DOCKETED	
Docket Number:	26-OPT-01
Project Title:	Vaca Dixon Power Center Project
TN #:	273183
Document Title:	AERMOD Hazard Consequence Analysis_VDPC_Part 1 of 3
Description:	Updated Hazard Consequence Analysis using AERMOD Software
Filer:	Adam Morrison
Organization:	Rincon Consultants, Inc.
Submitter Role:	Applicant Consultant
Submission Date:	10/21/2026 5:36:28 PM
Docketed Date:	10/22/2026



Vaca Dixon Power Center Project
CEC Docket No. 26-OPT-01

AERMOD Hazard Consequence Analysis for CEC Data Request, Attachment B; Requests DR PH-2 through DR PH-6

prepared for

Vaca Dixon BESS LLC/Arges BESS LLC
4350 Executive Drive, Suite 320
San Diego, California 92121

prepared by

Rincon Consultants
8825 Aero Drive, Suite 120
San Diego, California 92123

October 2026

RINCON CONSULTANTS

Preface

Lithium-ion batteries are the most commonly used chemistry in utility-scale Battery Energy Storage Systems (BESS) (i.e., larger than 50 megawatts [MW]) throughout the United States (U.S.) and are expected to remain so for the next decade. Data from the Department of Energy (DOE) shows that as of the end of 2022, about 9 gigawatts (GW) of energy storage has been added to the U.S. grid since 2010. More than 90 percent of the new storage capacity has a duration of 4 hours or less, and in the last few years, lithium-ion batteries have provided about 99 percent of new capacity (DOE National Renewable Energy Laboratory 2023). Thus, lithium-ion batteries are the nearly exclusive stationary energy storage technology currently being deployed for utility-scale BESS.

There are multiple types of lithium-ion chemistry, but two types are used primarily in BESS. The first is lithium nickel manganese cobalt (NMC) and the second is lithium iron phosphate (LFP). Initially, projects relied on the NMC batteries for utility-scale BESS. However, between 2021 and 2023, the industry started moving to LFP batteries for cost competitiveness, among a multitude of reasons (Investment Recovery Association 2026). Lithium NMC batteries typically have higher energy density and smaller size units compared to LFP batteries, meaning that they can store more energy in a smaller package. However, the current NMC technology is not as thermally stable as LFP batteries, leading to a greater risk of thermal runaway and battery fires. By 2024, LFP has emerged as the undisputed standard and accounts for over 90 percent of all utility-scale BESS developed across the U.S. (Investment Recovery Association 2026).

LFP batteries have improved safety and thermal stability compared to current NMC batteries due to their lithium iron phosphate (LiFePO4) chemical structure (Brand, M., 2013; Evlithium 2025; Tran, M-K, 2021). They are less prone to thermal runaway and combustion, provide a significantly longer cycle life, and are considered more environmentally friendly due to their relatively non-toxic constituents and readily available raw materials.

The proposed Project discussed within this report is a BESS with LFP batteries, which is anticipated to be considerably safer and thermally stable compared to using NMC batteries. This technical analysis and report were prepared specifically to respond to comments provided by the California Energy Commission (CEC) and in accordance with their specific requests and not specifically in accordance with fire protection codes, like the California Fire Code (CFC) or the National Fire Protection Agency (NFPA).

This technical analysis is based on numerous sources, including State and Federal resources, scientific literature and various software modeling programs that are considered industry standard. The included analysis is based upon the information and industry best practices available at the time of preparation. Due to the rapidly evolving technological and regulatory landscape, information and best practices relied upon may change over time. While this analysis demonstrates a reasonable effort to ensure the accuracy and reliability of the information provided, the scenarios analyzed in its reports are intended for informational purposes only and should not be construed as definitive or exhaustive. The analyses do not guarantee the specific outcomes identified in the modeling technology or assessed in the reports. The report is provided on an as-is basis and shall not be construed to create any duty or liability to any person. No party involved in the preparation of this report shall be liable for any damages or losses resulting from the implementation or failure to implement any recommendations or measures suggested in this analysis, nor for errors, omissions, or inaccuracies in the source information. Users are advised to interpret the findings with caution and consider the potential for variability in real-world applications.

Table of Contents

1 Introduction 1
1.1 Need for Updated HCA 1
1.2 Project Introduction 1
1.3 Project Description 2
1.4 Surrounding Area 5
2 Background 6
2.1 Large Scale and UL9540A Fire Testing 6
2.1.1 Vaca Dixon 57 MWh 6
2.1.2 Arges 400 MWh 7
2.2 Hazard Characterization 8
2.3 Literature Review 11
3 Methodology 14
3.1 Gas Production and Mass Loss Rate 14
3.1.1 General Assumptions 15
3.1.2 Non-Flaming Scenario 16
3.1.3 Flaming Scenario 17
3.2 Toxic Gas Emissions 18
3.2.1 Non-Flaming Scenario 18
3.2.2 Flaming Scenario 21
3.3 Metal Emissions 24
3.3.1 Particulate Yield 24
3.3.2 Particulate Size Distribution 24
3.3.3 Particulate Composition 25
3.4 AERMOD Model 26
3.4.1 Model Overview 26
3.4.2 Model Inputs 26
4 Results and Conclusions 32
4.1 Exposure Concentrations Compared Against Emergency Thresholds 32
4.1.1 Non-Flaming Scenario 32
4.1.2 Flaming Scenario 33
4.2 Health Risk Calculations 47
4.2.1 Non-Flaming Scenario 47
4.2.2 Flaming Scenario 49
5 Modeling Summary 52
6 References 53

Tables

Table 1 Summary of 1-Hour AEGLs and ERPGs 10
Table 2 Non-Flaming Scenario UL9540A Hazardous Gas Components, Vaca Dixon 19
Table 3 Non-Flaming Scenario Species Yields and Mass Production Rates, Vaca Dixon 20
Table 4 Non-Flaming Scenario UL9540A Hazardous Gas Components, Arges 20
Table 5 Non-Flaming Scenario Species Yields and Mass Production Rates, Arges 21
Table 6 Flaming Scenario Scaled UL9540A Hazardous Gas Components, Vaca Dixon 22
Table 7 Flaming Scenario Species Yields and Mass Production Rates, Vaca Dixon 22
Table 8 Flaming Scenario Acrolein and Formaldehyde Emission Rates, Vaca Dixon 22
Table 9 Flaming Scenario Scaled UL9540A Hazardous Gas Components, Arges 23
Table 10 Flaming Scenario Species Yields and Mass Production Rates, Arges 24
Table 11 Flaming Scenario Acrolein and Formaldehyde Emission Rates, Arges 24
Table 12 Particulate Composition 25
Table 13 Metal Emissions, Vaca Dixon 25
Table 14 Metal Emissions, Arges 25
Table 15 Vaca Dixon AEGL & ERPG Comparison, Non-Flaming Scenario 36
Table 16 Arges AEGL & ERPG Comparison, Non-Flaming Scenario 37
Table 17 Vaca Dixon AEGL & ERPG Comparison, Flaming Scenario 38
Table 18 Arges AEGL & ERPG Comparison, Flaming Scenario 39
Table 19 Vaca Dixon Non-Cancer Health Risk Impacts, Non-Flaming Scenario 48
Table 20 Arges Non-Cancer Health Risk Impacts, Non-Flaming Scenario 49
Table 21 Vaca Dixon Non-Cancer Health Risk Impacts, Flaming Scenario 50
Table 22 Arges Non-Cancer Health Risk Impacts, Flaming Scenario 51

Figures

Figure 1 Project Area 3
Figure 2 BESS Enclosure Area for Air Dispersion Modeling 4
Figure 3 AERMOD Modeled BESS Vent Locations 27
Figure 4 Wind Rose 30
Figure 5 Receptor Grid 31
Figure 6 Vaca Dixon Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth 40
Figure 7 Arges Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth 41
Figure 8 Arges Non-Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth 42
Figure 9 Vaca Dixon Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth 43
Figure 10 Vaca Dixon Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth 44
Figure 11 Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth 45
Figure 12 Arges Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth 46

Appendices

Appendix A Thresholds Summary
Appendix B Emissions Calculations & Summary
Appendix C Emergency Threshold Comparison Calculations
Appendix D Non-Cancer Health Risk Calculations
Appendix E AERMOD Files

This page intentionally left blank.

1 Introduction

1.1 Need for Updated HCA

Coffman Engineers, Inc. (Coffman) previously developed the *Vaca Dixon Energy Storage Hazard Consequence Analysis* (HCA) using the Phast model for the Vaca Dixon Power Center (Project) located in Vacaville, California[1]. A separate analysis was conducted for each of the Vaca Dixon BESS and Arges BESS. Following the initial HCA submission, the California Energy Commission (CEC), as lead agency, provided HCA-related Data Requests for the Vaca Dixon Project (26-OPT-01, Data Requests DR- PH-2 through DR PH-6) for an expansion of the Opt-In Application to include the use of U.S. Environmental Protection Agency (U.S. EPA) Regulatory Model (AERMOD) in conducting HCAs. The CEC has suggested that the reliance on the UL9540A report cell gas composition and identification of a "credible event" (with only a total of four cells undergoing thermal runaway per the unit test) is not sufficient for analyzing potential impacts. Rather, the CEC stated that a "worst-case fire could involve a whole BESS unit" which was understood, based on communications with the CEC, to mean an entire enclosure. The CEC also identified through literature review that other toxic air contaminants (TACs) beyond those identified in the UL9540A report may be emitted and requested that additional TACs be included in the analysis. In the absence of clear emissions and air dispersion modeling guidance promulgated by California regulatory agencies, a literature review was conducted as part of this process to identify potential health and environmental impacts of BESS thermal runaway incidents, review the factors contributing to the degree of the incidents, and review current modeling practices for air dispersion modeling.

1.2 Project Introduction

This study analyzes the potential health risk impacts associated with a thermal runaway event at the nearest sensitive receptors using the American Meteorological Society (AMS) and AERMOD for the Project located in the City of Vacaville, California. The Project intends to construct a nominal 57-megawatt hour (MWh) Vaca Dixon BESS associated with the existing 57 MW Vaca Dixon Peaker Plant as well as a separate, adjacent 400 MWh Arges BESS connecting to the Pacific Gas & Electric Company (PG&E) Vaca-Dixon Substation. There are generally two scenarios that can occur related to potential thermal runaway events, which are the release of toxic gases without fires and the release of toxic gases associated with a fire. The "non-flaming scenario" involves an array of toxic and flammable pollutants that are different from the "flaming scenario" (both scenarios defined below). The flaming scenario also has substantial heat and buoyancy and, therefore, has different dispersion characteristics from the non-flaming scenario, which has lower temperature and less buoyancy.

The "non-flaming scenario" was defined for both the Vaca Dixon BESS and Arges BESS as the thermal runaway propagation throughout one (1) bay (defined as containing 2 racks, with each containing 4 modules for a total of 832 cells) but with insufficient heat transfer to cause propagation across barriers separating the bays. Also, a "flaming scenario" was defined as the complete combustion of one (1) entire enclosure.[2] It is understood that the project will use lithium iron phosphate (LFP) battery types with a prismatic cell geometry.

The study is intended for use in responding to CEC comments DR PH-2 through DR PH-6 as well as support for the Emergency Response Plan (ERP) – prepared independently of this analysis – so that the

[1] Coffman Engineers, Inc. 2025. Vaca Dixon Power Center Project Hazard Consequence Analysis for Vaca Dixon BESS. December 19, 2025; Coffman Engineers, Inc. 2025. Vaca Dixon Power Center Project Hazard Consequence Analysis for Arges BESS. December 19, 2025

[2] This approach is consistent with the SFPE Report, discussed in more detail below, and consistent with CEC communicated requests.

Operator and First Responders understand the practices and procedures to be followed to provide immediate and effective response to emergencies that may arise.

1.3 Project Description

The BESS components of the Project are located in Vacaville, California on an approximately 10-acre site. The Project includes transmission intertie (gen-tie) lines crossing Interstate 80 (I-80) to the north to connect the BESS facilities to the existing PG&E Vaca-Dixon Substation located on a PG&E-owned parcel (APN 0133-060-070) in unincorporated Solano County. The Vaca Dixon 57 BESS would interconnect via a new 13.8 kV gen-tie connecting to the existing 13.8 kV/115 kV generation step-up transformer (GSU) at the Vaca Dixon Peaker Plant which has an existing 115 kV connection to the PG&E Vaca-Dixon Substation. The Arges 400 MWh BESS would connect directly to the PG&E Vaca-Dixon Substation at 115 kV, The Project would support California's current need for additional electrical supply capacity during high peak-load demand periods. The Project would include containerized battery systems with internal heating ventilation and air conditioning and internal fire detection in each container/enclosure, battery management systems, power conversion systems (also called inverters), transformers, and electrical conductors. The Vaca Dixon BESS yard will contain 29 CATL CO4285P10L01 enclosures manufactured by Contemporary Amprex Technology Co., Limited (CATL) and the Arges BESS will contain 108 Automotive Energy Supply Corporation (AESC) HE-L5030A enclosures manufactured by AESC, both containing lithium-ion battery technology.

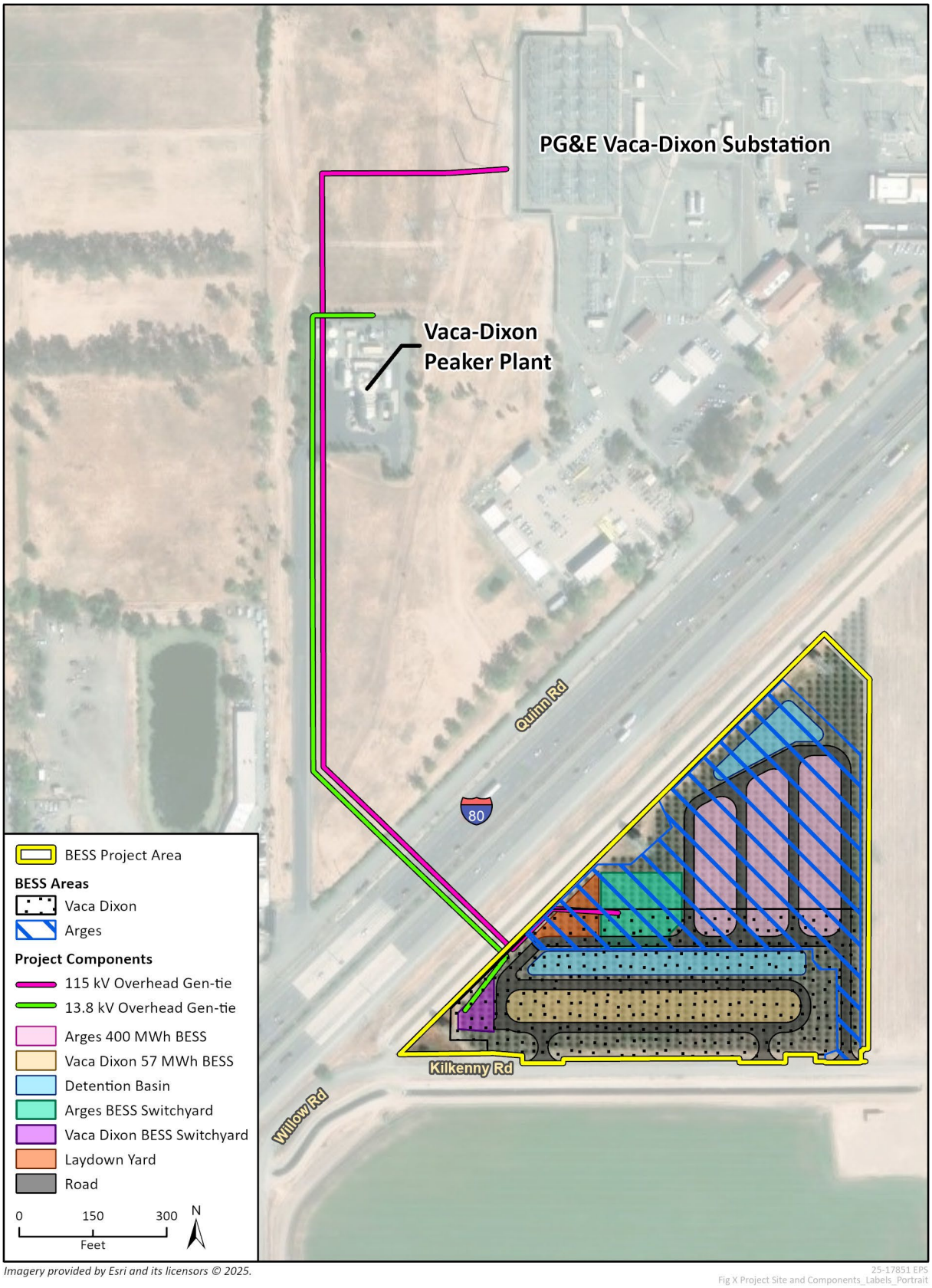
The Vaca Dixon and Arges sites will be co-located on shared transmission structures carrying both 13.8 kV and 115 kV conductors for approximately 1,500 feet of the gen-tie lengths, from the vicinity of the BESS switchyards across I-80 and up to the northwest corner of the Vaca Dixon Peaker Plant (VDPP) facility site. As shown in Figure 1, the 13.8 kV gen-tie component for the Vaca Dixon 57 MWh BESS would continue approximately 150 feet to the east for connection to the low side of the 13.8/115 kV GSU transformer at the VDPP. The Arges 400 MWh BESS 115 kV gen-tie route continues approximately 725 feet north and east to the connection point at the PG&E Vaca-Dixon Substation.

The transmission structures include the use of steel monopoles, approximately 45-100 feet tall, to support the 13.8 kV and 115 kV gen-tie lines. Where possible, the proposed gen-tie abuts existing roads and parcel boundaries and circumvents existing landowner permanent infrastructure. Access to the VDPP is via Quinn Road north of the I-80.

The Vaca Dixon and Arges facilities require discretionary permitting involving approval of from the CEC via the AB 205 Opt-in Application process. The Project's operational life and associated land leases are anticipated to be up to 40 years.

Please refer to Figure 1 for an overview of the Project site and Figure 2 for the BESS enclosure locations assumed for the air dispersion modeling analysis.

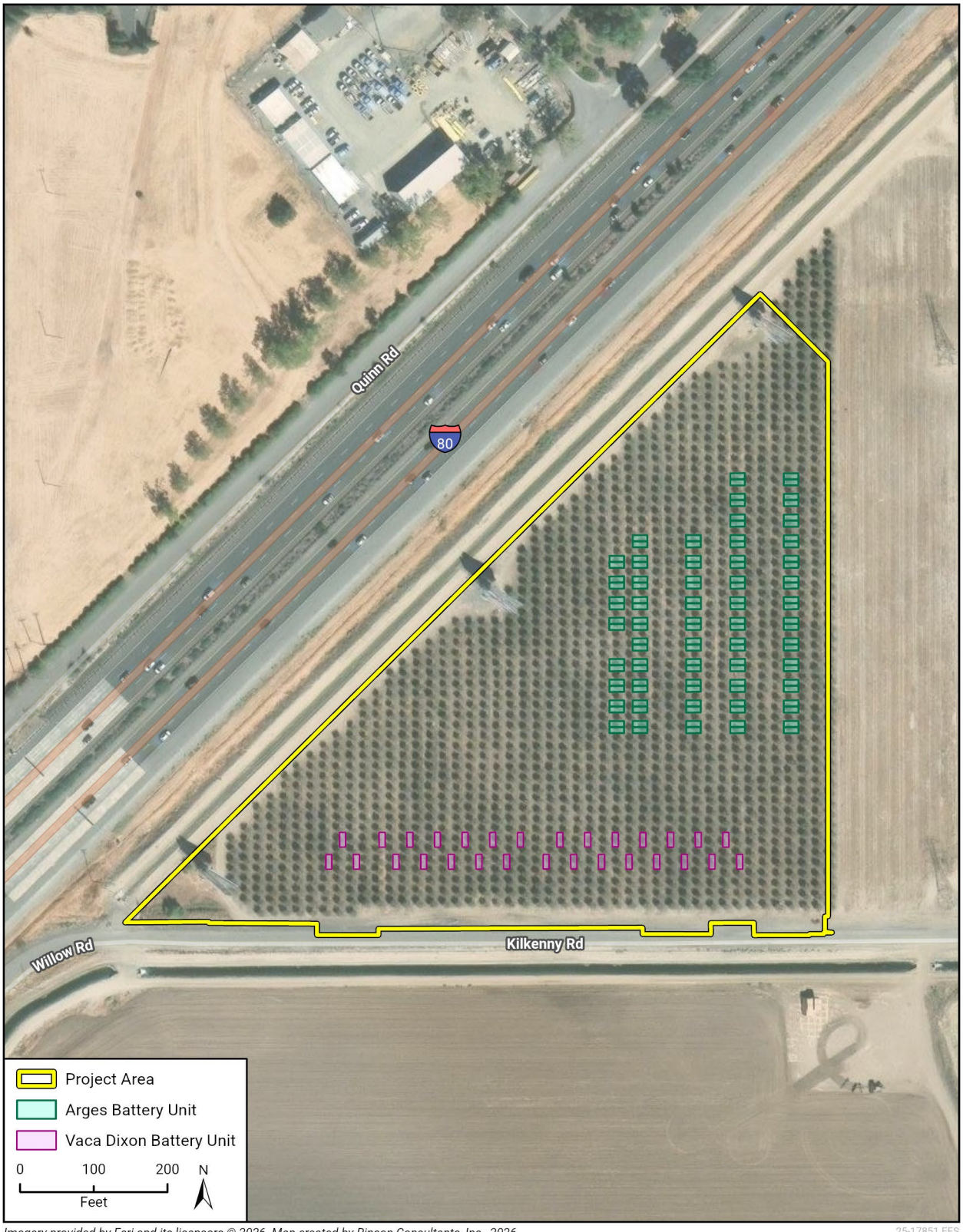
Figure 1 Project Area



Imagery provided by Esri and its licensors © 2025.

25-17851 EPS
Fig X Project Site and Components_Labels_Portrait

Figure 2 BESS Enclosure Area for Air Dispersion Modeling



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 2 BESS Enclosure Area for Air Dispersion Modeling

1.4 Surrounding Area

The proposed BESS Project Area is currently used for irrigated agriculture (plum orchard) and is designated by the City of Vacaville General Plan as Business Park and the BESS Project Area is located within the City's Northeast Growth Area. Pursuant to Vacaville General Plan Policy LU-P18.1, development within the Northeast Growth Area is intended for job generating uses such as high-quality offices, industrial uses, and technology campuses. The purpose of this overlay district is to guide temporary or interim development in a manner that preserves existing land for future development in the Northeast Growth Area. Permitted and Conditional Uses in the Northeast Growth Area do not include BESS projects.

The air dispersion modeling focused on the nearby residences. The nearest residences are located approximately 900 feet to the southwest. The modeled receptor grid was initially set to 1,000 feet to correspond with health risk methodologies, however the radius was expanded to the east, south and west to include a representative portion of the residential areas.

2 Background

Accidental releases of material during an unlikely BESS thermal runaway fire event have the potential to affect surrounding populated areas. The purpose of the dispersion modeling assessment is to determine the magnitude and extent of potential emissions of hazardous air pollutants from both a non-flaming and flaming scenario. The following sections discuss background information that will be used to develop the technical analyses.

2.1 Large Scale and UL9540A Fire Testing

UL9540A is the industry-standard methodology for evaluating thermal runaway and fire propagation in BESS. This is achieved typically by heating mats installed around the cell(s) to simulate excessive heat which could cause thermal runaway. At minimum at least one adjacent cell must enter thermal runaway during the test to simulate propagation.

2.1.1 Vaca Dixon 57 MWh

Vaca Dixon would use a CATL battery energy storage system (BESS), Model CO4285P10L01. The BESS system will include 8 modules (M0128fP10L01), and 4,160 Cells (CBDC0).

- **Large Scale Fire Test**
  - The primary purpose of large-scale fire testing is to evaluate the thermal exposure from a developed fire within a battery energy storage system, including non-battery components, to determine propagation or ignition risk to adjacent enclosures and exposures.
  - Heating elements were in contact with eight cells to with location chosen to maximize the potential for cell-to-cell thermal runaway propagation and ensure fire propagation within the module.
  - Fire growth from ignition to peak heat release rate (HRR) was approximately 90 minutes.
  - Duration of visible (exterior) flaming was approximately 14.5 hours.
  - Testing demonstrates that the BESS enclosure design will limit a thermal runaway event from propagating outside of a single enclosure with a clearance distance of 1500mm (59 inches) to adjacent units.
  - The testing demonstrated that under the test conditions the fire will not propagate from enclosure to enclosure even with one enclosure on fire.
- **Cell Level Test**
  - The cell test included the same test repeated 5 times with a separate cell each time. Each time, the single cell was forced into thermal runaway. On average, cell venting occurred at 161°C (321.87°F) and thermal runaway occurred at 220°C (428°F).
  - Gas composition was analyzed showing the primary flammable gas constituents as hydrogen, methane and ethylene. The primary toxic gas was carbon dioxide.
- **Module Level Test**
  - The module test was conducted with 5 cells being forced into thermal runaway by inducing heat via 1 film heater between the 2 initiating cells.
  - Gas composition was analyzed showing the primary flammable gas constituents as hydrogen, methane and ethylene. The primary toxic gas was carbon dioxide.
  - No flying debris, explosive discharge of gas, sparks or electrical arcs were observed.

- **Unit Level Test**
  - The unit test was conducted with a single module being forced into thermal runaway with one film heater used to simultaneously heat one cell within the module. No fire suppression system was installed for any test.
  - Thermal runaway of a single module occurred approximately 1 hour after heater activation with the test ending at approximately 1 hour and 50 minutes.
  - Thermal runaway propagated to two non-induced cells within the initiating module, resulting in a total of three cells in thermal runaway which self-extinguished without an external suppression or cooling.
  - The unit test results demonstrate that the thermal runaway event was limited to a single module within the initiating rack unit and there was no propagation to other modules within the initiating rack unit or any of the target rack units. There were no observations of a deflagration or explosive discharge of gases.
  - The UL9540A unit test supports the proposed layout and back-to-back spacing of 6 inches of rack units at the site.
  - Additional thermal runaway prevention will be provided via a Battery Management System (BMS) that monitors battery voltage, temperature, etc. to detect irregularities and disconnect power if needed. It is important to note that while the BMS may disconnect power it cannot discharge stored energy from the batteries.

2.1.2 Arges 400 MWh

Arges would use a AESC HE-L5030A BESS, Model HR-L630B. The BESS system will include 6 modules (HP-L630B), and 4,992 Cells (HC-L315A).

- **Large Scale Fire Test**
  - The primary purpose of large-scale fire testing is to evaluate the thermal exposure from a developed fire within a battery energy storage system, including non-battery components, to determine propagation or ignition risk to adjacent enclosures and exposures.
  - Heating elements were in contact with three cells with the location chosen to maximize the potential for cell-to-cell thermal runaway propagation and ensure fire propagation within the module.
  - Fire growth from ignition to peak HRR was approximately two hours and 45 minutes.
  - Duration of visible (exterior) flaming was approximately 33 hours and 40 minutes.
  - The LSFT demonstrates that the BESS enclosure design will limit a thermal runaway event from propagating outside of a single enclosure with a clearance distance of 50 mm (2 inches) to adjacent units.
  - The testing demonstrated that under the test conditions the fire will not propagate from enclosure to enclosure even with one enclosure fully involved with in fire.
- **Cell Level Test**
  - The cell test included the same test repeated 5 times with a separate cell each time. Each time, the single cell was forced into thermal runaway. On average, cell venting occurred at 159°C (318.2°F) and thermal runaway occurred at 246°C (474.8°F).
  - Gas composition was analyzed showing the primary flammable gas constituents as hydrogen, methane and ethylene. The primary toxic gas was carbon dioxide.
- **Module Level Test**
  - The module test was conducted with 1 cell being forced into thermal runaway by inducing heat via 2 film heaters.

- Gas composition was analyzed showing the primary flammable gas constituents as hydrogen, methane and ethylene. The primary toxic gas was carbon dioxide.
- No flying debris, explosive discharge of gas, sparks or electrical arcs were observed.

- **Unit Level Test**
  - The unit test was conducted with a single module being forced into thermal runaway with two film heaters used to simultaneously heat one cell within the module. No fire suppression system was installed for any test.
  - Thermal runaway of a single module occurred approximately 1 hour after heater activation.
  - Thermal runaway propagated to one non-induced cell within the initiating module, resulting in a total of two cells in thermal runaway.
  - The unit test results demonstrate that the thermal runaway event was limited to a single module within the initiating rack unit and there was no propagation to other modules within the initiating rack unit or any of the target rack units. There were no observations of a deflagration or explosive discharge of gases.
  - The testing supports the proposed layout and spacing of rack units at the site.
  - Additional thermal runaway prevention will be provided via a BMS that monitors battery voltage, temperature, etc. to detect irregularities and disconnect power if needed. Note that the BMS may cease charging and discharging but will not dissipate stranded energy.

2.2 Hazard Characterization

Based on the CEC Data Request DR PH-5, modeling results will be compared to the U.S. EPA Acute Exposure Guideline Level (AEGL) standards and the Emergency Response Planning Guidelines (ERPGs). The UL9540A cell level test reports identify hazardous substances captured during the thermal runaway that may have an impact on nearby receptors described earlier. These hazardous substances may include but are not limited to: carbon monoxide (CO), carbon dioxide (CO_2), hydrogen, methane, ethylene, acetylene, ethane, propane, propene (propylene), and others. However, toxic air contaminants (TACs), such as benzene, particulate matter (including ultrafine particulates and metals), hydrogen chloride (HCl), hydrogen fluoride (HF), hydrogen cyanide (HCN), acrolein, formaldehyde, VOCs (toluene, etc.), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), phosphoryl fluoride, and carbonyl fluoride could also be released, even though they are not evaluated in the cell/module level UL9540A test reports. To supplement the test UL9540A data, additional publicly available emissions data from other publicly available BESS project reports and technical analyses were reviewed and utilized for this analysis, including references provided by the CEC. More information is provided below.

