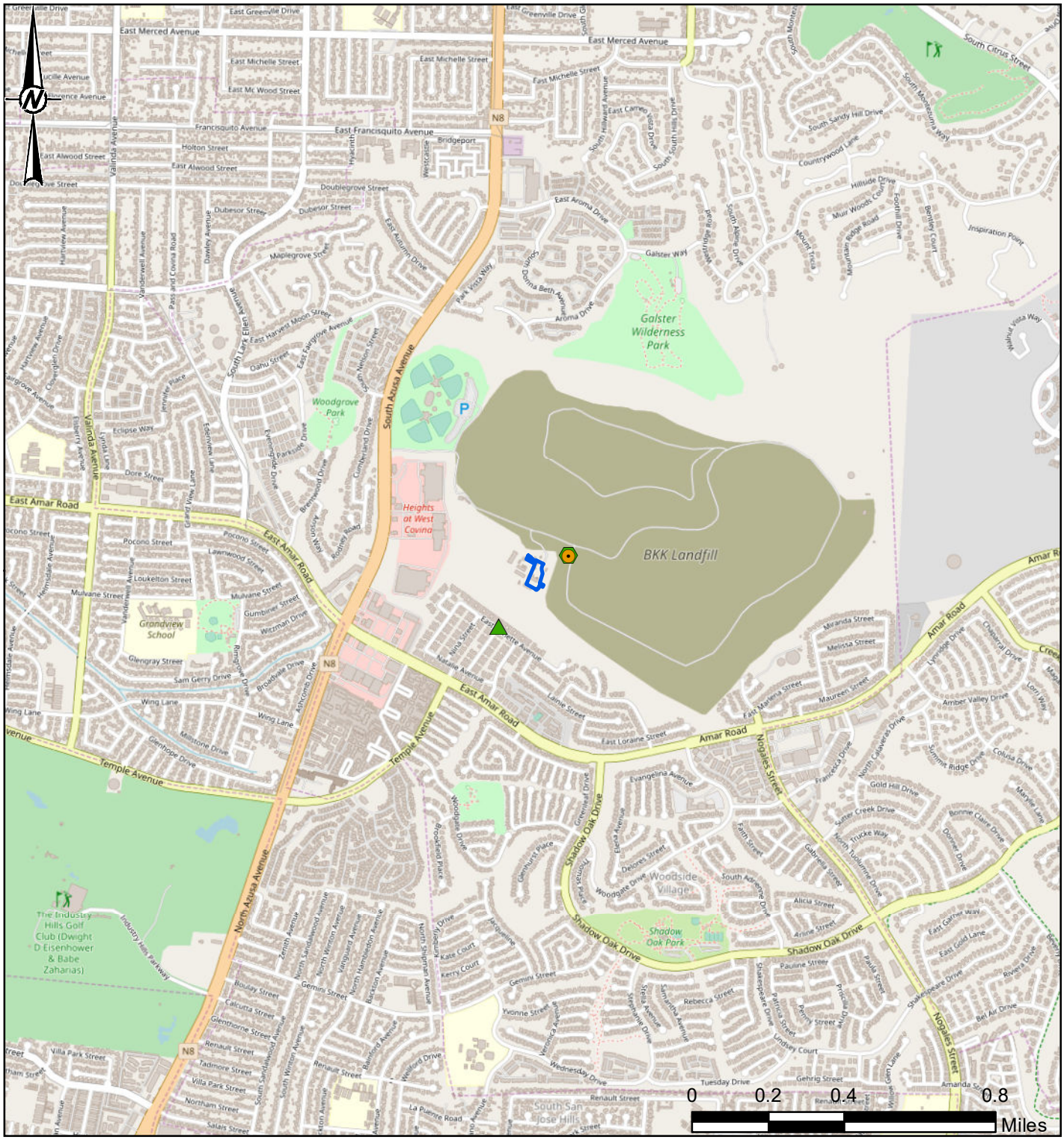
PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B005-GIS.mxd	0	5

Path: H:\18x-Projects\18101672-MM West Covina L\Figures\B-\18101672B005-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0



LEGEND

PROPERTY BOUNDARY

CHRONIC HAZARD RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL WORKER (MEIW)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

NOTE

POINT OF MAXIMUM IMPACT (PMI) AT THE SAME LOCATION AS MEIW.

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR CHRONIC HAZARD RISK

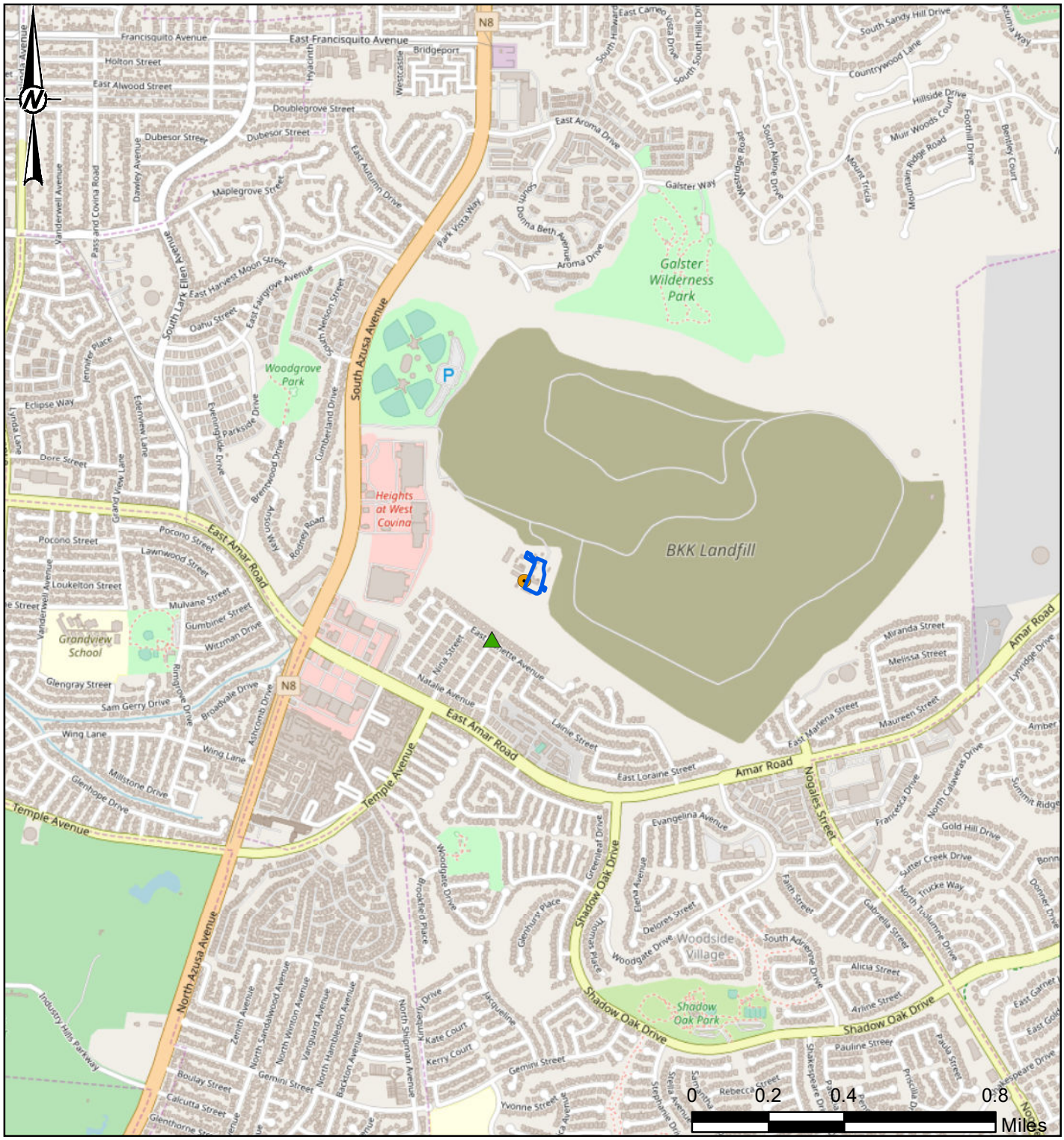
CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B006-GIS.mxd	0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

Path: H:\18x-Projects\18101672-MM West Covina LF\[figures\B-1\18101672B006-GIS.mxd



LEGEND

PROPERTY BOUNDARY

ACUTE HAZARD RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

CLIENT
FORTISTAR METHANE GROUP

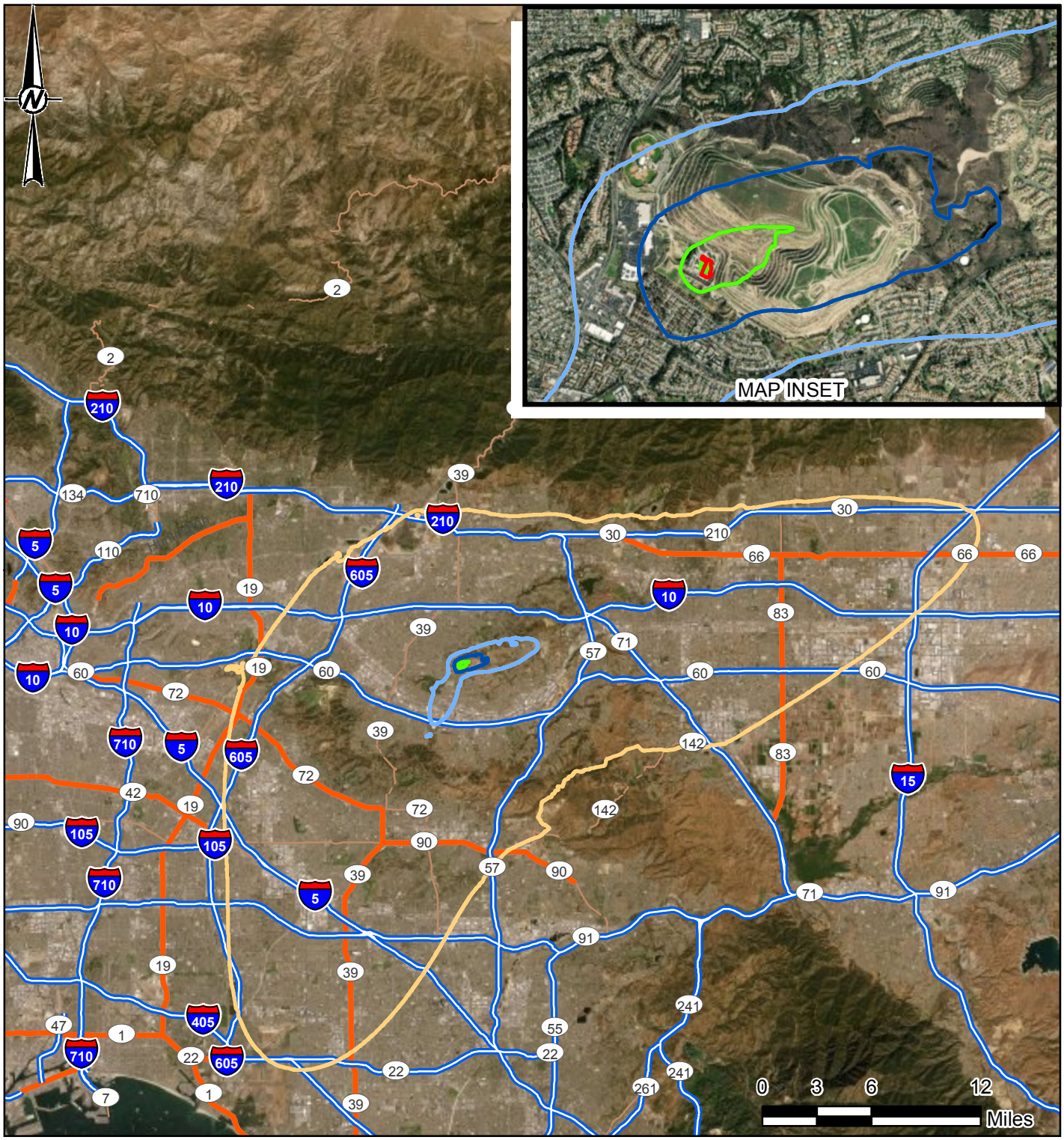
PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR ACUTE HAZARD RISK

CONSULTANT
GOLDER

YYYY-MM-DD	2018-06-07
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B007-GIS.mxd	0	**7**



LEGEND

PROPERTY BOUNDARY

CANCER RISK

1.0E-06 (1 IN-A-MILLION)

10E-06 (10 IN-A-MILLION)

25E-06 (25 IN-A-MILLION)

100E-06 (100 IN-A-MILLION)

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

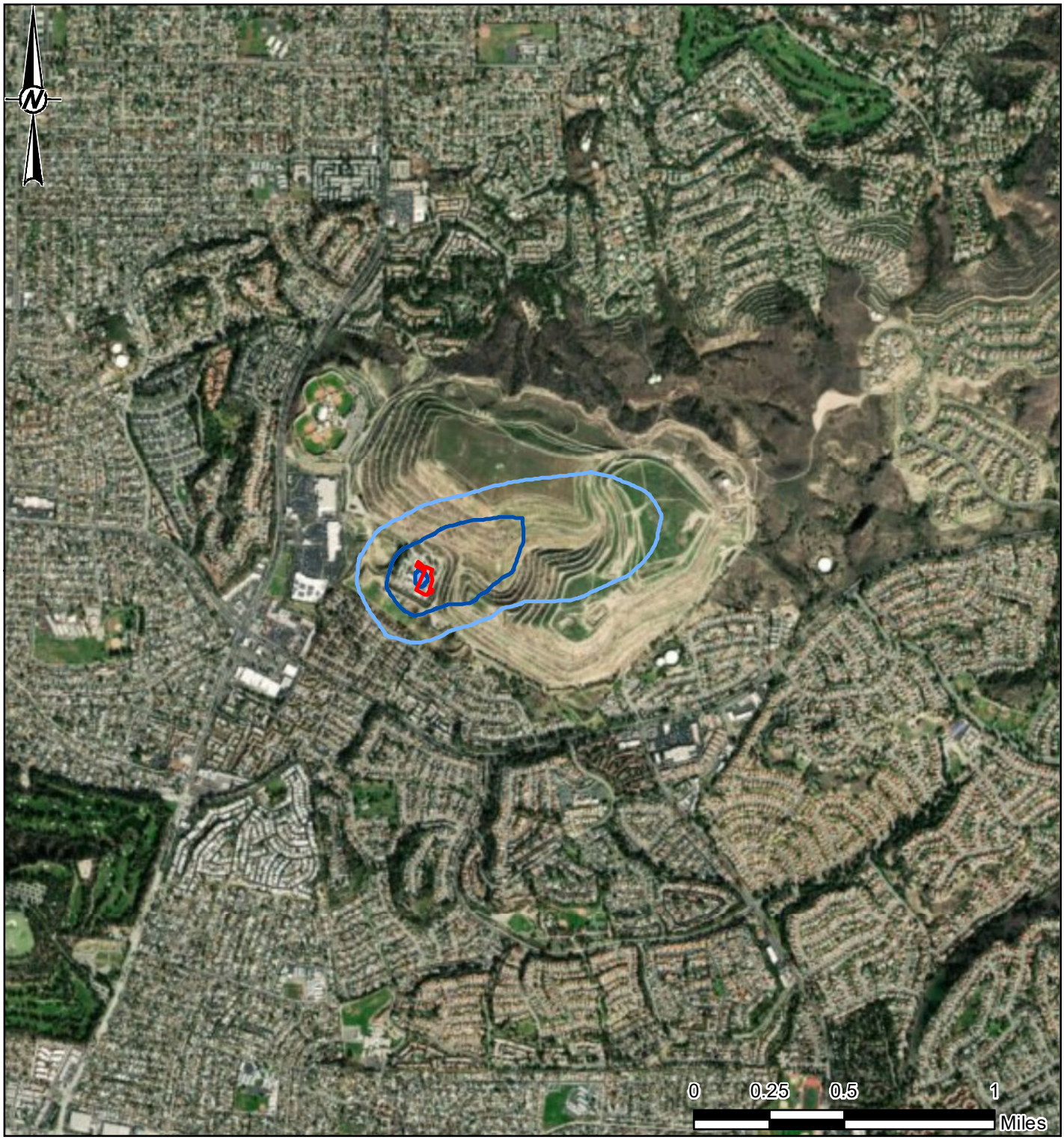
TITLE
CANCER RISK CONTOURS (RESIDENTIAL 30-YR EXPOSURE)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B008-GIS.mxd	0	8

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\B-1\18101672B008-GIS.mxd



LEGEND

PROPERTY BOUNDARY

CHRONIC HAZARD INDEX

0.5

1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
FORTISTAR METHANE GROUP

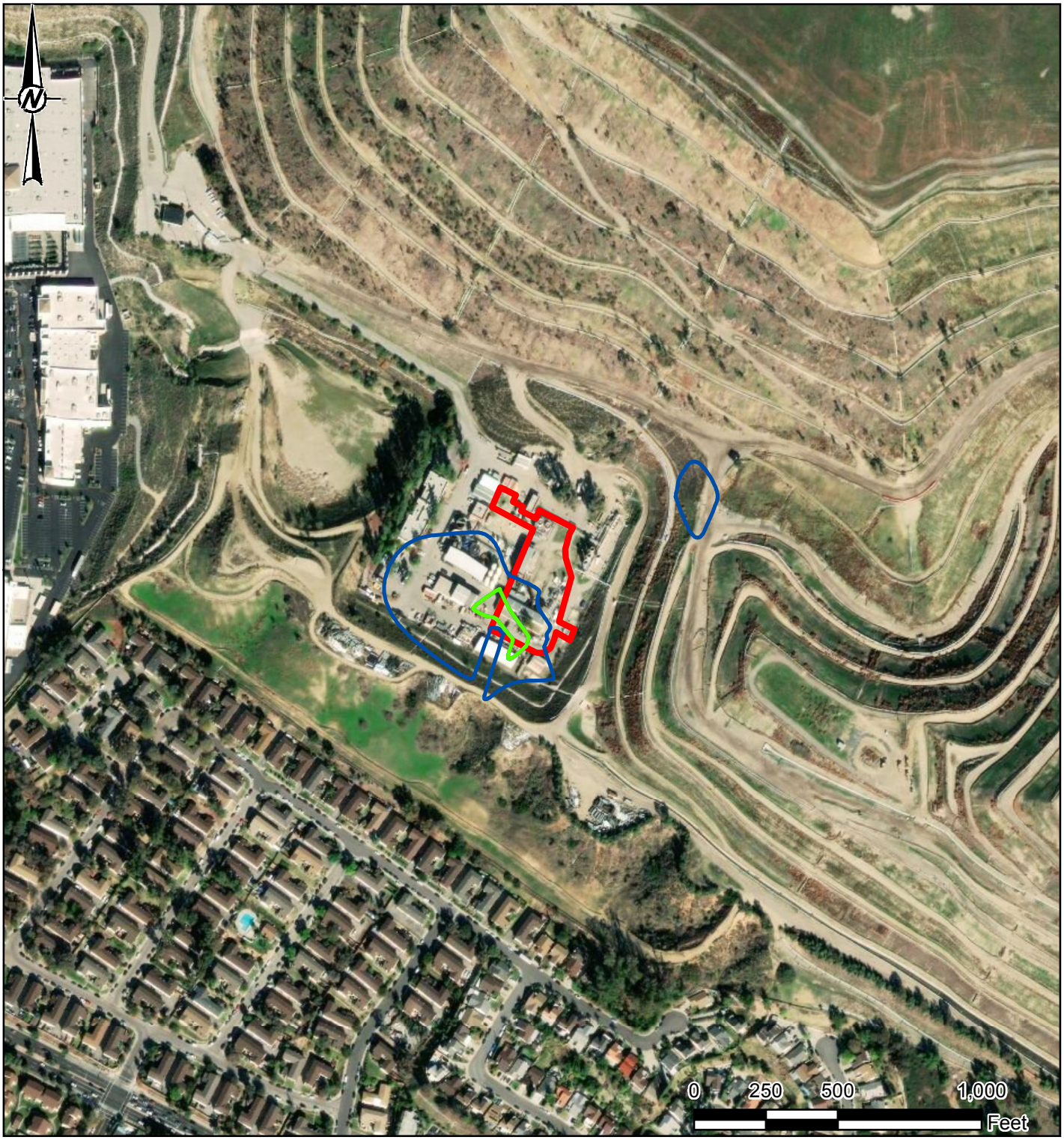
PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
CHRONIC HAZARD INDEX CONTOURS (RESIDENTIAL EXPOSURE)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B009-GIS.mxd	0	9



LEGEND

PROPERTY BOUNDARY

ACUTE HAZARD INDEX

0.5

1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
ACUTE HAZARD INDEX CONTOURS (RESIDENTIAL EXPOSURE)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

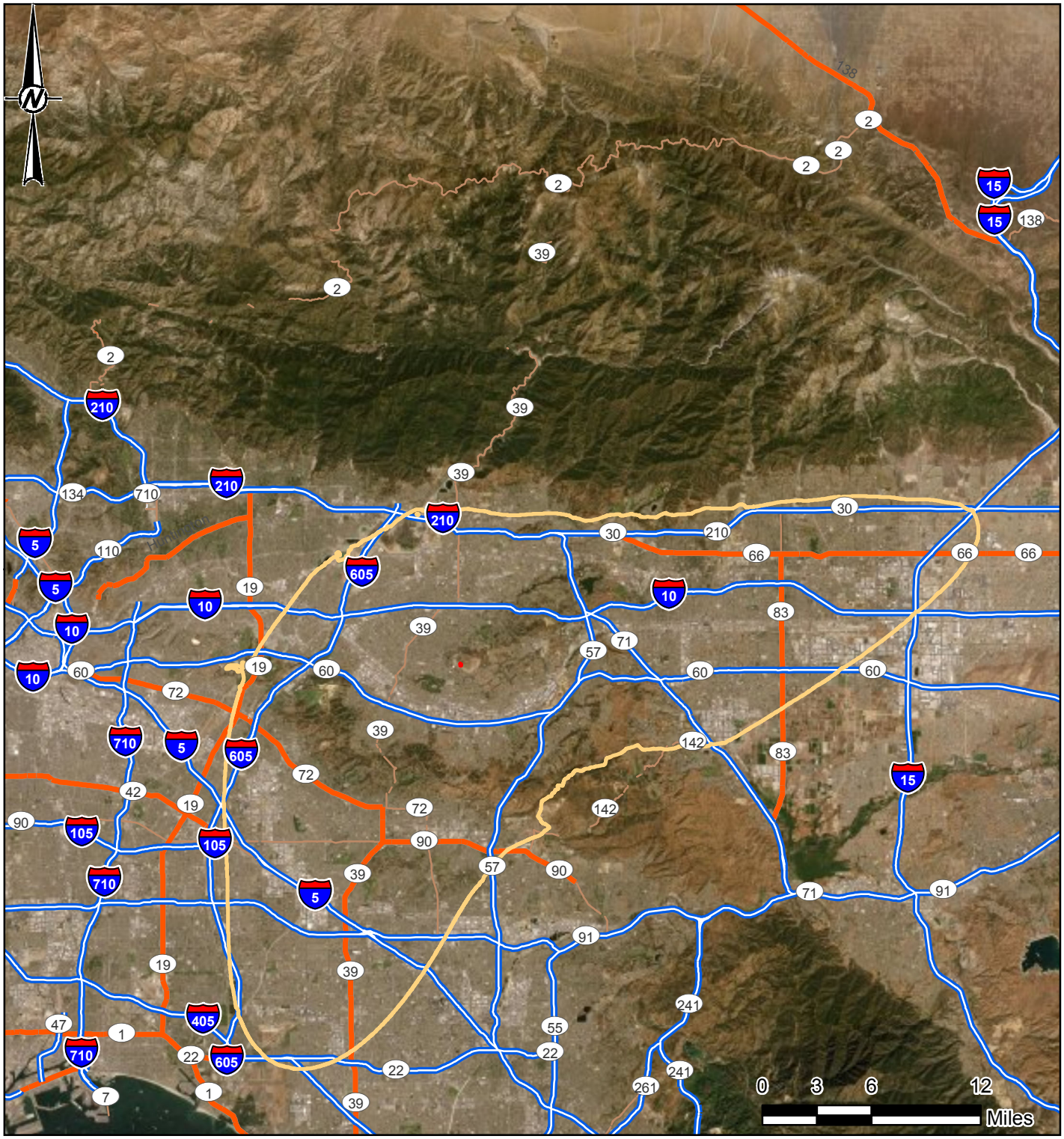
PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B010-GIS.mxd	0	**10**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\B-1\18101672B010-GIS.mxd



LEGEND

PROPERTY BOUNDARY

CANCER RISK

1.0E-06 (1 IN-A-MILLION)

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
FORTISTAR METHANE GROUP

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
CANCER RISK CONTOURS (RESIDENTIAL 70-YR EXPOSURE)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-14
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672B011-GIS.mxd	0	**11**

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\B-1\18101672B011-GIS.mxd

APPENDIX C

Alternate HRA

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

HEALTH RISK ASSESSMENT SUMMARY FORM

(Required in Executive Summary of HRA)

Facility Name : MM West Covina
Facility Address: 2210 South Azusa Avenue
West Covina, CA 91792
Type of Business: Electric Generation
SCAQMD ID No.: 113873

A. Cancer Risk

(One in a million means one chance in a million of getting cancer from being constantly exposed to a certain level of a chemical over a period of time)

1. Inventory Reporting Year : 2014
2. Maximum Cancer Risk to Receptors : *(Offsite and residence = 30-year exposure, worker = 25-year exposure)*
   a. Offsite 56.25 in a million Location: 416500, 3766300 (Rec. #9171)
   b. Residence 13.3 in a million Location: 416205.7, 3766041 (Rec. #12)
   c. Worker 3.0 in a million Location: 416500, 3766300 (Rec. #9171)
3. Substances Accounting for 90% of Cancer Risk: Hexavalent Chromium, Arsenic, Nickel
   Processes Accounting for 90% of Cancer Risk: Boiler Stack
4. Cancer Burden for a 70-yr exposure: *(Cancer Burden = [cancer risk] x [# of people exposed to specific cancer risk])*
   a. Cancer Burden 0.31
   b. Number of people exposed to >1 per million cancer risk for a 70-yr exposure 167,554
   c. Maximum distance to edge of 70-year, 1 x 10^{-6} cancer risk isopleth (meters) ~13,450

B. Hazard Indices

[Long Term Effects (chronic) and Short Term Effects (acute)]
(non-carcinogenic impacts are estimated by comparing calculated concentration to identified Reference Exposure Levels, and expressing this comparison in terms of a "Hazard Index")

1. Maximum Chronic Hazard Indices:
   a. Residence HI: 0.45 Location: Rec. #12 toxicological endpoint: Respiratory
   b. Worker HI : 0.98 Location: Rec. #9171 toxicological endpoint: Respiratory
2. Substances Accounting for 90% of Chronic Hazard Index: Nickel and Manganese
3. Maximum 8-hour Chronic Hazard Index:
   8-Hour Chronic HI: 0.15 Location: Rec. #9171 toxicological endpoint: Central Nervous System
4. Substances Accounting for 90% of 8-hour Chronic Hazard Index: Nickel and Manganese
5. Maximum Acute Hazard Index:
   PMI: 1.70 Location: 416319,3766205 (Rec. #53) toxicological endpoint: Immune
6. Substances Accounting for 90% of Acute Hazard Index: Nickel

C. Public Notification and Risk Reduction

1. Public Notification Required? ____ Yes X No
   a. If 'Yes', estimated population exposed to risks > 10 in a million for a 30-year exposure, or an HI >1
   _____
2. Risk Reduction Required? ____ Yes X No

REPORT

Health Risk Assessment Study

MM West Covina Energy LLC.

Submitted to:

MM West Covina LLC
2210 S Azusa Ave.
West Covina, CA 91792

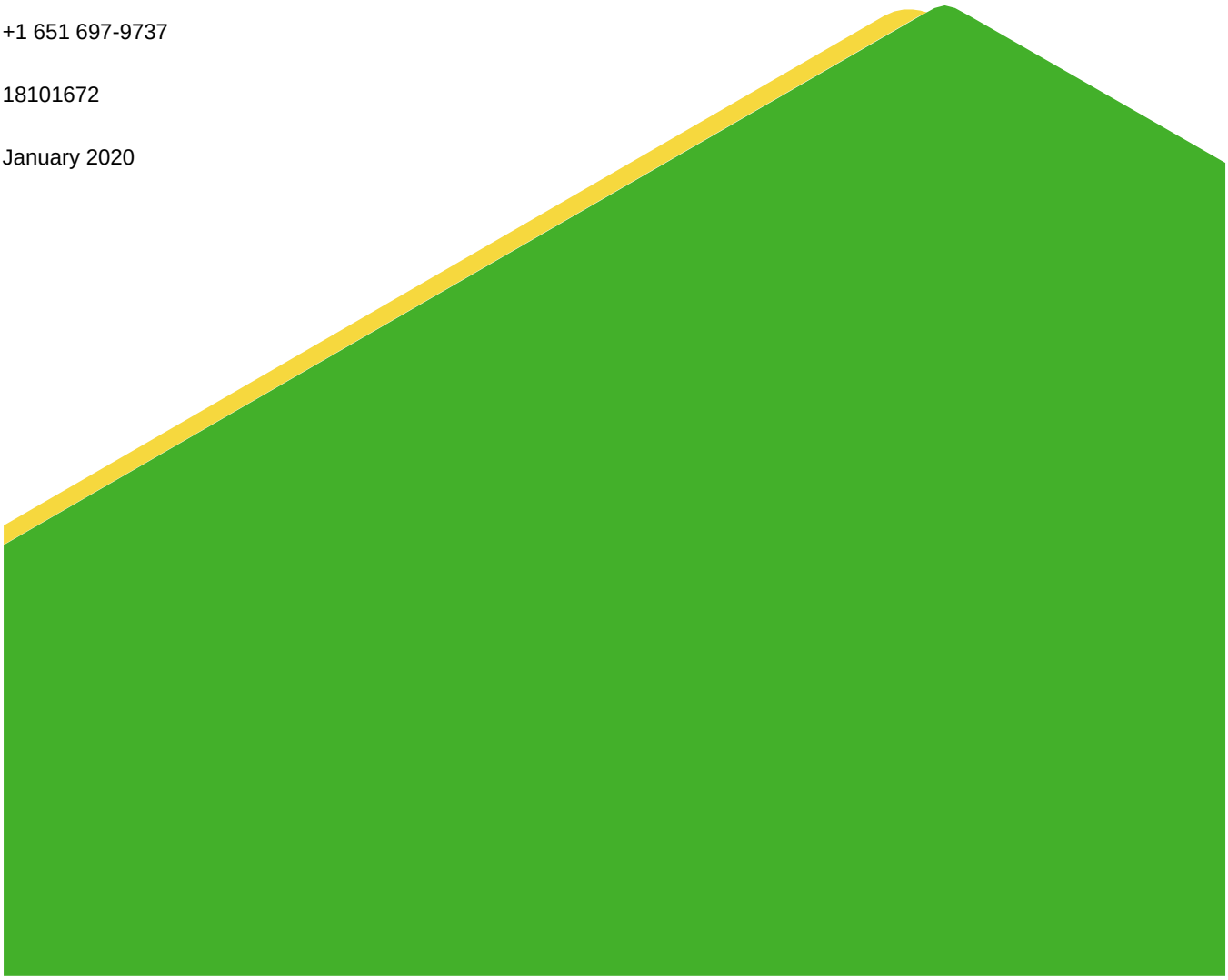
Submitted by:

Golder Associates Inc.
1751 West County Road B, Suite 105 Roseville, Minnesota, USA 55113

+1 651 697-9737

18101672

January 2020



Distribution List

South Coast Air Quality Management District (electronic)

Suparna Chakladar, MM West Covina LLC (electronic)

Table of Contents

TABLES

APPENDICES

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.
- **BPIP**: Building profile input file.
- **CAS Number**: A unique numerical identifier assigned by Chemical Abstracts Service to every chemical.
- **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.
- **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

1.0 EXECUTIVE SUMMARY

This Health Risk Assessment (HRA) has been conducted to characterize the nature and magnitude of health effects that could potentially be caused by air pollutants emitted by the MM West Covina LLC (Facility).

1.1 History and Overall Summary of Results

This HRA has been prepared following the South Coast Air Quality Management District (SCAQMD) "AB2588 and Rule 1402 Supplemental Guidelines". Section 1.1 provides history, a summary of results, conclusions, and major assumptions made while preparing this report.

1.1.1 History – 2006 HRA

An HRA report was prepared in 2006 for this Facility. In the 2006 HRA, the BKK landfill property line was used as the ambient boundary because the Facility is located on, and completely surrounded by land occupied by the landfill and because MM West Covina LLC owns the wells at the landfill. Dioxin and furan compounds were not included in the Air Toxics Emission Inventory for 2006, as the facility uses equipment designed for complete combustion. Emissions and risks were evaluated from two sources (boiler and combustion turbine) for the 2006 HRA. The HRA indicated that cancer risk captured at the maximum exposed individual resident (MEIR) was at a level that required public notice but did not require risk reduction. For reference, the estimated cancer risk, chronic hazard index, and acute hazard index at the MEIR was 18.7 in-a-million, 0.31, and 0.004 in the 2006 HRA.

1.1.2 History – 2018 HRA

An HRA report was prepared and submitted to SCAQMD on July 2, 2018. SCAQMD requested that the report be revised on the basis that some compounds in ATIR, specifically dioxin and furan compounds, were not included in the HRA report. MM West Covina's boiler combusts treated LFG rather than municipal solid waste. The boiler is designed for complete combustion, and research suggests that dioxin and furan emissions from LFG combustion boilers are either insignificant or undetectable. The Facility conducted a stack test on August 10, 2018 and the results supported Fortistar's original position in that the emission of dioxin and furan were mostly undetectable with a few compounds being detected at insignificant amounts. On October 5, 2018 the Facility submitted a revised report to SCAQMD based on the emission factors obtained during the stack test. History- 2019 HRA

The report submitted by the Facility on October 5, 2019 was rejected by SCAQMD upon which, the Facility submitted another revised HRA to SCAQMD in August, 2019. After reviewing the submitted HRA, SCAQMD communicated with the Facility to incorporate a finer grid than what is required by the guidance which resulted in different risk results. SCAQMD prepared a dispersion and risk model for the Facility and provided an option to either incorporate results obtained by SCAQMD in the revised HRA or re-run the model at a finer grid to arrive at the results obtained at SCAQMD. The Facility chose to accept the results provided by SCAQMD and incorporate them into the Main HRA report. However, the Facility believes that this Alternate HRA is a better representation of the risk results as the results are based on the emission factors obtained by stack testing conducted on August 10, 2018.

1.1.3 Results – 2020 HRA

This health risk assessment evaluates cancer risk, chronic non-cancer hazard and acute non-cancer hazard at various receptors and includes emissions from all the compounds as specified in the approved ATIR for the Facility, except for dioxin and furan compounds. The higher dioxin and furan emission rates are the primary reason why cancer risks are estimated to be so high in the Main HRA. The approved ATIR includes emissions of

dioxin and furan compounds at a significantly higher emission rate than what has been demonstrated to be emitted during a stack that was conducted by the Facility on August 10, 2018. In the options available to calculate emission factors, the stack test results are the most preferred and accurate measure of calculating emission factors and have been used to predict risks in this Alternate HRA.

The Facility no longer operates the combustion turbine that was included in the 2006 HRA; only the boiler is operated. Emissions and dispersion factors used are for the boiler.

Cancer risk at the point of maximum impact (PMI) is estimated to be 56.25 in-a-million. Since there is no residence at the PMI, even though the cancer risk is greater than 25 in-a-million, no risk reduction plan is required.

Cancer risk at the MEIR is estimated to be 13.3 in-a-million at a receptor placed at the closest residence from the source. Because cancer risk at the MEIR is more than 10 in-a-million, a public notice is required as per the rules mentioned in Table 4 of the guidance document by SCAQMD

Cancer risk at the location representing the maximum exposed individual worker (MEIW) is estimated to be 3.0 in-a-million at a cartesian receptor.

The maximum chronic hazard index at the MEIR is estimated to be 0.45. The maximum chronic hazard index at the MEIW is estimated to be 0.98. The maximum 8-hour chronic hazard index is estimated to be 0.15. Because the chronic hazard index does not exceed 1.0 at the MEIR, no public notification is required.

The maximum acute hazard index at the PMI is estimated to be 1.70, located on the lease line. There is no residential area at this point. The acute hazard index at the MEIR is estimated to be 0. 22.

The bullet points below summarize the above paragraphs:

- This Alternate HRA is based on the risk results obtained using emission factors from the approved ATIR except for emission factors of furan and dioxin compounds. Emission factors for furan and dioxin compounds were obtained by a stack test conducted by the Facility on August 10, 2018. Estimated cancer risk at MEIR is greater than 10 in a million, so public notice is required.
- Estimated cancer risk at the MEIR is less than 25 in-a-million, so no risk reduction plan is required.
- Estimated chronic and acute hazard index at the MEIR is less than 1.0, so no public notice is required and no risk reduction plan is required for this Facility.
- The landfill stopped accepting waste in 1996. Landfill gas generation typically peaks the year after waste acceptance ceases and continues to decline. Based on that assumption, landfill gas generation at the landfill and LFG combustion at the Facility has decreased from 2006 and therefore the emissions and risk are also reduced.
- Operations at this Facility have significantly reduced compared to 2006 since the Facility now only operates one source.