AEGLs are developed by the National Academy of Sciences. The public exposure guideline systems use a three-tier system to differentiate severity levels. The tier levels for each system are described below for reference as published by the U.S. EPA:

- AEGL-1 is the airborne concentration (expressed as parts per million [ppm] or milligrams per cubic meter [mg/m^3]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.
- AEGL-2 is the airborne concentration (expressed as ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- AEGL-3 is the airborne concentration, (expressed as ppm or mg/m^3), of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

The ERPG values are defined as follows:

- ERPG-1 is the maximum airborne concentration below which nearly all individuals could be exposed to for up to one hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.
- ERPG-2 is the maximum airborne concentration below which nearly all individuals could be exposed to for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
- ERPG-3 is the maximum airborne concentration below which nearly all individuals could be exposed to for up to one hour without experiencing or developing life-threatening health effects.

Non-cancer health effects can occur due to exposure of emissions of hazardous substances during a thermal runaway event. A risk evaluation measures the immediate or short-term adverse effects—such as nausea, headaches, or eye and throat irritation—resulting from chemical exposure lasting 1 hour or less. When multiple pollutants share the same toxicological effect (the same “pathway,” i.e., inhalation), the effects can be additive. The AEGLs or ERPGs do not explicitly calculate or predict the synergistic, antagonistic, or additive health effects of exposures to multiple pollutants. In determining potential non-cancer health risks from hazardous substances, it is assumed there is a dose of the chemical of concern below which there would be minimal impact on human health. The air concentration corresponding to this dose for the purposes of this analysis is the AEGL.

Non-cancer health risks can be measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its AEGL. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals expressed as hazard indices for each organ system. A hazard index of less than 1.0 is considered to be an insignificant health risk. For this assessment, the maximum hazard index is. This method leads to a conservative assessment.

Table 1 provides a summary of AEGL and ERPG, levels 1 through 3. Note that AEGL and ERPG values provided in milligrams per meter cubed (mg/m^3) or parts per million (ppm) were converted to micrograms per meter cubed ($\mu g/m^3$). The TACs presented in Table 1 below are those that had identified and usable emissions data for the AERMOD analysis, based on the literature review.

Table 1 Summary of 1-Hour AEGLs and ERPGs

Gas Species	Formula	CAS Number	AEGL-1 (µg/m³)	AEGL-2 (µg/m³)	AEGL-3 (µg/m³)	ERPG-1 (µg/m³)	ERPG-2 (µg/m³)	ERPG-3 (µg/m³)
Carbon Monoxide	CO	630-08-0	–	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	CO_2	124-38-9	–	–	–	–	–	–
Hydrogen	H_2	1333-74-0	–	–	–	–	–	–
Methane	CH_4	74-82-8	–	–	–	–	–	–
Acetylene	C_2H_2	74-86-2	–	–	–	–	–	–
Ethene (Ethylene)	C_2H_4	74-85-1	–	–	–	–	–	–
Ethane	C_2H_6	74-84-0	–	–	–	–	–	–
Propadiene	C_3H_6	115-07-1	–	–	–	–	–	–
Propene (Propylene)	C_3H_6	115-07-1	–	–	–	–	–	–
Propane	C_3H_8	74-98-6	9,900,000	31,000,000	59,000,000	–	–	–
Butane	C_4H_{10}	106-97-8	13,000,000	40,000,000	130,000,000	–	–	–
Pentane	C_5H_{12}	109-66-0	–	–	–	–	–	–
Iso-Pentane	C_5H_{12}	74-78-4	–	–	–	–	–	–
Hexane	C_6H_{14}	110-54-3	–	10,000,000	30,000,000	–	–	–
Benzene	C_6H_6	71-43-2	170,000	2,600,000	13,000,000	159,734	479,000	3,195,000
Toluene	C_7H_8	108-88-3	250,000	2,100,000	14,000,000	188,000	1,131,000	3,769,000
Dimethyl Carbonate	$C_3H_6O_3$	616-38-6	–	–	–	–	–	–
Ethyl Methyl Carbonate	$C_4H_8O_3$	623-53-0	–	–	–	–	–	–
Hydrogen Chloride	HCl	7647-01-0	2,700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	HF	7664-39-3	800	20,000	36,000	1,637	16,000	41,000
Hydrogen Cyanide	HCN	74-90-8	2,200	7,800	17,000	–	11,000	28,000
Copper and compounds	Cu	7440-5-8	–	–	–	–	–	–
Ammonia	NH_3	7664-41-7	21,000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	CH_2O	50-00-0	1,000	17,000	69,000	1,227	12,000	49,000
Acrolein	C_3H_4O	107-02-8	70	230	3,200	115	344	3,439
Nitrogen Dioxide	NO_2	10102-44-0	940	23,000	38,000	1,882	28,000	56,000
Sulfur Dioxide	SO_2	7446-09-5	520	1,950	49,000	786	8,000	66,000

1-Hour AEGL values from U.S. EPA. Units provided in mg/m³ and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m³.

AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m³ = micrograms per meter cubed.

Source: UL9540A Cell Test Report; Society of Fire Protection Engineers (SFPE) Report; U.S. EPA; Cameo Chemicals.

2.3 Literature Review

The following provides an overview of the materials reviewed and how they were incorporated into this analysis. Publicly available reports on other BESS projects were reviewed and utilized for this analysis, including references provided by the CEC. Many of the sources provided by the CEC and reviewed are referenced in the primary source document, the Society of Fire Protection Engineers "SFPE Report" listed first, below.

In addition to the sources included in the SFPE Report, the below sources were reviewed in support of this analysis. These studies provide an indication of the range of emissions that could be generated by a variety of battery cells. However, as these studies examine a wide range of battery cell sizes and configurations, the UL9540A testing conducted for this Project provides the most accurate estimate of a limited range of pollutants as they are conducted on the Project-specific cells. The UL9540A test did not analyze the wide range of different toxic materials that could potentially be produced, or the pollutants from the flaming scenario. So, other studies were applied to supplement this information to ensure a comprehensive analysis of potential pollutants and impacts.

McAllister, Jamie L. et al. SFPE Foundation. June 2025. Environmental and Health Impacts of Thermal Runaway Events in Outdoor Lithium-Ion Battery Energy Storage System Installations.

This document, referred throughout this analysis as the "SFPE Report" was utilized as the primary source of information besides the UL9540A test reports and standard California agency-related materials and guidance. The foundation of the SFPE presented this research study as methodology to assess the health and environmental impacts from thermal runaway events in outdoor, large-scale, Li-ion BESS units. Through application of the methodology, a relationship between exposure limit distance and wind speed, ambient temperature, event duration, cell chemistry, and toxic gas species can be established. This study did not consider other health factors, such as thermal exposure. The methodology involves additional literature review of approximately 51 sources (referencing other studies also reviewed here) to aggregate data, plume dispersion modeling, and a risk analysis of the model results.

As part of the SFPE Report literature review process, characteristics were identified for how they would be relevant for developing modeling inputs. How these characteristics varied between cell chemistry, state of charge (SOC), cell geometry, number of cells and their arrangement, cell capacity, and flaming or non-flaming conditions was also investigated. Publications that did not quantify the identified thermal runaway characteristics or identify the methods of quantification were excluded. The literature review primarily focused on determining characteristics for LFP and NMC cells. While some studies evaluated cell chemistries outside of LFP and NMC cells, that data was not considered for the modeling inputs. Studies on full-scale electric vehicles (EVs) were only included when they tested standalone batteries or used a method to isolate the contribution of the battery from the other vehicle components.[3]

This document provides an overview of rationale and approach, literature review, risk assessment methodologies (for both flaming and non-flaming scenarios) and a results and discussion section related to their hypothetical scenario. It also combines a great deal of information from peer-reviewed studies to help support the defining of variables in calculation methodologies, like emission factors, heats of combustion, etc.

A. Iqbal et al., July 2025. Comparative fire hazards of lithium-ion battery chemistries: Linking thermal behavior, gas toxicity, and state-of-charge to composite risk profiles. Journal of Power Sources 655 (2025) 237914.

This document provides some emission factors for a variety of battery types at a range of state-of-charge for acrolein and formaldehyde emission factors. It was used to develop emission factors for acrolein and

[3] A similar approach was applied for the literature review conducted for this analysis, including the exclusion of non-quantifiable data and EV testing that did not isolate other vehicle components.

formaldehyde for the flaming scenario. The inclusion of acrolein is considered a conservative assumption, as it was not identified as a consistently emitted hazardous gas component in the SFPE Report and was excluded from their technical analysis. Furthermore, Iqbal et al. made its conclusions and presented acrolein emission rates based on 15 total data points, of which 7 of the emission rates were either 0 or non-detected. The remaining 8 data points varied drastically with a large standard of deviation. This is based on review of Figure 11 in Iqbal et al. Formaldehyde observed similar results in Iqbal et al. Figure 10. Also, the LFP cells studied had a different cell geometry than those in the Project (cylindrical versus prismatic).

Nonetheless, this analysis incorporated the highest maximum average emission rate of acrolein and formaldehyde across the different state-of-charges studied. Therefore, the analysis presented herein incorporating acrolein and formaldehyde is conservative.

Ramboll, March 2024, Offsite Consequence Analysis, Vistra Morro Bay Battery Energy Storage System (BESS) Project.

This document prepared an HCA for an unexpected fire event at Vistra's proposed 600 megawatt (MW) BESS project in Morro Bay, California. This document was identified by the CEC as a more conservative source of HCl and HCN emission factors for the flaming scenario. Therefore, this document was used for the flaming scenario HCl and HCN emission factors.

Tetra Tech Limited. November 2023. Island Green Power Limited Cottam Solar Project Air Quality Impact Assessment of Battery Energy Storage Systems (BESS) Fire.

This document presented a similar type of modeling analysis; however, it did not provide specific emission information. The SFPE Report was favored due to its extensive research and more recent publication.

Electric Power Research Institute. December 2020. Summary of Prior Electrochemical Battery Fire Emissions Characterization Studies.

This study was reviewed for HF emission rates. Much of the data presented is not in a form that can be utilized for AERMOD modeling. The HF emissions from the study were presented in ppm and could not be readily converted to a usable emission rate in AERMOD. The studies that expressed emissions that would be potentially usable were not for LFP prismatic cells and, thus, were excluded in favor the SFPE Report.

Bugryniec, et al. March 2024. Review of gas emissions from lithium-ion battery thermal runaway failure – Considering toxic and flammable compounds.

This document analyzes the available literature data to determine how battery parameters affect the variation in off-gas volume and composition, to determine the flammability and toxicity hazards of different battery chemistries. Much of this type of research is also provided in the SPFE Report.

American Clean Power. August 2025. Assessment of Potential Impacts of Fires at BESS Facilities.

This study provides more of a historical context related to BESS facilities and potential fires. The study presents some analysis on airborne environmental impacts; however, much of the data presented is not in a form that can be utilized for AERMOD modeling. The emissions from the study were presented in ppm and could not be readily converted to a usable emission rate in AERMOD. The SFPE Report was considered more comprehensive for other source parameters, like cell gas volume produced and, thus, favored in this analysis.

Meister et al. March 2025. Evaluating inhalation risks and toxicological impacts of lithium-ion battery thermal runaway emissions.

The objective of this study was to evaluate the impact of lithium-ion battery thermal runaway particulate emission exposures on primary small airway epithelial cells for potential inhalation risk. Much of the data presented is not in a form that can be utilized for AERMOD modeling. The results are presented as impacts to cell viability. The particulate emissions were not usable for an emissions analysis because they were presented in terms of concentrations and not mass emission rates.

Truchot, et al. National Fire Protection Agency. October 2025. Environmental Impact of Lithium-Ion Battery Incidents Compared to Other Common Incidents.

This study provides a very similar research exercise to that of the SFPE Report. However, its scope is wider than the SFPE Report, including other battery sources besides BESS. The SFPE Report is more comprehensive in terms of TACs analyzed and detailed in the calculation methodologies (this report does not consider flaming versus non-flaming scenarios), so was chosen in support of this analysis over this study.

Shao et al. 2026. Toxicity and Explosive Hazards of Thermal Runaway Gases in Aged Batteries under Different States of Charge.

This study employs an experimental approach combined with empirical formulations to evaluate both the toxicity and explosion hazards of thermal runaway gases generated by aged lithium-ion batteries. Much of the data presented is not in a form that can be utilized for AERMOD modeling. The emissions from the study were presented in ppm and could not be readily converted to a usable emission rate in AERMOD. The SFPE Report and UL9540A cell test were favored for other source parameters, like vent temperature.

Texas A&M Engineering Extension Service. May 2024. Lithium-Ion Battery Fires and Emissions Characterization Report.

This study provides a detailed characterization of gaseous and particulate emissions from lithium-ion batteries (36V 12Ah) containing 50 cylindrical cells subjected to thermal runaway via overcharging. These batteries are widely used in electric scooters and similar consumer products. All batteries were of lithium-ion nickel manganese cobalt (Li-NMC) chemistry. Based on the battery chemistry and geometry, much of the data presented is not in a form that can be utilized for this analysis and the SFPE Report was favored for this analysis.

3 Methodology

The Risk Assessment Methodology from the SFPE Report was incorporated into the analysis. The SFPE Report methodology was determined to be most comprehensive and most relevant to the CEC data request and other communications, and the requested approach using the AERMOD model.

The analysis models both non-flaming and flaming thermal runaway scenarios for LFP cell chemistry that involves part of or a full single BESS unit. No fire suppression is assumed.[4] A non-flaming thermal runaway event is a thermal runaway condition in which cells off gas due to thermal decomposition, but gases are not ignited and no combustion occurs. A flaming runaway thermal runaway event is a thermal runaway condition where off gases from the cells ignite and sustained combustion takes place where there are visible flames. For non-flaming events, the analysis assumed that the thermal runaway propagated through one bay, but heat transfer was not sufficient to propagate across the barriers into other bays; therefore, only one bay was involved. For the flaming scenario, the analysis assumed propagation throughout an entire BESS enclosure.

The modeled emissions and resultant concentrations are based on estimates and assumptions from the data available at the time the report was generated. The AERMOD model and Rincon standalone modeling spreadsheets (provided in the Appendices A - E) are considered conservative in that they are designed to overpredict impacts. It is important to note that the accuracy of dispersion models is limited by data scarcity – only a few field experiments have been conducted in which hazardous gases were released and their concentrations measured. Furthermore, the complexity and randomness of the real world cannot be completely captured in any computer program. Additionally, the plume modeling represents a situation in which “all controls failed” and is intended for bounding consequence evaluation, not likelihood-weighted risk. Due to the inherent uncertainties, the modeling analysis incorporates conservative assumptions regarding emissions, meteorology, and plume characteristics to calculate the ground-level concentrations.

3.1 Gas Production and Mass Loss Rate

Calculation of gas concentrations is dependent on the release rate. To determine the mass loss rate (MLR), the heat release rate (HRR) and heat of combustion was estimated for the flaming scenario. MLR was determined based on data obtained from literature review and known project specifications. For the non-flaming scenario, gas production is a result of thermal decomposition of the cell’s chemistry. Thermal decomposition is the breakdown of a compound into smaller constituents in the present of heat and does not require a flame. Combustion is the reaction between a fuel and oxygen that produces a flame (heat and light). Gas production rates were determined based on the percentage gas composition.

An average steady state gas release volume was modeled for each scenario. The average gas production does not capture the peak gas production values; however, these peak values are hard to predict due to specific cell/module/unit configurations, cell geometry, failure mechanisms, ignition location, etc. Further, peaks would last minutes while community exposure is evaluated on one or more hours; therefore, it is expected that community exposure times would include fluctuations in the MLR or gas production rate profiles. Therefore, the use of the average gas production rate is considered the most representative approach and will be estimated based on project-specific information and literature review. Approaches for the non-flaming and flaming scenarios are discussed below.

[4] The potential role of fire suppression will be discussed qualitatively.

3.1.1 General Assumptions

The following general assumptions apply to this technical analysis.

BESS Cell Information

Vaca Dixon

As stated in UL9540A Cell Test Report for the Project, Vaca Dixon BESS contains C04285P10L01-R BESS enclosures.[5] Each enclosure has 5 battery bays and each battery bay contains 2 racks. One rack has 8 modules, each with 52 battery cells per module. This corresponds to 832 cells per bay and 4,160 cells per enclosure. The number of cells per bay was incorporated into the non-flaming scenario and the number of cells per enclosure was incorporated into the flaming scenario. Below is additional information related to the project that was incorporated into the analysis:

- **Cell type**: LFP [UL9540A Cell Report, Page 3]
- **Cell model**: CBDC0 [UL9540A Unit Level, Page 3]
- **Cell geometry**: Prismatic [UL9540A Cell Report, Page 3]
- **Total cell off-gas volume**: 176.3 Liters (L) [UL9540A Cell Report, Page 3]
- **Thermal Runaway Temperature**: 428 degrees Fahrenheit [UL9540A Cell Report, Page 3]
- **Cell weight**: 5,460 grams (approximately 12 lbs) [UL9540A Cell Report, Page 7]

Arges

As stated in UL9540A Cell Test Report for the Project, Arges BESS contains HE-L5030A BESS enclosures.[6] Each enclosure has 2 battery bays and each battery bay contains 3 racks. One rack has 8 modules, each with 104 battery cells. This corresponds to 2,496 cells per bay and 4,992 cells per enclosure. The number of cells per bay was incorporated into the non-flaming scenario and the number of cells per enclosure was incorporated into the flaming scenario. Below is additional information related to the project that was incorporated into the analysis:

- **Cell type**: LFP [UL9540A Cell Report, Page 8]
- **Cell model**: HC-L315A [UL9540A Unit Level, Page 2]
- **Cell geometry**: Prismatic [UL9540A Cell Report, Page 7]
- **Total cell off-gas volume**: 160.4 Liters (L) [UL9540A Cell Report, Page 2]
- **Thermal Runaway Temperature**: 474.8 degrees Fahrenheit [UL9540A Cell Report, Page 2]
- **Cell weight**: 5,650 grams (approximately 12 lbs) [UL9540A Cell Report, Page 6;]

Release Duration

Historical studies of incidents and unit level testing indicate that releases associated with a non-flaming thermal runaway scenario can occur over long periods of time, sometimes days. In the absence of comparable data from the UL9540A testing[7], a release duration for the non-flaming and flaming scenarios were developed based on the literature review and technical analyses performed in the SFPE Report. The SFPE Report Section 4.2.1 estimated a single bay release duration for a non-flaming scenario at 6.6 hours based upon the report's literature review and technical analysis. A duration of 6 hours was assumed in this analysis for the non-flaming scenario as a result. It is more conservative, as it presented a higher emission rate with the same mass loss occurring over a shorter time period.

[5] Atar Fire, LLC. CFD Modeling Report for Battery Energy Storage System. November 3, 2025.
[6] Atar Fire, LLC Large Scale Fire Test Supplemental Interpretation Report. 10/13/2025.
[7] The UL9540A testing was conducted using a heater to heat a subset of cells, not a full bay for the non-flaming scenario.

Similarly, a duration of 6 hours was assumed in the analysis for the flaming scenario. This was based on the SFPE Report Section 4.2.3 that analyzed historical events for enclosure burns, with the Elkhorn and Victoria fires occurring for 7 and 6.5 hours. These were for NMC cells, which were determined to burn much quicker than LFP cells based on the SFPE Report research. Furthermore, most new CSA TS-800 / UL9540A 6th edition full scale fire tests show a burn duration of 10 to 12 hours. Therefore, the 6-hour release duration for the flaming scenario was considered conservative. These assumptions related to release duration apply to both the Vaca Dixon BESS and Arges BESS.

Meteorology

Meteorology is an important variable for air dispersion modeling in this technical analysis. AERMOD utilizes meteorological inputs from real-world weather readings processed through AERMET. The AERMET meteorological file provides information on hourly variations in surface wind and direction, ambient temperature, boundary layers, relative humidity, pressure, precipitation, and cloud cover.

Five years of meteorological data provided by the Yolo/Solano Air Quality Management district for the Nut Tree Airport monitoring station were used for both Vaca Dixon BESS and Arges BESS. The AERMOD model analyzes the impacts from the hourly meteorology data to present the peak 1-hour concentrations produced for the potential project impacts. The station is located approximately 2.4 miles southwest of the Project Site and the data covers the years 2017 to 2021, which is the most recently available dataset at the time of this report. This is the most representative available meteorological data for use in AERMOD.

3.1.2 Non-Flaming Scenario

The non-flaming scenario assumed consumption of one bay, which considers a greater involvement than the previously analyzed by Coffman Engineers “credible event” (with only the three cells undergoing thermal runaway per the unit test for Vaca Dixon and four cells undergoing thermal runway per unit test for Arges) as described in Section 1.[8,9,10] This scenario is considered worst-case and non-probable, as thermal runaway occurs at 428 ºF and it is unlikely all modules would be at this excessive temperature without combustion starting. There is no flame produced in the non-flaming scenario; therefore, use of HRR and heat of combustion to predict MLR is not appropriate. Prediction of the gas rate required a different methodology from the flaming scenario. Mass loss was determined from the cell off gassing. The gas release rate was obtained from project-specific data, like gas volume release rate from the UL9540A reports and estimated non-flaming scenario event duration from the SFPE Report.

Venting time is the time it takes for the gas to leave the cell through the external vents. The cell capacity impacts the duration of venting due to higher gas production for larger units. For large capacity cells (>100 Wh) cell venting times were estimated at 6 hours for a single bay.[11]

Vaca Dixon

A single bay for the Project will hold 832 cells, and with an event duration of 6 hours, this corresponds to approximately 138.7 cells per hour undergoing thermal runaway in a non-flaming scenario. According to the UL9540A cell test report, the total single cell off-gas volume is 176.3 L. Using this off-gas volume and cell burning rate, the anticipated gas production rate will be **6.79 liters per second (L/s)**.

As a backcheck for the specific battery specified, the UL9540A cell-level test captured 176.3 L of gas during a thermal runaway event over a collection time of approximately 40 minutes resulting in a uniform gas production rate of 0.07 L/s for a single cell. The UL9540A unit-level test showed that simultaneous

[8] Coffman Engineers. 2025a. Vaca Dixon Power Centr Project Hazard Consequence Analysis for Vaca Dixon BESS. December 19, 2025.

[9] Coffman Engineers. 2025b. Vaca Dixon Power Centr Project Hazard Consequence Analysis for Arges BESS. December 19, 2025.

[10] 832 cells versus 6 cells.

[11] SFPE Report, page 32.

venting of four cells is probable and a 2x safety factor is recommended, resulting in an anticipated gas production rate of 0.3 L/s. The reality is that gas release rates will not be steady state, and the proposed uniform 6.79 L/s is a conservative approach.

Arges

A single bay for the Project will hold 2,496 cells, and with an event duration of 6 hours, this corresponds to approximately 416 cells per hour undergoing thermal runaway in a non-flaming scenario.[12] According to the UL9540A cell test report, the total single cell off-gas volume is 160.4. Using this off-gas volume and cell burning rate, the anticipated gas production rate will be **18.4 liters per second (L/s)**.

The UL9540A cell-level test captured 160.4 L of gas over a collection time of approximately 36 minutes. This results in a uniform gas production rate of 0.07 L/s for a single cell. Assuming a simultaneous venting of four cells and a recommended 2x safety factor, the anticipated gas production rate would be 0.59 L/s. Gas release rates will not likely be steady state, and the proposed uniform 18.4 L/s is a conservative approach.

3.1.3 Flaming Scenario

The flaming scenario assumes that all cells in the BESS enclosure unit would undergo thermal runaway and propagate beyond a non-flaming scenario. It is assumed that the full capacity of the enclosure – 3,800 kilowatt-hours (kWh) for Vaca Dixon and 5,030 kWh for Arges – would burn. To estimate HRR the total heat released (THR) will be divided across an estimated event duration. THR will be estimated using the normalized THR of 28.3 kilojoules per watt-hour [kJ/Wh] based on the average for prismatic LFP cells provided in Table 8 of the SFPE Report, multiplied by total enclosure capacity.

To calculate HRR:

Vaca HRR (kW) = THR (kJ) / Event Duration (sec)
= 107,540,000 kJ / 21,600 sec * 1 kW / kJ/s = 4,979 kW
Arges HRR (kW) = 142,349,000 kJ / 21,600 sec * 1 kW / kJ/s = 6,590 kW

Where:

Vaca THR = 28.3 kJ/Wh x 3,800 kWh = 107,540,000 kJ

Arges THR = 28.3 kJ/Wh x 5,030 kWh = 142,349,000 kJ

Event duration = 6 hours (21,600 sec)

Note: 1 kW = 1 kJ/s

Based on the SFPE Report methodologies and research, a 6-hour event duration was assumed for LFP cells.[13] So, a 6-hour scenario is used for the analysis.

To calculate the MLR:

Vaca MLR (g/s) = HRR (kW) / Heat of Combustion
= 4,979 kW / 15 kJ/g * 1 KJ/s / kW = 333 g/s
Arges MLR (g/s) = 6,590 kW / 15 kJ/g * 1 KJ/s / kW = 440 g/s

Where:

Vaca HRR = 4,979kW (calculated above)

Arges HRR = 5,030 kW (calculated above)

[12] This is significantly higher than the 832 cells per bay for the Vaca Dixon enclosures which have 5 bays and therefore results in a conservative test scenario.
[13] SFPE Report, Section 4.2.2

Heat of combustion = 15.0 kilojoules per gram (kJ/g) [Average for all prismatic LFP results from Table 10 of the SFPE Report]

Based upon the SFPE Report, the estimated MLR for the project flaming scenario is **333 grams per second (g/s)** for Vaca Dixon and **440 g/s** for Arges**.**

For comparison, the Arges 400 MWh UL9540A module level test, which involved two cells before self-extinguishing, had a loss of 0.5 kilograms (Kg) over an approximate period of 100 minutes test duration, or 0.8 grams per second (g/s). A larger fire event would be expected to consume more cells, and the MLR assumptions from the SFPE Report is a conservative approach.

3.2 Toxic Gas Emissions

Lithium-ion batteries, similar to all fuels, result in the release of chemical compounds that can be harmful to human health at sufficient dose. Toxic and asphyxiant gases produced during a thermal runaway event could include, but are not limited to benzene, CO, CO_2, HCl, HCN, HF, ammonia (NH_3), NO_2, and SO_2. Reviews of other studies conducted in the literature review demonstrate that the emission rates can vary substantially. For example, HF emissions are often expressed in terms of HF per energy unit (i.e., grams per Wh). Smaller cells often produce larger volumes of total gases per Wh than larger cells. So, directly extrapolating emissions rates from smaller cells to larger cells, such as the ones used for this Project, would overestimate emission rates. Therefore, it is preferable to use concentration values where possible, such as in the SFPE Report, and emission factors expressed in terms of per energy unit are expected to be conservative.

Full constituent lists used for the non-flaming and flaming scenarios are a combination of Table 12 and 14 from the SFPE Report and gas constituent data from UL9540A test reports; these constituents have been summarized with their applicable 1-hour AEGLs and ERPGs above in Table 1. More details related to the gas constituents of the non-flaming and flaming scenarios are provided below.

3.2.1 Non-Flaming Scenario

Mass production rate for each gas constituent is calculated using a percent volume of the gas composition. The percent volume is multiplied by the average total gas production rate then converted to mass using the ideal gas law under standard pressure and the thermal runaway reference temperature from the UL9540A report. This is reflected in the equation, below.

To calculate mass production rate:

m (g/s) = PVM / RT

Where:

P = Pressure, 1 atmosphere (atm)

V = Volumetric Gas Release Rate, 6.79 (L/s) Vaca Dixon and 18.54 (L/s) Arges [see above]

M = Molar Mass (g/mol), varies per compound [refer to Table 2]

R = Universal Gas Constant, 0.08206 L-atm/mol-K

T = Temperature, 493.15 Kelvin (Vaca Dixon) and 519.5 K (Arges) at thermal runaway [see above, presented in Fahrenheit]

Table 12 from the SFPE Report and gas constituent data from UL9540A test reports are used to determine the species' yields and mass production rates. Note that total percentage yield may conservatively exceed 100 percent with the combination of constituents from the two lists.

Vaca Dixon

Table 2, below, shows the UL9540A hazardous gas component breakdown associated with the Vaca Dixon BESS.

Table 2 Non-Flaming Scenario UL9540A Hazardous Gas Components, Vaca Dixon

Hazardous Gas Component	Molar Mass (g/mol)	UL9540A Gas Analysis (% vol)	Mass Production Rate [g/s] 6 hr
Carbon Monoxide	28.01	10.61	*0.50*
Carbon Dioxide	44.01	30.116	*2.22*
Hydrogen	2.02	43.569	*0.15*
Methane	16.043	6.625	*0.18*
Acetylene	26.04	0.188	*0.01*
Ethene (Ethylene)	28.05	4.159	*0.20*
Ethane	30.07	1.245	*0.06*
Propadiene (Allene)	40.065	0.005	*0.0003*
Propene (Propylene)	42.08	1.056	*0.07*
Propane	44.1	0.292	*0.02*
Butane	58.12	0.443	*0.04*
Pentane	72.15	0.089	*0.01*
Hexane	86.18	0.034	*0.005*
Benzene	78.11	0.015	*0.002*
Toluene	92.14	0.002	*0.00003*
Dimethyl Carbonate	90.09	1.477	*0.223*
Ethyl Methyl Carbonate	104.1	0.077	*0.013*

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

g/mol = grams per mole; % vol = percent volume; g/s = grams per second.

Source: UL9540A Cell Test Report, page 2.

Table 3 below provides the species yields and mass production rates for the LFP non-flaming scenario. Mass production rates for each constituent were calculated utilizing the percent volume composition of gas constituents and the average total gas production rate, discussed above. The percent volume for specific constituents, multiplied by the average total gas production rate, was then converted to mass using the ideal gas law under standard pressure and the thermal runaway reference temperature from the UL9540A report (see equation above). Note that no data was found for hydrogen bromide (HBr) and SO_2, and no usable data was found for NH_3, according to the literature research in the SFPE report. CO and CO_2 emissions were based on UL9540A test data, included with the other constituents in Table 2. Please refer to Appendix B for more information.

It is important to note that the SFPE report states: "*Ideally, for a specific BESS unit, the total gas production estimates will be derived from experimental testing of the actual unit or unit components.*" The limitation of the UL9540A cell data above is that it does not include all the plastic wiring, enclosure, HVAC system, etc. However, these components are no different from any other structural fire and, therefore, not requiring more concern than other construction in the immediate vicinity.