1.2 Facility Information:

Name of the Facility: MM West Covina LLC

Address: 2210 S. Azusa Avenue, West Covina, CA 91792

Facility ID number: 113873

This Health Risk Assessment Report is prepared for MM West Covina LLC located at the address mentioned above. The Facility generates electricity by routing landfill gas (LFG) generated at the BKK Landfill (Landfill) to a boiler. The boiler generates steam which drives a turbine to generate electricity. BKK Landfill is not owned by MM West Covina LLC. The Facility is located completely within the Landfill property line. The Facility occupies approximately 1.2 acres which is delineated by the lease line. This Facility has one emission source, SV001: Boiler Stack.

Emission rates of the substances from the 2014 Air Toxics Emission Inventory (ATIR) approved by South Coast Air Quality Management District (SCAQMD) on August 29, 2017 are presented in Table 1. Emission rates have been expressed in the units of pounds/hour, pounds/year and grams/second. The list of substances and emission rates identified in Table 1 were used for this HRA with the exception of emission rates of Dioxins and Furans which is explained in greater detail below. The emission rates for combustion of LFG were added to the emission rates for combustion of the natural gas pilot.

Dioxin and furan compounds are listed in the ATIR previously approved by SCAQMD. As mentioned in Section 1.1.2 and 1.1.4, the Facility conducted a stack test on August 10, 2018 and the results support Fortistar's original position in that the emission of dioxin and furan were mostly undetectable with a few compounds being detected at insignificant amounts. Some additional dioxins and furans that were not a part of the original ATIR were detected. The list of substances and emission rates identified in Table 1 were used for this HRA.

Table 1: Air Toxics Emission Inventory for MM West Covina for the year of 2014

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
Methane	74828	4.64E+03	6.67E-02	5.30E-01	6.68E-02
Hexane	110543	9.64E+02	1.39E-02	1.10E-01	1.39E-02
Benzene	71432	1.10E+02	1.59E-03	1.26E-02	1.59E-03
Toluene	108883	6.14E+00	8.84E-05	7.02E-04	8.85E-05
Benzyl Chloride	100447	2.62E+02	3.77E-03	3.00E-02	3.78E-03
Beryllium	7440417	2.92E+00	4.20E-05	3.34E-04	4.21E-05
Cadmium	7440439	1.78E+01	2.57E-04	2.04E-03	2.57E-04
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	2.41E-10	3.46E-15	2.75E-14	2.08E-13
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	6.47E-7	9.31E-12	7.39E-11	5.59E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	1.21E-10	1.74E-15	1.38E-14	1.04E-13

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	4.73E-07	6.80E-12	5.40E-11	4.08E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	1.21E-10	1.74E-15	1.38E-14	1.04E-13
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	1.21E-10	1.74E-15	1.38E-14	1.04E-13
1,2,3,7,8-Pentachlorodibenzofuran	57117416	1.21E-10	1.74E-15	1.38E-14	1.04E-13
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	1.21E-10	1.74E-15	1.38E-14	1.04E-13
2,3,7,8-Tetrachlorodibenzofuran	51207319	2.41E-10	3.46E-15	2.75E-14	2.08E-13
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	2.41E-10	3.46E-15	2.75E-14	2.08E-13
Formaldehyde	50000	3.56E+02	5.12E-03	4.07E-02	5.13E-03
Hexavalent Chromium	18540299	1.90E+00	2.73E-05	2.17E-04	2.73E-05
Arsenic	7440382	1.05E+01	1.51E-04	1.20E-03	1.51E-04
Lead	7439921	1.82E+01	2.62E-04	2.08E-03	2.62E-04
Nickel	7440020	3.06E+02	4.40E-03	3.49E-02	4.40E-03
Acenaphthene	83329	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Acenaphthylene	208968	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Anthracene	120127	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(a)anthracene	56553	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(a)pyrene	50328	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(b)fluoranthene	205992	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(g,h,I)perylene	191242	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Benzo(k)Fluoranthene	207089	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Chrysene	218019	1.12E+00	1.61E-05	1.27E-04	1.60E-05

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
Dibenz(a,h)anthracene	53703	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Fluoranthene	206440	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Fluorene	86737	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Indeno(1,2,3-cd)pyrene	193395	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Naphthalene	91203	6.90E+02	9.92E-03	7.87E-02	9.91E-03
Phenanthrene	85018	1.12E+00	1.61E-05	1.27E-04	1.60E-05
Pyrene	129000	1.18E+00	1.69E-05	1.34E-04	1.69E-05
Ammonia	7664417	6.27E+03	9.02E-02	7.15E-01	9.01E-02
Copper	7440508	2.96E+01	4.26E-04	3.37E-03	4.25E-04
Manganese	7439965	1.01E+03	1.45E-02	1.15E-01	1.45E-02
Mercury	7439976	2.10E-01	3.02E-06	2.39E-05	3.01E-06
Selenium	7782492	1.35E+00	1.94E-05	1.54E-04	1.94E-05
Total PAHs (excluding Naphthalene)	1151	4.34E-05	6.24E-10	4.96E-09	6.25E-10
Acetaldehyde	75070	3.92E-04	5.64E-09	4.47E-08	5.63E-09
Acrolein	107028	3.48E-04	5.01E-09	3.97E-08	5.00E-09
Ethyl Benzene	100414	8.70E-04	1.25E-08	9.93E-08	1.25E-08
Xylene	1330207	2.52E-03	3.62E-08	2.88E-07	3.63E-08
2,3,4,7,8- Pentachlorodibenzofuran*	57117314	3.57E-07	5.13E-12	4.07E-11	3.08E-10
1,2,3,4,7,8-Hexachlorodibenzofuran*	70648269	2.49E-07	3.58E-12	2.84E-11	2.15E-10
2,3,4,6,7,8-Hexachlorodibenzofuran*	60851345	1.95E-07	2.81E-12	2.23E-11	1.69E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin*	39227286	1.21E-10	1.74E-15	1.38E-14	1.04E-13

Substance	CAS	Total Annual (LB/YR)	Total Annual (G/S)	Total 1- Hour Max (LB/HR)	Total 1- Hour Max (G/S)
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin*	19408743	1.21E-10	1.74E-15	1.38E-14	1.04E-13
1,2,3,7,8,9-Hexachlorodibenzofuran*	72918219	1.21E-10	1.74E-15	1.38E-14	1.04E-13

*These compounds were not a part of the original ATIR. These compounds were tested for on August 10th, 2018 and have been included in this emission inventory.

1.3 Multi-pathway Substances and Pathways:

Multi-pathway substances are the chemicals or substances that can target human organs through multiple pathways. Not all chemicals in the emission inventory are multi-pathway substances. The list of multi-pathway substances and their target pathways can be found in Table 2. They are multi-pathway substances for the types of risk/hazard mentioned.

Table 2: Multi-Pathway Substances and Pathways

Substance	Type of Risk/ Hazard	INHAL	DERM	SOIL	MOTHER	VEG
Hexavalent Chromium	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Arsenic	Cancer, Chronic non-cancer	X	X	X	No	X
Lead	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(a)anthracene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(a)pyrene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(b)fluoranthene	Cancer, Chronic non-cancer	X	X	X	X	X
Benzo(k)Fluoranthene	Cancer, Chronic non-cancer	X	X	X	X	X
Chrysene	Cancer, Chronic non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	INHAL	DERM	SOIL	MOTHER	VEG
Dibenz(a,h)anthracene	Cancer, Chronic non-cancer	X	X	X	X	X
Indeno(1,2,3-cd)pyrene	Cancer, Chronic non-cancer	X	X	X	X	X
Total PAHs (excluding Naphthalene)	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Beryllium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Cadmium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	INHAL	DERM	SOIL	MOTHER	VEG
2,3,4,7,8- Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,4,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8,9-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Nickel	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Mercury	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Selenium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X

1.4 Overview of Dispersion Modeling:

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 is used to create plot files, which show the maximum 1-hr, 8-hr and average annual ground level concentration at each receptor. The Hotspots Analysis and Reporting Program Version 2 (HARP2) is the recommended program for the HRA study by SCAQMD. 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.

1.5 Summary of Dose- Response Assessment:

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 3 lists the organs targeted by each of the substances released for Acute Non-Cancer (ANC) and Chronic Non-Cancer (CNC) impact.

Table 3: Target Organ Systems by Substance for Non-Cancer Chronic Impacts

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Methane	No	No	No	No	No	No	No	No	No	No	No	No	No
Hexane	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzene	No	No	X	No	No	X	No	No	No	No	No	X	No
Toluene	No	X	No	No	No	X	X	No	X	No	No	No	No
Benzyl Chloride	No	No	No	No	No	No	X	No	X	No	No	No	No
Beryllium	No	No	No	No	No	No	No	No	No	No	No	No	No
Cadmium	No	No	No	No	No	No	No	No	No	No	No	No	No
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,4,7,8- Pentachlorodibenzofuran	No	No	No	X	X	X	No	No	No	No	X	No	X
1,2,3,4,7,8-Hexachlorodibenzofuran	No	No	No	X	X	X	No	No	No	No	X	No	X
2,3,4,6,7,8-Hexachlorodibenzofuran	No	No	No	X	X	X	No	No	No	No	X	No	X
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	X	X	X	No	No	No	No	X	No	X
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	No	No	No	X	X	X	No	No	No	No	X	No	X
1,2,3,7,8,9-Hexachlorodibenzofuran	No	No	No	X	X	X	No	No	No	No	X	No	X
Formaldehyde	No	No	No	No	No	No	No	No	X	No	No	No	No
Hexavalent Chromium	No	No	No	No	No	No	No	No	No	No	No	No	No
Arsenic	X	X	No	No	No	X	No	No	No	No	No	No	X
Lead	No	No	No	No	No	No	No	No	No	No	No	No	No
Nickel	No	No	X	No	No	No	No	No	No	No	No	No	No
Acenaphthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Acenaphthylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(b)fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(g,h,I)perylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(k)Fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Chrysene	No	No	No	No	No	No	No	No	No	No	No	No	No
Dibenz(a,h)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluoranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluorene	No	No	No	No	No	No	No	No	No	No	No	No	No
Indeno(1,2,3-cd)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Naphthalene	No	No	No	No	No	No	No	No	No	No	No	No	No
Phenanthrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Ammonia	No	No	No	No	No	No	X	No	X	No	No	No	No
Copper	No	No	No	No	No	No	X	No	No	No	No	No	No
Manganese	No	No	No	No	No	No	No	No	No	No	No	No	No
Mercury	No	X	No	No	No	X	No	No	No	No	No	No	No
Selenium	No	No	No	No	No	No	No	No	No	No	No	No	No
Total PAHs (excluding Naphthalene)	No	No	No	No	No	No	No	No	No	No	No	No	No
Acetaldehyde	No	No	No	No	No	No	X	No	X	No	No	No	No
Acrolein	No	No	No	No	No	No	X	No	X	No	No	No	No
Ethyl Benzene	No	No	No	No	No	No	No	No	No	No	No	No	No
Xylene	No	X	No	No	No	No	X	No	X	No	No	No	No

Table 4: Target Organs Systems by Substance for Non-Cancer Acute Impacts

Substance	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	ODOR	BLOOD
Methane	No	No	No	No	No	No	No	No	No	No	No	No	No
Hexane	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzene	No	No	X	No	No	X	No	No	No	No	No	X	No
Toluene	No	X	No	No	No	X	X	No	X	No	No	No	No
Benzyl Chloride	No	No	No	No	No	No	X	No	X	No	No	No	No
Beryllium	No	No	No	No	No	No	No	No	No	No	No	No	No
Cadmium	No	No	No	No	No	No	No	No	No	No	No	No	No
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,4,7,8- Pentachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X

1,2,3,4,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
2,3,4,6,7,8-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	No	No	No	No	X	X	X	No	No	No	X	No	X
1,2,3,7,8,9-Hexachlorodibenzofuran	No	No	No	No	X	X	X	No	No	No	X	No	X
Formaldehyde	No	No	No	No	No	No	No	No	X	No	No	No	No
Hexavalent Chromium	No	No	No	No	No	No	No	No	No	No	No	No	No
Arsenic	X	X	No	No	No	X	No	No	No	No	No	No	No
Lead	No	No	No	No	No	No	No	No	No	No	No	No	No
Nickel	No	No	X	No	No	No	No	No	No	No	No	No	No
Acenaphthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Acenaphthylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(a)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(b)fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(g,h,I)perylene	No	No	No	No	No	No	No	No	No	No	No	No	No
Benzo(k)Fluranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Chrysene	No	No	No	No	No	No	No	No	No	No	No	No	No
Dibenz(a,h)anthracene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluoranthene	No	No	No	No	No	No	No	No	No	No	No	No	No
Fluorene	No	No	No	No	No	No	No	No	No	No	No	No	No
Indeno(1,2,3-cd)pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No

Naphthalene	No	No	No	No	No	No	No	No	No	No	No	No	No
Phenanthrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Pyrene	No	No	No	No	No	No	No	No	No	No	No	No	No
Ammonia	No	No	No	No	No	No	X	No	X	No	No	No	No
Copper	No	No	No	No	No	No	X	No	No	No	No	No	No
Manganese	No	No	No	No	No	No	No	No	No	No	No	No	No
Mercury	No	X	No	No	No	X	No	No	No	No	No	No	No
Selenium	No	No	No	No	No	No	No	No	No	No	No	No	No
Total PAHs (excluding Naphthalene)	No	No	No	No	No	No	No	No	No	No	No	No	No
Acetaldehyde	No	No	No	No	No	No	X	No	X	No	No	No	No
Acrolein	No	No	No	No	No	No	X	No	X	No	No	No	No
Ethyl Benzene	No	No	No	No	No	No	No	No	No	No	No	No	No
Xylene	No	X	No	No	No	No	X	No	X	No	No	No	No

1.6 Summary of Results:

Risk prediction results were based on a study conducted with following specifications for MEIW, PMI, MEIR and cancer burden:

- MEIR/PMI: Potential cancer risk was based on Tier-1 analysis for 30-year exposure.
- MEIW: Potential cancer risk was based on Tier-1 analysis for 25-year exposure.
- Cancer Burden: Cancer burden calculation was based on the MEIR analysis assuming a 70-year exposure.

Table 5, Table 6, and Table 7 summarize the cancer risks and maximum acute and chronic non-cancer hazard indices for MEIR, MEIW, PMI. The tables include the location coordinates, risk sums and hazard indices.

Table 5: Point of Maximum Impact (PMI)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416500	3766300	56.25 At a Cartesian receptor	Not applicable

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Chronic Hazard	416500	3766300	Not applicable	1.9 At a Cartesian receptor
Acute Hazard	416319	3766205	Not applicable	1.7 At a Fenceline receptor

Table 6: Maximum Exposed Individual Resident (MEIR)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416205.7	3766041	13.3 At a Cartesian receptor at the closest residence from the source.	Not applicable
Chronic Hazard	416205.7	3766041	Not applicable	0.45 At a Cartesian receptor at a closest residence from the source.
Acute Hazard	416251	3766205	Not applicable	0.22 At a Cartesian receptor at a closest residence from the source.

Table 7: Maximum Exposed Individual Worker (MEIW)

Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	416500	3766300	3.0: At a Cartesian receptor	Not applicable
Chronic Hazard	416500	3766300	Not applicable	0.98: At a Cartesian receptor

Sensitive receptors were placed at locations where exposed population could be more susceptible to exposure to emitted pollutants. The receptors were placed to cover sensitive locations within 10 KM radius from the source.

Sensitive receptors include:

- Day care centers for children and adults
- Senior living/ assisted living centers and nursing homes
- Schools

- Public parks and playgrounds
- Open recreational centers like ballfields
- Hospitals and clinics

None of the sensitive receptors in the zone of impact are at or above the cancer risk of 25 in a million or at a non-cancer hazard index of one or above. Table 8 summarizes cancer risk and non-cancer hazard for sensitive receptors.

Table 8: Sensitive Receptor Risk for Cancer and Non-Cancer Risk

SENSITIVE Risk Type	UTM Coordinate		Risk Sum (in a million)	Hazard Index
	X	Y		
Cancer Risk	415913	3766969	2.12	Not applicable
Chronic Hazard	415836	3764445	Not applicable	0.08
Acute Hazard	416985	3767166	Not applicable	0.05

The total potential multi-pathway cancer risk at the MEIR is 13.3 per million assuming individual is in the same location for 30 years. The pathways included in the analysis are: inhalation (INHAL), soil ingestion (SOIL), dermal absorption (DERM), and mother's milk (MOTHER), homegrown produce (VEG). Over half of the risk is contributed by Arsenic. Major contributors of the remaining risk are Hexavalent Chromium, Nickel and Cadmium. Major pathways for these substances are inhalation, soil ingestion and homegrown produce.

Table 9: Cancer Risk by Substance for MEIR

Appendix A contains this information.

The total potential multi-pathway cancer risk at MEIW is 3.0 in a million assuming individual is in the same location for 25 years. The pathways included in the analysis are: inhalation (INHAL), soil ingestion (SOIL) and dermal absorption (DERM). Over half of the risk is contributed by hexavalent chromium. Major contributors of the remaining risk are arsenic, nickel and cadmium. The major pathways for these substances are inhalation and soil ingestion.

Table 10: Cancer Risk by Substance for MEIW

Appendix A contains this information.

A map of the Facility and surrounding area extended to a 10 miles radius with locations of the MEIR, MEIW and PMI for cancer risk is provided in Appendix B, Figure 5.

A map of 30-year exposure cancer risk zone of impact shows the 10, 25 and 100 in one million risk contour. The cancer burden is 0.31, which is not greater than 0.5, hence a map showing 1 in one million risk contour based on a 70-year exposure is not presented.

The following guidance was used to prepare this HRA report:

- Appendix C “Outline for the Health Risk Assessment Report”, a part of- South Coast Air Quality Management District- “Supplemental Guidelines for Preparing Risk Assessments and Risk Reduction Plan for the Air Toxics Hot Spots Information and Assessment Act”- November 4, 2016.

2.0 OVERVIEW OF HRA PROCESS

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

- Hazard Identification (see Section 3.0): identifies the specific hazards associated with the compounds included in the HRA.
- Dose-Response Assessment (see Section 0): identifies the specific cancer potency and non-cancer reference exposure levels to compare estimated concentrations.
- Exposure Assessment (see Section 5.0): estimates the ground level concentration for each substance at each receptor and each averaging time.
- Risk Characterization (see Section 6.0): 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 and PERIOD plot file for each source that contains dispersion factors. This function is part of the Exposure Assessment step of the HRA.
- Ground Level Concentration (GLC) calculation: Uses the emission inventory from the ATIR 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.

3.0 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 toxic air contaminants (TAC’s) from one point source (SV001). Source SV001 is a boiler exhaust located at the UTM coordinate 416343mE, 3766232mN (NAD83 Zone 11N). Emissions are from the combustion of treated LFG. The following table lists substances emitted from the Facility that are listed on the ATIR. These substances have been evaluated for cancer risk and non-cancer acute and chronic health hazard. Included in Table 11 are the chemical names, CAS numbers and physical state of each substance.

Table 11: Substances emitted from the Facility

Substance	CAS	Physical state
Methane	74828	Vapor
Hexane	110543	Vapor
Benzene	71432	Vapor
Toluene	108883	Vapor
Benzyl Chloride	100447	Vapor
Beryllium	7440417	Solid
Cadmium	7440439	Solid
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	Solid
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	Solid
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	Solid
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	Solid
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	Solid
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	Solid
1,2,3,7,8-Pentachlorodibenzofuran	57117416	Solid
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	Solid
2,3,7,8-Tetrachlorodibenzofuran	51207319	Solid
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	Solid
2,3,4,7,8- Pentachlorodibenzofuran	57117314	Solid
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	Solid
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	Solid
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	Solid
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	Solid
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	Solid

Formaldehyde	50000	Vapor
Hexavalent Chromium	18540299	Solid
Arsenic	7440382	Solid
Lead	7439921	Solid
Nickel	7440020	Solid
Acenaphthene	83329	Vapor
Acenaphthylene	208968	Vapor
Anthracene	120127	Solid
Benzo(a)anthracene	56553	Vapor
Benzo(a)pyrene	50328	Vapor
Benzo(b)fluoranthene	205992	Vapor
Benzo(g,h,I)perylene	191242	Vapor
Benzo(k)Fluoranthene	207089	Vapor
Chrysene	218019	Solid
Dibenz(a,h)anthracene	53703	Solid
Fluoranthene	206440	Solid
Fluorene	86737	Solid
Indeno(1,2,3-cd)pyrene	193395	Solid
Naphthalene	91203	Solid
Phenanthrene	85018	Solid
Pyrene	129000	Solid
Ammonia	7664417	Vapor
Copper	7440508	Solid
Manganese	7439965	Solid
Mercury	7439976	Solid

Selenium	7782492	Solid
Total PAHs (excluding Naphthalene)	1151	Vapor
Acetaldehyde	75070	Vapor
Acrolein	107028	Vapor
Ethyl Benzene	100414	Vapor
Xylene	1330207	Vapor

Some substances are multi-pathways substances which affect the human body through more than one pathway. Table 12 shows multi-pathway substances that can affect human organs through more than just inhalation including: dermal absorption (Dermal), soil ingestion (Soil), mother's milk (Mother) and homegrown produce (Veg). While evaluating risks for residents, all these pathways are assessed. However, for evaluating hazards and risk for an offsite worker, only inhalation, dermal absorption and soil ingestion should be assessed as per the guidance by SCAQMD.

Table 12: Multi-pathway substances and pathways

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
Hexavalent Chromium	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Arsenic	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Lead	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(a)anthracene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(a)pyrene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(b)fluoranthene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Benzo(k)Fluoranthene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Chrysene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
Dibenz(a,h)anthracene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Indeno(1,2,3-cd)pyrene	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Total PAHs (excluding Naphthalene)	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Beryllium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Cadmium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X

Substance	Type of Risk/ Hazard	Inhalation	Dermal	Soil	Mother	Veg
2,3,4,7,8- Pentachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
2,3,4,6,7,8-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
1,2,3,7,8,9-Hexachlorodibenzofuran	Cancer, Chronic non-cancer, Acute non-cancer	X	X	X	X	X
Nickel	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Mercury	Chronic non-cancer, Acute non-cancer	X	X	X	No	X
Selenium	Chronic non-cancer, Acute non-cancer	X	X	X	No	X

4.0 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 PMI and 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 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.

5.0 EXPOSURE ASSESSMENT

5.1 Facility Description

The Facility, SCAQMD ID 113873, is located at 2210 South Azusa Avenue in West Covina, California, 91792. The Facility is an electrical generating plant consisting of: one emission source (boiler), a steam turbine, and a landfill gas (LFG) treatment system. There are several buildings on the property to house generation and maintenance equipment. A site location map showing source location and surrounding buildings is shown in Figure 2. Figure 1 and Figure 2 shows the property line.

The Facility is bounded on all sides by property owned by the Landfill. The Landfill is bounded by: Azusa Avenue and retail shopping centers and ballfields on the west; by residential properties to the north and south; and by vacant foothills to the east. The Facility is located at approximately 600 feet above mean sea level. The landfill to the northeast of the Facility rises to approximately 1,200 feet above mean sea level. The terrain to the immediate north, south and west are relatively flat and at about the same elevation as the Facility. The terrain to the immediate east to northeast consists of elevated terrain.

The Facility generates electricity by routing landfill gas (LFG) being generated at the Landfill to a boiler. The boiler generates steam which drives a turbine to generate electricity. The Landfill is not owned by MM West Covina LLC. The Facility is located completely within the Landfill property line. The Facility occupies approximately 1.2 acres which is delineated by the lease line.

5.2 Emission Inventory

Table 1: “Air Toxics Emission Inventory Table” contains a complete list of emitted substances and emission rates expressed in Annual (lb/yr), Annual (g/s), 1-Hour Max (lb/hr) and 1-Hour Max (g/s) provided by MM West Covina for the Facility.

- Source: SV001, Boiler Stack
- Source location: 416343 (m)E, 3766232(m)N
- Source base elevation: 581.59 ft
- Source height: 45 feet (provided by MM West Covina LLC)
- Source dimensions: 3.96 ft inside diameter (provided by MM West Covina LLC)
- Stack exit gas velocity: 63.003 ft/s
- Stack gas volumetric flow rate: 46558 ACFM (from 2006 HRA)
- Stack gas exit temperature: 520 F (from stack test conducted on October 3, 2017)
- Number of operating hours per day : 24
- Number of operating hours per year: 8760

- Number of operating days per week: 7
- Number of operating weeks per year: 52

Emission inventory methods include a combination of measured and estimated emissions. A source test conducted on September 2, 2016 measured emissions of certain substances, and for others the standard emission factors have been used to estimate emissions (see the approved ATIR for additional details). Emission rates have already been reported in Table 1 in the Executive Summary section.

5.3 Air Dispersion

Although HARP2 can run air dispersion modeling, HARP2 is also capable of importing plot files using air dispersion modeling software such as AERMOD. For this HRA study, plot files were generated using AERMOD and imported into HARP2 for calculating GLCs.

5.3.1 Point Source

The Facility has only one source, SV001, which is evaluated for emissions. The source parameters are section 5.2 above.

5.3.2 Receptors

For this HRA study, four types of receptors were used. The total receptor grid was created to cover the area of 50,000 (m) x 50,000 (m), centered approximately on SV001, but the entire receptor grid was reduced to the shape that would encompass 1 in a million isopleth (70 year exposure) retaining 62,556 receptors with maximum coverage of 43,500 (m).

- Cartesian Grid: Cartesian grid receptors were centered approximately on SV001 and adjusted so that receptors end in hundreds (e.g. 100, 200). In addition, SCAQMD generated a “fine” receptor grid considering 26 receptors near the MEIR to refine the MEIR risk.
- 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.
- Sensitive Receptors: Sensitive receptors are placed where the population is potentially more susceptible to adverse effects from emitted pollutants. Some of these locations are hospitals, day care centers, schools and senior living.
- Fenceline Receptors: Receptors are placed on the lease line of the facility. SCAQMD has guidance on spacing of these receptors as mentioned in 3.11.4 “Receptor Grid” in SCAQMD Supplemental Guidelines. Adhering to that guidance, the receptors were placed 20 meters apart.

The zone of impact extends approximately 41 km to the northeast, 34 km to the southwest, 15 km to the northwest and 11 km to the southeast.

Dispersion from the Facility was modeled using the latest version of AERMOD.

Parameters used in AERMOD are summarized in Table 13.

Table 13: Model Options and Parameters

Parameter	Value/Notes
Model Versions	AERMOD = 18081; AERMAP=18081; BPIP=04274
Model Options	Default, Concentration
Averaging Times	1-hr, 8-hr, PERIOD
Dispersion Coefficient	Urban option used.
Point Source	Emission Rate = 1 g/s; Height = 45 ft; Temperature = 544K, Velocity = 19.2 m/s; Diameter = 3.96 ft. Emission rate is used to generate dispersion factors; height and diameter provided by MM West Covina LLC; temperature from recent stack test; velocity from 2006 HRA.
Downwash	Numerous buildings are included in the BPIP model to estimate downwash. Building data obtained from 2006 HRA and from Google Earth.
Urban Group	ALL source group assigned to the group using a population of 12,828,837 for the Los Angeles Mean Statistical Area (2010 census).
Receptors	Ambient Air Boundary: Facility lease line used Sensitive Receptors: Included for suggested receptors Population Receptors: Included for the zone of impact Grid Receptors: Included with 100 meter spacing out to encompass the 10 in a million risk contour and at 1,000 meter spacing from that point out to 43.5 km. Fine Receptors: Consists of 26 receptors located near the MEIR to further refine the risk.
Elevations	All point source, building, and receptor elevations assigned from 1 arc second terrain data downloaded from the National Elevation Dataset (NED). AERMAP was used to assign elevations.
MET Data	Azusa MET data obtained from SCAQMD used for this analysis. Justification is that it is the closest MET station (~6.9 miles from the Facility). The MET data includes the years 2012-2016.

5.4 Ground Level Concentration

The HARP2 software multiplies the ATIR 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.

6.0 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:

6.1 Risk Analysis

HARP2 compares the GLCs to established cancer, chronic, and acute risk thresholds to estimate risk. Table 14 provides risk scenario parameters used in HARP2.

Table 14: Risk Scenario Parameters for HARP2

Risk Type	Receptor Type	Exposure Duration	Method	Pathways
Cancer PMI and MEIR	Individual Resident	30 year	RMP using Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Cancer MEIW	Worker	25 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil Deposition rate = 0.02 m/s
Cancer Burden	Individual Resident	70 year	RMP using Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Chronic PMI and MEIR	Individual Resident	30 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s
Chronic MEIW	Worker	25 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil Deposition rate = 0.02 m/s
Chronic 8 hour	Individual Resident	30 year	OEHHA Derived Method	Inhalation, Dermal (warm), Soil, Homegrown produce, Mother's milk Deposition rate = 0.02 m/s

Risk Type	Receptor Type	Exposure Duration	Method	Pathways
Acute	Automatic	Automatic	OEHHA Derived Method	Inhalation

6.2 Receptors

Receptors are the points where the model estimates concentration due to dispersion. There are different types of receptors that are used in this model. See Section 5.3.2 for receptor details.

6.3 Site/Route Dependent Pathways

Site/ Route dependent pathways are the pathways that indirectly introduce the chemicals to human body. These pathways include:

- Water: The water pathway may be evaluated if a standing water body is contaminated by facility emissions and is used as a source for human drinking water.
- Fish: The fish pathway calculations assume that pollutants deposited into the water remain suspended or dissolved in the water column and are available for bioaccumulation in fish. The fish, if caught for human consumption, acts as a site/route dependent pathway.
- Pasture: The pollutants deposit in pasture, consumed by cattle. If the meat of this cattle is consumed by humans, this acts as a site/route dependent pathway.

The site/route dependent pathways were evaluated for of pollutants considered in this HRA. Appendix A, Table A13 shows these pollutant concentrations at MEIR.

6.4 Cancer Risk Estimates

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 5, Table 6, Table 7, and Table 8. Cancer risk contribution by substance can be found in Appendix A, Tables A1, A2 and A3. Since there is only one source of interest on this Facility, there is no separate table for the cancer risk by source.

6.4.1 MEIR Cancer Risk:

The MEIR Cancer Risk is predicted to be 13.3 per million at UTM coordinate 416205.7mE, 3766041mN which corresponds to a Cartesian grid receptor located at the nearest residence. This risk assumes that the resident is present/residing at the location for 30 years continuously. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. Major pathways for these substances are mother's milk, soil ingestion and inhalation.

6.4.2 MEIW Cancer Risk:

The MEIW Cancer Risk is predicted to be 3.0 per million at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes that the worker is employed at the location of the receptor for 25 years. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of

the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. The major pathways for these substances are soil ingestion and dermal.

6.4.3 PMI Cancer Risk:

The PMI Cancer Risk is predicted to be 56.25 per million at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes 30-years of continuous exposure. Over half of the risk is contributed by 1,2,3,7,8-Pentachlorodibenzo-p-dioxin. Major contributors of the remaining risk are 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic and hexavalent chromium. Major pathways for these substances are mother's milk, soil ingestion and inhalation.

6.4.4 Sensitive Receptors Cancer Risk:

For the sensitive receptors that were placed around the Facility, the highest cancer risk was predicted to be 2.8 per million at the UTM coordinate of 416985mE and 3767166mN.

6.5 Chronic, Non-Cancer Risk Estimates:

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 5, Table 6, Table 7, and Table 8. Since there is only one source of interest at this Facility, there is no separate table for the cancer risk by source.

6.5.1 MEIR Chronic, Non-Cancer Risk:

The MEIR chronic, non-cancer risk is predicted to be 0.45 at UTM coordinate 416205.7mE, 3766041mN which corresponds to a Cartesian grid receptor at the nearest residence. This risk assumes that the resident is present/residing at the location for 30 years continuously. Over half of the risk is due to Methane and Ammonia. Major contributors of the remaining risk are Manganese, Hexane and Naphthalene. The pathway for maximum exposure and contribution is Inhalation.

6.5.2 MEIW Chronic, Non-Cancer Risk:

The MEIR chronic, non-cancer risk is predicted to be 0.98 at UTM coordinate 416500mE, 3766300mN which corresponds to a fenceline receptor. This risk assumes that the worker is employed at the location of the receptor for 25 years. Over half of the risk is from Ammonia. Major contributors of the remaining risk are Methane, Manganese and Hexane. The pathway for maximum exposure and contribution is Inhalation.

6.5.3 PMI Chronic, Non-Cancer Risk:

The PMI chronic, non-cancer risk is predicted to be 1.92 at UTM coordinate 416500mE, 3766300mN which corresponds to a Cartesian receptor. This risk assumes 30-years of continuous exposure. Over half of the risk is from Methane and Ammonia. Major contributors of the remaining risk are Manganese, Hexane and Naphthalene. The pathway for maximum exposure and contribution is Inhalation.

6.5.4 Sensitive Receptors Chronic, Non-Cancer Risk:

Chronic, non-cancer risk is predicted to be below 0.14 HI for sensitive receptors included in this HRA. Over half of the risk is from Ammonia. The pathway for maximum exposure and contribution is inhalation.

6.6 Acute, Non-Cancer Risk Estimates:

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. The highest acute hazard index is predicted to be 1.70 at UTM coordinate 416319mE, 3766205mN which corresponds to a fence line receptor. Most of the risk is from Nickel. The pathway for maximum exposure and contribution is inhalation.

The chronic hazard estimates for PMI, MEIR and sensitive receptors are listed in Table 5, Table 6, and Table 8. Since there is only one source of interest at this Facility, there is no separate table for the cancer risk by source.

6.7 Estimates of Population Exposure.

As defined in SCAQMD Rule 1402, cancer burden is the “estimated increase in the occurrence of cancer cases in a population subject to a Maximum Individual Cancer Risk of greater than or equal to one in one million (1×10^{-6}) resulting from exposure to toxic air contaminants.”

Cancer burden is calculated with the following equation as given in the question # 5 of Summary Table found in Attachment A to Appendix C for HRA SCAQMD AB2588 and Rule 1402 Supplemental Guidelines.

Cancer Burden = Cancer Risk X No. of People Exposed to Specific Cancer Risk

With current predicted results for the Facility, estimated cancer burden for this impact zone is 0.31. The number of people estimated to be exposed to a cancer risk of more than 1 in a million is 167,554.

6.8 Maps

Appendix B contains the required maps/figures. These maps are prepared to reflect results from the HRA.

- Figure 1, “Site Vicinity Map”: This map shows the site location, and surrounding area.
- Figure 2, “Plot Plan”: This map shows the Facility property boundary, and location of the emission sources within the Facility that are evaluated for this HRA.
- Figure 3, “Sensitive Receptors”: This map shows the locations of the sensitive receptors on the map within the zone of impact around the emission source. Sensitive receptors were placed at schools, day care centers, hospitals, playgrounds/parks and elderly care centers, where the occupants could be more susceptible to the potential adverse effects due to exposure to pollutants.
- Figure 4, “Population Receptors”: This map shows the locations of the population receptors on the map within the zone of impact around the emission source. Population receptors and their locations were taken from the HARP database.
- Figure 5, “Locations of MEIR, MEIW, and PMI for Cancer Risk”: This map shows locations of the receptors that are at the maximum cancer risk for a resident, a worker and for the maximum impact.
- Figure 6, “Locations of MEIR, MEIW and PMI for Chronic Hazard Risk”: This map shows locations of the receptors that are at the maximum chronic, non-cancer risk for a resident, a worker and for the maximum impact.

- Figure 7, “Locations of MEIR, MEIW and PMI for Acute Hazard Risk”: This map shows locations of the receptors that are at the maximum acute, non-cancer risk for a resident, a worker and for the maximum impact.
- Figure 8, “Cancer Risk Contours 30 yr”: This map shows the property boundary, and cancer risk contours for receptors exposed to a cancer risk of more than or equal to 1,10, 25 and 100-in-a-million. This assumes residential exposure for a 30-year period.
- Figure 9, “Chronic Hazard Index Contours (Residential Exposure)”: This map shows property boundary, and chronic, non-cancer risk contours for residential exposure for receptors exposed to a hazard index of 0.5, 1, 3, 5.
- Figure 10, “Acute Hazard Index Contours (Residential Exposure)”: This map shows property boundary, and acute hazard risk contours for the residential exposure for the scenarios for 0.5, 1, 3, 5 in a million risk thresholds.
- Figure 11, ““Cancer Risk Contours 70 yr”: This map shows the property boundary, and cancer risk contours for receptors exposed to a cancer risk of more than or equal to 1 in-a-million. This assumes residential exposure for a 70-year period.

7.0 REFERENCES

- SCAQMD. Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act – September 2018
- California Office of Environmental Hazard Assessment, Air Toxics Hotspots Program Risk Assessment Guidelines - February 2015
- California Environmental Protection Agency- User Manual for the Hotspots Analysis and Reporting Programs Air Dispersion Modeling and Risk Assessment Tool, Version 2

Signature Page

Golder Associates Inc.