Table 3 Non-Flaming Scenario Species Yields and Mass Production Rates, Vaca Dixon

Species	Molar Mass g/mol	Yield % vol	Mass Production Rate [g/s] 6 hr
Hydrogen Chloride	36.46	1.9	0.12
Hydrogen Cyanide	27.03	0.5	0.02
Hydrogen Fluoride	20.01	2.7	0.09
Nitrogen Dioxide	46.01	7.9	0.61

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

g/mol = grams per mole; % vol = percent volume; mg/g = milligrams per gram; mg/Wh = milligrams per watt-hour; g/s = grams per second.

Source: SFPE Report, Table 12.

Arges

Table 4, below, shows the UL9540A hazardous gas component breakdown associated with the Arges BESS.

Table 4 Non-Flaming Scenario UL9540A Hazardous Gas Components, Arges

Hazardous Gas Component	Molar Mass (g/mol)	UL9540A Gas Analysis (% vol)	Mass Production Rate [g/s] 6 hr
Carbon Monoxide	28.01	12.896	1.57
Carbon Dioxide	44.01	23.467	4.49
Hydrogen	2.02	51.38	0.45
Methane	16.043	4.98	0.35
Acetylene	26.04	0.243	0.03
Ethene (Ethylene)	28.05	2.458	0.30
Ethane	30.07	0.845	0.11
Propadiene (Allene)	40.065	0.005	0.001
Propene (Propylene)	42.08	1.252	0.23
Propane	44.1	0.254	0.05
Pentane	72.15	0.099	0.031
Benzene	78.11	0.012	0.004
Dimethyl Carbonate	90.09	1.453	0.57
Ethyl Methyl Carbonate	104.1	0.217	0.10

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

g/mol = grams per mole; % vol = percent volume; g/s = grams per second.

Source: UL9540A Cell Test Report, pages 7 - 8.

Table 5 below provides the species yields and mass production rates for the LFP non-flaming scenario. Mass production rates for each constituent were calculated utilizing the percent volume composition of gas constituents and the average total gas production rate, discussed above and detailed under the Vaca Dixon discussion.

Table 5 Non-Flaming Scenario Species Yields and Mass Production Rates, Arges

Species	Molar Mass g/mol	Yield % vol	Mass Production Rate [g/s] 6 hr
Hydrogen Chloride	36.46	1.9	0.30
Hydrogen Cyanide	27.03	0.5	0.06
Hydrogen Fluoride	20.01	2.7	0.24
Nitrogen Dioxide	46.01	7.9	1.58

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

g/mol = grams per mole; % vol = percent volume; mg/g = milligrams per gram; mg/Wh = milligrams per watt-hour; g/s = grams per second.

Source: SFPE Report, Table 12.

3.2.2 Flaming Scenario

Vaca Dixon

Mass production rates for the flaming scenario are calculated using the species' mass normalized by the amount of mass consumed and the average MLR as determined in Section 3.1.3 above. This is reflected in the equation, below.

To calculate mass production rate:

m (g/s) = yield * MLR / 1000

Where:

yield = mass consumed (mg/g) [refer to Table 7]

MLR = 333 g/s [see above]

The species yield and mass production rates for the flaming scenario are taken from Table 14 of the SFPE Report because the UL9540A testing does not account for this type of scenario. The flaming scenario will result in emissions of toxics as well as criteria air pollutants, including NO_2, SO_2 and particulate. CO and CO_2 emissions were based on the SFPE Report data, assuming it was more representative than the UL9540A test data for a flaming scenario. However, the SFPE Report is missing many of the constituents from the UL9540A test report. Emissions from the constituents in Table 2 that were missing from the SFPE Report were scaled up from one bay to one enclosure based on cell numbers (4,160 instead of 832) for inclusion in the flaming scenario analysis.

Iqbal et al, 2025 was utilized to estimate acrolein and formaldehyde emissions. The emission factors were generated in terms of L/kWh (similar to the non-flaming scenario) based on data from experiments performed in the study for LFP batteries. The peak average emission factors across the state-of-charges was 3.0 L/kWh for acrolein and 1.5 L/kWh for formaldehyde. The emissions were scaled up to the kWh for an enclosure then converted to g/s using ideal gas law parameters similar to the non-flaming scenario.

The scaled emissions from the UL9450A test report are provided in Table 6, below. The flaming scenario species yields and mass production rates, as identified in the SFPE Report, are provided in Table 7, below. The acrolein and formaldehyde gas release rates and mass production rates are provided below in Table 8. Please refer to Appendix B for more information.

Table 6 Flaming Scenario Scaled UL9540A Hazardous Gas Components, Vaca Dixon

Hazardous Gas Component	Molar Mass (g/mol)	UL9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr
Hydrogen	2.02	43.569	0.738
Methane	16.043	6.625	0.892
Acetylene	26.04	0.188	0.041
Ethene (Ethylene)	28.05	4.159	0.979
Ethane	30.07	1.245	0.314
Propadiene (Allene)	40.065	0.005	0.002
Propene (Propylene)	42.08	1.056	0.373
Propane	44.1	0.292	0.108
Butane	58.12	0.443	0.216
Pentane	72.15	0.089	0.054
Hexane	86.18	0.034	0.025
Benzene	78.11	0.015	0.010
Toluene	92.14	0.002	0.010
Dimethyl Carbonate	90.09	1.477	0.002
Ethyl Methyl Carbonate	104.1	0.077	0.067

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

Source: UL9540A Cell Test Report, page 2.

Table 7 Flaming Scenario Species Yields and Mass Production Rates, Vaca Dixon

Species	Yield		Mass Production Rate [g/s] 6 hr
	mg/g	mg/Wh	
CO	35.1	–	11.66
CO_2	1463	–	485.9
HCl	2.6	–	0.86
HF	24.8	–	8.24
HCN	1.3	–	0.42
NH_3	0.5	–	0.17
NO_2	1.9	–	0.63
SO_2	3.5	–	1.16
Particulate	56	–	18.60

Source: SFPE Report, Table 14.

Table 8 Flaming Scenario Acrolein and Formaldehyde Emission Rates, Vaca Dixon

Hazardous Gas Component	Gas Release Rate (L/s)	Molar Mass (g/mol)	Mass Production Rate [g/s] 6 hr
Formaldehyde	0.26	30	0.19
Acrolein	0.53	56.1	0.72

Gas release rate based on 6 hour event and 3,794 kWh total per enclosure.

Source: Iqbal et al, 2025.

Arges

Mass production rates for the flaming scenario are calculated using the species' mass normalized by the amount of mass consumed and the average MLR as determined in Section 3.1.3 above. This is reflected in the equation, below.

To calculate mass production rate:

m (g/s) = yield * MLR / 1000

Where:

yield = mass consumed (mg/g) [refer to Table 10]

MLR = 440 g/s [see above]

The species yield and mass production rates for the flaming scenario are determined following the same methodology as detailed for Vaca Dixon above. The scaled emissions from the UL9450A test report are provided in Table 9, below. The flaming scenario species yields and mass production rates, as identified in the SFPE Report, are provided inTable 10, below. The acrolein and formaldehyde gas release rates and mass production rates are provided below in Table 11. Please refer to Appendix B for more information.

Table 9 Flaming Scenario Scaled UL9540A Hazardous Gas Components, Arges

Hazardous Gas Component	Molar Mass (g/mol)	UL9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr
Hydrogen	2.02	51.38	0.90
Methane	16.043	4.98	0.70
Acetylene	26.04	0.243	0.06
Ethene (Ethylene)	28.05	2.458	0.60
Ethane	30.07	0.845	0.22
Propadiene (Allene)	40.065	0.005	0.00
Propene (Propylene)	42.08	1.252	0.46
Propane	44.1	0.254	0.10
Butane	58.12	0.417	0.21
Pentane	72.15	0.099	0.06
Hexane	86.18	0.021	0.02
Benzene	78.11	0.012	0.01
Dimethyl carbonate	90.09	1.453	1.14
Ethyl Methyl Carbonate	104.1	0.217	0.20

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runaway temperature identified in the UL9540A cell test report.

Source: UL9540A Cell Test Report, page 7&8.

Table 10 Flaming Scenario Species Yields and Mass Production Rates, Arges

Species	Yield		Mass Production Rate [g/s] 6 hr
	mg/g	mg/Wh	
CO	35.1	–	15.41
CO_2	1463	–	644.2
HCl	2.6	–	1.13
HF	24.8	–	10.92
HCN	1.3	–	0.55
NH_3	0.5	–	0.22
NO_2	1.9	–	0.84
SO_2	3.5	–	1.54
Particulate	56	–	24.66

Source: SFPE Report, Table 14.

Table 11 Flaming Scenario Acrolein and Formaldehyde Emission Rates, Arges

Hazardous Gas Component	Gas Release Rate (L/s)	Molar Mass (g/mol)	Mass Production Rate [g/s] 6 hr
Formaldehyde	0.35	30	0.26
Acrolein	0.70	56.1	0.95

Gas release rate based on 6 hour event and 3,794 kWh total per enclosure.
Source: Iqbal et al, 2025.

3.3 Metal Emissions

Metals can be emitted into the air during lithium-ion thermal runaway events. These metals include lithium (Li), aluminum (Al), copper (Cu), chromium (Cr), and zinc (Zn). Chromium and copper are typically the only ones considered heavy metals; however, all can be considered toxic to humans and the environment with a high enough dose. The metals are transported in particulate matter (PM) produced during thermal runaway events and deposited when the particulate matter falls out of the plume into the surrounding environment. The information in this section is based on the research efforts in the SFPE Report, Section 4.4. Please refer to Appendix B for more information.

3.3.1 Particulate Yield

Table 19 of the SFPE Report identifies particulate yields under a non-flaming thermal runaway event for LFP cells as 55 milligrams per gram (mg/g) of fuel. Total particulate matter is based on the number of cells undergoing thermal runaway. Data provided includes particulate yields from PM_{900} (particulate matter at 900 microns or less). Detailed in the reviewed SFPE Report, fine particulate matter ($PM_{2.9}$) was not identified as it did not settle out of the plume where analyzed, therefore a 1 percent increase was applied to the PM emission factor to account for the PM that did not settle out of the plume, resulting in a PM emission yield of 56 mg/g. Based on the SFPE Report research and methodologies, this PM emission yield was applied for both the non-flaming and flaming scenarios.

3.3.2 Particulate Size Distribution

Particulate size distribution determines the size of the particulates that settle out of the plume in the surrounding areas. The size of the particulates that are relevant to the health risks associated with thermal runaway events is PM_{10}. The particulate size distribution for LFP cells is identified in Table 21 of

the SFPE Report. This table identifies PM_{13} or less as 10 percent of the settled particulate matter. As PM_{10} is the target size, the analysis will conservatively use the 10 percent distribution identified. This corresponds to a PM_{10} mass production rate of **1.86 g/s** for Vaca Dixon and **2.47 g/s** for Arges (i.e., 10 percent of the particulate mass production rate provided in Table 7 for Vaca Dixon and Table 9 for Arges).

As discussed in Section 3.3.1 above, $PM_{2.5}$ was not identified in the analysis and, therefore, is not quantified separately from PM_{10}.

3.3.3 Particulate Composition

Particulate composition is assumed to be homogeneous for all particulate matter. Specific data on the particulate composition of LFP cells was not identified during data reviews. Therefore, data composition for non-flaming and flaming scenarios is based on the particulate composition of NMC cells and adjusted to remove metals that are specific to NMC cells. Table 23 in the SFPE Report identifies the particulate composition that will be used in the analysis, presented below for reference in Table 12.

Table 12 Particulate Composition

	Particulate Composition [% Mass]			
Scenario	**Li**	**Al**	**Cu**	**Fe**
Non-Flaming	17.5	6.3	5.4	14.4
Flaming	20.4	3.9	0.0	16.6

Li = lithium; Al = aluminum; Cu = copper; Fe = iron.
Source: SFPE Report, Table 23.

Table 13 presents the estimated metal emissions for the Vaca Dixon BESS using the particulate composition data in Table 12 combined with the estimated particulate emission rates provided in Table 7.

Table 13 Metal Emissions, Vaca Dixon

	Metal Emissions (g/s)			
Scenario	**Li**	**Al**	**Cu**	**Fe**
Non-Flaming	3.26	1.17	1.00	2.68
Flaming	3.80	0.73	0.00	3.09

Table 14 presents the estimated metal emissions for the Arges BESS.

Table 14 Metal Emissions, Arges

	Metal Emissions (g/s)			
Scenario	**Li**	**Al**	**Cu**	**Fe**
Non-Flaming	4.32	1.55	1.33	3.55
Flaming	5.03	0.96	0.00	4.09

3.4 AERMOD Model

3.4.1 Model Overview

The latest version of the AERMOD dispersion model, version 26135 dated July 9, 2026, was used to estimate ambient air concentrations. AERMOD is the preferred U.S. EPA's and CARB dispersion model for use in assessing health risk when air is the predominant pathway. OEHHA has also adopted the AERMOD model as the preferred model for assessing health risk impacts from sources of toxic emissions. AERMOD is a steady-state dispersion model that uses planetary boundary layer (PBL) theory to model air pollutant concentrations. The planetary boundary layer is the breathable portion of the atmosphere that is influenced by contact with the ground surfaces or friction. AERMOD is a regulatory method for providing conservative estimates of ground-level concentrations from combustion and non-combustion source types. AERMOD requires the pre-processing of surface characteristics to calculate the effects of meteorology and terrain on air pollutant concentrations. Surface characteristics and meteorological data such as wind speed and direction, temperature, etc. are combined with upper air data to compute planetary boundary parameters used by AERMOD to estimate vertical and horizontal pollutant dispersion. Terrain data was also processed to allow the influence of terrain on modeled concentrations.

3.4.2 Model Inputs

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Along with the referenced inputs below, land use type is required as input into the model which will be determined based on the project site. The maximum concentrations were determined for a 1-hour averaging period for the health risk assessment.

AERMOD Source Parameters

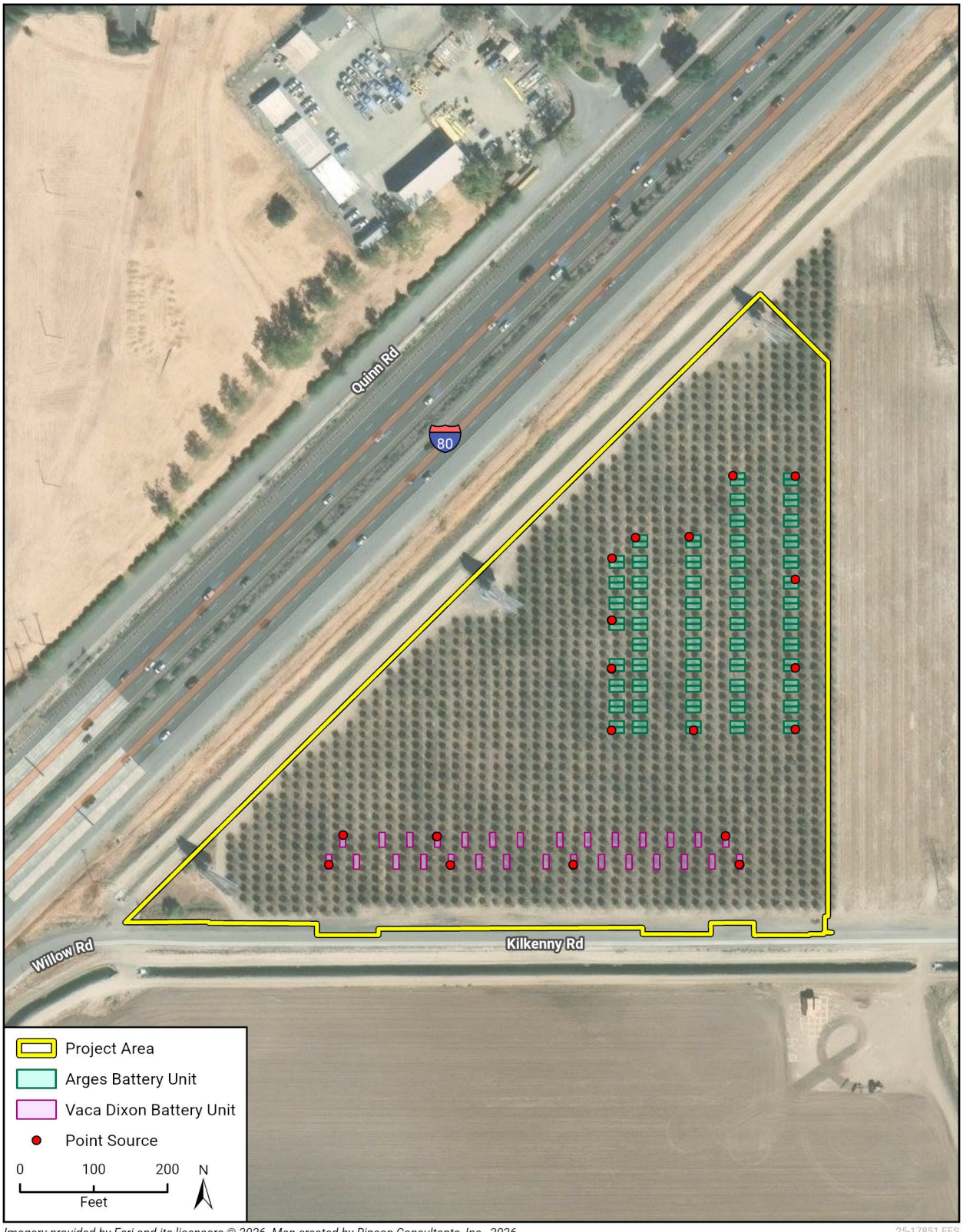
Sources were defined in AERMOD to simulate a potential thermal runaway event. There were 19 "worst-case representative" locations identified for the battery enclosures (7 for Vaca Dixon and 12 for Arges), of which it is assumed that any of these enclosures could observe a thermal runaway event. These are presented in Figure 3. Each enclosure was represented by a point source situated in the middle of the enclosure location, along the enclosure edge closest to fencelines. The concentrations from a thermal runaway event occurring at any one of the 19 battery enclosures were modeled and analyzed individually. This was intended to capture reasonable worst-case impacts from a potential thermal runaway event and estimate the potential risk at sensitive receptors.

A unitized emission rate (i.e., 1 gram per second [g/s]) was normalized for each of the identified potential emissions sources for a thermal runaway event.[14] A unitized emission rate produces in AERMOD a "X/Q," which is a dispersion factor normalized concentration at each modeled receptor location (i.e., a ground level concentration "per 1 g/s of emissions from the source"). Because AERMOD is a linear Gaussian dispersion model for non-reactive pollutants, predicted ground-level concentrations scale directly with the emission rate. Actual ground-level concentrations can be determined by multiplying X/Q by the actual emission rates (g/s).

The SFPE Report implemented a point source to represent emission releases from a thermal runaway event, which were similarly be used in these analyses. AERMOD source parameters were obtained from both the SFPE Report and the UL9540A reports. Variable emissions (i.e., what time of day the events could occur) were not applied in the model because it is unpredictable when a potential thermal runaway event would occur.

[14] Except the 1-hour NO_2 analyses was run in a separate model using estimated emission rates to account for NO_x to NO_2 conversion.

Figure 3 AERMOD Modeled BESS Vent Locations



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 3 AERMOD Modeled BESS Vent Locations

The specific point source parameters assumed are shown below.

Vaca Dixon

- **Release Height:** 2.986 m; corresponding to the enclosure height.[15]
- **Emission Rate:** 1 g/s (except for NO_2 modeling, where actual emission rates were used. Please reference above on how the actual emission rate is derived).
- **Gas Exit Temperature**
  - **Non-Flaming Scenario**: 428 degrees Fahrenheit [220C UL9540A Cell Report, page 3]
  - **Flaming Scenario**: 438.5 degrees Fahrenheit [499 degrees Kelvin, SFPE Report, Table 25 for LFP][16]
- **Stack Inside Diameter:** 0.6 meters (assumed effective diameter of air exhaust vent from LSFT report) for non-flaming and 2.478 m for flaming[17].
- **Gas Exit Velocity**
  - **Non-Flaming Scenario**: 0.449 m/s [Calculated based on Exit Flow Rate & Stack Inside Diameter]
  - **Flaming Scenario**: 8.5 m/s [SPFE Report, Table 25)
- **Gas Exit Flow Rate**
  - **Non-Flaming Scenario**: 0.127 cubic meters per second (m^3/s) [SPFE Report, Table 25)
  - **Flaming Scenario**: 40.99 m^3/s [Calculated based on Exit Velocity & Stack Inside Diameter]

Arges

- **Release Height:** 2.896 m; corresponding to the enclosure height.[18]
- **Emission Rate:** 1 g/s (except for NO_2 modeling as described above).
- **Gas Exit Temperature**
  - **Non-Flaming Scenario**: 474.8 degrees Fahrenheit [245 ^oC; UL9540A Cell Report, page 2]
  - **Flaming Scenario**: 438.5 degrees Fahrenheit [499 degrees Kelvin, SFPE Report, Table 25 for LFP]
- **Stack Inside Diameter:** 0.6 meters (assumed effective diameter of air exhaust vent from LSFT report) for non-flaming and 2.438 m for flaming.[19]
- **Gas Exit Velocity**
  - **Non-Flaming Scenario**: 0.449 m/s [Calculated based on Exit Flow Rate & Stack Inside Diameter]
  - **Flaming Scenario**: 8.5 m/s [SPFE Report, Table 25)
- **Gas Exit Flow Rate**
  - **Non-Flaming Scenario**: 0.127 cubic meters per second (m^3/s) [SPFE Report, Table 25)
  - **Flaming Scenario**: 39.68 m^3/s [Calculated based on Exit Velocity & Stack Inside Diameter]

[15] NFPA 68 Report, page 3.
[16] As noted in Footnote 7 of the SFPE report, the gas exit temperature input utilized in the flaming scenario is lower than the non-flaming scenario. This is due to the methodology used to capture the characteristics of the plume at a point above the combustion reaction. With this methodology, the values indicated for the flaming scenario represent the average temperature of gases released from the BESS unit combined with the ambient air that has been entrained into the plume.
[17] Flaming scenario uses the container width as flames in the LSFT report are shown to engulf the entire top of the bay engulfed, this is conservative as the entire enclosure is assumed to burn in this analysis.
[18] NFPA855-2023 Test Report page 5.
[19] Flaming scenario uses the container width as flames in the LSFT report are shown to engulf the entire top of the bay engulfed, this is conservative as the entire enclosure is assumed to burn in this analysis.

Meteorology

The meteorology data used for this analysis are discussed under Section 3.1.1 General Assumptions above. Figure 4 presents an annual wind rose for the meteorological data period.

Receptors and Terrain

Receptor and source base elevations were determined from United States Geological Survey (USGS) National Elevation Dataset (NED) data. The NED data was processed with the EPA-model AERMAP for the receptor locations selected. All coordinates (both sources and receptors) referenced UTM North American Datum 1983 (NAD83, Zone 10). AERMAP is capable of interpolating the elevation data in the NED data for both receptor elevations and hill height scales.

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the project areas for assessing ground-level pollution concentrations, to identify the potential severity of impacts, and to identify maximum impact locations. The nearest sensitive receptors were identified within the grid and analyzed for potential health risk impacts, including residential developments to the south, southwest, west and east. The modeling domain and receptor grids are provided in Figure 5.

Figure 4 Wind Rose

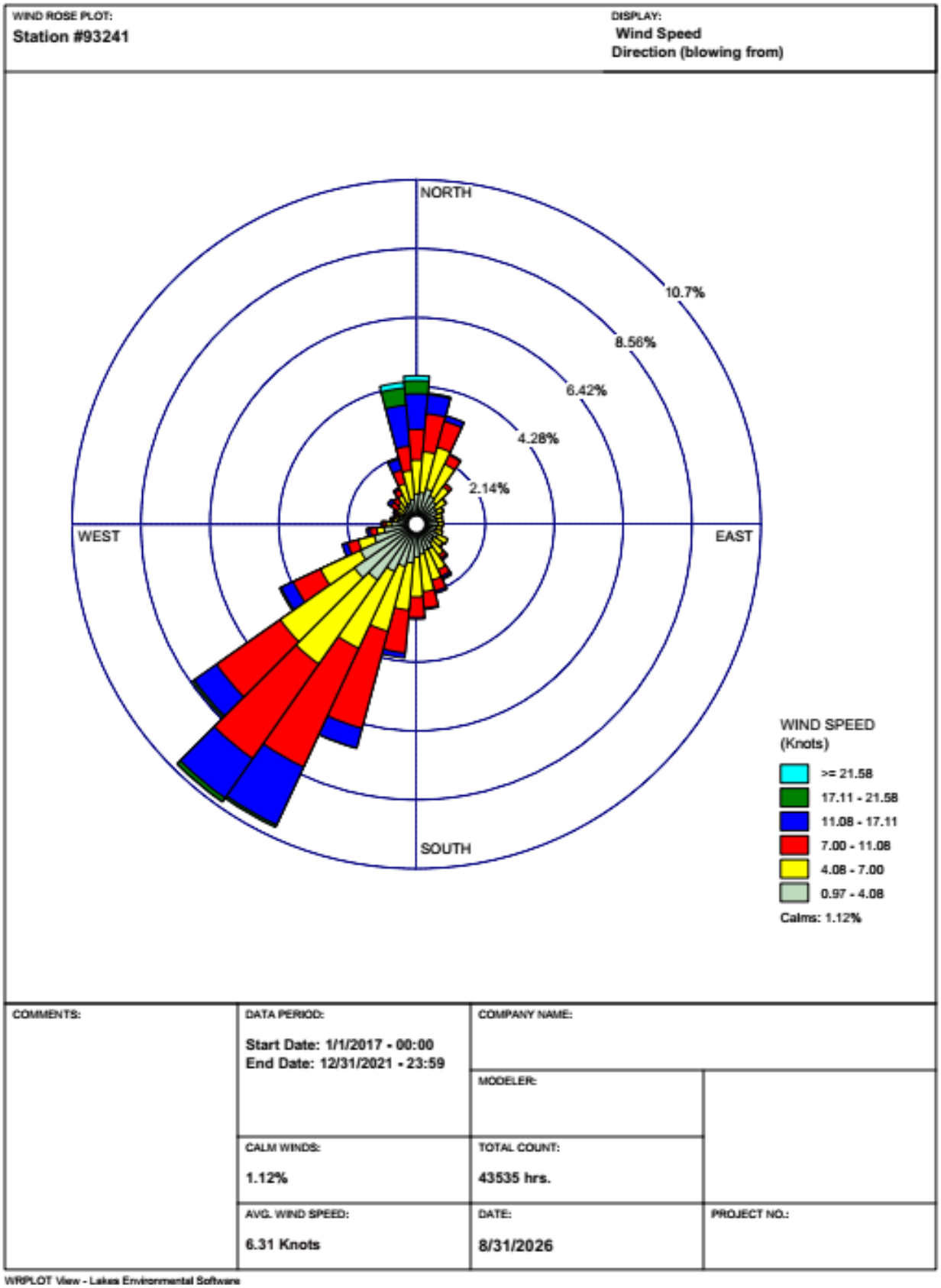
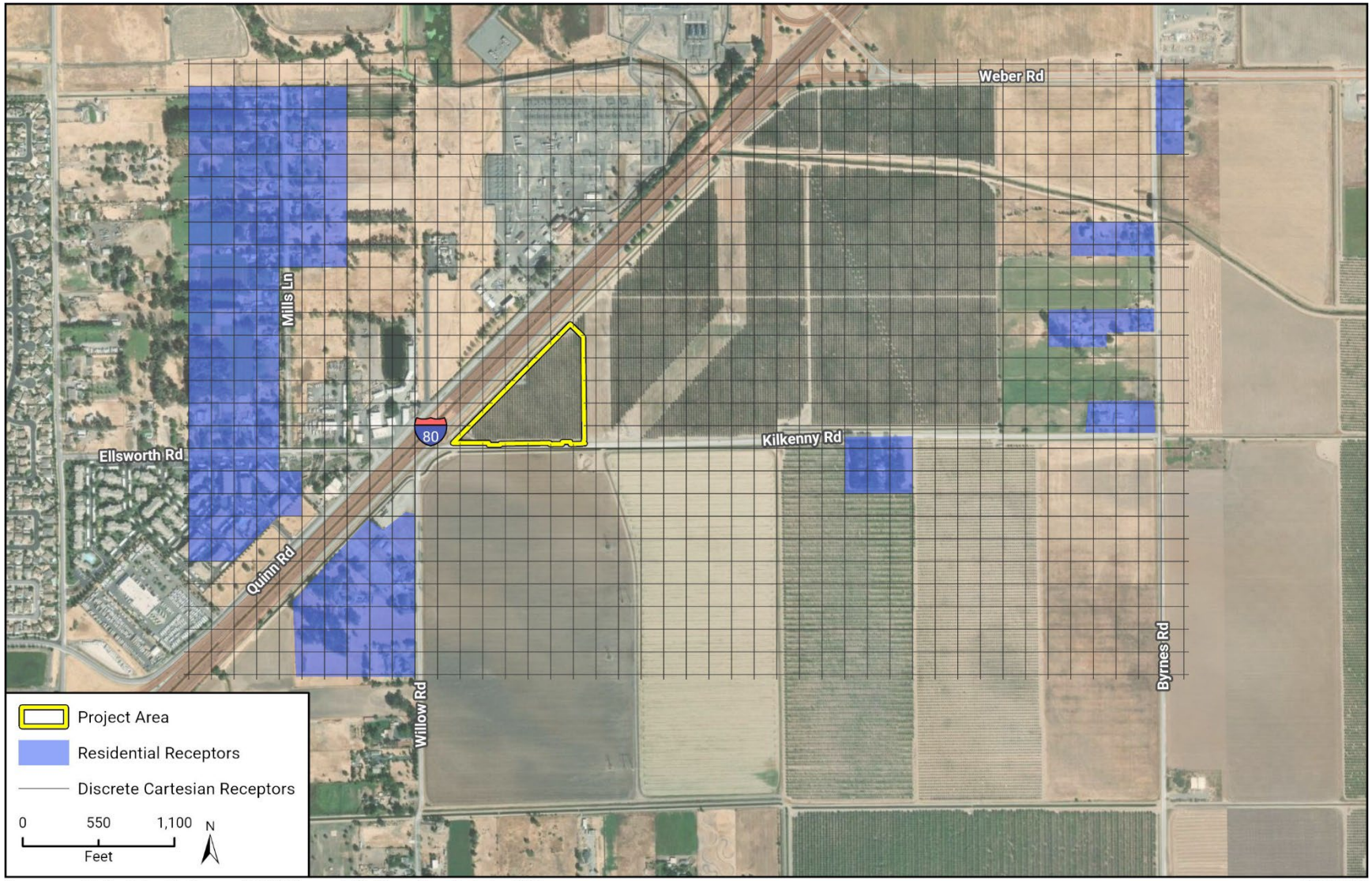


Figure 5 Receptor Grid



Basemap provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 5 Receptor Grid

4 Results and Conclusions

The following section provides the results and conclusions to the analyses performed for this study. The plume modeling represents a situation when "all controls failed," as requested by the CEC. It should be noted that these results are intended for bounding consequence evaluation, not likelihood-weighted risk. The modeled scenarios represent low-frequency emergency events. The overall risk is reduced through engineering and administrative controls aimed at preventing a thermal runaway event from ever occurring. It should be noted that the conclusions herein are limited to the scope of non-flaming and flaming scenarios for a thermal runaway, as defined above.