Neha Damlé
Staff Engineer

Ryan Birkenholz
Associate and Senior Consultant

ND/RB/ND

APPENDIX A

Tables

Table A1: Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	1.64E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	6.63E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	3.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	3.98E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	9.86E-17	1.26E-15	5.96E-17	9.72E-16	8.44E-17
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	2.65E-13	3.38E-12	1.60E-13	5.36E-12	2.27E-13
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	1.65E-15	2.11E-14	9.97E-16	1.63E-14	1.41E-15
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	6.45E-12	8.23E-11	3.90E-12	1.31E-10	5.52E-12
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	1.65E-14	2.11E-13	9.97E-15	1.63E-13	1.41E-14
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	1.65E-14	2.11E-13	9.97E-15	3.34E-13	1.41E-14
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.95E-15	6.32E-14	2.99E-15	4.88E-14	4.24E-15
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	1.65E-13	2.11E-12	9.97E-14	3.34E-12	1.41E-13
2,3,7,8-Tetrachlorodibenzofuran	51207319	3.29E-14	4.19E-13	1.99E-14	3.24E-13	2.81E-14
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	3.29E-13	4.19E-12	1.99E-13	6.66E-12	2.81E-13
Formaldehyde	50000	1.11E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	1.44E-05	2.49E-07	7.98E-09	0.00E+00	8.16E-06
Arsenic	7440382	1.32E-06	9.76E-06	3.97E-07	0.00E+00	6.29E-06
Lead	7439921	8.03E-09	9.59E-08	1.95E-09	1.74E-09	1.92E-08
Nickel	7440020	4.13E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	4.55E-09	1.66E-08	3.45E-09	3.94E-08	8.13E-08
Benzo(a)pyrene	50328	4.55E-08	1.66E-07	3.45E-08	3.94E-07	8.13E-07
Benzo(b)fluranthene	205992	4.55E-09	1.66E-08	3.45E-09	3.94E-08	8.13E-08
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	4.55E-09	1.66E-08	3.45E-09	3.94E-08	8.13E-08

Table A1: Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	4.55E-10	1.66E-09	3.45E-10	3.94E-09	8.13E-09
Dibenz(a,h)anthracene	53703	4.79E-08	5.67E-08	1.18E-08	1.35E-07	2.78E-07
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	4.55E-09	1.66E-08	3.45E-09	3.94E-08	8.13E-08
Naphthalene	91203	1.21E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	1.78E-12	6.47E-12	1.35E-12	1.54E-11	3.17E-11
Acetaldehyde	75070	5.81E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.12E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	1.46E-10	1.86E-09	8.83E-11	1.44E-09	1.25E-10
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	3.40E-11	4.33E-10	2.05E-11	3.35E-10	2.91E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	2.66E-11	3.39E-10	1.61E-11	2.62E-10	2.28E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	1.64E-14	2.10E-13	9.93E-15	3.33E-13	1.41E-14
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	1.64E-14	2.10E-13	9.93E-15	3.33E-13	1.41E-14
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	1.64E-14	2.10E-13	9.93E-15	1.62E-13	1.41E-14

Table A2 : Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	3.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	1.27E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	6.96E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	7.60E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	1.88E-17	2.40E-16	1.14E-17	1.86E-16	1.61E-17
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	5.06E-14	6.45E-13	3.06E-14	1.02E-12	4.33E-14
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	3.15E-16	4.02E-15	1.91E-16	3.11E-15	2.70E-16
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.23E-12	1.57E-11	7.45E-13	2.50E-11	1.06E-12
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	3.15E-15	4.02E-14	1.91E-15	3.11E-14	2.70E-15
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	3.15E-15	4.02E-14	1.91E-15	6.39E-14	2.70E-15
1,2,3,7,8-Pentachlorodibenzofuran	57117416	9.46E-16	1.21E-14	5.71E-16	9.32E-15	8.10E-16
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	3.15E-14	4.02E-13	1.91E-14	6.39E-13	2.70E-14
2,3,7,8-Tetrachlorodibenzofuran	51207319	6.28E-15	8.01E-14	3.79E-15	6.19E-14	5.38E-15
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	6.28E-14	8.01E-13	3.79E-14	1.27E-12	5.38E-14
Formaldehyde	50000	2.12E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	2.75E-06	4.76E-08	1.53E-09	0.00E+00	1.56E-06
Arsenic	7440382	2.53E-07	1.86E-06	7.59E-08	0.00E+00	1.20E-06
Lead	7439921	1.53E-09	1.83E-08	3.73E-10	3.32E-10	3.68E-09
Nickel	7440020	7.88E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	8.70E-10	3.17E-09	6.60E-10	7.53E-09	1.55E-08
Benzo(a)pyrene	50328	8.70E-09	3.17E-08	6.60E-09	7.53E-08	1.55E-07
Benzo(b)fluranthene	205992	8.70E-10	3.17E-09	6.60E-10	7.53E-09	1.55E-08
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	8.70E-10	3.17E-09	6.60E-10	7.53E-09	1.55E-08

Table A2 : Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	8.70E-11	3.17E-10	6.60E-11	7.53E-10	1.55E-09
Dibenz(a,h)anthracene	53703	9.15E-09	1.08E-08	2.26E-09	2.57E-08	5.30E-08
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	8.70E-10	3.17E-09	6.60E-10	7.53E-09	1.55E-08
Naphthalene	91203	2.32E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	3.39E-13	1.24E-12	2.58E-13	2.94E-12	6.06E-12
Acetaldehyde	75070	1.11E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	2.14E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	2.79E-11	3.56E-10	1.69E-11	2.75E-10	2.39E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	6.49E-12	8.28E-11	3.92E-12	6.39E-11	5.56E-12
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	5.08E-12	6.48E-11	3.07E-12	5.01E-11	4.35E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	3.14E-15	4.01E-14	1.90E-15	6.36E-14	2.69E-15
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	3.14E-15	4.01E-14	1.90E-15	6.36E-14	2.69E-15
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	3.14E-15	4.01E-14	1.90E-15	3.09E-14	2.69E-15

Table A3: Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
Methane	74828	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	1.33E-08	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.40E-08	0.00E+00	0.00E+00
Beryllium	7440417	2.97E-08	0.00E+00	0.00E+00
Cadmium	7440439	3.24E-07	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	8.40E-18	5.31E-17	2.47E-17
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	2.26E-14	1.43E-13	6.63E-14
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	1.41E-16	8.89E-16	4.13E-16
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	5.50E-13	3.47E-12	1.62E-12
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	1.41E-15	8.89E-15	4.13E-15
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	1.41E-15	8.89E-15	4.13E-15
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.22E-16	2.67E-15	1.24E-15
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	1.41E-14	8.89E-14	4.13E-14
2,3,7,8-Tetrachlorodibenzofuran	51207319	2.80E-15	1.77E-14	8.23E-15
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	2.80E-14	1.77E-13	8.23E-14
Formaldehyde	50000	9.05E-09	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	1.17E-06	2.48E-08	1.72E-09
Arsenic	7440382	1.13E-07	4.12E-07	1.65E-07
Lead	7439921	9.25E-10	4.05E-09	4.21E-10
Nickel	7440020	3.36E-07	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	3.88E-10	1.65E-09	1.43E-09
Benzo(a)pyrene	50328	3.88E-09	1.65E-08	1.43E-08
Benzo(b)fluranthene	205992	3.88E-10	1.65E-09	1.43E-09
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	3.88E-10	1.65E-09	1.43E-09
Chrysene	218019	3.88E-11	1.65E-10	1.43E-10
Dibenz(a,h)anthracene	53703	5.52E-09	5.65E-09	2.54E-09
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	3.88E-10	1.65E-09	1.43E-09
Naphthalene	91203	9.89E-08	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	1.51E-13	6.45E-13	5.59E-13
Acetaldehyde	75070	4.73E-15	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00

Table A3: Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
Ethyl Benzene	100414	9.15E-15	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	1.24E-11	7.87E-11	3.66E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	2.89E-12	1.83E-11	8.51E-12
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	2.27E-12	1.43E-11	6.66E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	1.40E-15	8.85E-15	4.12E-15
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	1.40E-15	8.85E-15	4.12E-15
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	1.40E-15	8.85E-15	4.12E-15

Table A4: Chronic, Non-Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	9.98E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	2.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	2.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	1.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	6.29E-05	5.68E-07	1.83E-08	0.00E+00	1.73E-07
Cadmium	7440439	3.84E-04	3.47E-06	7.46E-09	0.00E+00	5.89E-06
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	5.18E-15	1.01E-17	7.59E-19	1.93E-16	1.15E-18
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	1.39E-11	2.72E-14	2.04E-15	1.07E-12	3.08E-15
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	2.60E-15	5.08E-18	3.81E-19	9.71E-17	5.76E-19
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.02E-11	1.99E-14	1.49E-15	7.80E-13	2.25E-15
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	2.60E-15	5.08E-18	3.81E-19	9.71E-17	5.76E-19
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	2.60E-15	5.08E-18	3.81E-19	2.00E-16	5.76E-19
1,2,3,7,8-Pentachlorodibenzofuran	57117416	2.60E-15	5.08E-18	3.81E-19	9.71E-17	5.76E-19
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	2.60E-15	5.08E-18	3.81E-19	2.00E-16	5.76E-19
2,3,7,8-Tetrachlorodibenzofuran	51207319	5.18E-15	1.01E-17	7.59E-19	1.93E-16	1.15E-18
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	5.18E-15	1.01E-17	7.59E-19	3.97E-16	1.15E-18
Formaldehyde	50000	7.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	4.09E-05	3.69E-07	7.93E-09	0.00E+00	9.57E-06
Arsenic	7440382	2.26E-04	2.04E-06	1.32E-07	0.00E+00	2.40E-06
Lead	7439921	3.92E-04	3.54E-06	1.14E-07	2.08E-06	4.13E-07
Nickel	7440020	6.57E-03	5.94E-05	1.28E-06	0.00E+00	3.55E-05
Acenaphthene	83329	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Benzo(a)pyrene	50328	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Benzo(b)fluranthene	205992	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Benzo(g,h,I)perylene	191242	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08

Table A4: Chronic, Non-Cancer Risk Contribution by Substance for PMI

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Dibenz(a,h)anthracene	53703	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Fluoranthene	206440	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	2.39E-05	3.07E-09	1.43E-09	2.84E-07	3.80E-08
Naphthalene	91203	1.46E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	2.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	2.52E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	1.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	6.34E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	2.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	4.50E-06	4.07E-08	1.75E-09	0.00E+00	2.60E-08
Selenium	7782492	2.90E-05	2.62E-07	8.44E-09	0.00E+00	1.14E-06
Total PAHs (excluding Naphthalene)	1151	9.33E-10	1.20E-13	5.58E-14	1.11E-11	1.48E-12
Acetaldehyde	75070	8.42E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	7.47E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.87E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	5.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	7.67E-12	1.50E-14	1.12E-15	2.86E-13	1.70E-15
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	5.35E-12	1.05E-14	7.84E-16	2.00E-13	1.19E-15
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	4.19E-12	8.19E-15	6.14E-16	1.56E-13	9.28E-16
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	2.59E-15	5.06E-18	3.79E-19	1.99E-16	5.74E-19
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	2.59E-15	5.06E-18	3.79E-19	1.99E-16	5.74E-19
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	2.59E-15	5.06E-18	3.79E-19	9.67E-17	5.74E-19

Table A5 :Chronic, Non-Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Methane	74828	1.91E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	3.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	4.53E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108883	2.53E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	1.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	1.20E-05	1.09E-07	3.50E-09	0.00E+00	3.30E-08
Cadmium	7440439	7.34E-05	6.63E-07	1.42E-09	0.00E+00	1.13E-06
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	9.90E-16	1.93E-18	1.45E-19	3.69E-17	2.19E-19
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	2.66E-12	5.19E-15	3.89E-16	2.04E-13	5.88E-16
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	4.97E-16	9.71E-19	7.28E-20	1.85E-17	1.10E-19
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.94E-12	3.80E-15	2.84E-16	1.49E-13	4.30E-16
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	4.97E-16	9.71E-19	7.28E-20	1.85E-17	1.10E-19
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	4.97E-16	9.71E-19	7.28E-20	3.81E-17	1.10E-19
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.97E-16	9.71E-19	7.28E-20	1.85E-17	1.10E-19
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	4.97E-16	9.71E-19	7.28E-20	3.81E-17	1.10E-19
2,3,7,8-Tetrachlorodibenzofuran	51207319	9.90E-16	1.93E-18	1.45E-19	3.69E-17	2.19E-19
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	9.90E-16	1.93E-18	1.45E-19	7.59E-17	2.19E-19
Formaldehyde	50000	1.46E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	7.81E-06	7.05E-08	1.52E-09	0.00E+00	1.83E-06
Arsenic	7440382	4.32E-05	3.90E-07	2.51E-08	0.00E+00	4.58E-07
Lead	7439921	7.48E-05	6.76E-07	2.18E-08	3.98E-07	7.89E-08
Nickel	7440020	1.26E-03	1.13E-05	2.44E-07	0.00E+00	6.79E-06
Acenaphthene	83329	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Benzo(a)pyrene	50328	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Benzo(b)fluranthene	205992	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Benzo(g,h,I)perylene	191242	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09

Table A5 :Chronic, Non-Cancer Risk Contribution by Substance for MEIR

Compound	CAS	Inhalation	Soil	Dermal	Milk	Veg
Chrysene	218019	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Dibenz(a,h)anthracene	53703	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Fluoranthene	206440	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	4.57E-06	5.86E-10	2.73E-10	5.42E-08	7.26E-09
Naphthalene	91203	2.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	4.57E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	4.82E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	2.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	1.21E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	4.14E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	8.60E-07	7.77E-09	3.34E-10	0.00E+00	4.97E-09
Selenium	7782492	5.54E-06	5.01E-08	1.61E-09	0.00E+00	2.18E-07
Total PAHs (excluding Naphthalene)	1151	1.78E-10	2.29E-14	1.07E-14	2.11E-12	2.83E-13
Acetaldehyde	75070	1.61E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	1.43E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	3.57E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	1.47E-12	2.87E-15	2.15E-16	5.47E-14	3.25E-16
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	1.02E-12	2.00E-15	1.50E-16	3.82E-14	2.26E-16
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	8.01E-13	1.57E-15	1.17E-16	2.99E-14	1.77E-16
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	4.95E-16	9.67E-19	7.25E-20	3.80E-17	1.10E-19
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	4.95E-16	9.67E-19	7.25E-20	3.80E-17	1.10E-19
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	4.95E-16	9.67E-19	7.25E-20	1.85E-17	1.10E-19

Table A6: Chronic, Non-Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
Methane	74828	9.98E-02	0.00E+00	0.00E+00
Hexane	110543	2.07E-02	0.00E+00	0.00E+00
Benzene	71432	2.37E-03	0.00E+00	0.00E+00
Toluene	108883	1.32E-04	0.00E+00	0.00E+00
Benzyl Chloride	100447	5.65E-03	0.00E+00	0.00E+00
Beryllium	7440417	6.29E-05	3.12E-07	4.46E-08
Cadmium	7440439	3.84E-04	1.91E-06	1.82E-08
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	5.18E-15	5.57E-18	1.85E-18
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	1.39E-11	1.49E-14	4.96E-15
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	2.60E-15	2.79E-18	9.28E-19
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.02E-11	1.09E-14	3.63E-15
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	2.60E-15	2.79E-18	9.28E-19
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	2.60E-15	2.79E-18	9.28E-19
1,2,3,7,8-Pentachlorodibenzofuran	57117416	2.60E-15	2.79E-18	9.28E-19
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	2.60E-15	2.79E-18	9.28E-19
2,3,7,8-Tetrachlorodibenzofuran	51207319	5.18E-15	5.57E-18	1.85E-18
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	5.18E-15	5.57E-18	1.85E-18
Formaldehyde	50000	7.66E-03	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	4.09E-05	2.03E-07	1.93E-08
Arsenic	7440382	2.26E-04	1.12E-06	3.21E-07
Lead	7439921	3.92E-04	1.95E-06	2.78E-07
Nickel	7440020	6.57E-03	3.26E-05	3.11E-06
Acenaphthene	83329	2.39E-05	0.00E+00	0.00E+00
Acenaphthylene	208968	2.39E-05	0.00E+00	0.00E+00
Anthracene	120127	2.39E-05	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	2.39E-05	5.63E-09	3.48E-09
Benzo(a)pyrene	50328	2.39E-05	5.63E-09	3.48E-09
Benzo(b)fluranthene	205992	2.39E-05	5.63E-09	3.48E-09
Benzo(g,h,I)perylene	191242	2.39E-05	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	2.39E-05	5.63E-09	3.48E-09
Chrysene	218019	2.39E-05	5.63E-09	3.48E-09
Dibenz(a,h)anthracene	53703	2.39E-05	5.63E-09	3.48E-09
Fluoranthene	206440	2.39E-05	0.00E+00	0.00E+00
Fluorene	86737	2.39E-05	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	2.39E-05	5.63E-09	3.48E-09
Naphthalene	91203	1.46E-02	0.00E+00	0.00E+00
Phenanthrene	85018	2.39E-05	0.00E+00	0.00E+00
Pyrene	129000	2.52E-05	0.00E+00	0.00E+00
Ammonia	7664417	1.35E-01	0.00E+00	0.00E+00
Copper	7440508	6.34E-04	0.00E+00	0.00E+00
Manganese	7439965	2.17E-02	0.00E+00	0.00E+00
Mercury	7439976	4.50E-06	2.24E-08	4.26E-09
Selenium	7782492	2.90E-05	1.44E-07	2.06E-08
Total PAHs (excluding Naphthalene)	1151	9.33E-10	2.20E-13	1.36E-13
Acetaldehyde	75070	8.42E-09	0.00E+00	0.00E+00
Acrolein	107028	7.47E-09	0.00E+00	0.00E+00
Ethyl Benzene	100414	1.87E-08	0.00E+00	0.00E+00
Xylene	1330207	5.42E-08	0.00E+00	0.00E+00

Table A6: Chronic, Non-Cancer Risk Contribution by Substance for MEIW

Compound	CAS	Inhalation	Soil	Dermal
2,3,4,7,8- Pentachlorodibenzofuran	57117314	7.67E-12	8.24E-15	2.74E-15
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	5.35E-12	5.75E-15	1.91E-15
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	4.19E-12	4.50E-15	1.50E-15
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	2.59E-15	2.78E-18	9.25E-19
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	2.59E-15	2.78E-18	9.25E-19
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	2.59E-15	2.78E-18	9.25E-19

Table A7: Acute, Non-Cancer Risk Contribution by Substance

Compound	CAS	Hazard Index
Methane	74828	0.00E+00
Hexane	110543	0.00E+00
Benzene	71432	1.47E-02
Toluene	108883	7.97E-07
Benzyl Chloride	100447	2.63E-03
Beryllium	7440417	0.00E+00
Cadmium	7440439	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00
Formaldehyde	50000	7.77E-03
Hexavalent Chromium	18540299	0.00E+00
Arsenic	7440382	1.89E-01
Lead	7439921	0.00E+00
Nickel	7440020	1.83E+00
Acenaphthene	83329	0.00E+00
Acenaphthylene	208968	0.00E+00
Anthracene	120127	0.00E+00
Benzo(a)anthracene	56553	0.00E+00
Benzo(a)pyrene	50328	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00
Chrysene	218019	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00
Fluoranthene	206440	0.00E+00
Fluorene	86737	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00
Naphthalene	91203	0.00E+00
Phenanthrene	85018	0.00E+00
Pyrene	129000	0.00E+00
Ammonia	7664417	4.69E-03

Table A7: Acute, Non-Cancer Risk Contribution by Substance

Compound	CAS	Hazard Index
Copper	7440508	3.54E-04
Manganese	7439965	0.00E+00
Mercury	7439976	8.37E-04
Selenium	7782492	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00
Acetaldehyde	75070	2.00E-09
Acrolein	107028	3.34E-07
Ethyl Benzene	100414	0.00E+00
Xylene	1330207	4.13E-10
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00

Table A8 : Chronic, Non-Cancer Risk Contribution by Organs for PMI

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	2.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.91E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	4.41E-07	0.00E+00	0.00E+00	0.00E+00	4.41E-07	4.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	8.98E-03	0.00E+00	3.80E-04	0.00E+00	8.98E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	3.79E-02	0.00E+00	0.00E+00	1.92E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.26E-12	6.26E-12	6.26E-12	0.00E+00	0.00E+00	0.00E+00	6.26E-12	6.26E-12	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.34E-08	3.34E-08	3.34E-08	0.00E+00	0.00E+00	0.00E+00	3.34E-08	3.34E-08	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-10	1.04E-10	1.04E-10	0.00E+00	0.00E+00	0.00E+00	1.04E-10	1.04E-10	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.06E-07	8.06E-07	8.06E-07	0.00E+00	0.00E+00	0.00E+00	8.06E-07	8.06E-07	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-09	1.04E-09	1.04E-09	0.00E+00	0.00E+00	0.00E+00	1.04E-09	1.04E-09	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E-09	2.06E-09	2.06E-09	0.00E+00	0.00E+00	0.00E+00	2.06E-09	2.06E-09	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-10	3.15E-10	3.15E-10	0.00E+00	0.00E+00	0.00E+00	3.15E-10	3.15E-10	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E-08	2.06E-08	2.06E-08	0.00E+00	0.00E+00	0.00E+00	2.06E-08	2.06E-08	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-09	2.07E-09	2.07E-09	0.00E+00	0.00E+00	0.00E+00	2.07E-09	2.07E-09	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-08	4.11E-08	4.11E-08	0.00E+00	0.00E+00	0.00E+00	4.11E-08	4.11E-08	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E-04	0.00E+00	0.00E+00
Arsenic	7440382	1.32E+00	1.32E+00	0.00E+00	0.00E+00	0.00E+00	1.32E+00	1.32E+00	1.32E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.74E-03	4.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.69E-01	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	2.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	5.78E-04	0.00E+00	5.78E-04	0.00E+00	5.78E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	2.83E-04	2.83E-04	0.00E+00	0.00E+00	2.83E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	9.35E-12	9.35E-12	9.35E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.35E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	7.75E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-11	0.00E+00	7.75E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.28E-06	9.28E-06	9.28E-06	0.00E+00	0.00E+00	0.00E+00	9.28E-06	9.28E-06	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-06	2.14E-06	2.14E-06	0.00E+00	0.00E+00	0.00E+00	2.14E-06	2.14E-06	0.00E+00	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-06	1.67E-06	1.67E-06	0.00E+00	0.00E+00	0.00E+00	1.67E-06	1.67E-06	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-09	2.05E-09	2.05E-09	0.00E+00	0.00E+00	0.00E+00	2.05E-09	2.05E-09	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-09	2.05E-09	2.05E-09	0.00E+00	0.00E+00	0.00E+00	2.05E-09	2.05E-09	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-09	1.03E-09	1.03E-09	0.00E+00	0.00E+00	0.00E+00	1.03E-09	1.03E-09	0.00E+00	0.00E+00

Table A9: Chronic, Non-Cancer Risk Contribution by Target Organs for MEIR

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	5.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	8.42E-08	0.00E+00	0.00E+00	0.00E+00	8.42E-08	8.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	1.72E-03	0.00E+00	7.25E-05	0.00E+00	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	7.25E-03	0.00E+00	0.00E+00	3.67E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-12	1.20E-12	1.20E-12	0.00E+00	0.00E+00	0.00E+00	1.20E-12	1.20E-12	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-09	6.39E-09	6.39E-09	0.00E+00	0.00E+00	0.00E+00	6.39E-09	6.39E-09	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-11	1.98E-11	1.98E-11	0.00E+00	0.00E+00	0.00E+00	1.98E-11	1.98E-11	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-07	1.54E-07	1.54E-07	0.00E+00	0.00E+00	0.00E+00	1.54E-07	1.54E-07	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-10	1.98E-10	1.98E-10	0.00E+00	0.00E+00	0.00E+00	1.98E-10	1.98E-10	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-10	3.94E-10	3.94E-10	0.00E+00	0.00E+00	0.00E+00	3.94E-10	3.94E-10	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-11	6.01E-11	6.01E-11	0.00E+00	0.00E+00	0.00E+00	6.01E-11	6.01E-11	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-09	3.94E-09	3.94E-09	0.00E+00	0.00E+00	0.00E+00	3.94E-09	3.94E-09	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E-10	3.95E-10	3.95E-10	0.00E+00	0.00E+00	0.00E+00	3.95E-10	3.95E-10	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.85E-09	7.85E-09	7.85E-09	0.00E+00	0.00E+00	0.00E+00	7.85E-09	7.85E-09	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.50E-05	0.00E+00	0.00E+00
Arsenic	7440382	2.52E-01	2.52E-01	0.00E+00	0.00E+00	0.00E+00	2.52E-01	2.52E-01	2.52E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-03	8.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.97E-02	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.29E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	1.10E-04	0.00E+00	1.10E-04	0.00E+00	1.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	5.41E-05	5.41E-05	0.00E+00	0.00E+00	5.41E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	1.79E-12	1.79E-12	1.79E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	1.48E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-11	0.00E+00	1.48E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-06	1.77E-06	1.77E-06	0.00E+00	0.00E+00	0.00E+00	1.77E-06	1.77E-06	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.08E-07	4.08E-07	4.08E-07	0.00E+00	0.00E+00	0.00E+00	4.08E-07	4.08E-07	0.00E+00	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-07	3.20E-07	3.20E-07	0.00E+00	0.00E+00	0.00E+00	3.20E-07	3.20E-07	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.92E-10	3.92E-10	3.92E-10	0.00E+00	0.00E+00	0.00E+00	3.92E-10	3.92E-10	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.92E-10	3.92E-10	3.92E-10	0.00E+00	0.00E+00	0.00E+00	3.92E-10	3.92E-10	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-10	1.97E-10	1.97E-10	0.00E+00	0.00E+00	0.00E+00	1.97E-10	1.97E-10	0.00E+00	0.00E+00

Table A10: Chronic, Non-Cancer Risk Contribution by Target Organs for MEIW

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	2.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.91E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	4.41E-07	0.00E+00	0.00E+00	0.00E+00	4.41E-07	4.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	8.98E-03	0.00E+00	1.79E-04	0.00E+00	8.98E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	2.31E-02	0.00E+00	0.00E+00	1.92E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-05	0.00E+00	0.00E+00
Arsenic	7440382	4.27E-01	4.27E-01	0.00E+00	0.00E+00	0.00E+00	4.27E-01	4.27E-01	4.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E-03	4.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.69E-01	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	2.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	3.16E-04	0.00E+00	3.16E-04	0.00E+00	3.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	3.44E-05	3.44E-05	0.00E+00	0.00E+00	3.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	9.35E-12	9.35E-12	9.35E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.35E-12	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	7.75E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-11	0.00E+00	7.75E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.92E-07	3.92E-07	3.92E-07	0.00E+00	0.00E+00	0.00E+00	3.92E-07	3.92E-07	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.00E-08	9.00E-08	9.00E-08	0.00E+00	0.00E+00	0.00E+00	9.00E-08	9.00E-08	0.00E+00	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.05E-08	7.05E-08	7.05E-08	0.00E+00	0.00E+00	0.00E+00	7.05E-08	7.05E-08	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	4.35E-11	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	4.35E-11	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	4.35E-11	0.00E+00	0.00E+00	0.00E+00	4.35E-11	4.35E-11	0.00E+00	0.00E+00

Table A11: Acute, Non-Cancer Risk Contribution by Target Organs- PMI

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	4.90E-03	0.00E+00	0.00E+00	4.90E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.90E-03	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	1.99E-07	0.00E+00	0.00E+00	0.00E+00	1.99E-07	1.99E-07	0.00E+00	1.99E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-03	0.00E+00	1.31E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440382	6.30E-02	6.30E-02	0.00E+00	0.00E+00	0.00E+00	6.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	1.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-03	0.00E+00	2.35E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.54E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	4.18E-04	0.00E+00	0.00E+00	0.00E+00	4.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E-10	0.00E+00	9.99E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-07	0.00E+00	1.67E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	1.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.38E-10	0.00E+00	1.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A12: Acute, Non-Cancer Risk Contribution by Target Organs- MEIR

Compound	CAS	CV	CNS	IMMUN	KIDNEY	GLIV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL
Methane	74828	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71432	0.00E+00	0.00E+00	4.43E-04	0.00E+00	0.00E+00	4.43E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.43E-04	0.00E+00	0.00E+00
Toluene	108883	0.00E+00	1.80E-08	0.00E+00	0.00E+00	0.00E+00	1.80E-08	1.80E-08	0.00E+00	1.80E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl Chloride	100447	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-04	0.00E+00	1.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	7440417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	7440439	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium	18540299	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440382	5.69E-03	5.69E-03	0.00E+00	0.00E+00	0.00E+00	5.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7439921	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	7440020	0.00E+00	0.00E+00	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	83329	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	208968	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	120127	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	56553	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluranthene	205992	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,I)perylene	191242	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)Fluranthene	207089	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	218019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	53703	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	206440	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	86737	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	193395	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	85018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	129000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	7664417	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-04	0.00E+00	2.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7440508	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	7439965	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	7439976	0.00E+00	3.78E-05	0.00E+00	0.00E+00	0.00E+00	3.78E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782492	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PAHs (excluding Naphthalene)	1151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.02E-11	0.00E+00	9.02E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E-08	0.00E+00	1.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene	1330207	0.00E+00	1.24E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-11	0.00E+00	1.24E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8- Pentachlorodibenzofuran	57117314	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A13: Site/ Route Dependent Exposure Pathways by Substance for MEIR

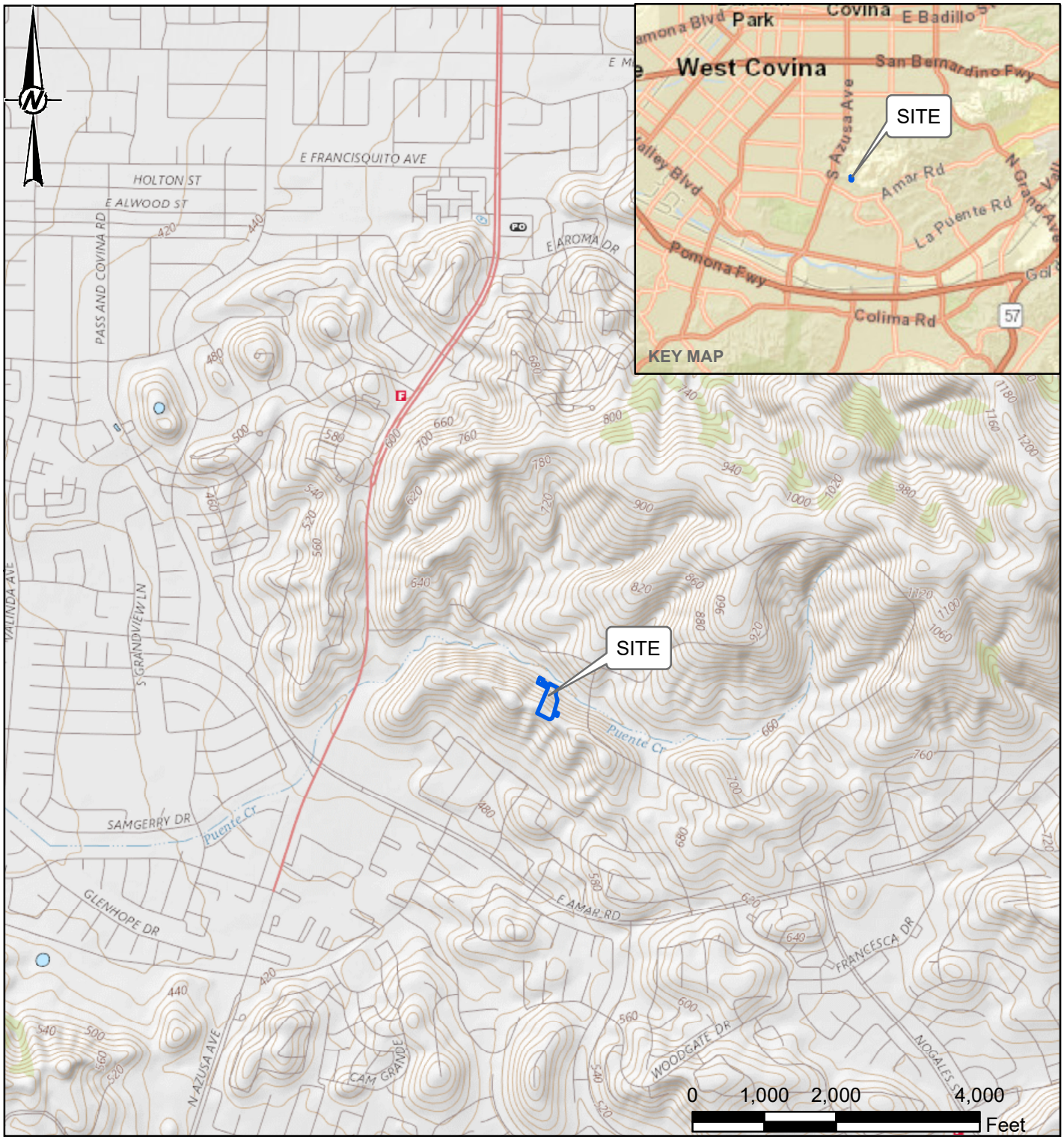
Compound	CAS	Water	Fish	Pasture
Methane	74828	1.90E-02	1.90E-02	1.90E-02
Hexane	110543	3.96E-03	3.96E-03	3.96E-03
Benzene	71432	4.52E-04	4.52E-04	4.52E-04
Toluene	108883	2.52E-05	2.52E-05	2.52E-05
Benzyl Chloride	100447	1.08E-03	1.08E-03	1.08E-03
Beryllium	7440417	1.20E-05	1.20E-05	1.20E-05
Cadmium	7440439	7.31E-05	7.31E-05	7.31E-05
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	9.90E-16	9.90E-16	9.90E-16
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	2.66E-12	2.66E-12	2.66E-12
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	4.97E-16	4.97E-16	4.97E-16
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.94E-12	1.94E-12	1.94E-12
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	4.97E-16	4.97E-16	4.97E-16
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	4.97E-16	4.97E-16	4.97E-16
1,2,3,7,8-Pentachlorodibenzofuran	57117416	4.97E-16	4.97E-16	4.97E-16
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	4.97E-16	4.97E-16	4.97E-16
2,3,7,8-Tetrachlorodibenzofuran	51207319	9.90E-16	9.90E-16	9.90E-16
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	9.90E-16	9.90E-16	9.90E-16
Formaldehyde	50000	1.46E-03	1.46E-03	1.46E-03
Hexavalent Chromium	18540299	7.80E-06	7.80E-06	7.80E-06
Arsenic	7440382	4.31E-05	4.31E-05	4.31E-05
Lead	7439921	7.47E-05	7.47E-05	7.47E-05
Nickel	7440020	1.26E-03	1.26E-03	1.26E-03
Acenaphthene	83329	4.60E-06	4.60E-06	4.60E-06
Acenaphthylene	208968	4.60E-06	4.60E-06	4.60E-06
Anthracene	120127	4.60E-06	4.60E-06	4.60E-06
Benzo(a)anthracene	56553	4.60E-06	4.60E-06	4.60E-06
Benzo(a)pyrene	50328	4.60E-06	4.60E-06	4.60E-06
Benzo(b)fluranthene	205992	4.60E-06	4.60E-06	4.60E-06
Benzo(g,h,I)perylene	191242	4.60E-06	4.60E-06	4.60E-06
Benzo(k)Fluranthene	207089	4.60E-06	4.60E-06	4.60E-06
Chrysene	218019	4.60E-06	4.60E-06	4.60E-06
Dibenz(a,h)anthracene	53703	4.60E-06	4.60E-06	4.60E-06
Fluoranthene	206440	4.60E-06	4.60E-06	4.60E-06
Fluorene	86737	4.60E-06	4.60E-06	4.60E-06
Indeno(1,2,3-cd)pyrene	193395	4.60E-06	4.60E-06	4.60E-06
Naphthalene	91203	2.83E-03	2.83E-03	2.83E-03
Phenanthrene	85018	4.60E-06	4.60E-06	4.60E-06
Pyrene	129000	4.84E-06	4.84E-06	4.84E-06
Ammonia	7664417	2.57E-02	2.57E-02	2.57E-02
Copper	7440508	1.22E-04	1.22E-04	1.22E-04
Manganese	7439965	4.15E-03	4.15E-03	4.15E-03
Mercury	7439976	8.62E-07	8.62E-07	8.62E-07
Selenium	7782492	5.54E-06	5.54E-06	5.54E-06
Total PAHs (excluding Naphthalene)	1151	1.78E-10	1.78E-10	1.78E-10
Acetaldehyde	75070	1.61E-09	1.61E-09	1.61E-09

Table A13: Site/ Route Dependent Exposure Pathways by Substance for MEIR

Compound	CAS	Water	Fish	Pasture
Acrolein	107028	1.43E-09	1.43E-09	1.43E-09
Ethyl Benzene	100414	3.57E-09	3.57E-09	3.57E-09
Xylene	1330207	1.03E-08	1.03E-08	1.03E-08
2,3,4,7,8- Pentachlorodibenzofuran	57117314	1.47E-12	1.47E-12	1.47E-12
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	1.02E-12	1.02E-12	1.02E-12
2,3,4,6,7,8-Hexachlorodibenzofuran	60851345	8.01E-13	8.01E-13	8.01E-13
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	4.95E-16	4.95E-16	4.95E-16
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	4.95E-16	4.95E-16	4.95E-16
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	4.95E-16	4.95E-16	4.95E-16

APPENDIX B

Figures



LEGEND

PROPERTY BOUNDARY

Service Layer Credits: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data. Data Refreshed July, 2017. Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
SITE VICINITY MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A001-GIS.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in
0