4.1 Exposure Concentrations Compared Against Emergency Thresholds

The AEGLs and ERPGs were developed to protect the public against exposure to potentially hazardous substances in the event of an accidental release of chemicals. A thermal runaway event is by nature an accidental release of chemicals and an unpredictable and emergency event; therefore, the application of these thresholds is appropriate for determining potential significance.

AERMOD outputs were obtained in concentration form. Actual ground level concentrations of each toxic air contaminant were estimated and compared against the corresponding AEGL and ERPG at the sensitive receptors. As discussed above, level 1 of the AEGL and ERPG correlate to discomfort, generally; whereas, level 2 of the AEGL and ERPG correlate to more serious potential health impacts and/or an impaired ability to escape. Level 3 of the AEGL and ERPG correlate to potential life-threatening effects or death. Exposure concentrations are provided below in table format, identifying maximum impacts.

To support emergency planning, this report recommends that an exceedance of an AEGL or ERPG Level 1 result in community notification, an exceedance of Level 2 result in a community shelter-in-place advisory and an exceedance of a Level 3 result in a community evacuation advisory. This is consistent with the "Suggested Applications for AEGLs" as identified in the United States Army Public Health Center's 2011 *Frequently Asked Questions Regarding Acute Exposure Guideline Levels (AEGLs) and their Applications*. Isopleths were developed for any exceedance of AEGL or ERPG levels to provide the relationship between distances and for notification and advisory requirements. Please refer to Appendix C for more information.

4.1.1 Non-Flaming Scenario

The following sections discuss the potential exposure concentrations compared against the AEGLs and ERPGs for the Vaca Dixon BESS and Arges BESS.

Vaca Dixon

Potential emissions from the non-flaming scenario are compared against the corresponding AEGL and ERPG values in Table 15, below. The results demonstrated that only NO_2 Level 1 AEGLs and ERPGs were exceeded at locations readily accessible to the public (however, not at any of the identified sensitive receptors). This means that a potential non-flaming scenario could result in notable discomfort or irritation among members of the public. Any effects are anticipated to be reversible.

It should be noted that the NO_2 concentrations did *not* exceed the Level 2 or 3 AEGLs and any Level 2 or 3 ERPGs at any point readily accessible by the public (i.e., sidewalks and businesses located near the Project site). Therefore, a potential non-flaming scenario is *not* anticipated to result in any serious or potentially irreversible health effects or result in potential life-threatening effects associated with Level 2 or 3 AEGLs and ERGPs.

Because a Level 1 AEGL is exceeded, isopleths for impacts were prepared to demonstrate the relationship between NO_2 concentrations, the Level 1 AEGL and distance. The prepared isopleth takes the maximum NO_2 impacts from each of the point sources (representing the enclosure locations at the fenceline) at all of the receptors in the vicinity of the Project site. This is intended to capture the potential worst-case impacts. This isopleth is provided as Figure 6 for NO_2. As demonstrated, the maximum distance from the fenceline of the facility to exceedance of the Level 1 AEGL for NO_2 is 276 feet.

Arges

Potential emissions from the non-flaming scenario are compared against the corresponding AEGL and ERPG values in Table 16, below. The results demonstrated that only NO_2 and HF Level 1 AEGLs were exceeded at locations readily accessible to the public (however, not at any of the identified sensitive receptors). This means that a potential non-flaming scenario could result in notable discomfort or irritation among members of the public. Any effects are anticipated to be reversible.

It should be noted that the NO_2 and HF concentrations did *not* exceed the Level 2 or 3 AEGLs and ERPGs at any point readily accessible by the public (i.e., sidewalks and businesses located near the Project site). Therefore, a potential non-flaming scenario is *not* anticipated to result in any serious or potentially irreversible health effects or result in potential life-threatening effects associated with Level 2 or 3 AEGLs and ERGPs.

Because a Level 1 AEGL is exceeded, isopleths for impacts were prepared to demonstrate the relationship between NO_2 and HF concentrations, the Level 1 AEGL and distance. The prepared isopleth takes the maximum NO_2 impacts from each of the point sources (representing the enclosure locations at the fenceline) at all of the receptors in the vicinity of the Project site. This is intended to capture the potential worst-case impacts. The isopleth is provided as Figure 7 for NO_2. As demonstrated, the maximum distance from the fenceline of the facility to exceedance of the Level 1 AEGL for NO_2 is 481 feet. The isopleth is provided as Figure 8 for HF. As demonstrated, the maximum distance from the fenceline of the facility to exceedance of the Level 1 AEGL for NO_2 is 74 feet.

Non-Flaming Conclusion

Therefore, in the event of a non-flaming thermal runaway scenario, at a minimum, a community notification should be provided to any individuals within the highest impact area of isopleth (a distance of 276 feet for Vaca Dixon and 481 feet for Arges), based on these figures. This could include the I-80 freeway.

In conclusion, a non-flaming scenario may result in an AEGL Level 1 exceedance; however, it is not anticipated to occur at any of the identified sensitive receptors nor result in a more serious exceedance of an emergency threshold (i.e., Level 2 or 3). Minimum emergency precautions for a non-flaming scenario are to issue a community notification to at least the buildings captured by the highest impact areas of the isopleths. However, it may be prudent for first responders to utilize increased levels of PPE out of an abundance of caution.

4.1.2 Flaming Scenario

The following sections discuss the potential exposure concentrations compared against the AEGLs and ERPGs for the Vaca Dixon BESS and Arges BESS.

Vaca Dixon

Potential emissions from the flaming scenario are compared against the corresponding AEGL and ERPG values in Table 17, below. The results demonstrated that the HF and acrolein concentrations exceeded the Level 1 AEGL and ERPG values at locations readily accessible to the public. This means that a potential flaming scenario could result in notable discomfort or irritation among members of the public. However, any effects associated with Level 1 exceedances are anticipated to be reversible.

The modeled HF concentrations did *not* exceed the Level 2 or 3 AEGL and ERPG at any point readily accessible by the public. However, acrolein has the potential to exceed Level 2 AEGL and ERPG values within 18 feet of the project boundary, depending on a potential "worst-case" enclosure undergoing a flaming thermal runaway scenario. The AEGL-2 exceedances are at or just beyond the fenceline and would be in areas that are not anticipated to be occupied by the general public during an active fire incident. It should be noted that no sensitive receptors would experience a Level 2 exceedance, with the nearest sensitive receptor remaining approximately 551 feet beyond the modeled perimeter of the Level 2 AEGL exceedance.

The flaming scenario is *not* anticipated to result in potential life-threatening effects. Although a Level 2 exceedance is not anticipated to occur at sensitive receptors, it is assumed that measures will be taken to avoid a potentially more serious or potentially irreversible health effects associated with Level 2 threshold exceedance at locations readily accessible by the public. The areas where exposure could exceed Level 2 exposure levels, a warm zone should be established where the public should be evacuated during the potential thermal runaway event (45 feet from the fenceline).

Due to threshold exceedances, isopleths for impacts were prepared to demonstrate the relationship between concentrations, the Level 1 and/or Level 2 AEGL and distance. It should be noted that the AEGL is less than the ERPG and is used as the basis for community notification (and potentially evacuation orders) and isopleth preparation. The prepared isopleths were developed like those for the non-flaming scenario, and the HF AEGL-1 isopleth is provided as Figure 9 and the acrolein isopleth is provided as Figure 10. As demonstrated, the maximum distance from the fenceline of the facility to exceedance of the Level 1 AEGL for HF and acrolein is 422 feet and for Level 2 acrolein is 45 feet.

Arges

Potential emissions from the flaming scenario are compared against the corresponding AEGL and ERPG values in Table 18, below. Similar to the non-flaming scenario, the results demonstrated that, with the exception of HF and acrolein, the Level 1 AEGL and ERPG values were not exceeded at locations readily accessible to the public. This means that a potential flaming scenario could result in notable discomfort or irritation among members of the public. However, any effects associated with Level 1 exceedances are anticipated to be reversible.

The modeled HF concentrations did *not* exceed the Level 2 or 3 AEGL and ERPG at any point readily accessible by the public. However, acrolein has the potential to exceed Level 2 AEGL and ERPG within 45 feet of project boundary depending a potential "worst-case" enclosure undergoing a flaming thermal runaway scenario. Similar to Vaca Dixon, the AEGL-2 exceedances are at or just beyond the fenceline and would be in areas that are not anticipated to be occupied by the general public during an active fire incident. It should be noted that no sensitive receptors would experience a Level 2 exceedance, with the nearest sensitive receptor remaining approximately 1,724 feet beyond the modeled perimeter of the Level 2 AEGL exceedance.

The flaming scenario is *not* anticipated to result in potential life-threatening effects. Although a Level 2 exceedance is not anticipated to occur at sensitive receptors, it is assumed that measures will be taken to avoid a potentially more serious or potentially irreversible health effects associated with Level 2 threshold exceedance at locations readily accessible by the public. The areas where exposure could exceed Level 2 exposure levels, a warm zone should be established where the public should be evacuated during the potential thermal runaway event (38 feet from the fenceline).

Due to threshold exceedances, isopleths for impacts were prepared to demonstrate the relationship between concentrations, the Level 1 and/or Level 2 AEGL and distance. It should be noted that the AEGL is less than the ERPG and is used as the basis for community notification (and potentially evacuation orders) and isopleth preparation. The prepared isopleths were developed like for the non-flaming scenario, and the HF AEGL-1 isopleth is provided as Figure 11 and the acrolein AEGL-1 & 2 Isopleth is provided as Figure 12. As demonstrated, the maximum distance from the fenceline of the facility to exceedance of the Level 1 AEGL for HF and acrolein is 393 feet and for Level 2 acrolein is 38 feet

Flaming Conclusion

In the event of a flaming thermal runaway scenario, at a minimum, a community notification should be provided at least to the building owners, and individual community members, (potentially including drivers on the I-80 freeway) captured within the impact areas of isopleth (i.e., a distance of approximately 394 feet for Vaca Dixon and Arges). A flaming thermal runaway scenario has the potential to result in more severe health impacts associated with a Level 2 AEGL or ERPG. First responders should utilize increased levels of PPE and a warm zone (an area where people are evacuated and kept out of the area) should be created to the extent of the Level 2 exceedance areas as detailed in the isopleth figures provided below. Figure 10 for Vaca Dixon shows the maximum extent to be 45 feet from the site. Figure 12 for Arges shows the maximum extent to be 38 feet from the site. However, both of these exceedances are at or just beyond the fenceline, areas where the public would not be anticipated to be during an active fire incident.

Table 15 Vaca Dixon AEGL & ERPG Comparison, Non-Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m³)	AEGL-1 (µg/m³)	AEGL-2 (µg/m³)	AEGL-3 (µg/m³)	ERPG-1 (µg/m³)	ERPG-2 (µg/m³)	ERPG-3 (µg/m³)
Carbon Monoxide	0.499	2,412	–	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	2.224	10,757	–	–	–	–	–	–
Hydrogen	0.148	714	–	–	–	–	–	–
Methane	0.178	863	–	–	–	–	–	–
Acetylene	0.008	40	–	–	–	–	–	–
Ethene (Ethylene)	0.196	947	–	–	–	–	–	–
Ethane	0.063	304	–	–	–	–	–	–
Propadiene (Allene)	0.000	2	–	–	–	–	–	–
Propene (Propylene)	0.075	361	–	–	–	–	–	–
Propane	0.022	105	9900000	31,000,000	59,000,000	–	–	–
Butane	0.043	209	13000000	40,000,000	130,000,000	–	–	–
Pentane	0.011	52	–	–	–	–	–	–
Hexane	0.005	24	–	10,000,000	30,000,000	–	–	–
Benzene	0.002	10	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Dimethyl Carbonate	0.223	1,080	–	–	–	–	–	–
Ethyl Methyl Carbonate	0.013	65	–	–	–	–	–	–
Hydrogen Chloride	0.116	562	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	0.091	438	800	20,000	36,000	1,637	16,000	41,000
Hydrogen Cyanide	0.023	110	2200	7,800	17,000	–	11,000	28,000
Copper and compounds	1.01	4,865	–	–	–	–	–	–
Ammonia	0	0	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0	0	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0	0	70	230	3,200	115	344	3,439
Nitrogen Dioxide	0.610	**1,442**	940	23,000	38,000	1,882	28,000	56,000
Sulfur Dioxide	0	0	520	1,950	49,000	786	8,000	66,000

Bold lettering indicates an exceedance.
1-Hour AEGL values from U.S. EPA. Units provided in mg/m³ and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m³.
CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m³ = micrograms per meter cubed.
Source: U.S. EPA 2026a; Cameo Chemical 2026.

Table 16 Arges AEGL & ERPG Comparison, Non-Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m³)	AEGL-1 (µg/m³)	AEGL-2 (µg/m³)	AEGL-3 (µg/m³)	ERPG-1 (µg/m³)	ERPG-2 (µg/m³)	ERPG-3 (µg/m³)
Carbon Monoxide	1.572	9,801	–	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	4.493	28,022	–	–	–	–	–	–
Hydrogen	0.452	2,816	–	–	–	–	–	–
Methane	0.348	2,168	–	–	–	–	–	–
Acetylene	0.028	172	–	–	–	–	–	–
Ethene (Ethylene)	0.300	1,871	–	–	–	–	–	–
Ethane	0.111	689	–	–	–	–	–	–
Propadiene (Allene)	0.0009	5	–	–	–	–	–	–
Propene (Propylene)	0.229	1,429	–	–	–	–	–	–
Propane	0.049	304	9900000	31,000,000	59,000,000	–	–	–
Butane	0.105	658	13000000	40,000,000	130,000,000	–	–	–
Pentane	0.031	194	–	–	–	–	–	–
Hexane	0.008	49	–	10,000,000	30,000,000	–	–	–
Benzene	0.004	25	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Dimethyl Carbonate	0.570	3,552	–	–	–	–	–	–
Ethyl Methyl Carbonate	0.098	613	–	–	–	–	–	–
Hydrogen Chloride	0.301	1,880	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	0.235	**1,466**	**800**	20,000	36,000	1,637	16,000	41,000
Hydrogen Cyanide	0.059	367	2200	7,800	17,000	–	11,000	28,000
Copper and compounds	1.332	8,304	–	–	–	–	–	–
Ammonia	0.000	0	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0.000	0	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0.000	0	70	230	3,200	115	344	3,439
Nitrogen Dioxide	1.581	**9,862**	**940**	23,000	38,000	**1,882**	28,000	56,000
Sulfur Dioxide	0.000	0	520	1,950	49,000	786	8,000	66,000

Bold lettering indicates an exceedance. Copper is present only for the non-flaming scenarios based on the SFPE Report.
1-Hour AEGL values from U.S. EPA. Units provided in mg/m³ and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m³.
CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m³ = micrograms per meter cubed.
Source: U.S. EPA 2026a; Cameo Chemical 2026.

Table 17 Vaca Dixon AEGL & ERPG Comparison, Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m³)	AEGL-1 (µg/m³)	AEGL-2 (µg/m³)	AEGL-3 (µg/m³)	ERPG-1 (µg/m³)	ERPG-2 (µg/m³)	ERPG-3 (µg/m³)
Carbon Monoxide	11.68	4,008	–	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	486.7	167,047	–	–	–	–	–	–
Hydrogen	0.738	253	–	–	–	–	–	–
Methane	0.892	306	–	–	–	–	–	–
Acetylene	0.041	14	–	–	–	–	–	–
Ethene (Ethylene)	0.979	336	–	–	–	–	–	–
Ethane	0.314	108	–	–	–	–	–	–
Propadiene (Allene)	0.002	1	–	–	–	–	–	–
Propene (Propylene)	0.373	128	–	–	–	–	–	–
Propane	0.108	37	9900000	31,000,000	59,000,000	–	–	–
Butane	0.216	74	13000000	40,000,000	130,000,000	–	–	–
Pentane	0.054	18	–	–	–	–	–	–
Hexane	0.025	8	–	10,000,000	30,000,000	–	–	–
Benzene	0.010	3	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Toluene	0.010	3	250000	2,100,000	14,000,000	188,000	1,131,000	3,769,000
Dimethyl Carbonate	0.002	1	–	–	–	–	–	–
Ethyl Methyl Carbonate	0.067	23	–	–	–	–	–	–
Hydrogen Chloride	0.857	294	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	8.250	**2,832**	**800**	20,000	36,000	**1,637**	16,000	41,000
Hydrogen Cyanide	0.417	143	2200	7,800	17,000	–	11,000	28,000
Copper and compounds	0	0	–	–	–	–	–	–
Ammonia	0.166	57	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0.193	66	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0.721	**248**	**70**	**230**	3,200	**115**	344	3,439
Nitrogen Dioxide	0.632	99	940	23,000	38,000	1,882	28,000	56,000
Sulfur Dioxide	1.164	400	520	1,950	49,000	786	8,000	66,000

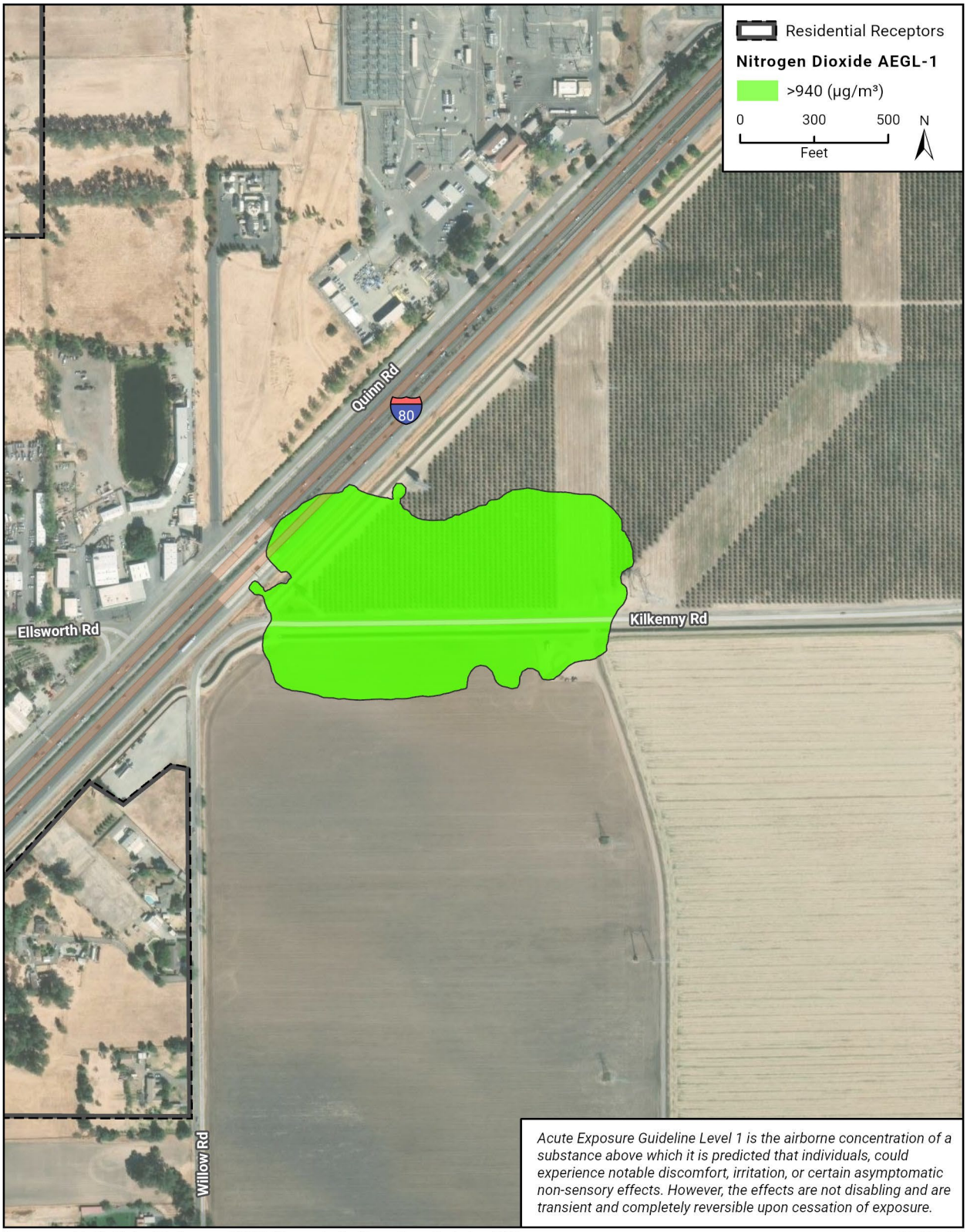
Bold lettering indicates an exceedance. Copper is present only for the non-flaming scenarios based on the SFPE Report.
1-Hour AEGL values from U.S. EPA. Units provided in mg/m³ and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m³.
CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m³ = micrograms per meter cubed.
Source: U.S. EPA 2026a; Cameo Chemical 2026.

Table 18 Arges AEGL & ERPG Comparison, Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m³)	AEGL-1 (µg/m³)	AEGL-2 (µg/m³)	AEGL-3 (µg/m³)	ERPG-1 (µg/m³)	ERPG-2 (µg/m³)	ERPG-3 (µg/m³)
Carbon Monoxide	15.46	4,448	–	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	644.20	185,392	–	–	–	–	–	–
Hydrogen	0.90	260	–	–	–	–	–	–
Methane	0.70	200	–	–	–	–	–	–
Acetylene	0.06	16	–	–	–	–	–	–
Ethene (Ethylene)	0.60	173	–	–	–	–	–	–
Ethane	0.22	64	–	–	–	–	–	–
Propadiene (Allene)	0.002	0.5017	–	–	–	–	–	–
Propene (Propylene)	0.46	132	–	–	–	–	–	–
Propane	0.10	28	9900000	31000000	59000000	–	–	–
Butane	0.21	61	13000000	40000000	130000000	–	–	–
Pentane	0.06	18	–	–	–	–	–	–
Hexane	0.02	5	–	10000000	30000000	–	–	–
Benzene	0.01	2	170000	2600000	13000000	159,734	479000	3195000
Dimethyl Carbonate	1.14	328	–	–	–	–	–	–
Ethyl Methyl Carbonate	0.20	57	–	–	–	–	–	–
Hydrogen Chloride	1.13	326	2700	33000	155000	4,350	29000	217000
Hydrogen Fluoride	10.92	**3,143**	**800**	20000	36000	**1,637**	16000	41000
Hydrogen Cyanide	0.55	159	2200	7800	17000	–	11000	28000
Copper and compounds	0.00	0	–	–	–	–	–	–
Ammonia	0.22	63	21000	112000	769000	17,413	104000	1045000
Formaldehyde	0.26	74	1000	17000	69000	1,227	12000	49000
Acrolein	0.96	**275**	**70**	**230**	3200	**115**	344	3439
Nitrogen Dioxide	0.84	241	940	23000	38000	1,882	28000	56000
Sulfur Dioxide	1.54	444	520	1950	49000	786	8000	66000

Bold lettering indicates an exceedance. Copper is present only for the non-flaming scenarios based on the SFPE Report.
1-Hour AEGL values from U.S. EPA. Units provided in mg/m³ and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m³.
CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m³ = micrograms per meter cubed.
Source: U.S. EPA 2026a; Cameo Chemical 2026.

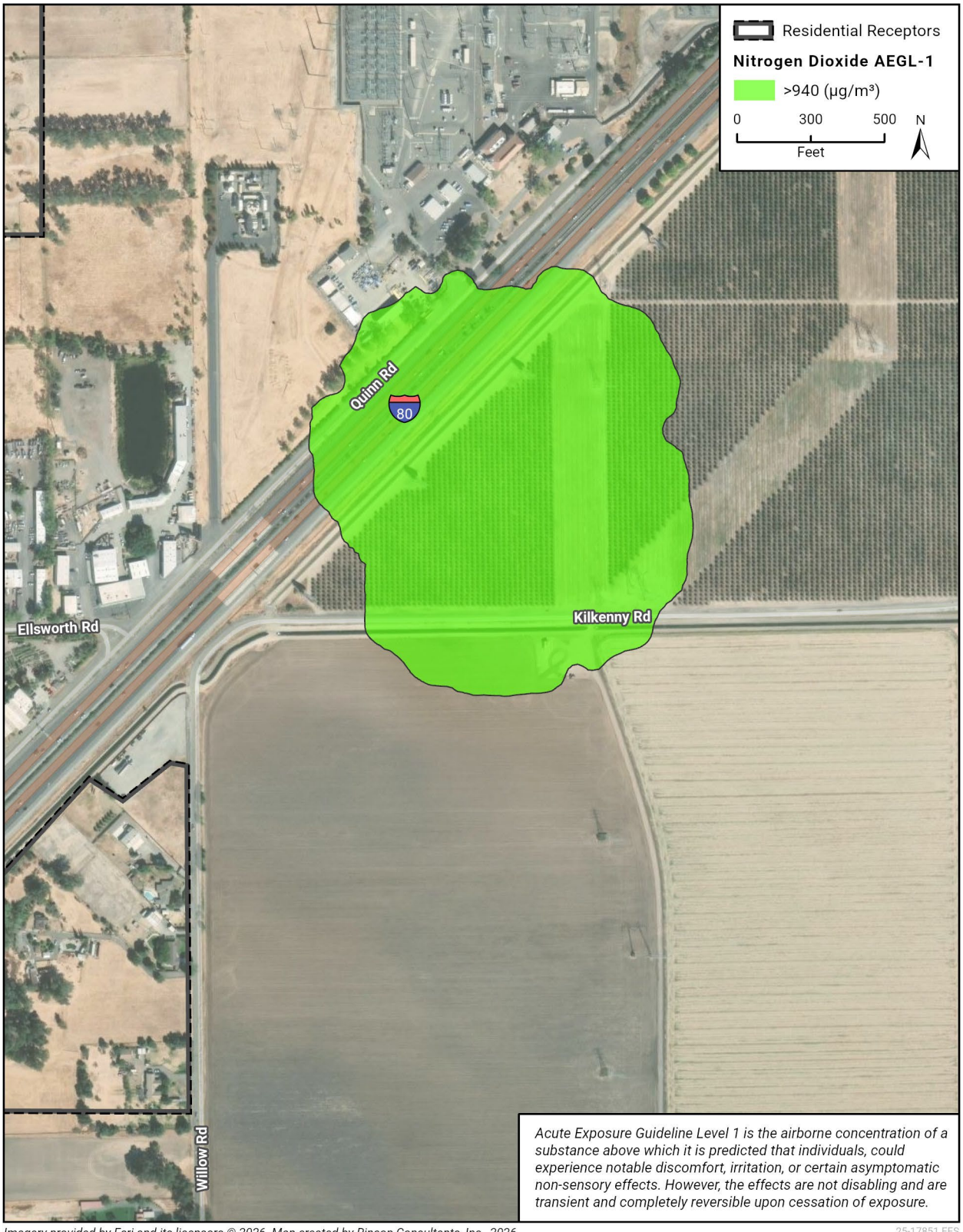
Figure 6 Vaca Dixon Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 6 Vaca Dixon Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth

Figure 7 Arges Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 7 Arges Non-Flaming Scenario, Nitrogen Dioxide AEGL-1 Isopleth

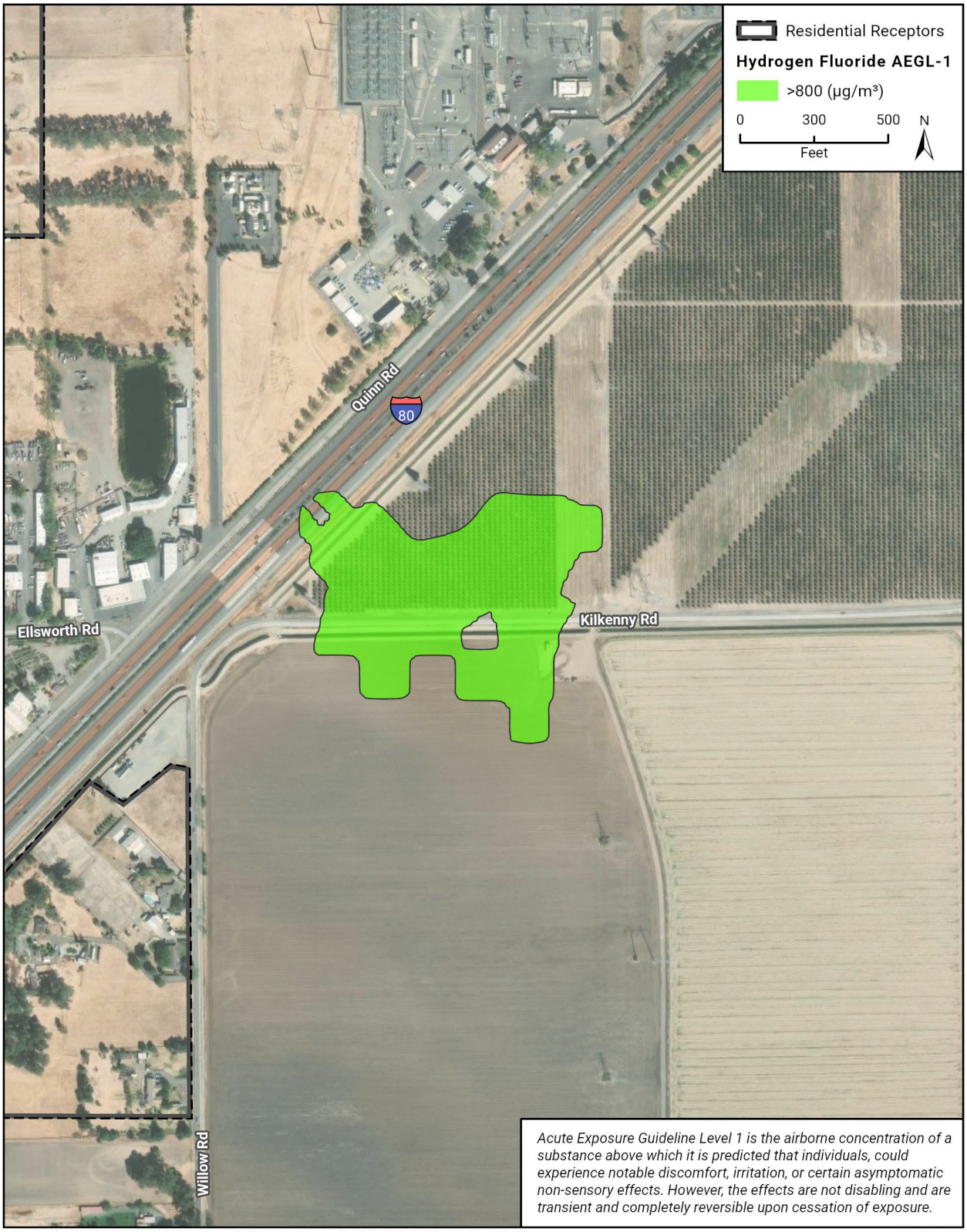
Figure 8 Arges Non-Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 8 Arges Non-Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth

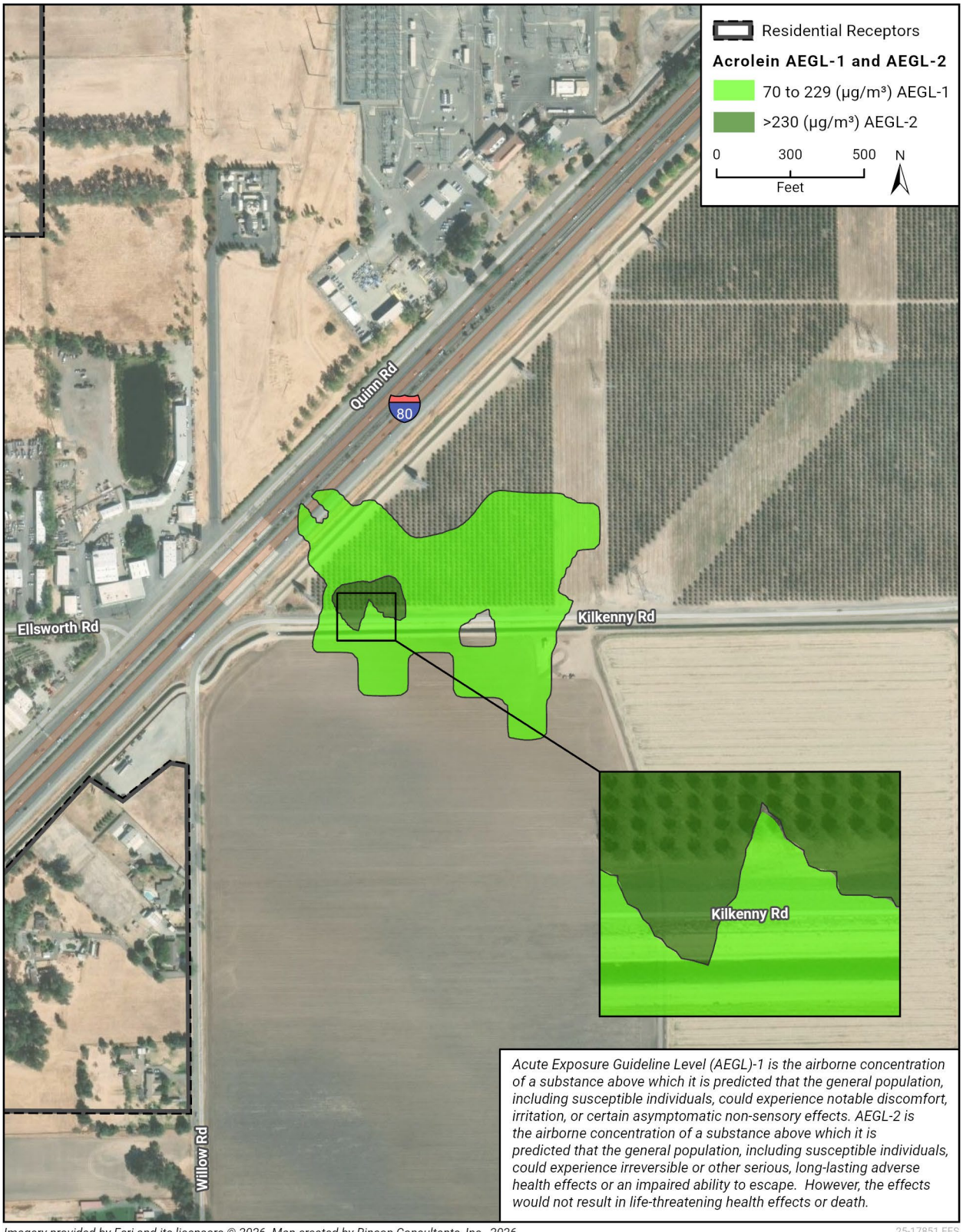
Figure 9 Vaca Dixon Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 9 Vaca Dixon Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth

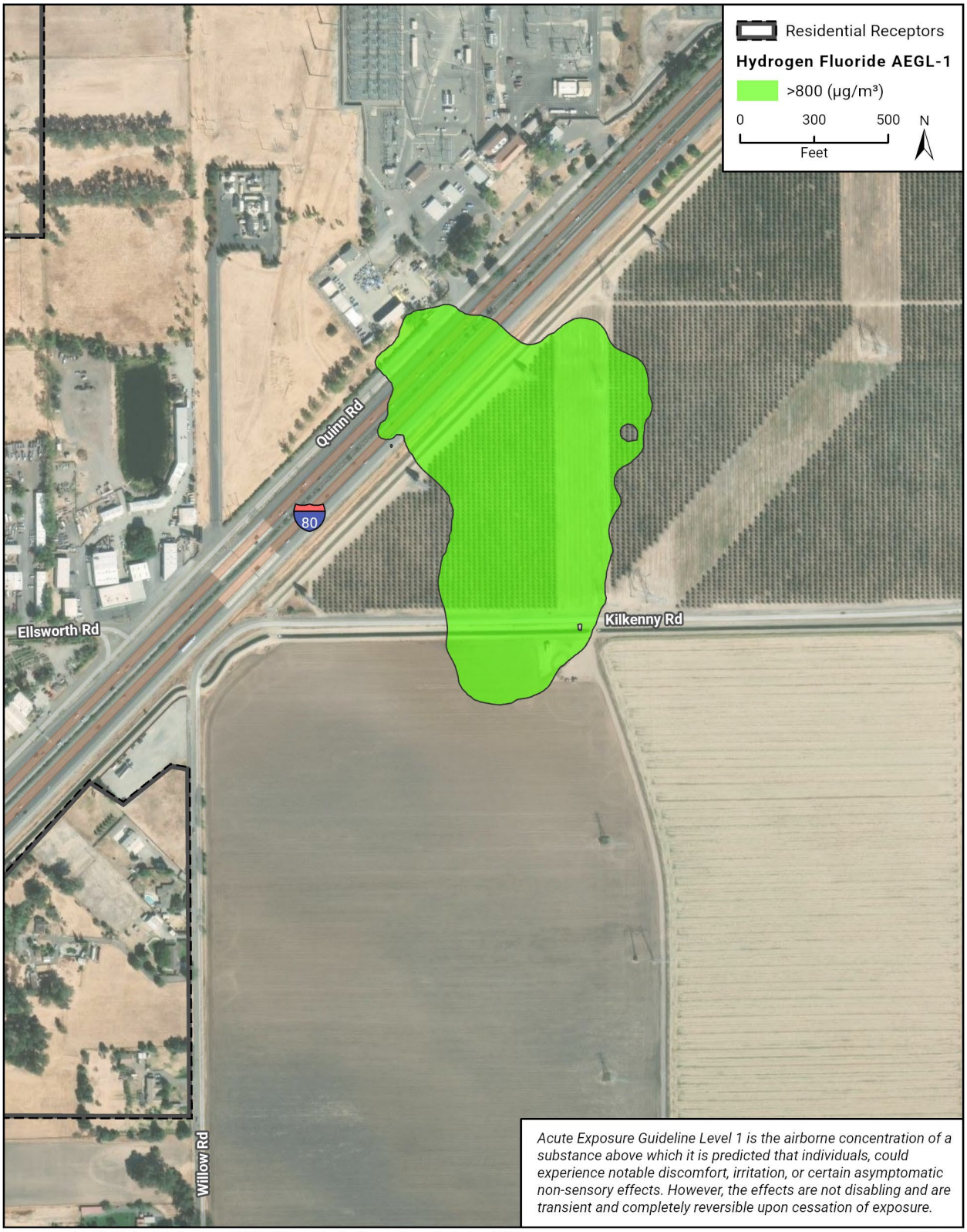
Figure 10 Vaca Dixon Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 10 Vaca Dixon Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth

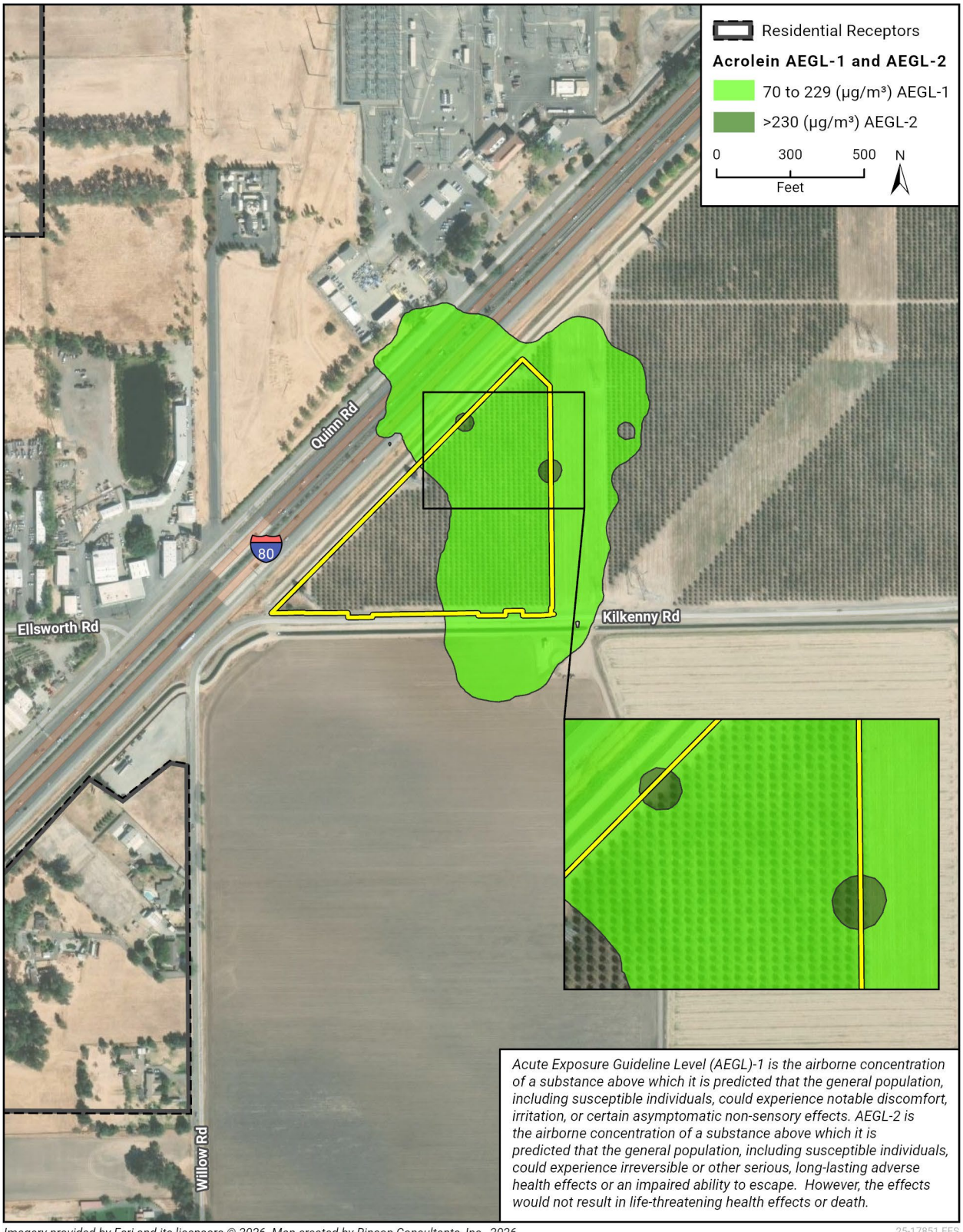
Figure 11 Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 11 Arges Flaming Scenario, Hydrogen Fluoride AEGL-1 Isopleth

Figure 12 Arges Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25-17851 EES
Fig 12 Arges Flaming Scenario, Acrolein AEGL-1 & 2 Isopleth

4.2 Health Risk Calculations

According to the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA), the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly) was enacted in 1987, requiring stationary sources of pollutants to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels (OEHHA 2026b). This includes the methodologies to calculate non-cancer health risk, like that being conducted in this report.

OEHHA also prepared a document in 2001 titled *A Guide to Health Risk Assessment*, with the purpose of providing a "basic explanation of risk assessment for laypeople." This document provides helpful context related to non-cancer health risk, and states within:

> Non-cancer risk is usually determined by comparing the actual level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects, even in the most susceptible people. Levels of exposure at which no adverse health effects are expected are called "health reference levels," and they generally are based on the results of animal studies. However, scientists usually set health reference levels much lower than the levels of exposure that were found to have no adverse effects in the animals tested. This approach helps to ensure that real health risks are not underestimated by adjusting for possible differences in a chemical's effects on laboratory animals and humans; the possibility that some humans, such as children and the elderly, may be particularly sensitive to a chemical; and possible deficiencies in data from the animal studies.
>
> Depending on the amount of uncertainty in the data, scientists may set a health reference level 100 to 10,000 times lower than the levels of exposure observed to have no adverse effects in animal studies. Exposures above the health reference level are not necessarily hazardous, but the risk of toxic effects increases as the dose increases.

AERMOD outputs were imported into Excel to perform non-cancer health risk calculations. Non-cancer health risks were measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its AEGL, as shown in the equation below.

$$Hazard\ Quotient = \frac{1-Hour\ Max\ Concentration\ (\frac{\mu g}{m^3})}{Acute\ Exposure\ Guideline\ Level\ (AEGL)\ (\frac{\mu g}{m^3})}$$

Hazard quotients for pollutants affecting the same target organ were summed with the resulting totals expressed as hazard indices for each organ system. It was assumed that all pollutants affected the inhalation pathway and thus were all summed together. A hazard index of less than 1.0 is considered to be an insignificant health risk. The maximum hazard quotient are presented below at sensitive receptors in table format.

4.2.1 Non-Flaming Scenario

Potential non-cancer health risk impacts from the non-flaming scenario were calculated at the sensitive receptors as requested in the CEC Data Request, item DR PH-2 through PH-6. The maximum hazard quotient value was calculated for each hazardous gas component at each residential sensitive receptor. The hazard quotient values were then summed together for each target organ (i.e., respiratory system, eyes, nervous system, etc.). Please note that copper emissions were identified, but it was assumed that the metals would deposit from the plume very quickly and not disperse to the distance of the sensitive receptors identified. The non-cancer health risk impacts from the non-flaming scenario are provided in Table 19 for Vaca Dixon and Table 20 for Arges. As demonstrated in the table, non-cancer health risk impacts remain below the hazard index threshold of 1.0.

Table 19 Vaca Dixon Non-Cancer Health Risk Impacts, Non-Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m³)	AEGL-1 (µg/m³)	Res Haz Quotient
Carbon Monoxide	0.499	336.5	–	N/A
Carbon Dioxide	2.224	1500.7	–	N/A
Hydrogen	0.148	99.6	–	N/A
Methane	0.178	120.3	–	N/A
Acetylene	0.008	5.5	–	N/A
Ethene (Ethylene)	0.196	132.1	–	N/A
Ethane	0.063	42.4	–	N/A
Propadiene (Allene)	0.0003	0.2	–	N/A
Propene (Propylene)	0.075	50.3	–	N/A
Propane	0.022	14.6	9,900,000	1.4764E-06
Butane	0.043	29.2	13,000,000	2.24804E-06
Pentane	0.011	7.3	–	N/A
Hexane	0.005	3.3	–	N/A
Benzene	0.002	1.3	170,000	7.82E-06
Dimethyl Carbonate	0.223	150.7	–	N/A
Ethyl Methyl Carbonate	0.013	9.1	–	N/A
Hydrogen Chloride	0.116	78.4	2,700	2.91E-02
Hydrogen Fluoride	0.091	61.2	800	7.67E-02
Hydrogen Cyanide	0.023	15.3	2,200	6.97E-03
Copper and compounds	1.01	N/A	–	N/A
Ammonia	0	0	21,000	0
Formaldehyde	0	0	1,000	0
Acrolein	0	0	70	0
Nitrogen Dioxide	0.610	258.1	940	2.11E-01
Sulfur Dioxide	0	0	520	0
Hazard Index				0.32
Threshold				**1**
Exceed?				**No**

Table 20 Arges Non-Cancer Health Risk Impacts, Non-Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m³)	AEGL-1 (µg/m³)	Res Haz Quotient
Carbon Monoxide	1.572	749.3	–	N/A
Carbon Dioxide	4.493	2142.4	–	N/A
Hydrogen	0.452	215.3	–	N/A
Methane	0.028	13.1	–	N/A
Acetylene	0.348	165.7	–	N/A
Ethene (Ethylene)	0.300	143.0	–	N/A
Ethane	0.111	52.7	–	N/A
Propadiene (Allene)	0.229	109.3	–	N/A
Propene (Propylene)	0.049	23.2	9,900,000	N/A
Propane	0.105	50.3	13,000,000	2.24482E-06
Butane	0.031	14.8	–	3.69882E-06
Pentane	0.008	3.8	–	N/A
Hexane	0.004	1.9	170,000	N/A
Benzene	0.570	271.5	–	1.09392E-05
Dimethyl Carbonate	0.098	46.9	–	N/A
Ethyl Methyl Carbonate	0.301	143.7	2,700	N/A
Hydrogen Chloride	0.235	112.1	800	5.09E-02
Hydrogen Fluoride	0.059	28.0	2,200	1.34E-01
Hydrogen Cyanide	1.33	N/A	–	1.22E-02
Copper and compounds	0	0	21,000	N/A
Ammonia	0	0	1,000	0
Formaldehyde	0	0	70	0
Acrolein	1.581	227.8	940	0
Nitrogen Dioxide	0	0	520	3.73E-01
Sulfur Dioxide	1.572	749.3	–	0
Hazard Index				0.57
Threshold				**1**
Exceed?				**No**

4.2.2 Flaming Scenario

Potential non-cancer health risk impacts from the flaming scenario were calculated at the sensitive receptors as requested in the CEC Data Request, item DR PH-5. The maximum hazard quotient value was calculated for each hazardous gas component at each residential sensitive receptor. The flaming scenario differs from the non-flaming scenario with the inclusion of formaldehyde and acrolein emissions and revised emission factors for HCl and HCN based on the CEC request.[20]

The non-cancer health risk impacts from the flaming scenario are provided in Table 21 for Vaca Dixon and Table 22 for Arges. As demonstrated in the table, non-cancer health risk impacts do not exceed the hazard index threshold of 1.0 at the residential sensitive receptors.

[20] Email from R. Longman of the CEC, May 13, 2026.

Table 21 Vaca Dixon Non-Cancer Health Risk Impacts, Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m³)	AEGL-1 (µg/m³)	Res Haz Quotient
Carbon Monoxide	11.676	155.5	–	N/A
Carbon Dioxide	486.7	6,481	–	N/A
Hydrogen	0.738	9.8	–	N/A
Methane	0.892	11.9	–	N/A
Acetylene	0.041	0.5	–	N/A
Ethene (Ethylene)	0.979	13.0	–	N/A
Ethane	0.314	4.2	–	N/A
Propadiene (Allene)	0.002	0.0	–	N/A
Propene (Propylene)	0.373	5.0	–	N/A
Propane	0.108	1.4	9,900,000	1.43502E-07
Butane	0.216	2.9	13,000,000	2.18503E-07
Pentane	0.054	0.7	–	N/A
Hexane	0.025	0.3	–	N/A
Benzene	0.010	0.1	170000	7.60E-07
Toluene	0.010	0.1	250,000	5.17E-07
Dimethyl Carbonate	0.002	0.0	–	N/A
Ethyl Methyl Carbonate	0.067	0.9	–	N/A
Hydrogen Chloride	0.857	11.4	2,700	4.17E-03
Hydrogen Fluoride	8.250	109.9	800	0.14
Hydrogen Cyanide	0.417	5.6	2,200	2.49E-03
Copper and compounds	0	0	–	N/A
Ammonia	0.166	2.2	21,000	1.04E-04
Formaldehyde	0.193	2.6	1,000	2.54E-03
Acrolein	0.721	9.6	70	1.36E-01
Nitrogen Dioxide	0.632	13.6	940	5.90E-03
Sulfur Dioxide	1.164	15.5	520	2.94E-02
Hazard Index				**0.32**
Threshold				**1**
Exceed?				**No**

Table 22 Arges Non-Cancer Health Risk Impacts, Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m³)	AEGL-1 (µg/m³)	Res Haz Quotient
Carbon Monoxide	15.455	160	–	N/A
Carbon Dioxide	644.2	6674	–	N/A
Hydrogen	0.903	9	–	N/A
Methane	0.695	7	–	N/A
Acetylene	0.600	6	–	N/A
Ethene (Ethylene)	0.600	6	–	N/A
Ethane	0.221	2	–	N/A
Propadiene (Allene)	0.458	5	–	N/A
Propene (Propylene)	0.458	5	–	N/A
Propane	0.097	1	9,900,000	1.00958E-07
Butane	0.211	2	13,000,000	1.66349E-07
Pentane	0.062	1	–	N/A
Hexane	0.016	0	–	N/A
Benzene	0.008	0	170000	4.91973E-07
Dimethyl Carbonate	1.139	12	–	N/A
Ethyl Methyl Carbonate	0.197	2	–	N/A
Hydrogen Chloride	0.000	0	–	4.31E-03
Hydrogen Fluoride	1.134	12	2,700	0.14
Hydrogen Cyanide	10.920	113	800	2.57E-03
Copper and compounds	0.552	6	2,200	N/A
Ammonia	0	0	–	1.08E-04
Formaldehyde	0.220	2	21,000	2.62E-03
Acrolein	0.256	3	1,000	1.40E-01
Nitrogen Dioxide	0.956	10	70	9.13E-03
Sulfur Dioxide	0.837	9	940	3.04E-02
Hazard Index				0.33
Threshold				**1**
Exceed?				**No**

5 Modeling Summary

The goal of this analysis was to present a modeling analysis that will achieve the objectives in the CEC Data Request PH-2 through PH-6 in the *Data Requests for Vaca Dixon Project (26-OPT-01)*. The analysis represents a situation when "all controls failed," as requested by the CEC. It should be noted that these results were intended for bounding consequence evaluation, not likelihood-weighted risk. The modeled scenarios represented low-frequency emergency events.

The Project is anticipated to result in concentrations exceeding Level 1 AEGLs and/or ERPGs for hydrofluoric acid and nitrogen dioxide and Level 1 and Level 2 AEGLs and/or ERPGs for acrolein due to the emergency occurrence of a non-flaming or flaming thermal runaway event. The Project is *not* anticipated to exceed any Level 3 emergency thresholds. The Project may result in reversible effects to the public, like noticeable discomfort or irritation and has the potential to result in more serious or potentially irreversible health effects from acrolein depending on exposure duration and which enclosure burns; however, it is *not* anticipated to result in life threatening effects associated with Level 3 AEGLs or ERPGs. Level 2 exposure for acrolein is anticipated to occur within up to 45 feet of the project boundary for Vaca Dixon and 38 feet from the project boundary for Arges. Level 1 exposure is expected within 422 feet of the project site for Vaca Dixon and 393 feet of the project site for Arges. Neither the Level 1 or Level 2 exposures for any pollutants exceedances reach the nearest sensitive receptors and only potentially impact areas where people would be passing by for a short period of time for AEGL-1 or areas directly adjacent to the project fenceline where the general public would not be anticipated to be located during an active fire incident.

As a result, isopleths were provided to anticipate the potential area of Level 1 and Level 2 emergency threshold exceedance, intended for use in community notification recommendations for Level 1. In the event of a flaming scenario, where Level 2 AEGL's are exceeded, the areas where exposure could exceed Level 2 thresholds, a warm zone (or area that covers the extent of the Level 2 exposure) should be established where the public should be evacuated during the potential thermal runaway event. As acrolein exceeds Level 2 emergency thresholds first responders should use increased levels of PPE. In the event of a non-flaming or flaming scenario, it is recommended that notifications be provided, at a minimum, to the nearby businesses and community members within a radius of 422 feet (as discussed in Section 4.1) for a non-flaming scenario and where a flaming scenario occurs a warm zone should be established to prevent public exposure during the fire event (45 feet).

Potential non-cancer health risk impacts are not anticipated to exceed the hazard index thresholds at sensitive receptors for the non-flaming or flaming scenarios. The AEGL's are used to determine a short-term exposure limit for individual pollutants where effects could occur, whereas the hazard index is used to determine a combined chronic (continuous daily) exposure from all pollutants where impacts could occur.

Direct mitigation of potential Project impacts is infeasible. Rather, the overall risk is reduced through engineering and administrative controls, such as a battery management system, aimed at preventing a thermal runaway event from ever occurring or an NFPA 69 combustible concentration reduction system designed to exhaust flammable gases and prevent fire.

6 References

American Clean Power. 2023. “Claims vs. Facts: Energy Storage Safety”. December. Accessed online at: https://cleanpower.org/wpcontent/uploads/gateway/2023/12/ACP_Energy-Storage-Leading-onSafety_FactSheet.pdf (accessed July 2026)

Brand, M., et al, 2013. “Electrical safety of commercial Li-ion cells based on NMC and NCA technology compared to LFP technology.” World Electric Vehicle Journal Vol. 6 - ISSN 2032-6653.

California Air Resources Board (CARB). 2024. Table of Ambient Air Quality Standards. Available at: https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf (accessed April 2026).

California Energy Commission (CEC). 2026. *Data Requests for Vaca Dixon Power Center (VDPC) Project (6-OPT-01).*

Cameo Chemicals. 2026. Database of Hazardous Materials, Chemical Search. Available at: https://cameochemicals.noaa.gov/search/simple (accessed June 2026).

Coffman Engineers, Inc. 2025a. Vaca Dixon Power Center Project Hazard Consequence Analysis for Vaca Dixon BESS. December 19, 2025.

_____. 2025b. Vaca Dixon Power Center Project Hazard Consequence Analysis for Arges BESS. December 19, 2025.

Department of Energy (DOE) National Renewable Energy Laboratory. 2023. Denholm, Paul, Wesley Cole, and Nate Blair. Moving Beyond 4-Hour Li-Ion Batteries: Challenges and Opportunities for Long(er)-Duration Energy Storage. Section 2.0. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A40-85878.

Evlithium 2025. LFP vs NMC Batteries: Who’s The Real Winner? Accessed online at: https://www.evlithium.com/Blog/lfp-vs-nmc-batteries-comparison.html

Iqbal et al., 2025. Comparative fire hazards of lithium-ion battery chemistries: Linking thermal behavior, gas toxicity, and state-of-charge to composite risk profiles. Journal of Power Sources 655 (2025) 237914.

McAllister, Jamie L. et al. 2025. SFPE Foundation. Environmental and Health Impacts of Thermal Runaway Events in Outdoor Lithium-Ion Battery Energy Storage System Installations (SFPE Report).

National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration. 2026. Emergency Response Planning Guidelines (ERPGs). Available at: https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html (accessed June 2026).

Office of Environmental Health Hazard Assessment (OEHHA). 2021. A Guide to Health Risk Assessment. Available at: https://oehha.ca.gov/sites/default/files/media/downloads/risk-assessment/document/hrsguide2001.pdf (accessed June 2026).

_____. 2015. Air Toxics Hotspots Program Guidance Manual for Preparation of Health Risk Assessments. Available at: https://oehha.ca.gov/sites/default/files/media/downloads/crnr/2015guidancemanual.pdf (accessed June 2026).

_____. 2026a. OEHHA Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary. Available at: https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary (accessed June 2026).

_____. 2026b. Air Toxics Hot Spots. Available at: https://oehha.ca.gov/air/air-toxics-hot-spots (accessed June 2026).

_____. 2026c. Acrolein. Available at: https://oehha.ca.gov/chemicals/acrolein (accessed June 2026)

_____. 2026d. Hydrogen Fluoride. Available at: https://oehha.ca.gov/chemicals/hydrogen-fluoride (accessed June 2026)

_____. 2026e. Interactive Map of Air Quality Monitors. Available at: https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors (accessed June 2026).

Ramboll. 2024. Offsite Consequence Analysis, Vistra Morro Bay Battery Energy Storage System (BESS) Project.

San Diego Air Pollution Control District (SDAPCD). 2020. Rule 20.2 New Source Review Non-Major Stationary Sources. Available at: https://www.sdapcd.org/content/dam/sdapcd/documents/rules/current-rules/Rule-20.2.pdf (accessed June 2026).

TUVRheinland 2025. Test Report Products. Test Report No. CN25PS92 001.

UL LLC. 2023. Cell Test Report UL9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems (AACD). Project Number 4790838636.1. Issued 9/7/2023. Revised 12/11/2023.

United States Army Public Health Center. 2011. Frequently Asked Questions Regarding Acute Exposure Guideline Levels (AEGLs) and their Applications. Available at: https://ph.health.mil/resources/FAQs%20and%20AEGLs%20July%202011%20agag_VH%20edits%207_19.pdf (accessed June 2026).