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A001-GIS.mxd

LEGEND

PROPERTY BOUNDARY

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
PLOT PLAN

CONSULTANT
GOLDER

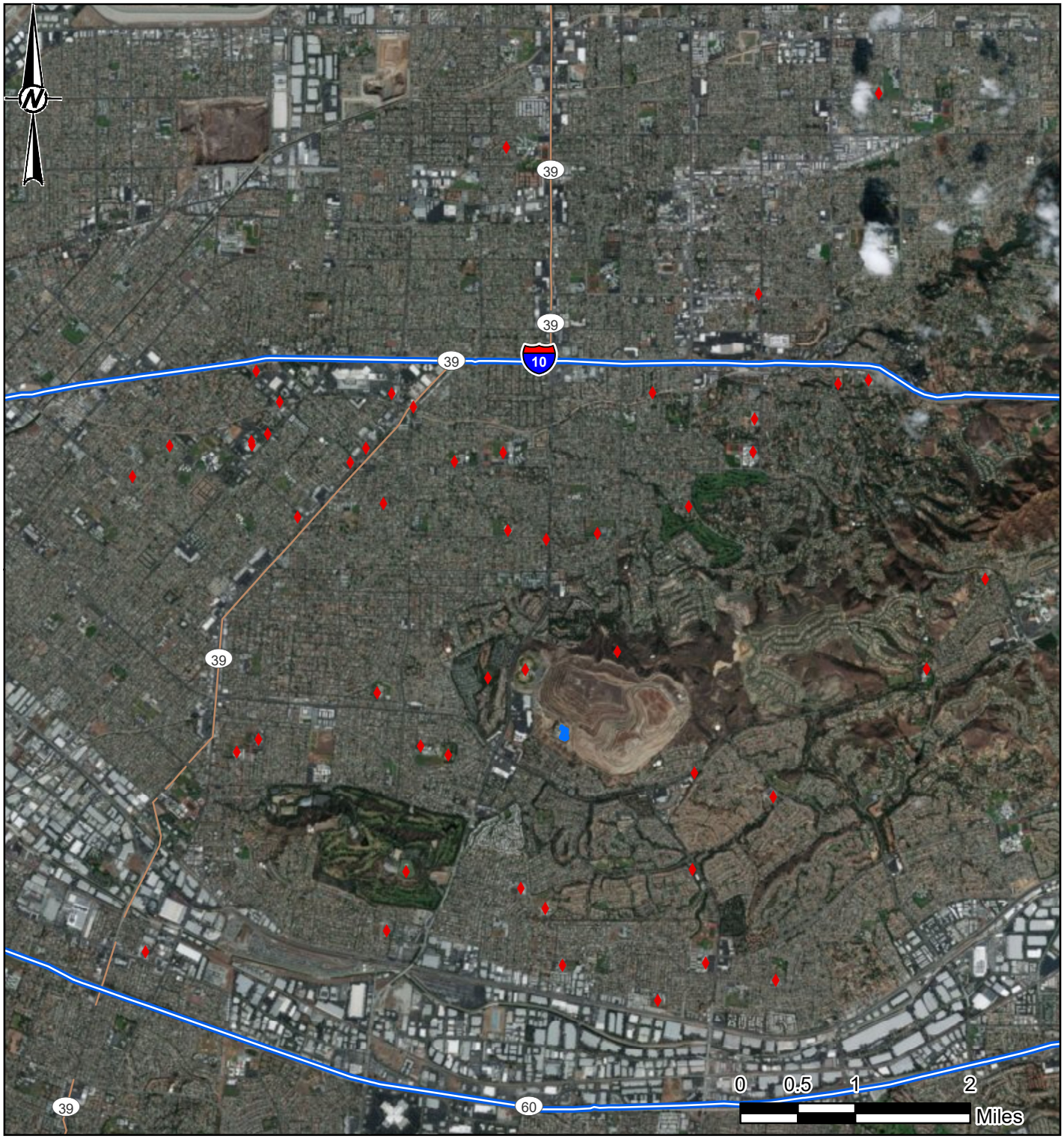
YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No. 18101672 | CONTROL 18101672A002-GIS.mxd | Rev. 0 | FIGURE **2**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\A-1\18101672A002-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A
1 in
0



LEGEND

- PROPERTY BOUNDARY
- SENSITIVE RECEPTORS

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
SENSITIVE RECEPTORS

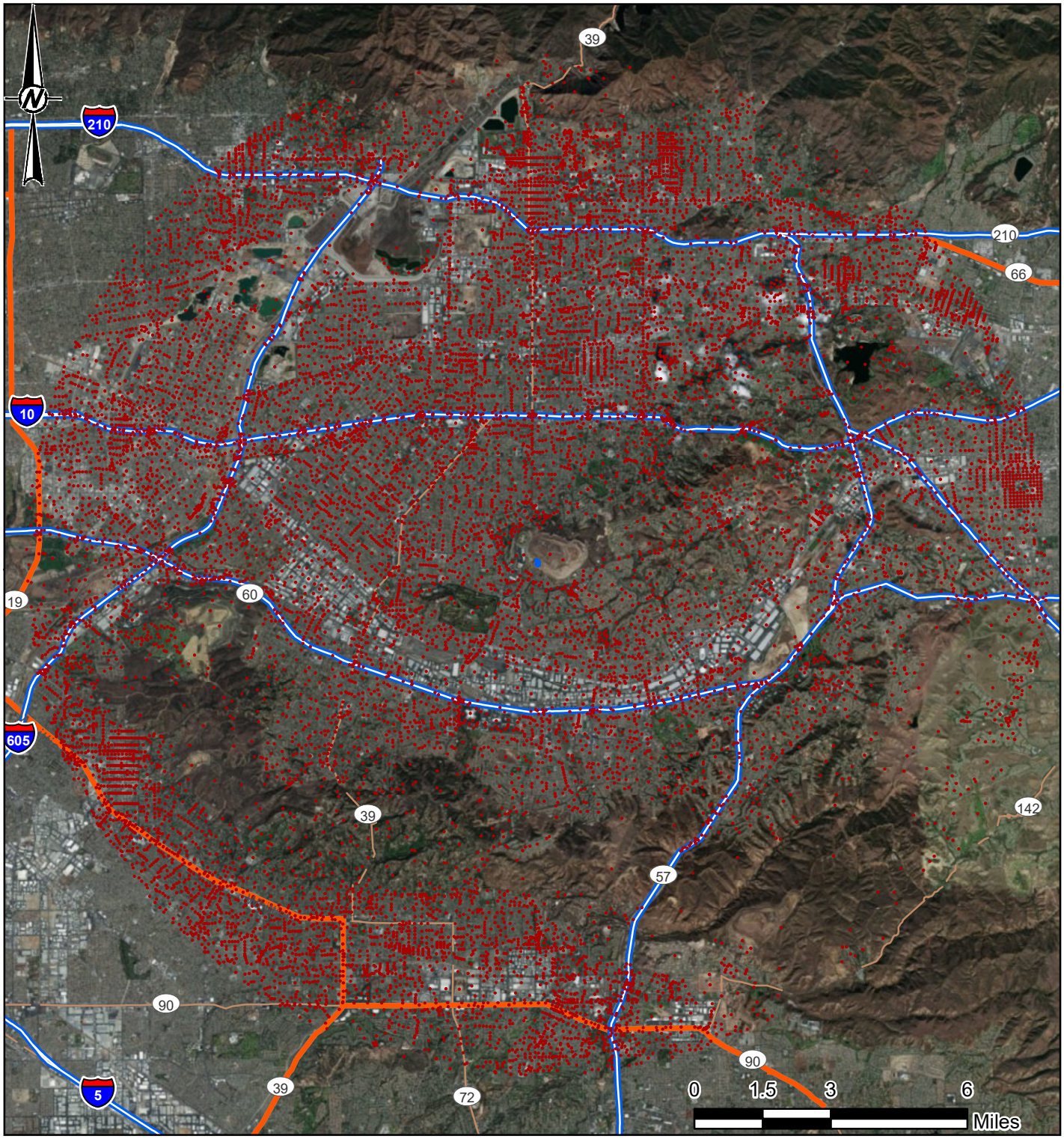
CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A003-GIS.mxd	0	3

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A003-GIS.mxd



LEGEND

- PROPERTY BOUNDARY
- POPULATION RECEPTORS

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
POPULATION RECEPTORS

CONSULTANT
GOLDER

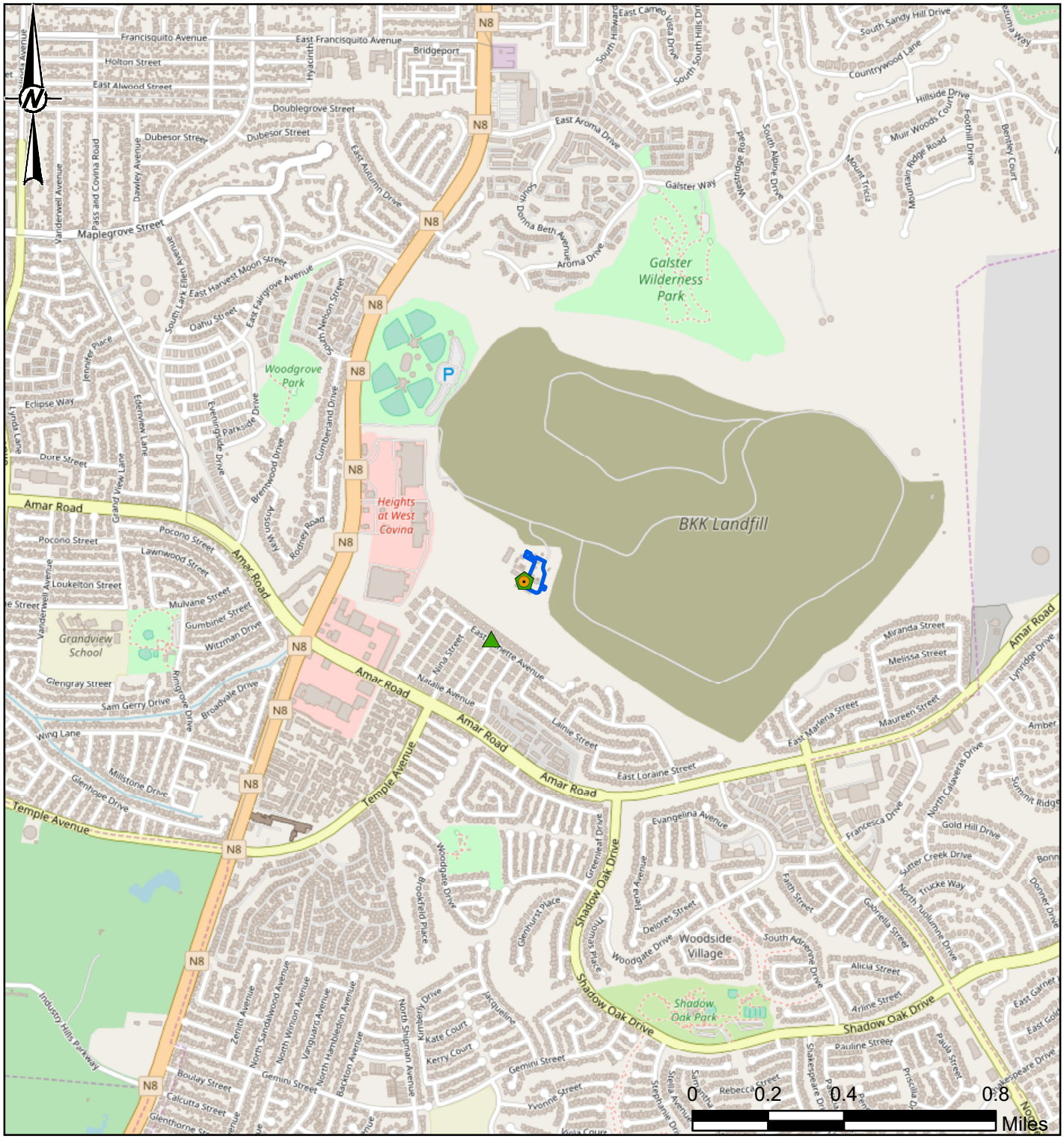
YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A004-GIS.mxd	0	4

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\A-1\18101672A004-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A
1 in
0



LEGEND

PROPERTY BOUNDARY

CANCER RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL WORKER (MEIW)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

NOTE

POINT OF MAXIMUM IMPACT (PMI) AT THE SAME LOCATION AS MEIW.

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR CANCER RISK

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

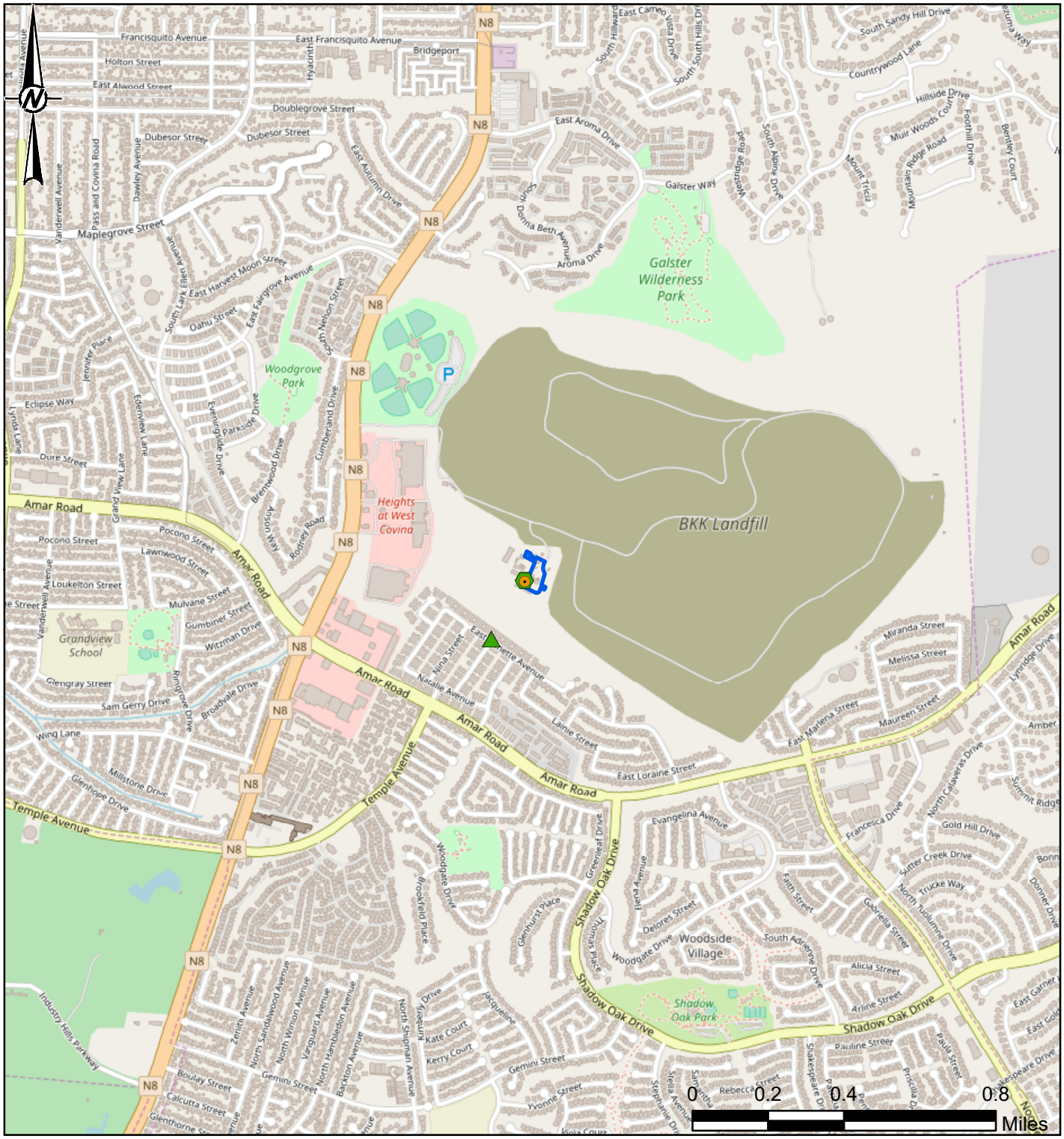
PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A005-GIS.mxd	0	**5**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0

Path: H:\18x-Projects\18101672-MM West Covina LF\Figures\A-1\18101672A005-GIS.mxd



LEGEND

PROPERTY BOUNDARY

CHRONIC HAZARD RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL WORKER (MEIW)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

NOTE

POINT OF MAXIMUM IMPACT (PMI) AT THE SAME LOCATION AS MEIW.

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR CHRONIC HAZARD RISK

CONSULTANT

GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

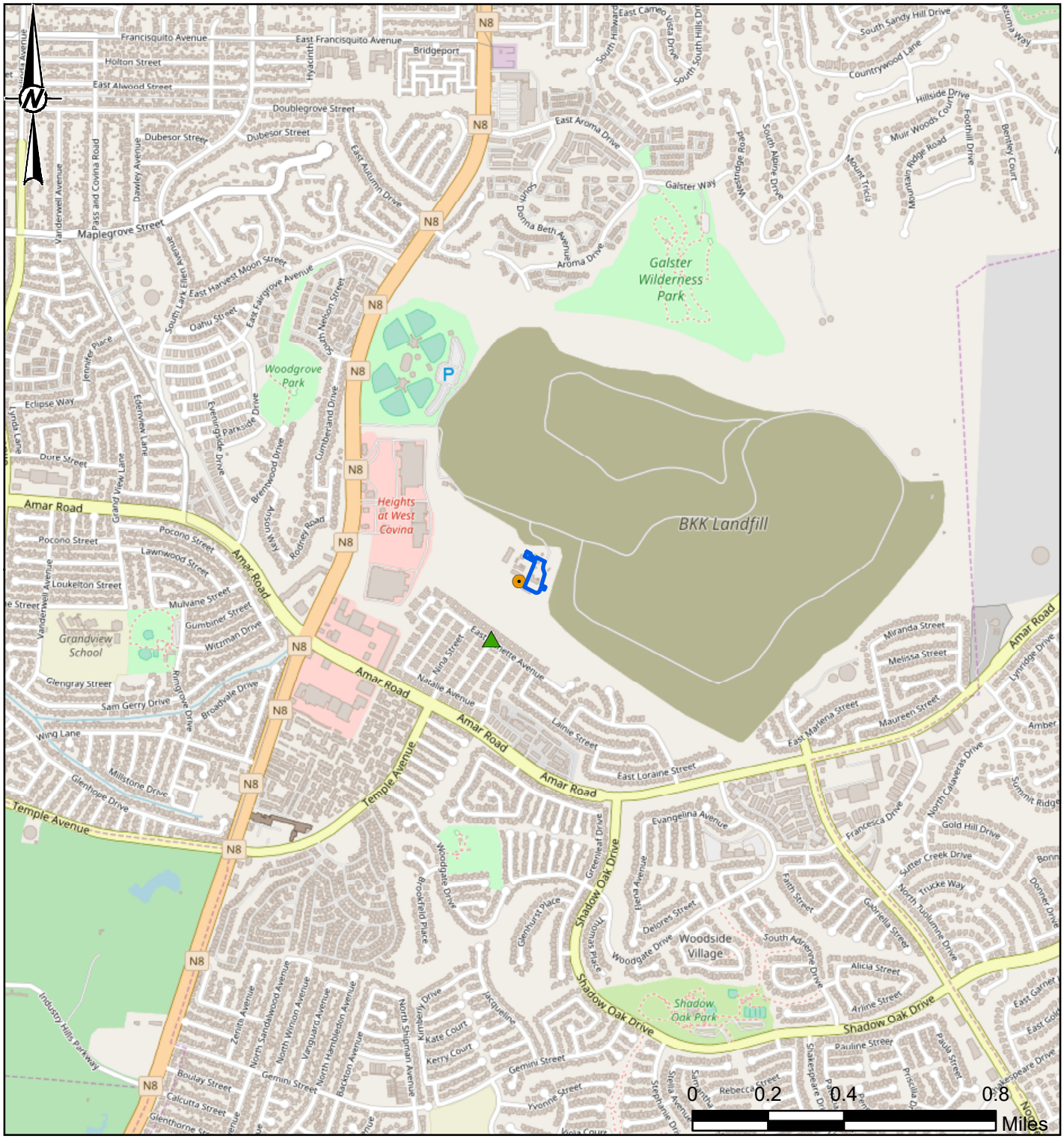
PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A006-GIS.mxd	0	**6**

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A006-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0



LEGEND

PROPERTY BOUNDARY

ACUTE HAZARD RISK

POINT OF MAXIMUM IMPACT (PMI)

MAXIMUM EXPOSED INDIVIDUAL RESIDENT (MEIR)

CLIENT
MM West Covina LLC

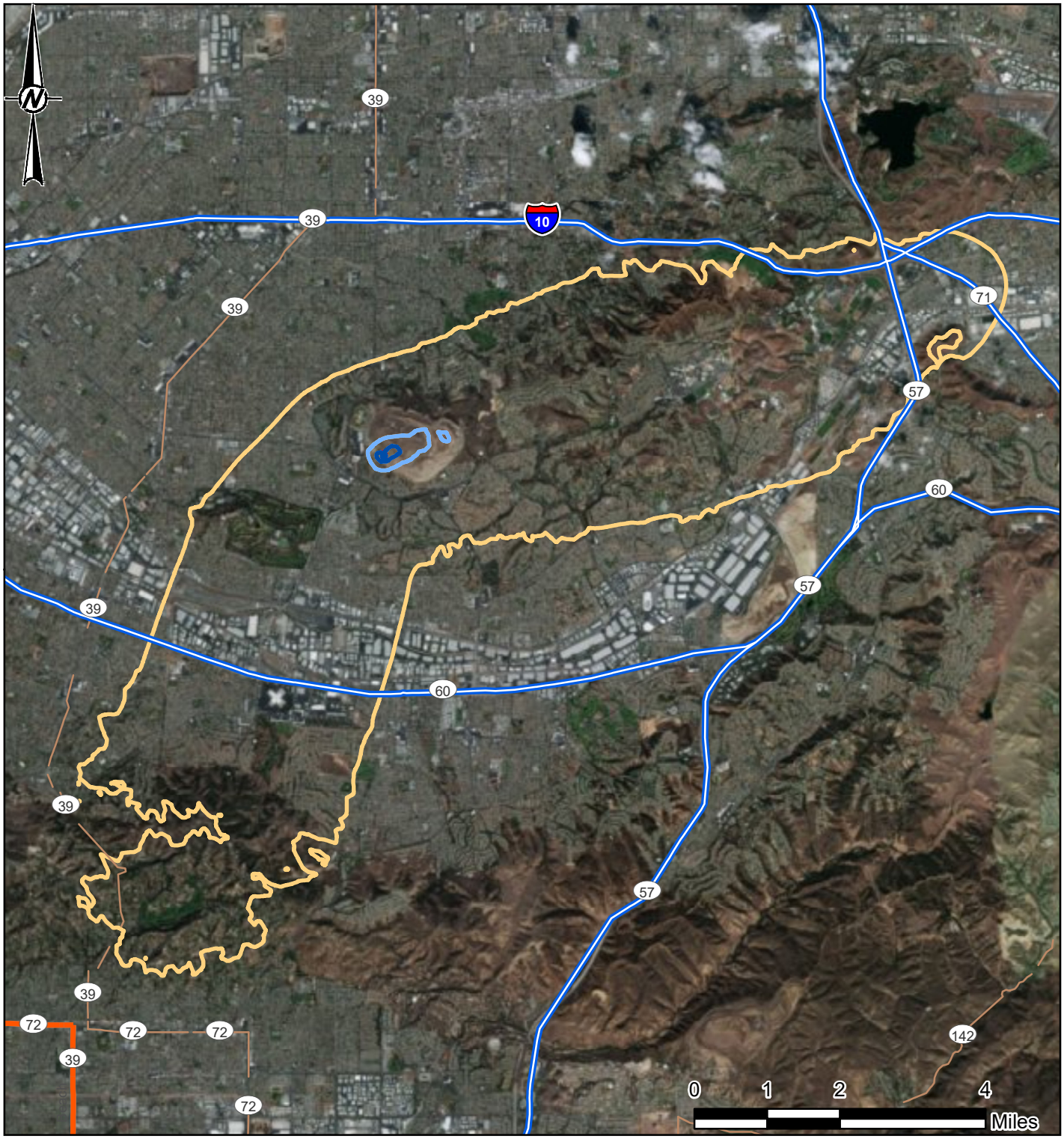
PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
LOCATIONS OF MEIR, MEIW AND PMI FOR ACUTE HAZARD RISK

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A007-GIS.mxd	0	7



LEGEND

PROPERTY BOUNDARY

CANCER RISK

1.0E-05 (1 IN-A-MILLION)

10E-05 (10 IN-A-MILLION)

25E-05 (25 IN-A-MILLION)

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
CANCER RISK CONTOURS (RESIDENTIAL EXPOSURE)

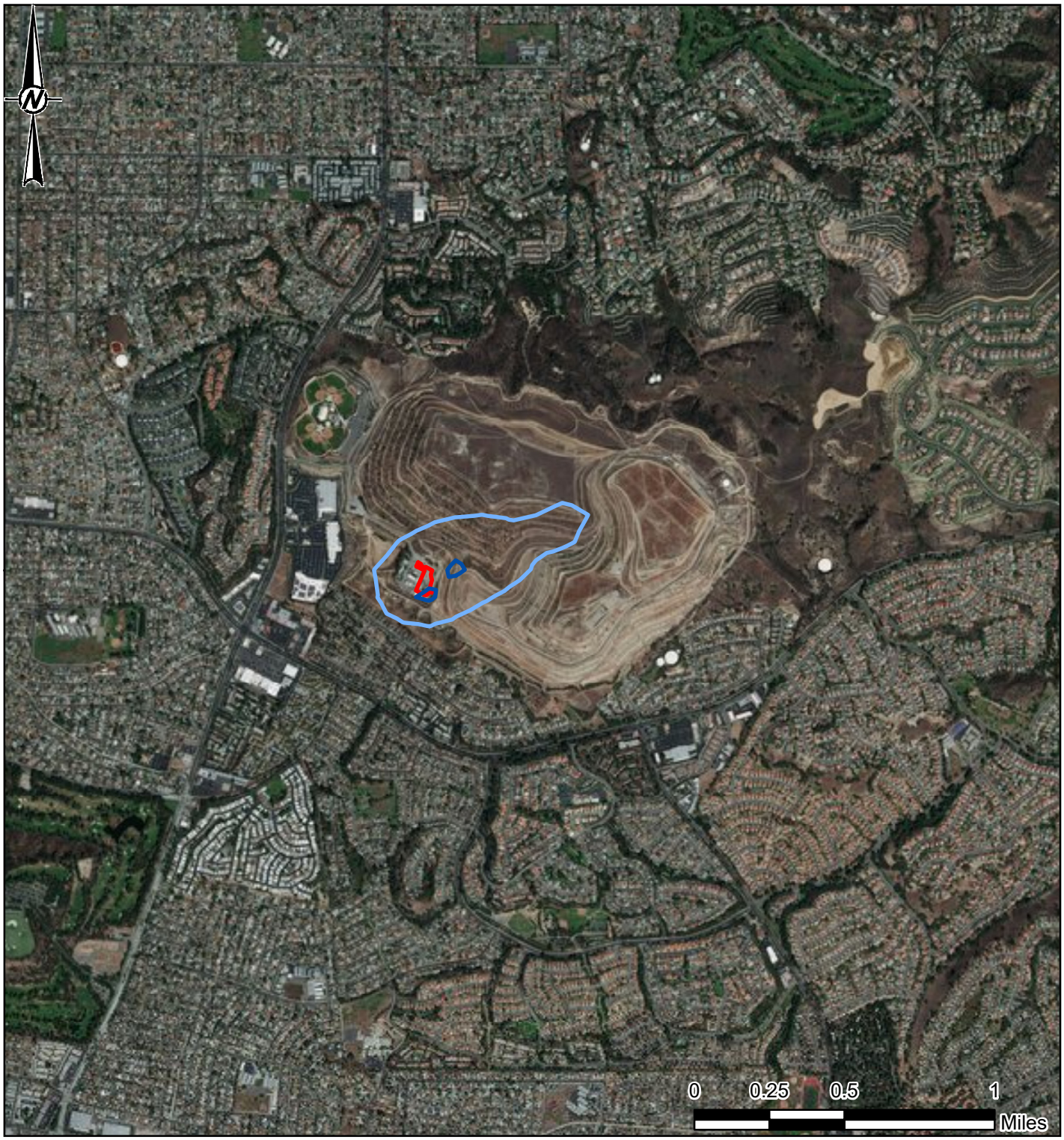
CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A008-GIS.mxd	0	8

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A008-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANSI A



LEGEND

PROPERTY BOUNDARY

CHRONIC HAZARD INDEX

1

0.5

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
CHRONIC HAZARD INDEX CONTOURS (RESIDENTIAL EXPOSURE)

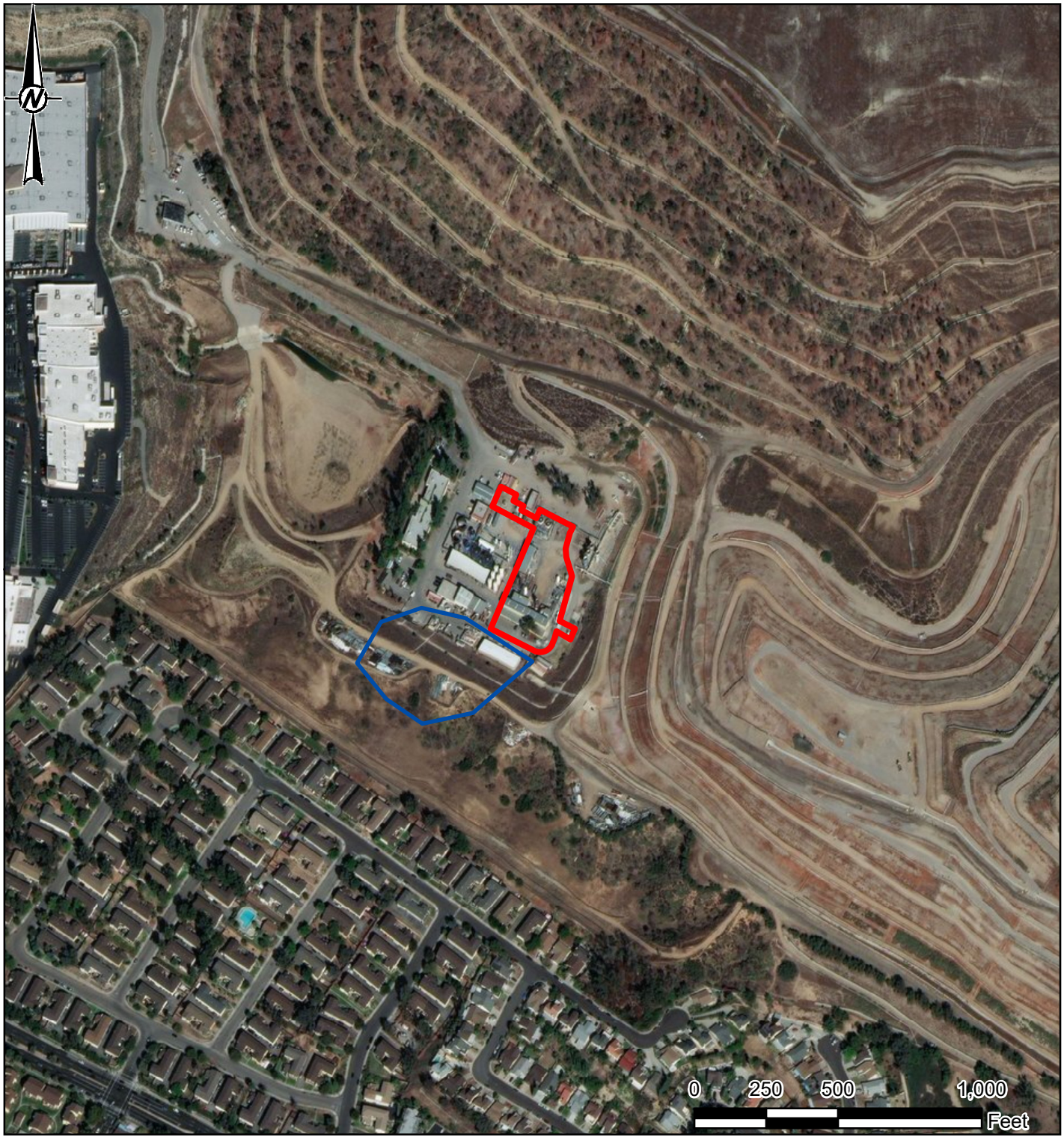
CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A009-GIS.mxd	0	9

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A009-GIS.mxd



LEGEND

PROPERTY BOUNDARY

ACUTE HAZARD INDEX

0.5

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLIENT
MM West Covina LLC

PROJECT
MM WEST COVINA LLC
HEALTH RISK ASSESSMENT

TITLE
ACUTE HAZARD INDEX CONTOURS (RESIDENTIAL EXPOSURE)

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-01
PREPARED	DJC
DESIGN	ND
REVIEW	ND
APPROVED	RCB

PROJECT No.	CONTROL	Rev.	FIGURE
18101672	18101672A010-GIS.mxd	0	**10**

Path: H:\18x-Projects\18101672-MM West Covina LF\figures\A-1\18101672A010-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A
1 in
0

APPENDIX C: STACK TEST AND ASSOCIATED CALCULATIONS

PCDD/PCDF TEST RESULTS SUMMARY
Fortistar Methane Group
MM West Covina
115 MMBtu/hr Zurn Boiler
August 10-12, 2018

	Test 1					Test 2					Test 3					Average			
	Sample Catch	Conc.	Emission Rates			Sample Catch	Conc.	Emission Rates			Sample Catch	Conc.	Emission Rates			Conc.	Emission Rates		
Analytes	(pg)	(ug/dscm)	(g/hr)	lb/hr	lb/MMscf	(pg)	(ug/dscm)	(g/hr)	lb/hr	lb/MMscf	(pg)	(ug/dscm)	(g/hr)	lb/hr	lb/MMscf	(ug/dscm)	(g/hr)	lb/hr	lb/hr
2378-TCDD	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12378-PeCDD	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123478-HxCDD	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123678-HxCDD	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123789-HxCDD	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1234678-HpCDD	**3.92**	**5.88E-07**	**2.35E-08**	**5.17E-11**	**1.55E-10**	**3.81**	**5.62E-07**	**2.18E-08**	**4.81E-11**	**1.43E-10**	**4.85**	**7.60E-07**	**2.82E-08**	**6.22E-11**	**1.85E-10**	**6.37E-07**	**2.45E-08**	**5.40E-11**	**1.61E-10**
OCDD	**5.04**	**7.56E-07**	**3.02E-08**	**6.65E-11**	**1.99E-10**	**12.30**	**1.81E-06**	**7.04E-08**	**1.55E-10**	**4.62E-10**	**0.00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**8.56E-07**	**3.35E-08**	**7.39E-11**	**2.20E-10**
2378 -TCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12378-PeCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
23478-PeCDF	**2.79**	**4.18E-07**	**1.67E-08**	**3.68E-11**	**1.10E-10**	**3.84**	**5.66E-07**	**2.20E-08**	**4.84E-11**	**1.44E-10**	**2.88**	**4.51E-07**	**1.68E-08**	**3.69E-11**	**1.10E-10**	**4.79E-07**	**1.85E-08**	**4.07E-11**	**1.21E-10**
123478-HxCDF	**1.54**	**2.31E-07**	**9.22E-09**	**2.03E-11**	**6.09E-11**	**1.85**	**2.73E-07**	**1.06E-08**	**2.33E-11**	**6.95E-11**	**3.24**	**5.08E-07**	**1.89E-08**	**4.16E-11**	**1.24E-10**	**3.37E-07**	**1.29E-08**	**2.84E-11**	**8.47E-11**
123678-HxCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
234678-HxCDF	**1.59**	**2.38E-07**	**9.51E-09**	**2.10E-11**	**6.29E-11**	**1.90**	**2.80E-07**	**1.09E-08**	**2.40E-11**	**7.14E-11**	**4.05**	**6.35E-07**	**2.36E-08**	**5.20E-11**	**1.55E-10**	**3.84E-07**	**1.47E-08**	**3.23E-11**	**9.63E-11**
123789-HxCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1234678-HpCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OCDF	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total PCDD/PCDF	14.88	2.23E-06	8.90E-08	1.96E-10	5.88E-10	23.70	3.49E-06	1.36E-07	2.99E-10	8.90E-10	15.02	2.35E-06	8.74E-08	1.93E-10	5.74E-10	2.69E-06	1.04E-07	2.29E-10	6.84E-10

	Test 1	Test 2	Test 3
Sample volume (Vmstd, dscf)	235.51	239.52	225.27
Volumetric Air Flow (DSCFM)	23,488	22,845	21,848
Average % CO_2 by volume, dry	16.43	17.08	17.10
Average % O_2 by volume, dry	2.49	2.39	2.42
Fuel Consumption (scfm)	5,562	5,599	5,599
Fuel Consumption (MMscf/hr)	0.334	0.336	0.336

Note: Zero catch is entered if all three runs are ND.

Dioxin and Furan emission rates based on MDL*

Test time for each sample (hrs)	8
Samples per test	1
g/pg	1.00E-12
lb/g	0.0022

Dioxin or Furan compound	CAS number	MDL (pg/sample)	Emission rate at MDL (g/hr)	Emission rate at MDL (lb/hr)	Emission rate at MDL (lb/yr)
1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	100	1.25E-11	2.75E-14	2.409E-10
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	100	1.25E-11	2.75E-14	2.409E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5753857	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,7,8-Pentachlorodibenzofuran	57117416	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	50	6.25E-12	1.38E-14	1.2045E-10
2,3,7,8-Tetrachlorodibenzofuran	51207319	10	1.25E-12	2.75E-15	2.409E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	10	1.25E-12	2.75E-15	2.409E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	50	6.25E-12	1.38E-14	1.2045E-10
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	50	6.25E-12	1.38E-14	1.2045E-10

*MDL: Method Detection Level, is a minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

$$\text{Emission rate at MDL (g/hr)} = \frac{\text{(MDL (pg/sample) * samples per test * conversion factor (g/pg))}}{\text{Test time for each sample (hrs)}}$$