United States Environmental Protection Agency (U.S. EPA), 2026a. Acute Exposure Guideline Levels for Airborne Chemicals. Available at: https://www.epa.gov/aegl (accessed June 2026).

_____. 2026b. Treatment of Air Quality Monitoring Data Influenced by Exceptional Events. Available at: https://www.epa.gov/air-quality-analysis/treatment-air-quality-monitoring-data-influenced-exceptional-events (accessed June 2026).

_____. 2026c. Federal Register Notice – Final Revisions to the Exceptional Events Rule. Available at: https://www.epa.gov/air-quality-analysis/federal-register-notice-final-revisions-exceptional-events-rule (accessed June 2026).

Appendix A

Thresholds Summary

Summary of AEGLs and ERPGs (1-Hour Average)

Gas Species	Formula	CAS #	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)	MW	ERPG-1 (ppm)	ERPG-2 (ppm)	ERPG-3 (ppm)
Carbon Monoxide	CO	630-08-0	--	95,000	380,000	229,000	401,000	573,000	28.01	200	350	500
Carbon Dioxide	CO_2	124-38-9	--	--	--	--	--	--		--	--	--
Hydrogen	H_2	1333-74-0	--	--	--	--	--	--		--		
Methane	CH_4	74-82-8	--	--	--	--	--	--		--		
Acetylene	C_2H_2	74-86-2	--	--	--	--	--	--		--		
Ethene (Ethylene)	C_2H_4	74-85-1	--	--	--	--	--	--		--		
Ethane	C_2H_6	74-84-0	--	--	--	--	--	--		--		
Propene (Propylene)	C_3H_6	115-07-1	--	--	--	--	--	--		--		
Propane	C_3H_8	74-98-6	9,900,000	31,000,000	59,000,000	--	--	--		--		
Butane	C_4H_{10}	106-97-8	13,000,000	40,000,000	130,000,000	--	--	--		--		
Pentane	C_5H_{12}	109-66-0	--	--	--	--	--	--		--		
Hexane	C_6H_{14}	110-54-3	--	10,000,000	30,000,000	--	--	--		--		
Heptene	C_7H_{14}	592-76-7	--	--	--	--	--	--		--		
Styrene	C_8H_8	100-42-5	85,000	550,000	4,690,000	213,000	1,065,000	4,260,000	104.15	50	250	1000
Benzene	C_6H_6	71-43-2	170,000	2,600,000	13,000,000	159,734	479,000	3,195,000	78.11	50	150	1000
Toluene	C_7H_8	108-88-3	250,000	2,100,000	14,000,000	188,000	1,131,000	3,769,000	92.14	50	300	1000
Dimethyl Carbonate	$C_3H_6O_3$	616-38-6	--	--	--	--	--	--		--		
Ethyl Methyl Carbonate	$C_4H_8O_3$	623-53-0	--	--	--	--	--	--		--		
Hydrogen Chloride	HCl	7647-01-0	2,700	33,000	155,000	4,350	29,000	217,000	35.45	3	20	150
Hydrogen Fluoride	HF	7664-39-3	800	20,000	36,000	1,637	16,000	41,000	20.01	2	20	50
Hydrogen Cyanide	HCN	74-90-8	2,200	7,800	17,000	--	11,000	28,000	27.03	--	10	25
Copper and compounds	Cu	7440-5-8	--	--	--	--	--	--				
Ammonia	NH_3	7664-41-7	21,000	112,000	769,000	17,413	104,000	1,045,000	17.03	25	150	1500
Formaldehyde	CH_2O	50-00-0	1,000	17,000	69,000	1,227	12,000	49,000	30	1	10	40
Acrolein	C_3H_4O	107-02-8	70	230	3,200	115	344	3,439	56.06	0.05	0.15	1.5
Nitrogen Dioxide	NO_2	10102-44-0	940	23,000	38,000	1,882	28,000	56,000	46.01	1	15	30
Sulfur Dioxide	SO_2	7446-09-5	520	1,950	49,000	786	8,000	66,000	64.07	0.3	3	25

Additional air toxics from SFPE Foundation, Environmental and Health Impacts of Thermal Runaway Events in Outdoor Lithium-Ion Battery Energy Storage System Installations, June 2025

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m^3 = micrograms per meter cubed;

Summary of AEGLs and ERPGs (1-Hour Average)

Gas Species	Formula	CAS #	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)	MW	ERPG-1 (ppm)	ERPG-2 (ppm)	ERPG-3 (ppm)
Carbon Monoxide	CO	630-08-0	--	95,000	380,000	229,000	401,000	573,000	28.01	200	350	500
Carbon Dioxide	CO_2	124-38-9	--	--	--	--	--	--		--	--	--
Hydrogen	H_2	1333-74-0	--	--	--	--	--	--		--		
Methane	CH_4	74-82-8	--	--	--	--	--	--		--		
Ethene (Ethylene)	C_2H_4	74-85-1	--	--	--	--	--	--		--		
Ethane	C_2H_6	74-84-0	--	--	--	--	--	--		--		
Propene (Propylene)	C_3H_6	115-07-1	--	--	--	--	--	--		--		
Propane	C_3H_8	74-98-6	9,900,000	31,000,000	59,000,000	--	--	--		--		
Butene	C_4H_8	106-98-9	--	--	--	--	--	--		--		
Butane	C_4H_{10}	106-97-8	13,000,000	40,000,000	130,000,000	--	--	--		--		
Pentene	C_5H_{10}	25377-72-4	--	--	--	--	--	--		--		
Pentane	C_5H_{12}	109-66-0	--	--	--	--	--	--		--		
Iso-Pentane	C_5H_{12}	78-78-4	--	--	--	--	--	--		--		
Hydrogen Chloride	HCl	7647-01-0	2,700	33,000	155,000	4,350	29,000	217,000	35.45	3	20	150
Hydrogen Fluoride	HF	7664-39-3	800	20,000	36,000	1,637	16,000	41,000	20.01	2	20	50
Hydrogen Cyanide	HCN	74-90-8	2,200	7,800	17,000	--	11,000	28,000	27.03	--	10	25
Copper and compounds	Cu	7440-5-8	--	--	--	--	--	--				
Ammonia	NH_3	7664-41-7	21,000	112,000	769,000	17,413	104,000	1,045,000	17.03	25	150	1500
Formaldehyde	CH_2O	50-00-0	1,000	17,000	69,000	1,227	12,000	49,000	30	1	10	40
Acrolein	C_3H_4O	107-02-8	70	230	3,200	115	344	3,439	56.06	0.05	0.15	1.5
Nitrogen Dioxide	NO_2	10102-44-0	940	23,000	38,000	1,882	28,000	56,000	46.01	1	15	30
Sulfur Dioxide	SO_2	7446-09-5	520	1,950	49,000	786	8,000	66,000	64.07	0.3	3	25

Additional air toxics from SFPE Foundation, Environmental and Health Impacts of Thermal Runaway Events in Outdoor Lithium-Ion Battery Energy Storage System Installations, June 2025

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m^3 = micrograms per meter cubed;

Appendix B

Emissions Calculations & Summary

Vaca Dixon BESS

Health Consequence Analysis with AERMOD

	Emission Rate (g/sec)	
Hazardous Gas Component	**Non-Flaming Scenario**	**Flaming Scenario**
Carbon Monoxide	0.741	11.66
Carbon Dioxide	2.355	485.9
Hydrogen	0.164	0.821
Methane	0.234	1.168
Acetylene	0.005	0.026
Ethene (Ethylene)	0.243	1.216
Ethane	0.073	0.365
Propene (Propylene)	0.107	0.537
Propane	0.064	0.318
Butene	0.000	0.000
Butane	0.148	0.741
Pentane	0.048	0.238
Hexane	0.025	0.125
Heptene	0.005	0.024
Styrene	0.003	0.013
Benzene	0.008	0.038
Toluene	0.002	0.038
Dimethyl Carbonate	0.163	0.012
Ethyl Methyl Carbonate	0.011	0.056
Hydrogen Chloride	0.136	0.855
Hydrogen Fluoride	0.106	8.237
Hydrogen Cyanide	0.027	0.416
Copper and compounds	1.00	0
Ammonia	0	0.166
Formaldehyde	0	0.193
Acrolein	0	0.721
Nitrogen Dioxide	0.715	0.631
Sulfur Dioxide	0	1.162

Hazardous Gas Component	Molar Mass (g/mol)	UL 9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr	*Mass Production Rate [g/s] 6 hr*
Carbon Monoxide	28.01	13.453	0.74	*0.74*
Carbon Dioxide	44.01	27.205	2.36	*2.36*
Hydrogen	2.02	41.313	0.16	*0.16*
Methane	16.043	7.403	0.23	*0.23*
Acetylene	26.04	0.101	0.01	*0.01*
Ethene (Ethylene)	28.05	4.408	0.24	*0.24*
Ethane	30.07	1.235	0.07	*0.07*
Propene (Propylene)	42.08	1.297	0.11	*0.11*
Propane	44.1	0.734	0.06	*0.06*
Butane	58.12	1.296	0.15	*0.15*
Pentane	72.15	0.335	0.05	*0.05*
Hexane	86.18	0.147	0.02	*0.02*
Heptene	98.18	0.025	0.00	*0.00*
Styrene	104.15	0.013	0.003	*0.00*
Benzene	78.11	0.049	0.01	*0.01*
Toluene	92.14	0.013	0.002	*0.002*
Dimethyl Carbonate	90.09	0.917	0.163	*0.163*
Ethyl Methyl Carbonate	104.1	0.055	0.011	*0.011*

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report.

Source: UL 9540A Cell Test Report, page 2.

Species	Molar Mass	Yield			Mass Production Rate [g/s]
	g/mol	% vol	mg/g	mg/Wh	6 hr
Benzene - n/a	78.11	0.65	-	-	0.10
Hydrogen Chloride	36.46	1.9	-	-	0.14
Hydrogen Cyanide	27.03	0.5	-	-	0.03
Hydrogen Fluoride	20.01	2.7	-	-	0.11
Nitrogen Dioxide	46.01	7.9	-	-	0.72

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report.

Source: SFPE Report, Table 12

Ideal Gas Law Parameters	PV=nRT; m = PVM/RT		
Gas Release Rate	8.15437037	L/s	
Pressure	1	atm	
R	0.08206	L-atm/(mol-K)	
Temperature	505.15	K	449.6 F @ thermal runway

Mass Loss Rate: 332 g/s

Species	Yield		Mass Production Rate [g/s]
	mg/g	mg/Wh	6 hr
Carbon Monoxide	35.1	-	11.66
Carbon Dioxide	1463	-	485.9
Hydrogen Chloride	2.575	-	0.86
Hydrogen Fluoride	24.8	-	8.24
Hydrogen Cyanide	1.253	-	0.42
Ammonia	0.5	-	0.17
Formaldehyde	See below	-	0.19
Acrolein	See below	-	0.72
Nitrogen Dioxide	1.9	-	0.63
Sulfur Dioxide	3.5	-	1.16
Particulate	56	-	18.60
PM_{10}		-	1.86

Source: SFPE Report, Table 14. Acrolein and formaledhyde emissions from Iqbal et al., 2025. HCl and HCN emission factors using the more conservative emission factors from Vista Morro Bay project Table 3-4.

Hazardous Gas Component	Molar Mass (g/mol)	UL 9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr
Carbon Monoxide - n/a	28.01	13.453	3.71
Carbon Dioxide - n/a	44.01	27.205	11.78
Hydrogen	2.02	41.313	0.82
Methane	16.043	7.403	1.17
Acetylene	26.04	0.101	0.03
Ethene (Ethylene)	28.05	4.408	1.22
Ethane	30.07	1.235	0.37
Propene (Propylene)	42.08	1.297	0.54
Propane	44.1	0.734	0.32
Butane	58.12	0.193	0.74
Pentane	72.15	0.335	0.24
Hexane	86.18	0.147	0.12
Heptene	98.18	0.025	0.02
Styrene	104.15	0.013	0.01
Benzene	78.11	0.049	0.04
Toluene	92.14	0.013	0.04
Dimethyl Carbonate	90.09	0.917	0.01
Ethyl Methyl Carbonate	104.1	0.055	0.06

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report. The values were then scaled up for an entire enclosure.

Source: UL 9540A Cell Test Report, page 2.

Iqbal et al, 2025 supplementary calculations

Gas Emitted (L/kWh) per SOC %	10%	25%	50%	75%	100%	Average	Peak Average
Formaledhyde	1.5	0.25	0.75	0	0	0.5	1.5
Acrolein	3	0.5	2	2.5	2	2	3

Approximations based off of Figure 10 & Figure 11 for LFP batteries, excluding outlier values. SOC = State of Charge

Ideal Gas Law Parameters

Gas Release Rate	tbd	L/s	
Pressure	1	atm	PV=nRT; m = PVM/RT
R	0.08206	L-atm/(mol-K)	
Temperature	499	K	438.5 degrees Fahrenheit [499 degrees Kelvin, SFPE Report, Table 25 for LFP]

Ideal Gas Law Calculation

Hazardous Gas Component	Gas Release Rate (L/s)	Molar Mass (g/mol)	Mass Production Rate [g/s] 6 hr
Formaledhyde	0.2635	30	0.1930
Acrolein	0.5269	56.06	0.7214

Gas release rate based on 6 hour event and 3794 kWh total per enclosure.

Scenario	Particulate Composition [% Mass]			
	Li	Al	Cu	Fe
Non-Flaming	17.5	6.3	5.4	14.4
Flaming	20.4	3.9	0	16.6

Source: SFPE Report, Table 23

Scenario	Metal Emissions (g/s)			
	Li	Al	Cu	Fe
Non-Flaming	3.254850161	1.2	1.004353764	2.7
Flaming	3.79422533	0.725366607	0	3.087457867

Arges BESS

Health Consequence Analysis with AERMOD

	Emission Rate (g/sec)	
Hazardous Gas Component	**Non-Flaming Scenario**	**Flaming Scenario**
Carbon Monoxide	0.487	15.41
Carbon Dioxide	1.266	642.4
Hydrogen	0.108	0.648
Methane	0.063	0.379
Ethene (Ethylene)	0.042	0.251
Ethane	0.018	0.106
Propene (Propylene)	0.034	0.202
Propane	0.009	0.051
Butene	0.013	0.079
Butane	0.004	0.025
Pentene	0.004	0.024
Pentane	0.006	0.035
Iso-Pentane	0.009	0.052
Hydrogen Chloride	0.074	1.131
Hydrogen Fluoride	0.058	10.890
Hydrogen Cyanide	0.014	0.550
Copper and compounds	1.33	0
Ammonia	0	0.220
Formaldehyde	0	0.255
Acrolein	0	0.954
Nitrogen Dioxide	0.390	0.834
Sulfur Dioxide	0	1.537

Hazardous Gas Component	Molar Mass (g/mol)	UL 9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr
Carbon Monoxide	28.01	16.202	0.49
Carbon Dioxide	44.01	26.81	1.27
Hydrogen	2.02	49.875	0.11
Methane	16.043	3.671	0.06
Ethene (Ethylene)	28.05	1.389	0.04
Ethane	30.07	0.548	0.02
Propene (Propylene)	42.08	0.745	0.03
Propane	44.1	0.18	0.01
Butene	56.12	0.22	0.01
Butane	58.12	0.068	0.004
Pentene	70.13	0.053	0.00
Pentane	72.15	0.076	0.01
Iso-Pentane	72.15	0.112	0.01

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report.

Source: UL 9540A Cell Test Report, page 2.

Mass Production Rate [g/s] 6 hr
0.49
1.27
0.11
0.06
0.04
0.02
0.03
0.01
0.01
0.004
0.00
0.01
0.01

Species	Molar Mass	Yield		Mass Production Rate [g/s]
	g/mol	% vol	mg/g	mg/Wh	6 hr
Benzene - n/a	78.11	0.65	-	-	0.05
Hydrogen Chloride	36.46	1.9	-	-	0.07
Hydrogen Cyanide	27.03	0.5	-	-	0.01
Hydrogen Fluoride	20.01	2.7	-	-	0.06
Nitrogen Dioxide	46.01	7.9	-	-	0.39

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report.

Source: SFPE Report, Table 12

Ideal Gas Law Parameters	PV=nRT; m = PVM/RT		
Gas Release Rate	5.007407407	L/s	
Pressure	1	atm	
R	0.08206	L-atm/(mol-K)	
Temperature	568.85	K	564.26 F @ thermal runway

Mass Loss Rate: 439 g/s

Species	Yield		Mass Production Rate [g/s]
	mg/g	mg/Wh	6 hr
Carbon Monoxide	35.1	-	15.41
Carbon Dioxide	1463	-	642.4
Hydrogen Chloride	2.575	-	1.13
Hydrogen Fluoride	24.8	-	10.89
Hydrogen Cyanide	1.253	-	0.55
Ammonia	0.5	-	0.22
Formaldehyde	See below	-	0.26
Acrolein	See below	-	0.95
Nitrogen Dioxide	1.9	-	0.83
Sulfur Dioxide	3.5	-	1.54
Particulate	56	-	24.59
PM_{10}		-	2.46

Source: SFPE Report, Table 14. Acrolein and formaledhyde emissions from Iqbal et al., 2025. HCl and HCN emission factors using the more conservative emission factors from Vista Morro Bay project Table 3-4.

Hazardous Gas Component	Molar Mass (g/mol)	UL 9540A Gas Analysis (%)	Mass Production Rate [g/s] 6 hr
Carbon Monoxide - n/a	28.01	16.202	2.92
Carbon Dioxide - n/a	44.01	26.81	7.59
Hydrogen	2.02	49.875	0.65
Methane	16.043	3.671	0.38
Ethene (Ethylene)	28.05	1.389	0.25
Ethane	30.07	0.548	0.11
Propene (Propylene)	42.08	0.745	0.20
Propane	44.1	0.18	0.05
Butene	56.12	0.22	0.08
Butane	58.12	0.068	0.03
Pentene	70.13	0.053	0.02
Pentane	72.15	0.076	0.04
Iso-Pentane	72.15	0.112	0.05

Notes: The ideal gas law was used to convert gas production to mass production, assuming standard pressure and the thermal runway temperature identified in the UL 9540A cell test report. The values were then scaled up for an entire enclosure.

Source: UL 9540A Cell Test Report, page 2.

Iqbal et al, 2025 supplementary calculations

Gas Emitted (L/kWh) per SOC %	10%	25%	50%	75%	100%	Average	Peak Average
Formaledhyde	1.5	0.25	0.75	0	0	0.5	1.5
Acrolein	3	0.5	2	2.5	2	2	3

Approximations based off of Figure 10 & Figure 11 for LFP batteries, excluding outlier values. SOC = State of Charge

Ideal Gas Law Parameters

Gas Release Rate	tbd	L/s	
Pressure	1	atm	PV=nRT; m = PVM/RT
R	0.08206	L-atm/(mol-K)	
Temperature	499	K	438.5 degrees Fahrenheit [499 degrees Kelvin, SFPE Report, Table 25 for LFP]

Ideal Gas Law Calculation

Hazardous Gas Component	Gas Release Rate (L/s)	Molar Mass (g/mol)	Mass Production Rate [g/s] 6 hr
Formaledhyde	0.3483	30	0.2552
Acrolein	0.6967	56.06	0.9538

Gas release rate based on 6 hour event and 5016 kWh total per enclosure. 5016

Arges BESS

Health Consequence Analysis with AERMOD

Scenario	Particulate Composition [% Mass]			
	Li	Al	Cu	Fe
Non-Flaming	17.5	6.3	5.4	14.4
Flaming	20.4	3.9	0	16.6

Source: SFPE Report, Table 23

Scenario	Metal Emissions (g/s)			
	Li	Al	Cu	Fe
Non-Flaming	4.30319673	1.5	1.327844	3.5
Flaming	5.01629791	0.958998	0	4.081889

Appendix C

Emergency Thresholds Comparison Calculations

Non-Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m^3)	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)
Carbon Monoxide	0.499	2,412	--	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	2.224	10,757	--	--	--	--	--	--
Hydrogen	0.148	714	--	--	--	--	--	--
Methane	0.178	863	--	--	--	--	--	--
Acetylene	0.008	40	--	--	--	--	--	--
Ethene (Ethylene)	0.196	947	--	--	--	--	--	--
Ethane	0.063	304	--	--	--	--	--	--
Propadiene (Allene)	0.000	2	--	--	--	--	--	--
Propene (Propylene)	0.075	361	--	--	--	--	--	--
Propane	0.022	105	9900000	31,000,000	59,000,000	--	--	--
Butane	0.043	209	13000000	40,000,000	130,000,000	--	--	--
Pentane	0.011	52	--	--	--	--	--	--
Hexane	0.005	24	--	10,000,000	30,000,000	--	--	--
Benzene	0.002	10	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Dimethyl Carbonate	0.223	1,080	--	--	--	--	--	--
Ethyl Methyl Carbonate	0.013	65	--	--	--	--	--	--
Hydrogen Chloride	0.116	562	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	0.091	438	800	20,000	36,000	1,637	16,000	41,000
Hydrogen Cyanide	0.023	110	2200	7,800	17,000	--	11,000	28,000
Copper and compounds	1.01	4,865	--	--	--	--	--	--
Ammonia	0	0	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0	0	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0	0	70	230	3,200	115	344	3,439
Nitrogen Dioxide	0.610	**1,442**	940	23,000	38,000	1,882	28,000	56,000
Sulfur Dioxide	0	0	520	1,950	49,000	786	8,000	66,000

Additional air toxics from SFPE Report. Bold lettering indicates an exceedance. Note that ammonia is only present for flaming scenarios based on SFPE Report.

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines;µg/m^3 = micrograms per meter cubed.

Source: U.S. EPA 2026a; Cameo Chemical 2026.

Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m^3)	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)
Carbon Monoxide	11.68	4,008	--	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	486.7	167,047	--	--	--	--	--	--
Hydrogen	0.738	253	--	--	--	--	--	--
Methane	0.892	306	--	--	--	--	--	--
Acetylene	0.041	14	--	--	--	--	--	--
Ethene (Ethylene)	0.979	336	--	--	--	--	--	--
Ethane	0.314	108	--	--	--	--	--	--
Propadiene (Allene)	0.002	1	--	--	--	--	--	--
Propene (Propylene)	0.373	128	--	--	--	--	--	--
Propane	0.108	37	9900000	31,000,000	59,000,000	--	--	--
Butane	0.216	74	13000000	40,000,000	130,000,000	--	--	--
Pentane	0.054	18	--	--	--	--	--	--
Hexane	0.025	8	--	10,000,000	30,000,000	--	--	--
Benzene	0.010	3	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Toluene	0.010	3	250000	2,100,000	14,000,000	188,000	1,131,000	3,769,000
Dimethyl Carbonate	0.002	1	--	--	--	--	--	--
Ethyl Methyl Carbonate	0.067	23	--	--	--	--	--	--
Hydrogen Chloride	0.857	294	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	8.250	**2,832**	**800**	20,000	36,000	**1,637**	16,000	41,000
Hydrogen Cyanide	0.417	143	2200	7,800	17,000	--	11,000	28,000
Copper and compounds	0	0	--	--	--	--	--	--
Ammonia	0.166	57	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0.193	66	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0.721	**248**	**70**	**230**	3,200	**115**	344	3,439
Nitrogen Dioxide	0.632	99	940	23,000	38,000	1,882	28,000	56,000
Sulfur Dioxide	1.164	400	520	1,950	49,000	786	8,000	66,000

Additional air toxics from SFPE Report. Bold lettering indicates an exceedance. Note that copper is present only for the non-flaming scenarios based on the SFPE Report.

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines;µg/m^3 = micrograms per meter cubed.

Source: U.S. EPA 2026a; Cameo Chemical 2026.

Non-Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m^3)	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)
Carbon Monoxide	1.572	9,801	--	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	4.493	28,022	--	--	--	--	--	--
Hydrogen	0.452	2,816	--	--	--	--	--	--
Methane	0.348	2,168	--	--	--	--	--	--
Acetylene	0.028	172	--	--	--	--	--	--
Ethene (Ethylene)	0.300	1,871	--	--	--	--	--	--
Ethane	0.111	689	--	--	--	--	--	--
Propadiene (Allene)	0.0009	5	--	--	--	--	--	--
Propene (Propylene)	0.229	1,429	--	--	--	--	--	--
Propane	0.049	304	9900000	31,000,000	59,000,000	--	--	--
Butane	0.105	658	13000000	40,000,000	130,000,000	--	--	--
Pentane	0.031	194	--	--	--	--	--	--
Hexane	0.008	49	--	10,000,000	30,000,000	--	--	--
Benzene	0.004	25	170000	2,600,000	13,000,000	159,734	479,000	3,195,000
Dimethyl Carbonate	0.570	3,552	--	--	--	--	--	--
Ethyl Methyl Carbonate	0.098	613	--	--	--	--	--	--
Hydrogen Chloride	0.301	1,880	2700	33,000	155,000	4,350	29,000	217,000
Hydrogen Fluoride	0.235	**1,466**	**800**	20,000	36,000	1,637	16,000	41,000
Hydrogen Cyanide	0.059	367	2200	7,800	17,000	--	11,000	28,000
Copper and compounds	1.332	8,304	--	--	--	--	--	--
Ammonia	0.000	0	21000	112,000	769,000	17,413	104,000	1,045,000
Formaldehyde	0.000	0	1000	17,000	69,000	1,227	12,000	49,000
Acrolein	0.000	0	70	230	3,200	115	344	3,439
Nitrogen Dioxide	1.581	**9,862**	**940**	23,000	38,000	**1,882**	28,000	56,000
Sulfur Dioxide	0.000	0	520	1,950	49,000	786	8,000	66,000

Additional air toxics from SFPE Report. Bold lettering indicates an exceedance. Note that ammonia is only present for flaming scenarios based on SFPE Report.

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m^3 = micrograms per meter cubed.

Source: U.S. EPA 2026a; Cameo Chemical 2026.

Flaming Scenario

Gas Species	Emission Rate (g/sec)	Ground Level Conc (µg/m^3)	AEGL-1 (µg/m^3)	AEGL-2 (µg/m^3)	AEGL-3 (µg/m^3)	ERPG-1 (µg/m^3)	ERPG-2 (µg/m^3)	ERPG-3 (µg/m^3)
Carbon Monoxide	15.46	4,448	--	95,000	380,000	229,000	401,000	573,000
Carbon Dioxide	644.20	185,392	--	--	--	--	--	--
Hydrogen	0.90	260	--	--	--	--	--	--
Methane	0.70	200	--	--	--	--	--	--
Acetylene	0.06	16	--	--	--	--	--	--
Ethene (Ethylene)	0.60	173	--	--	--	--	--	--
Ethane	0.22	64	--	--	--	--	--	--
Propadiene (Allene)	0.002	0.5017	--	--	--	--	--	--
Propene (Propylene)	0.46	132	--	--	--	--	--	--
Propane	0.10	28	9900000	31000000	59000000	--	--	--
Butane	0.21	61	13000000	40000000	130000000	--	--	--
Pentane	0.06	18	--	--	--	--	--	--
Hexane	0.02	5	--	10000000	30000000	--	--	--
Benzene	0.01	2	170000	2600000	13000000	159734.15	479000	3195000
Dimethyl Carbonate	1.14	328	--	--	--	--	--	--
Ethyl Methyl Carbonate	0.20	57	--	--	--	--	--	--
Hydrogen Chloride	1.13	326	2700	33000	155000	4349.6933	29000	217000
Hydrogen Fluoride	10.92	**3,143**	**800**	20000	36000	1636.8098	16000	41000
Hydrogen Cyanide	0.55	159	2200	7800	17000	--	11000	28000
Copper and compounds	0.00	0	--	--	--	--	--	--
Ammonia	0.22	63	21000	112000	769000	17413.088	104000	1045000
Formaldehyde	0.26	74	1000	17000	69000	1226.9939	12000	49000
Acrolein	0.96	**275**	**70**	**230**	3200	114.64213	344	3439
Nitrogen Dioxide	0.84	241	940	23000	38000	1881.7996	28000	56000
Sulfur Dioxide	1.54	444	520	1950	49000	786.13497	8000	66000

Additional air toxics from SFPE Report. Bold lettering indicates an exceedance. Note that copper is present only for the non-flaming scenarios based on the SFPE Report.

1-Hour AEGL values from U.S. EPA. Units provided in mg/m^3 and converted to ERPG's obtained from Cameo Chemicals and converted from ppm to µg/m^3.

CAS = Chemical Abstract Service; AEGL = Acute Exposure Guideline; ERPG = Emergency Response Planning Guidelines; µg/m^3 = micrograms per meter cubed.

Source: U.S. EPA 2026a; Cameo Chemical 2026.

Appendix D

Non-Cancer Health Risk Calculations

Non-Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m^3)	AEGL-1 (µg/m^3)	Res Haz Quotient
Carbon Monoxide	0.499	337.3	--	N/A
Carbon Dioxide	2.224	1504.4	--	N/A
Hydrogen	0.148	99.9	--	N/A
Methane	0.178	120.6	--	N/A
Acetylene	0.008	5.6	--	N/A
Ethene (Ethylene)	0.196	132.4	--	N/A
Ethane	0.063	42.5	--	N/A
Propadiene (Allene)	0.0003	0.2	--	N/A
Propene (Propylene)	0.075	50.4	--	N/A
Propane	0.022	14.6	9,900,000	1.4764E-06
Butane	0.043	29.2	13,000,000	2.24804E-06
Pentane	0.011	7.3	--	N/A
Hexane	0.005	3.3	--	N/A
Benzene	0.002	1.3	170,000	7.82E-06
Dimethyl Carbonate	0.223	151.0	--	N/A
Ethyl Methyl Carbonate	0.013	9.1	--	N/A
Hydrogen Chloride	0.116	78.6	2,700	2.91E-02
Hydrogen Fluoride	0.091	61.3	800	7.67E-02
Hydrogen Cyanide	0.023	15.3	2,200	6.97E-03
Copper and compounds	1.01	N/A	--	N/A
Ammonia	0	0	21,000	0
Formaldehyde	0	0	1,000	0
Acrolein	0	0	70	0
Nitrogen Dioxide	0.610	198.3	940	2.11E-01
Sulfur Dioxide	0	0	520	0
			Hazard Index:	0.32
			Threshold:	1
			Exceed?	no

g/sec = grams per second; µg/m^3 = micrograms per meter cubed; AEGL = Acute Exposure Guideline Level

Flaming Scenario

Vaca Dixon BESS

Health Consequence Analysis with AERMOD

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m^3)	AEGL-1 (µg/m^3)	Res Haz Quotient
Carbon Monoxide	11.676	153.5	--	N/A
Carbon Dioxide	486.7	6,399	--	N/A
Hydrogen	0.738	9.7	--	N/A
Methane	0.892	11.7	--	N/A
Acetylene	0.041	0.5	--	N/A
Ethene (Ethylene)	0.979	12.9	--	N/A
Ethane	0.314	4.1	--	N/A
Propadiene (Allene)	0.002	0.0	--	N/A
Propene (Propylene)	0.373	4.9	--	N/A
Propane	0.108	1.4	9,900,000	1.43502E-07
Butane	0.216	2.8	13,000,000	2.18503E-07
Pentane	0.054	0.7	--	N/A
Hexane	0.025	0.3	--	N/A
Benzene	0.010	0.1	170000	7.60E-07
Toluene	0.010	0.1	250,000	5.17E-07
Dimethyl Carbonate	0.002	0.0	--	N/A
Ethyl Methyl Carbonate	0.067	0.9	--	N/A
Hydrogen Chloride	0.857	11.3	2,700	4.17E-03
Hydrogen Fluoride	8.250	108.5	800	0.14
Hydrogen Cyanide	0.417	5.5	2,200	2.49E-03
Copper and compounds	0	0	--	N/A
Ammonia	0.166	2.2	21,000	1.04E-04
Formaldehyde	0.193	2.5	1,000	2.54E-03
Acrolein	0.721	9.5	70	1.36E-01
Nitrogen Dioxide	0.632	5.5	940	5.90E-03
Sulfur Dioxide	1.164	15.3	520	2.94E-02
			Hazard Index:	**0.32**
			Threshold:	**1**
			Exceed?	**no**

g/sec = grams per second; µg/m^3 = micrograms per meter cubed; AEGL = Acute Exposure Guideline Level

Non-Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m^3)	AEGL-1 (µg/m^3)	Res Haz Quotient
Carbon Monoxide	1.572	716.7	--	N/A
Carbon Dioxide	4.493	2049.1	--	N/A
Hydrogen	0.452	205.9	--	N/A
Acetylene	0.028	12.6	--	N/A
Methane	0.348	158.5	--	N/A
Ethene (Ethylene)	0.300	136.8	--	N/A
Ethane	0.111	50.4	--	N/A
Propene (Propylene)	0.229	104.5	--	N/A
Propane	0.049	22.2	9,900,000	2.24482E-06
Butane	0.105	48.1	13,000,000	3.69882E-06
Pentane	0.031	14.2	--	N/A
Hexane	0.008	3.6	--	N/A
Benzene	0.004	1.9	170,000	1.09392E-05
Dimethyl Carbonate	0.570	259.7	--	N/A
Ethyl Methyl Carbonate	0.098	44.8	--	N/A
Hydrogen Chloride	0.301	137.4	2,700	5.09E-02
Hydrogen Fluoride	0.235	107.2	800	1.34E-01
Hydrogen Cyanide	0.059	26.8	2,200	1.22E-02
Copper and compounds	1.33	N/A	--	N/A
Ammonia	0	0	21,000	0
Formaldehyde	0	0	1,000	0
Acrolein	0	0	70	0
Nitrogen Dioxide	1.581	350.4	940	3.73E-01
Sulfur Dioxide	0	0	520	0
			Hazard Index:	0.57
			Threshold:	1
			Exceed?	no

g/sec = grams per second; µg/m^3 = micrograms per meter cubed; AEGL = Acute Exposure Guideline Level

Flaming Scenario

Hazardous Gas Component	Emission Rate (g/sec)	Res Conc (µg/m^3)	AEGL-1 (µg/m^3)	Res Haz Quotient
Carbon Monoxide	15.455	158	--	N/A
Carbon Dioxide	644.2	6606	--	N/A
Hydrogen	0.903	9	--	N/A
Methane	0.695	7	--	N/A
Acetylene	0.600	6	--	N/A
Ethene (Ethylene)	0.600	6	--	N/A
Ethane	0.221	2	--	N/A
Propadiene (Allene)	0.458	5	--	N/A
Propene (Propylene)	0.458	5	--	N/A
Propane	0.097	1	9,900,000	1.00958E-07
Butane	0.211	2	13,000,000	1.66349E-07
Pentane	0.062	1	--	N/A
Hexane	0.016	0	--	N/A
Benzene	0.008	0	170000	4.91973E-07
Toluene	1.139	12	--	N/A
Dimethyl Carbonate	0.197	2	--	N/A
Ethyl Methyl Carbonate	0.000	0	--	N/A
Hydrogen Chloride	1.134	12	2,700	4.31E-03
Hydrogen Fluoride	10.920	112	800	0.14
Hydrogen Cyanide	0.552	6	2,200	2.57E-03
Copper and compounds	0	0	--	N/A
Ammonia	0.220	2	21,000	1.08E-04
Formaldehyde	0.256	3	1,000	2.62E-03
Acrolein	0.956	10	70	1.40E-01
Nitrogen Dioxide	0.837	9	940	9.13E-03
Sulfur Dioxide	1.541	16	520	3.04E-02
			Hazard Index:	0.33
			Threshold:	1
			Exceed?	no

g/sec = grams per second; µg/m^3 = micrograms per meter cubed; AEGL = Acute Exposure Guideline Level

Appendix E, Part 1

AERMOD Files

Control Pathway

Dispersion Options

Titles

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Dispersion Options

- [x] Regulatory Default
- [ ] Non-Default Options

Dispersion Coefficient

Rural

Output Type

- [x] Concentration
- [ ] Total Deposition (Dry & Wet)
- [ ] Dry Deposition
- [ ] Wet Deposition

Plume Depletion

- [ ] Dry Removal
- [ ] Wet Removal

Output Warnings

- [ ] No Output Warnings
- [ ] Non-fatal Warnings for Non-sequential Met Data

Pollutant / Averaging Time / Terrain Options

Pollutant Type

Averaging Time Options

Hours

1	2	3	4	6	8	12	24
☑	☐	☐	☐	☐	☐	☐	☐

- [ ] Month
- [ ] Period
- [ ] Annual

Exponential Decay

Option not available

Terrain Height Options

- [ ] Flat
- [x] Elevated

SO: Meters
RE: Meters
TG: Meters

Flagpole Receptors

- [ ] Yes
- [x] No

Default Height = 0.00 m

Control Pathway

Optional Files

Re-Start File	Init File	Multi-Year Analyses	Event Input File	Error Listing File
☐	☐	☐	☐	■

Detailed Error Listing File

Filename: Vaca Arges HCA Bulding Unitized_3.err

Source Pathway - Source Inputs

AERMOD

Point Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [K]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	VD1_NF	594071.61	4250263.64	25.69	2.90	1.00000	493.15	0.45	0.60
POINT	VD2_NF	594065.77	4250251.46	25.70	2.90	1.00000	493.15	0.45	0.60
POINT	VD3_NF	594116.04	4250251.88	25.69	2.90	1.00000	493.15	0.45	0.60
POINT	VD4_NF	594166.64	4250252.43	25.63	2.90	1.00000	493.15	0.45	0.60
POINT	AR1_NF	594181.59	4250353.65	25.43	2.90	1.00000	519.15	0.45	0.60
POINT	AR2_NF	594181.64	4250333.65	25.48	2.90	1.00000	519.15	0.45	0.60
POINT	AR3_NF	594181.98	4250308.12	25.48	2.90	1.00000	519.15	0.60	0.60
POINT	AR4_NF	594215.92	4250308.53	25.47	2.90	1.00000	519.15	0.45	0.60
POINT	AR5_NF	594181.44	4250379.34	25.36	2.90	1.00000	519.15	0.45	0.60
POINT	AR6_NF	594191.15	4250387.97	25.34	2.90	1.00000	519.15	0.45	0.60
POINT	AR7_NF	594213.17	4250388.56	25.31	2.90	1.00000	519.15	0.45	0.60
POINT	VD5_NF	594235.47	4250253.30	25.58	2.90	1.00000	493.15	0.45	0.60

Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [K]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	VD6_NF	594229.68	4250264.96	25.58	2.90	1.00000	493.15	0.45	0.60
POINT	AR8_NF	594231.06	4250413.89	25.26	2.90	1.00000	519.15	0.45	0.60
POINT	AR9_NF	594256.85	4250414.09	25.24	2.90	1.00000	519.45	0.45	0.60
POINT	AR10_NF	594257.28	4250371.35	25.28	2.90	1.00000	519.15	0.45	0.60
POINT	AR11_NF	594257.68	4250334.81	25.38	2.90	1.00000	519.15	0.45	0.60
POINT	AR12_NF	594257.88	4250309.33	25.45	2.90	1.00000	519.15	0.45	0.60
POINT	VD1_F	594071.61	4250263.64	25.69	2.90	1.00000	499.00	8.50	2.48
POINT	VD2_F	594065.77	4250251.46	25.70	2.90	1.00000	499.00	8.50	2.48
POINT	VD3_F	594116.04	4250251.88	25.69	2.90	1.00000	499.00	8.50	2.48
POINT	VD4_F	594166.64	4250252.43	25.63	2.90	1.00000	499.00	8.50	2.48
POINT	VD5_F	594235.47	4250253.30	25.58	2.90	1.00000	499.00	8.50	2.48
POINT	VD6_F	594229.68	4250264.96	25.58	2.90	1.00000	499.00	8.50	2.48
POINT	AR1_F	594181.59	4250353.65	25.43	2.90	1.00000	499.00	8.50	2.44

Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [K]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	AR2_F	594181.64	4250333.65	25.48	2.90	1.00000	499.00	8.50	2.44
POINT	AR3_F	594181.98	4250308.12	25.48	2.90	1.00000	499.00	8.50	2.44
POINT	AR4_F	594215.92	4250308.53	25.47	2.90	1.00000	499.00	8.50	2.44
POINT	AR5_F	594181.44	4250379.34	25.36	2.90	1.00000	499.00	8.50	2.44
POINT	AR6_F	594191.15	4250387.97	25.34	2.90	1.00000	499.00	8.50	2.44
POINT	AR7_F	594213.17	4250388.56	25.31	2.90	1.00000	499.00	8.50	2.44
POINT	AR8_F	594231.06	4250413.89	25.26	2.90	1.00000	499.00	8.50	2.44
POINT	AR9_F	594256.85	4250414.09	25.24	2.90	1.00000	499.00	8.50	2.44
POINT	AR10_F	594257.28	4250371.35	25.28	2.90	1.00000	499.00	8.50	2.44
POINT	AR11_F	594257.68	4250334.81	25.38	2.90	1.00000	499.00	8.50	2.44
POINT	AR12_F	594257.88	4250309.33	25.45	2.90	1.00000	499.00	8.50	2.44
POINT	VD7_F	594110.24	4250263.56	25.68	2.90	1.00000	499.00	8.50	2.48
POINT	VD7_NF	594110.24	4250263.56	25.68	2.90	1.00000	493.15	0.45	0.60

Source Pathway - Source Inputs

Building Downwash Information

Source ID: VD1_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	3.55	12.55	14.18	15.38	16.11	16.12
70-120 deg	15.94	14.48	14.29	14.50	14.28	13.62
130-180 deg	12.54	11.09	9.72	9.31	8.62	8.20
190-240 deg	10.53	12.55	14.18	15.38	16.11	16.12
250-300 deg	15.94	14.48	14.29	14.50	14.28	6.44
310-360 deg	6.16	5.70	5.47	4.28	3.36	8.20

Lengths [m] (10 to 360 deg)

10-60 deg	6.40	14.28	13.62	12.54	11.09	13.96
70-120 deg	13.90	10.18	8.20	10.53	12.55	14.18
130-180 deg	15.38	16.11	16.35	16.10	15.36	14.29
190-240 deg	14.50	14.28	13.62	12.54	11.09	13.96
250-300 deg	13.90	10.18	8.20	10.53	12.55	5.20
310-360 deg	5.81	6.24	6.70	6.52	6.36	14.29

Along Flow [m] (10 to 360 deg)

10-60 deg	-13.12	-12.69	-11.88	-10.72	-9.22	-7.44
70-120 deg	-5.44	1.54	-1.43	-1.60	-1.72	-1.79
130-180 deg	-1.80	-1.76	-1.67	-1.52	-1.33	-1.15
190-240 deg	-1.39	-1.58	-1.73	-1.83	-1.87	-6.52
250-300 deg	-8.46	-11.71	-6.77	-8.93	-10.83	-16.58
310-360 deg	-17.27	-17.43	-14.69	-12.80	-13.15	-13.14

Across Flow [m] (10 to 360 deg)

10-60 deg	-1.91	-4.55	-5.30	-5.89	-6.29	-9.01
70-120 deg	-8.22	-7.57	-6.00	-5.86	-5.55	-5.08
130-180 deg	-4.44	-3.68	-2.59	-0.79	1.03	2.67
190-240 deg	3.67	4.55	5.30	5.89	6.29	9.01
250-300 deg	8.22	7.57	5.99	5.86	5.55	3.46
310-360 deg	0.99	-1.52	0.46	3.30	1.60	-2.67

Source ID: VD2_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74

70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	6.36	6.09	6.40	6.52	6.44
130-180 deg	6.17	5.71	5.07	4.28	3.36	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47
250-300 deg	6.52	6.36	6.09	6.40	6.52	6.44
310-360 deg	6.17	5.71	5.07	4.28	3.36	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	6.44	6.17	5.71	5.07
70-120 deg	4.28	3.36	2.54	3.55	4.44	5.20
130-180 deg	5.81	6.24	6.47	6.52	6.36	14.29
190-240 deg	6.40	6.52	6.44	6.17	5.71	5.07
250-300 deg	4.28	3.36	2.54	3.55	4.44	5.20
310-360 deg	5.81	6.24	6.47	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-1.75	-1.84	-1.87	-1.85	-1.77	-1.64
70-120 deg	-1.45	-1.22	-1.06	-1.81	-2.51	-3.14
130-180 deg	-3.67	-4.08	-4.38	-4.53	-4.56	-12.68
190-240 deg	-4.65	-4.68	-4.57	-4.32	-3.94	-3.44
250-300 deg	-2.83	-2.14	-1.48	-11.77	-1.93	-2.07
310-360 deg	-2.14	-2.15	-2.10	-1.98	-1.80	-1.61
Across Flow [m] (10 to 360 deg)						
10-60 deg	0.04	0.29	0.54	0.76	0.96	1.14
70-120 deg	1.28	1.38	1.43	1.45	1.42	1.35
130-180 deg	1.23	1.08	0.90	0.69	0.46	2.72
190-240 deg	-0.04	-0.29	-0.54	-0.76	-0.96	-1.14
250-300 deg	-1.28	-1.38	-1.43	-3.33	-1.42	-1.35
310-360 deg	-1.23	-1.08	-0.90	-0.69	-0.46	-2.72

Source ID: VD3_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Source Pathway

Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	15.35	14.35	15.49	16.16	16.33
130-180 deg	16.01	14.85	5.06	4.27	3.35	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47
250-300 deg	6.52	6.36	6.09	6.40	6.52	6.44
310-360 deg	6.16	14.85	5.06	4.27	3.35	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	6.44	6.16	5.70	5.06
70-120 deg	4.27	13.88	13.21	14.03	14.43	14.39
130-180 deg	15.36	12.72	6.47	6.52	6.36	14.29
190-240 deg	6.40	6.52	6.44	6.16	5.70	5.06
250-300 deg	4.27	3.35	2.54	3.55	4.44	5.20
310-360 deg	5.81	12.72	6.47	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-1.40	-1.49	-1.54	-1.54	-1.49	-1.40
70-120 deg	-1.27	-21.90	-22.09	-22.55	-22.32	-21.41
130-180 deg	-21.31	-17.41	-4.65	-4.84	-4.89	-13.03
190-240 deg	-5.01	-5.03	-4.90	-4.63	-4.21	-3.66
250-300 deg	-3.01	-2.26	-1.54	-1.73	-1.86	-1.94
310-360 deg	-1.96	4.69	-1.83	-1.67	-1.47	-1.26
Across Flow [m] (10 to 360 deg)						
10-60 deg	0.04	0.36	0.66	0.94	1.19	1.41
70-120 deg	1.59	7.91	5.68	2.46	-0.84	-4.11
130-180 deg	-7.26	-6.25	1.13	0.87	0.58	2.78
190-240 deg	-0.04	-0.36	-0.66	-0.94	-1.19	-1.41
250-300 deg	-1.59	-1.71	-1.79	-1.81	-1.77	-1.68
310-360 deg	-1.54	6.25	-1.13	-0.87	-0.58	-2.78

Source ID: VD4_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	15.35	14.35	15.49	16.15	16.33
130-180 deg	16.01	14.85	5.07	4.28	3.35	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47

250-300 deg	6.52	6.36	6.10	6.41	6.53	6.45
310-360 deg	6.17	14.85	5.07	4.28	3.35	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.41	6.53	6.45	6.17	5.71	5.07
70-120 deg	4.28	13.88	13.20	14.02	14.42	14.38
130-180 deg	15.36	12.72	6.47	6.52	6.36	14.29
190-240 deg	6.41	6.53	6.45	6.17	5.71	5.07
250-300 deg	4.28	3.35	2.54	3.55	4.44	5.20
310-360 deg	5.81	12.72	6.47	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-1.63	-1.80	-1.91	-1.97	-1.96	-1.90
70-120 deg	-1.78	-22.41	-22.57	-22.99	-22.72	-21.76
130-180 deg	-21.59	-17.61	-4.76	-4.87	-4.83	-12.88
190-240 deg	-4.78	-4.73	-4.54	-4.20	-3.74	-3.17
250-300 deg	-2.50	-1.75	-1.05	-1.27	-1.46	-1.59
310-360 deg	-1.68	4.89	-1.71	-1.65	-1.53	-1.41
Across Flow [m] (10 to 360 deg)						
10-60 deg	0.50	0.77	1.01	1.22	1.39	1.53
70-120 deg	1.61	7.84	5.53	2.23	-1.15	-4.49
130-180 deg	-7.70	-6.72	0.63	0.36	0.07	2.29
190-240 deg	-0.50	-0.77	-1.01	-1.22	-1.39	-1.53
250-300 deg	-1.61	-1.65	-1.64	-1.58	-1.47	-1.31
310-360 deg	-1.12	6.72	-0.63	-0.36	-0.07	-2.29

Source ID: AR1_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	6.57	6.48	6.20	5.73	5.09
70-120 deg	22.65	23.23	23.20	23.22	22.54	21.17
130-180 deg	19.15	18.28	19.47	20.06	20.05	19.57
190-240 deg	20.10	6.57	6.48	6.20	5.73	5.09
250-300 deg	8.87	7.26	6.14	3.55	4.46	21.16
310-360 deg	19.15	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	4.46	5.22	5.83	6.27	6.51
70-120 deg	20.06	20.05	19.57	20.10	20.02	19.33

130-180 deg	18.06	19.46	21.38	22.65	23.23	23.20
190-240 deg	23.22	4.46	5.22	5.83	6.27	6.51
250-300 deg	12.15	11.68	11.05	6.45	6.57	19.34
310-360 deg	18.06	19.46	21.38	22.65	23.23	23.19
Along Flow [m] (10 to 360 deg)						
10-60 deg	-19.58	-3.80	-3.59	-3.28	-2.87	-2.38
70-120 deg	-4.64	-2.57	-0.50	0.79	2.05	3.25
130-180 deg	4.35	3.70	2.39	1.00	-0.42	-1.87
190-240 deg	-3.64	-0.66	-1.63	-2.55	-3.39	-4.13
250-300 deg	-18.25	-18.86	-18.98	-19.32	-19.07	-26.93
310-360 deg	-27.96	-29.75	-31.20	-31.70	-31.23	-29.86
Across Flow [m] (10 to 360 deg)						
10-60 deg	-10.84	-3.23	-3.46	-3.58	-3.59	-3.49
70-120 deg	-12.33	-11.20	-9.73	-7.97	-5.96	-3.78
130-180 deg	-1.48	0.85	3.17	5.39	7.45	9.29
190-240 deg	10.84	3.23	3.46	3.58	3.59	3.49
250-300 deg	5.44	3.21	1.20	-0.36	-3.15	11.13
310-360 deg	7.96	4.57	1.02	-2.56	-6.06	-9.38

Source ID: AR2_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	6.57	6.47	6.19	5.73	21.37
70-120 deg	22.65	23.23	23.20	23.22	22.54	5.23
130-180 deg	5.84	6.27	6.51	6.56	6.40	19.57
190-240 deg	6.45	6.57	6.47	6.19	5.73	21.37
250-300 deg	22.65	23.23	23.20	23.22	22.54	21.17
310-360 deg	19.15	12.02	12.29	6.55	6.40	6.13
Lengths [m] (10 to 360 deg)						
10-60 deg	3.55	4.47	5.23	5.84	6.27	19.47
70-120 deg	20.06	20.05	19.57	20.10	20.02	6.48
130-180 deg	6.20	5.73	5.09	4.29	3.36	23.20
190-240 deg	3.56	4.47	5.23	5.84	6.27	19.47
250-300 deg	20.06	20.05	19.57	20.10	20.02	19.34
310-360 deg	18.06	11.25	10.21	4.29	3.36	2.54

Source Pathway

Along Flow [m] (10 to 360 deg)						
10-60 deg	-9.73	-6.91	-1.33	-1.26	-1.15	-5.20
70-120 deg	-3.67	-2.03	-0.40	0.44	4.27	2.05
130-180 deg	2.77	5.42	3.95	4.36	4.65	4.10
190-240 deg	3.62	2.45	-3.91	-4.58	-5.12	-14.27
250-300 deg	-16.40	-18.02	-19.17	-20.54	-24.30	-25.74
310-360 deg	-26.40	-21.26	-21.59	-16.70	-16.42	-15.76
Across Flow [m] (10 to 360 deg)						
10-60 deg	-4.14	-4.55	-2.26	-2.01	-1.69	-10.91
70-120 deg	-9.95	-8.69	-7.17	-5.43	-11.51	-3.82
130-180 deg	-2.84	-3.43	-0.66	0.48	1.60	9.49
190-240 deg	3.66	4.55	2.26	2.01	1.69	10.91
250-300 deg	9.95	8.69	7.17	5.43	11.51	8.85
310-360 deg	5.92	5.96	3.23	2.36	-0.21	-2.77

Source ID: AR3_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.43	6.56	6.47	6.19	5.73	5.08
70-120 deg	4.29	3.36	6.14	3.55	4.46	10.42
130-180 deg	11.40	12.04	6.51	6.55	6.40	6.13
190-240 deg	11.81	6.56	6.47	6.19	5.73	5.08
250-300 deg	4.29	3.36	6.14	3.55	4.46	10.42
310-360 deg	11.40	6.18	5.39	5.80	6.04	6.09
Lengths [m] (10 to 360 deg)						
10-60 deg	3.42	4.46	5.22	5.83	6.27	6.51
70-120 deg	6.55	6.40	11.07	6.44	6.57	12.26
130-180 deg	11.93	11.23	5.09	4.29	3.36	2.54
190-240 deg	7.54	4.46	5.22	5.83	6.27	6.51
250-300 deg	6.55	6.40	2.54	6.44	6.56	12.26
310-360 deg	11.93	5.63	3.07	2.11	1.09	0.24
Along Flow [m] (10 to 360 deg)						
10-60 deg	-11.35	-3.00	4.52	-2.55	3.21	-1.80
70-120 deg	-1.33	-0.82	-0.36	-0.21	-1.00	3.07
130-180 deg	4.04	4.88	-1.85	0.51	-10.39	-10.57
190-240 deg	3.95	-1.45	-2.40	-3.28	-4.06	-4.71

250-300 deg	-5.22	-5.58	-10.71	-6.23	-6.47	-15.33
310-360 deg	-15.96	-12.52	-12.92	-12.84	-12.37	-11.63
Across Flow [m] (10 to 360 deg)						
10-60 deg	-4.57	-3.19	1.07	-3.27	3.44	-2.95
70-120 deg	-2.65	-2.27	-0.44	-1.32	1.65	-4.97
130-180 deg	-3.34	-1.62	2.73	1.95	4.19	2.61
190-240 deg	6.79	3.19	3.28	3.27	3.16	2.95
250-300 deg	2.65	2.27	0.44	1.32	0.77	4.97
310-360 deg	3.34	4.45	3.30	1.27	-0.79	-2.84

Source ID: AR4_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.44	6.56	6.47	4.68	5.73	5.08
70-120 deg	4.29	3.36	6.13	3.56	4.47	5.23
130-180 deg	5.84	6.27	6.51	6.56	6.04	6.09
190-240 deg	6.00	5.73	5.29	4.68	5.73	5.08
250-300 deg	4.29	3.36	6.13	3.56	4.47	5.23
310-360 deg	5.84	6.27	6.51	6.56	6.40	6.13
Lengths [m] (10 to 360 deg)						
10-60 deg	3.56	4.47	5.23	4.10	6.27	6.51
70-120 deg	6.56	6.40	11.06	6.45	6.57	6.47
130-180 deg	6.20	5.73	5.08	4.29	1.09	0.24
190-240 deg	1.29	2.31	3.25	4.10	6.27	6.51
250-300 deg	6.56	6.40	11.06	6.45	6.57	6.48
310-360 deg	6.20	5.73	5.08	4.29	3.36	2.55
Along Flow [m] (10 to 360 deg)						
10-60 deg	0.94	0.73	0.49	4.75	-0.01	-0.26
70-120 deg	-0.51	-0.74	-0.99	-1.12	-1.24	-2.64
130-180 deg	-1.37	-1.37	-3.58	-1.24	-7.27	-7.30
190-240 deg	-8.07	-8.59	-8.85	-8.84	-6.27	-6.25
250-300 deg	-6.05	-5.66	-10.07	-5.33	-5.32	-5.16
310-360 deg	-4.83	-2.36	-1.50	-3.05	-2.24	1.12
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.63	-1.13	-0.60	3.07	0.50	1.04
70-120 deg	1.54	2.00	1.19	0.17	0.54	3.11

AERMOD

130-180 deg	1.20	1.49	2.99	1.91	3.23	2.01
190-240 deg	0.74	-0.56	-1.85	-3.07	-0.50	-1.04
250-300 deg	-1.54	-2.00	-1.19	-0.17	-0.54	-0.88
310-360 deg	-1.20	-3.13	-2.99	-1.91	-2.04	-2.07

Source ID: AR5_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	20.10	20.02	19.34	18.06	19.46	5.09
70-120 deg	4.29	3.36	6.14	3.55	4.46	5.22
130-180 deg	5.83	6.27	6.51	6.55	20.05	6.14
190-240 deg	6.45	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.14	3.55	4.46	5.22
310-360 deg	5.83	6.27	6.51	6.55	20.05	19.57

Lengths [m] (10 to 360 deg)

10-60 deg	23.21	22.53	21.16	19.15	18.28	6.51
70-120 deg	6.55	6.40	11.05	6.45	6.57	6.48
130-180 deg	6.20	5.73	5.09	4.29	23.23	2.54
190-240 deg	3.55	4.46	5.22	5.83	6.27	6.51
250-300 deg	6.55	6.40	11.05	6.45	6.57	6.48
310-360 deg	6.20	5.73	5.09	4.29	23.23	23.19

Along Flow [m] (10 to 360 deg)

10-60 deg	-30.40	-30.35	-29.38	-27.51	-25.69	-4.32
70-120 deg	-4.01	-3.58	-7.99	-2.87	-2.57	-2.20
130-180 deg	-1.76	-1.26	4.45	5.43	4.91	0.84
190-240 deg	0.30	-0.24	-0.78	-1.29	-1.77	-2.19
250-300 deg	-2.54	-2.82	-3.06	-3.58	-3.99	-4.29
310-360 deg	-4.45	-4.47	-9.54	-9.72	-28.14	-29.53

Across Flow [m] (10 to 360 deg)

10-60 deg	3.33	0.01	-3.31	-6.52	-9.54	-1.82
70-120 deg	-1.97	-2.07	-0.87	-2.08	-1.99	-1.83
130-180 deg	-1.63	-1.37	-3.98	-2.70	-9.56	-0.01
190-240 deg	0.36	0.71	1.04	1.35	1.61	1.82
250-300 deg	1.97	2.07	0.87	2.08	1.99	1.83
310-360 deg	1.63	1.37	3.98	2.70	9.56	6.54

Source ID: AR6_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	6.45	6.57	6.48	6.20	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	4.47	10.40
130-180 deg	11.38	12.02	6.51	6.56	6.40	6.14
190-240 deg	11.84	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.13	3.56	9.07	10.40
310-360 deg	11.38	12.02	6.51	6.55	6.40	6.14

Lengths [m] (10 to 360 deg)

10-60 deg	3.55	4.47	5.23	5.84	6.27	6.51
70-120 deg	6.56	6.41	11.07	6.45	6.57	12.29
130-180 deg	11.95	11.25	5.09	4.29	3.36	2.55
190-240 deg	7.52	4.47	5.23	5.84	6.27	6.51
250-300 deg	6.56	6.41	2.54	6.45	12.24	12.29
310-360 deg	11.95	11.25	5.09	4.29	3.36	2.54

Along Flow [m] (10 to 360 deg)

10-60 deg	-12.57	-4.20	-4.08	-3.84	-3.48	-3.01
70-120 deg	-2.46	-1.41	-1.21	-0.88	-0.56	2.81
130-180 deg	4.00	5.06	0.80	1.11	1.38	1.50
190-240 deg	5.05	-0.27	-1.16	-2.01	-2.80	-3.50
250-300 deg	-4.10	-5.00	-9.86	-5.57	-21.56	-15.09
310-360 deg	-15.95	-16.32	-13.32	-13.45	-13.16	-12.58

Across Flow [m] (10 to 360 deg)

10-60 deg	-3.91	-2.73	-3.02	-3.23	-3.34	-3.35
70-120 deg	-3.25	-0.51	-1.39	-2.41	-1.96	-6.22
130-180 deg	-4.61	-2.87	0.24	0.82	1.37	1.89
190-240 deg	6.13	2.73	3.02	3.23	3.34	3.35
250-300 deg	3.25	0.51	1.39	2.41	5.11	6.22
310-360 deg	4.61	2.87	3.94	2.00	0.01	-1.98

Source ID: AR7_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74

190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	12.25	12.29	11.95	11.25	10.21
70-120 deg	8.86	3.36	6.13	3.56	6.56	6.47
130-180 deg	17.82	18.28	12.26	12.15	11.68	19.57
190-240 deg	20.10	12.24	12.28	11.96	11.26	10.23
250-300 deg	6.55	6.40	14.67	6.44	6.56	6.47
310-360 deg	17.82	18.28	12.26	6.55	6.40	6.14
Lengths [m] (10 to 360 deg)						
10-60 deg	3.55	9.10	10.40	11.38	12.02	12.29
70-120 deg	12.19	6.40	2.54	6.45	4.46	5.22
130-180 deg	18.06	17.84	10.23	8.88	7.27	14.67
190-240 deg	15.88	9.07	10.37	11.35	11.98	12.26
250-300 deg	4.29	3.36	19.57	3.55	4.46	5.22
310-360 deg	18.06	17.84	10.23	4.29	3.36	2.54
Along Flow [m] (10 to 360 deg)						
10-60 deg	-11.61	-16.36	-18.15	-19.38	-20.02	-20.05
70-120 deg	-19.47	-16.92	-8.22	-16.87	-8.69	-8.53
130-180 deg	-14.23	-12.44	0.87	2.58	4.20	-2.87
190-240 deg	-2.87	4.76	3.86	2.85	1.75	0.59
250-300 deg	4.46	5.20	-2.82	5.03	4.24	3.31
310-360 deg	-3.83	-5.41	-11.10	-11.46	-11.47	-11.23
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.58	7.36	5.11	2.71	0.22	-2.28
70-120 deg	-4.70	0.82	-0.20	-1.38	-2.56	-3.65
130-180 deg	-5.28	-5.47	-6.72	-5.49	-4.10	-6.97
190-240 deg	-6.82	0.43	1.95	3.41	4.77	5.99
250-300 deg	-2.19	-1.01	4.47	1.40	2.56	3.65
310-360 deg	5.28	5.47	6.72	3.55	1.88	0.15

Source ID: VD5_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	10.08	4.87	13.77	15.02	15.81	16.12

70-120 deg	15.93	15.27	14.30	14.51	14.28	13.62
130-180 deg	12.54	11.08	9.71	4.71	3.81	3.00
190-240 deg	4.00	4.87	13.77	15.02	15.81	16.12
250-300 deg	15.93	15.27	14.30	14.51	14.28	13.62
310-360 deg	12.54	11.08	9.71	4.71	8.61	7.88
Lengths [m] (10 to 360 deg)						
10-60 deg	14.51	6.70	13.62	12.54	11.08	9.71
70-120 deg	9.30	8.61	7.88	10.08	12.11	13.77
130-180 deg	15.02	15.81	16.12	6.67	6.44	6.11
190-240 deg	6.50	6.70	13.62	12.54	11.08	9.71
250-300 deg	9.30	8.61	7.88	10.08	12.11	13.77
310-360 deg	15.02	15.81	16.12	6.67	15.27	14.30
Along Flow [m] (10 to 360 deg)						
10-60 deg	-2.34	5.21	-2.35	-2.25	-2.09	-2.28
70-120 deg	-3.66	-4.93	-6.16	-8.14	-9.88	-11.32
130-180 deg	-12.41	-13.13	-13.45	-11.74	-12.07	-12.08
190-240 deg	-12.18	-11.90	-11.27	-10.29	-9.00	-7.43
250-300 deg	-5.64	-3.68	-1.72	-1.93	-2.23	-2.45
310-360 deg	-2.61	-2.68	-2.67	5.07	-2.41	-2.22
Across Flow [m] (10 to 360 deg)						
10-60 deg	3.11	2.88	4.43	4.90	5.23	5.39
70-120 deg	5.39	5.22	4.93	4.92	4.76	4.46
130-180 deg	4.02	3.46	2.58	3.29	1.78	0.22
190-240 deg	-1.35	-2.88	-4.43	-4.90	-5.23	-5.39
250-300 deg	-5.39	-5.22	-4.93	-4.92	-4.76	-4.46
310-360 deg	-4.02	-3.46	-2.58	-3.29	0.62	2.22

Source ID: VD6_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	4.00	4.87	5.60	6.16	6.53	6.70
70-120 deg	6.67	6.44	6.11	6.50	6.70	6.69
130-180 deg	6.47	6.06	5.47	4.71	3.81	3.00
190-240 deg	4.00	4.87	5.60	6.16	6.53	6.70
250-300 deg	6.67	6.44	6.11	6.50	6.70	6.69
310-360 deg	6.47	6.06	5.47	4.71	3.81	3.00

Source Pathway

Lengths [m] (10 to 360 deg)						
10-60 deg	6.50	6.70	6.69	6.47	6.06	5.47
70-120 deg	4.71	3.81	3.00	4.00	4.87	5.60
130-180 deg	6.16	6.53	6.70	6.67	6.44	6.11
190-240 deg	6.50	6.70	6.69	6.47	6.06	5.47
250-300 deg	4.71	3.81	3.00	4.00	4.87	5.60
310-360 deg	6.16	6.53	6.70	6.67	6.44	6.11
Along Flow [m] (10 to 360 deg)						
10-60 deg	-4.95	-5.01	-4.91	-4.66	-4.27	-3.75
70-120 deg	-3.12	-2.39	-1.69	-1.89	-2.04	-2.12
130-180 deg	-2.14	-2.09	-1.98	-1.81	-1.58	-1.36
190-240 deg	-1.55	-1.69	-1.78	-1.81	-1.79	-1.72
250-300 deg	-1.59	-1.42	-1.31	-2.11	-2.84	-3.48
310-360 deg	-4.02	-4.44	-4.73	-4.86	-4.86	-4.75
Across Flow [m] (10 to 360 deg)						
10-60 deg	-0.11	-0.40	-0.68	-0.94	-1.18	-1.37
70-120 deg	-1.53	-1.64	-1.69	-1.70	-1.66	-1.57
130-180 deg	-1.42	-1.24	-1.02	-0.76	-0.49	-0.19
190-240 deg	0.11	0.40	0.68	0.94	1.18	1.37
250-300 deg	1.53	1.64	1.69	1.70	1.66	1.57
310-360 deg	1.42	1.24	1.02	0.76	0.49	0.19

Source ID: AR8_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	6.57	6.48	6.20	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	4.47	10.40
130-180 deg	11.39	6.27	6.51	6.56	6.40	6.14
190-240 deg	11.84	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.13	3.56	4.47	10.40
310-360 deg	11.39	6.27	6.51	6.56	6.40	6.14
Lengths [m] (10 to 360 deg)						
10-60 deg	3.56	4.47	5.23	5.84	6.27	6.51
70-120 deg	6.56	6.41	11.07	6.45	6.57	12.29
130-180 deg	11.95	5.73	5.09	4.29	3.36	2.55
190-240 deg	7.53	4.47	5.24	5.85	6.28	6.51

250-300 deg	6.56	6.41	2.54	6.45	6.57	12.29
310-360 deg	11.95	5.73	5.09	4.29	3.36	2.55
Along Flow [m] (10 to 360 deg)						
10-60 deg	-9.38	-1.14	-3.48	-3.29	-3.00	-2.62
70-120 deg	-2.16	-1.22	-1.13	-0.91	-0.70	2.55
130-180 deg	3.64	4.62	5.46	0.54	0.76	0.86
190-240 deg	4.40	-0.90	-3.98	-4.52	-4.92	-3.89
250-300 deg	-4.39	-5.19	-9.94	-5.54	-5.86	-14.84
310-360 deg	-15.60	-10.36	-10.55	-10.43	-9.99	-9.35
Across Flow [m] (10 to 360 deg)						
10-60 deg	-3.40	-1.67	-2.77	-2.88	-2.90	-2.83
70-120 deg	-2.68	0.11	-0.76	-1.76	-1.33	-5.62
130-180 deg	-4.08	-3.63	-2.28	1.12	1.56	1.97
190-240 deg	6.10	2.58	1.45	1.19	0.90	2.83
250-300 deg	2.68	-0.11	0.76	1.76	1.33	5.62
310-360 deg	4.08	3.63	2.28	0.85	-0.60	-2.03

Source ID: AR9_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	20.02	12.29	11.95	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	6.56	6.47
130-180 deg	17.82	18.28	19.47	20.06	20.05	19.57
190-240 deg	20.10	20.02	19.33	18.06	17.84	6.51
250-300 deg	16.91	15.66	14.66	15.87	6.56	6.47
310-360 deg	17.82	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	22.54	10.40	11.39	6.27	6.51
70-120 deg	6.56	6.40	2.54	6.45	4.46	5.22
130-180 deg	18.06	17.84	17.64	22.65	23.23	14.66
190-240 deg	15.87	17.05	17.70	17.82	18.28	5.08
250-300 deg	20.06	20.05	19.57	20.10	4.46	5.22
310-360 deg	18.06	17.84	17.64	22.65	23.23	23.20
Along Flow [m] (10 to 360 deg)						
10-60 deg	-30.13	-30.34	-18.86	-20.24	-19.35	-19.85
70-120 deg	-19.75	-18.08	-9.37	-17.98	-9.72	-9.45

130-180 deg	-15.02	-13.06	-10.71	-5.72	4.15	-2.72
190-240 deg	-2.52	-2.69	-2.77	-2.78	-2.69	4.65
250-300 deg	-2.28	-1.97	-1.67	-2.12	5.27	4.23
310-360 deg	-3.04	-4.78	-6.94	-16.93	-27.38	-29.01
Across Flow [m] (10 to 360 deg)						
10-60 deg	4.78	1.49	6.03	3.49	3.60	0.73
70-120 deg	-2.16	0.87	-0.35	-1.72	-3.10	-4.35
130-180 deg	-6.13	-6.45	-7.21	-10.58	-10.83	-8.12
190-240 deg	-7.93	-7.50	-6.85	-5.99	-4.14	-3.75
250-300 deg	0.42	2.72	4.61	5.41	3.10	4.35
310-360 deg	6.13	6.45	7.21	10.58	10.83	7.92

Source ID: AR10_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	20.02	19.33	18.06	19.46	10.21
70-120 deg	8.86	23.24	23.20	23.22	22.53	5.22
130-180 deg	11.38	12.02	12.29	20.06	20.05	19.58
190-240 deg	20.11	20.03	19.34	18.07	19.47	21.39
250-300 deg	22.66	23.24	23.20	23.22	22.53	21.16
310-360 deg	19.15	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	22.54	21.17	19.15	18.28	12.29
70-120 deg	12.19	20.05	19.58	20.11	20.03	6.47
130-180 deg	11.95	11.25	10.21	22.66	23.23	23.20
190-240 deg	23.22	22.53	21.16	19.15	18.28	19.47
250-300 deg	20.06	20.05	19.58	20.11	20.03	19.34
310-360 deg	18.06	19.47	21.39	22.66	23.23	23.20
Along Flow [m] (10 to 360 deg)						
10-60 deg	-31.43	-31.62	-30.85	-29.14	-27.43	-21.98
70-120 deg	-21.28	-19.94	-18.07	-16.44	-14.32	-19.13
130-180 deg	-19.95	-18.85	-17.17	-4.62	5.37	-1.45
190-240 deg	-0.18	1.10	2.34	3.52	3.73	2.51
250-300 deg	1.22	-0.11	-1.51	-3.67	-5.71	-3.23
310-360 deg	-3.66	-5.60	-7.91	-18.04	-28.60	-30.28

Source Pathway

Across Flow [m] (10 to 360 deg)						
10-60 deg	4.81	1.30	-2.26	-5.75	-9.06	-2.81
70-120 deg	-5.56	-8.56	-10.15	-11.43	-12.37	-2.79
130-180 deg	-2.73	-5.18	-7.47	-11.25	-11.31	-8.28
190-240 deg	-6.39	-4.30	-2.09	0.19	2.46	4.66
250-300 deg	6.71	8.56	10.15	11.43	12.37	5.58
310-360 deg	6.61	7.46	8.07	11.25	11.31	8.18

Source ID: AR11_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.08	20.01	12.28	11.94	11.25	10.21
70-120 deg	8.86	3.36	6.13	3.56	9.10	5.22
130-180 deg	5.83	6.27	6.51	12.16	20.07	19.57
190-240 deg	20.10	20.02	19.34	11.96	11.26	10.23
250-300 deg	22.03	22.58	22.53	22.56	9.10	5.22
310-360 deg	5.83	6.27	6.51	12.16	20.07	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	15.91	17.09	10.40	11.38	12.02	12.29
70-120 deg	12.19	6.40	11.07	6.45	12.25	6.47
130-180 deg	6.19	5.73	5.08	8.88	15.68	22.53
190-240 deg	22.56	21.91	20.59	11.35	11.99	12.26
250-300 deg	20.06	20.05	19.57	20.10	12.25	6.47
310-360 deg	6.19	5.73	5.08	8.88	15.68	14.67
Along Flow [m] (10 to 360 deg)						
10-60 deg	-24.10	-26.16	-20.07	-21.37	-22.02	-22.00
70-120 deg	-21.31	-18.59	-18.20	-18.06	-17.37	-3.29
130-180 deg	-2.58	-1.79	-0.94	3.39	5.32	-1.48
190-240 deg	-0.20	1.08	2.33	4.84	3.74	2.53
250-300 deg	1.25	-0.08	-1.47	-3.62	5.12	-3.18
310-360 deg	-3.61	-3.94	-4.14	-12.27	-21.00	-21.72
Across Flow [m] (10 to 360 deg)						
10-60 deg	4.87	1.36	5.67	2.92	0.08	-2.76
70-120 deg	-5.51	-0.30	-1.59	-3.00	-5.63	-3.29
130-180 deg	-3.25	-3.11	-2.88	-7.33	-11.35	-8.32
190-240 deg	-6.43	-4.35	-2.14	3.20	4.90	6.46

250-300 deg	6.35	8.19	9.79	11.08	5.63	3.29
310-360 deg	3.25	3.11	2.88	7.33	11.35	8.22

Source ID: AR12_NF

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	19.60	20.02	19.33	18.06	16.23	13.92
70-120 deg	6.55	3.36	6.14	3.55	4.46	6.48
130-180 deg	6.20	12.03	12.31	19.23	19.65	19.54
190-240 deg	19.60	20.02	19.33	18.06	16.23	13.92
250-300 deg	6.55	10.32	9.24	10.57	12.00	14.29
310-360 deg	6.20	16.65	18.22	19.23	19.65	19.54

Lengths [m] (10 to 360 deg)

10-60 deg	14.84	12.00	14.29	16.53	18.28	19.47
70-120 deg	4.29	6.40	2.54	6.44	6.57	5.22
130-180 deg	5.83	11.23	10.19	14.61	14.83	14.67
190-240 deg	14.84	12.00	14.29	16.53	18.28	19.47
250-300 deg	4.29	20.05	19.57	20.10	20.02	19.33
310-360 deg	5.83	15.85	15.39	14.61	14.83	14.67

Along Flow [m] (10 to 360 deg)

10-60 deg	-3.15	-7.26	-10.07	-12.58	-14.70	-16.38
70-120 deg	-9.66	-18.21	-9.84	-18.30	-18.62	-10.83
130-180 deg	-10.50	-21.44	-20.06	-15.76	-14.68	-13.19
190-240 deg	-11.69	-4.75	-4.22	-3.96	-3.58	-3.09
250-300 deg	5.37	-1.85	-1.20	-1.32	-1.40	-1.44
310-360 deg	4.67	3.59	2.40	1.14	-0.15	-1.48

Across Flow [m] (10 to 360 deg)

10-60 deg	10.07	8.61	8.22	7.59	6.72	5.66
70-120 deg	4.42	2.85	1.59	-2.45	-2.60	-2.91
130-180 deg	-4.29	-3.28	-6.05	-5.13	-7.01	-8.66
190-240 deg	-10.07	-8.61	-8.22	-7.59	-6.72	-5.66
250-300 deg	-4.42	-4.16	-3.14	-1.06	1.25	2.92
310-360 deg	4.29	0.98	3.10	5.13	7.01	8.66

Source ID: VD1_F

Source Pathway

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	12.55	14.18	15.38	16.11	16.12
70-120 deg	15.94	14.48	14.29	14.50	14.28	13.62
130-180 deg	12.54	11.09	9.72	9.31	8.62	8.20
190-240 deg	10.53	12.55	14.18	15.38	16.11	16.12
250-300 deg	15.94	14.48	14.29	14.50	14.28	6.44
310-360 deg	6.16	5.70	5.47	4.28	3.36	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	14.28	13.62	12.54	11.09	13.96
70-120 deg	13.90	10.18	8.20	10.53	12.55	14.18
130-180 deg	15.38	16.11	16.35	16.10	15.36	14.29
190-240 deg	14.50	14.28	13.62	12.54	11.09	13.96
250-300 deg	13.90	10.18	8.20	10.53	12.55	5.20
310-360 deg	5.81	6.24	6.70	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-13.12	-12.69	-11.88	-10.72	-9.22	-7.44
70-120 deg	-5.44	1.54	-1.43	-1.60	-1.72	-1.79
130-180 deg	-1.80	-1.76	-1.67	-1.52	-1.33	-1.15
190-240 deg	-1.39	-1.58	-1.73	-1.83	-1.87	-6.52
250-300 deg	-8.46	-11.71	-6.77	-8.93	-10.83	-16.58
310-360 deg	-17.27	-17.43	-14.69	-12.80	-13.15	-13.14
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.91	-4.55	-5.30	-5.89	-6.29	-9.01
70-120 deg	-8.22	-7.57	-6.00	-5.86	-5.55	-5.08
130-180 deg	-4.44	-3.68	-2.59	-0.79	1.03	2.67
190-240 deg	3.67	4.55	5.30	5.89	6.29	9.01
250-300 deg	8.22	7.57	5.99	5.86	5.55	3.46
310-360 deg	0.99	-1.52	0.46	3.30	1.60	-2.67

Source ID: VD2_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74

250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	6.36	6.09	6.40	6.52	6.44
130-180 deg	6.17	5.71	5.07	4.28	3.36	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47
250-300 deg	6.52	6.36	6.09	6.40	6.52	6.44
310-360 deg	6.17	5.71	5.07	4.28	3.36	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	6.44	6.17	5.71	5.07
70-120 deg	4.28	3.36	2.54	3.55	4.44	5.20
130-180 deg	5.81	6.24	6.47	6.52	6.36	14.29
190-240 deg	6.40	6.52	6.44	6.17	5.71	5.07
250-300 deg	4.28	3.36	2.54	3.55	4.44	5.20
310-360 deg	5.81	6.24	6.47	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-1.75	-1.84	-1.87	-1.85	-1.77	-1.64
70-120 deg	-1.45	-1.22	-1.06	-1.81	-2.51	-3.14
130-180 deg	-3.67	-4.08	-4.38	-4.53	-4.56	-12.68
190-240 deg	-4.65	-4.68	-4.57	-4.32	-3.94	-3.44
250-300 deg	-2.83	-2.14	-1.48	-11.77	-1.93	-2.07
310-360 deg	-2.14	-2.15	-2.10	-1.98	-1.80	-1.61
Across Flow [m] (10 to 360 deg)						
10-60 deg	0.04	0.29	0.54	0.76	0.96	1.14
70-120 deg	1.28	1.38	1.43	1.45	1.42	1.35
130-180 deg	1.23	1.08	0.90	0.69	0.46	2.72
190-240 deg	-0.04	-0.29	-0.54	-0.76	-0.96	-1.14
250-300 deg	-1.28	-1.38	-1.43	-3.33	-1.42	-1.35
310-360 deg	-1.23	-1.08	-0.90	-0.69	-0.46	-2.72

Source ID: VD3_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	15.35	14.35	15.49	16.16	16.33

130-180 deg	16.01	14.85	5.06	4.27	3.35	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47
250-300 deg	6.52	6.36	6.09	6.40	6.52	6.44
310-360 deg	6.16	14.85	5.06	4.27	3.35	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	6.44	6.16	5.70	5.06
70-120 deg	4.27	13.88	13.21	14.03	14.43	14.39
130-180 deg	15.36	12.72	6.47	6.52	6.36	14.29
190-240 deg	6.40	6.52	6.44	6.16	5.70	5.06
250-300 deg	4.27	3.35	2.54	3.55	4.44	5.20
310-360 deg	5.81	12.72	6.47	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-1.40	-1.49	-1.54	-1.54	-1.49	-1.40
70-120 deg	-1.27	-21.90	-22.09	-22.55	-22.32	-21.41
130-180 deg	-21.31	-17.41	-4.65	-4.84	-4.89	-13.03
190-240 deg	-5.01	-5.03	-4.90	-4.63	-4.21	-3.66
250-300 deg	-3.01	-2.26	-1.54	-1.73	-1.86	-1.94
310-360 deg	-1.96	4.69	-1.83	-1.67	-1.47	-1.26
Across Flow [m] (10 to 360 deg)						
10-60 deg	0.04	0.36	0.66	0.94	1.19	1.41
70-120 deg	1.59	7.91	5.68	2.46	-0.84	-4.11
130-180 deg	-7.26	-6.25	1.13	0.87	0.58	2.78
190-240 deg	-0.04	-0.36	-0.66	-0.94	-1.19	-1.41
250-300 deg	-1.59	-1.71	-1.79	-1.81	-1.77	-1.68
310-360 deg	-1.54	6.25	-1.13	-0.87	-0.58	-2.78

Source ID: VD4_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	5.20	5.81	6.24	6.47
70-120 deg	6.52	15.35	14.35	15.49	16.15	16.33
130-180 deg	16.01	14.85	5.07	4.28	3.35	8.20
190-240 deg	3.55	4.44	5.20	5.81	6.24	6.47
250-300 deg	6.52	6.36	6.10	6.41	6.53	6.45
310-360 deg	6.17	14.85	5.07	4.28	3.35	8.20

Source Pathway

Lengths [m] (10 to 360 deg)

10-60 deg	6.41	6.53	6.45	6.17	5.71	5.07
70-120 deg	4.28	13.88	13.20	14.02	14.42	14.38
130-180 deg	15.36	12.72	6.47	6.52	6.36	14.29
190-240 deg	6.41	6.53	6.45	6.17	5.71	5.07
250-300 deg	4.28	3.35	2.54	3.55	4.44	5.20
310-360 deg	5.81	12.72	6.47	6.52	6.36	14.29

Along Flow [m] (10 to 360 deg)

10-60 deg	-1.63	-1.80	-1.91	-1.97	-1.96	-1.90
70-120 deg	-1.78	-22.41	-22.57	-22.99	-22.72	-21.76
130-180 deg	-21.59	-17.61	-4.76	-4.87	-4.83	-12.88
190-240 deg	-4.78	-4.73	-4.54	-4.20	-3.74	-3.17
250-300 deg	-2.50	-1.75	-1.05	-1.27	-1.46	-1.59
310-360 deg	-1.68	4.89	-1.71	-1.65	-1.53	-1.41

Across Flow [m] (10 to 360 deg)

10-60 deg	0.50	0.77	1.01	1.22	1.39	1.53
70-120 deg	1.61	7.84	5.53	2.23	-1.15	-4.49
130-180 deg	-7.70	-6.72	0.63	0.36	0.07	2.29
190-240 deg	-0.50	-0.77	-1.01	-1.22	-1.39	-1.53
250-300 deg	-1.61	-1.65	-1.64	-1.58	-1.47	-1.31
310-360 deg	-1.12	6.72	-0.63	-0.36	-0.07	-2.29

Source ID: VD5_F

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	10.08	4.87	13.77	15.02	15.81	16.12
70-120 deg	15.93	15.27	14.30	14.51	14.28	13.62
130-180 deg	12.54	11.08	9.71	4.71	3.81	3.00
190-240 deg	4.00	4.87	13.77	15.02	15.81	16.12
250-300 deg	15.93	15.27	14.30	14.51	14.28	13.62
310-360 deg	12.54	11.08	9.71	4.71	8.61	7.88

Lengths [m] (10 to 360 deg)

10-60 deg	14.51	6.70	13.62	12.54	11.08	9.71
70-120 deg	9.30	8.61	7.88	10.08	12.11	13.77
130-180 deg	15.02	15.81	16.12	6.67	6.44	6.11
190-240 deg	6.50	6.70	13.62	12.54	11.08	9.71

250-300 deg	9.30	8.61	7.88	10.08	12.11	13.77
310-360 deg	15.02	15.81	16.12	6.67	15.27	14.30
Along Flow [m] (10 to 360 deg)						
10-60 deg	-2.34	5.21	-2.35	-2.25	-2.09	-2.28
70-120 deg	-3.66	-4.93	-6.16	-8.14	-9.88	-11.32
130-180 deg	-12.41	-13.13	-13.45	-11.74	-12.07	-12.08
190-240 deg	-12.18	-11.90	-11.27	-10.29	-9.00	-7.43
250-300 deg	-5.64	-3.68	-1.72	-1.93	-2.23	-2.45
310-360 deg	-2.61	-2.68	-2.67	5.07	-2.41	-2.22
Across Flow [m] (10 to 360 deg)						
10-60 deg	3.11	2.88	4.43	4.90	5.23	5.39
70-120 deg	5.39	5.22	4.93	4.92	4.76	4.46
130-180 deg	4.02	3.46	2.58	3.29	1.78	0.22
190-240 deg	-1.35	-2.88	-4.43	-4.90	-5.23	-5.39
250-300 deg	-5.39	-5.22	-4.93	-4.92	-4.76	-4.46
310-360 deg	-4.02	-3.46	-2.58	-3.29	0.62	2.22

Source ID: VD6_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	4.00	4.87	5.60	6.16	6.53	6.70
70-120 deg	6.67	6.44	6.11	6.50	6.70	6.69
130-180 deg	6.47	6.06	5.47	4.71	3.81	3.00
190-240 deg	4.00	4.87	5.60	6.16	6.53	6.70
250-300 deg	6.67	6.44	6.11	6.50	6.70	6.69
310-360 deg	6.47	6.06	5.47	4.71	3.81	3.00
Lengths [m] (10 to 360 deg)						
10-60 deg	6.50	6.70	6.69	6.47	6.06	5.47
70-120 deg	4.71	3.81	3.00	4.00	4.87	5.60
130-180 deg	6.16	6.53	6.70	6.67	6.44	6.11
190-240 deg	6.50	6.70	6.69	6.47	6.06	5.47
250-300 deg	4.71	3.81	3.00	4.00	4.87	5.60
310-360 deg	6.16	6.53	6.70	6.67	6.44	6.11
Along Flow [m] (10 to 360 deg)						
10-60 deg	-4.95	-5.01	-4.91	-4.66	-4.27	-3.75
70-120 deg	-3.12	-2.39	-1.69	-1.89	-2.04	-2.12

130-180 deg	-2.14	-2.09	-1.98	-1.81	-1.58	-1.36
190-240 deg	-1.55	-1.69	-1.78	-1.81	-1.79	-1.72
250-300 deg	-1.59	-1.42	-1.31	-2.11	-2.84	-3.48
310-360 deg	-4.02	-4.44	-4.73	-4.86	-4.86	-4.75
Across Flow [m] (10 to 360 deg)						
10-60 deg	-0.11	-0.40	-0.68	-0.94	-1.18	-1.37
70-120 deg	-1.53	-1.64	-1.69	-1.70	-1.66	-1.57
130-180 deg	-1.42	-1.24	-1.02	-0.76	-0.49	-0.19
190-240 deg	0.11	0.40	0.68	0.94	1.18	1.37
250-300 deg	1.53	1.64	1.69	1.70	1.66	1.57
310-360 deg	1.42	1.24	1.02	0.76	0.49	0.19

Source ID: AR1_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	6.57	6.48	6.20	5.73	5.09
70-120 deg	22.65	23.23	23.20	23.22	22.54	21.17
130-180 deg	19.15	18.28	19.47	20.06	20.05	19.57
190-240 deg	20.10	6.57	6.48	6.20	5.73	5.09
250-300 deg	8.87	7.26	6.14	3.55	4.46	21.16
310-360 deg	19.15	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	4.46	5.22	5.83	6.27	6.51
70-120 deg	20.06	20.05	19.57	20.10	20.02	19.33
130-180 deg	18.06	19.46	21.38	22.65	23.23	23.20
190-240 deg	23.22	4.46	5.22	5.83	6.27	6.51
250-300 deg	12.15	11.68	11.05	6.45	6.57	19.34
310-360 deg	18.06	19.46	21.38	22.65	23.23	23.19
Along Flow [m] (10 to 360 deg)						
10-60 deg	-19.58	-3.80	-3.59	-3.28	-2.87	-2.38
70-120 deg	-4.64	-2.57	-0.50	0.79	2.05	3.25
130-180 deg	4.35	3.70	2.39	1.00	-0.42	-1.87
190-240 deg	-3.64	-0.66	-1.63	-2.55	-3.39	-4.13
250-300 deg	-18.25	-18.86	-18.98	-19.32	-19.07	-26.93
310-360 deg	-27.96	-29.75	-31.20	-31.70	-31.23	-29.86

Across Flow [m] (10 to 360 deg)						
10-60 deg	-10.84	-3.23	-3.46	-3.58	-3.59	-3.49
70-120 deg	-12.33	-11.20	-9.73	-7.97	-5.96	-3.78
130-180 deg	-1.48	0.85	3.17	5.39	7.45	9.29
190-240 deg	10.84	3.23	3.46	3.58	3.59	3.49
250-300 deg	5.44	3.21	1.20	-0.36	-3.15	11.13
310-360 deg	7.96	4.57	1.02	-2.56	-6.06	-9.38

Source ID: AR2_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	6.57	6.47	6.19	5.73	21.37
70-120 deg	22.65	23.23	23.20	23.22	22.54	5.23
130-180 deg	5.84	6.27	6.51	6.56	6.40	19.57
190-240 deg	6.45	6.57	6.47	6.19	5.73	21.37
250-300 deg	22.65	23.23	23.20	23.22	22.54	21.17
310-360 deg	19.15	12.02	12.29	6.55	6.40	6.13
Lengths [m] (10 to 360 deg)						
10-60 deg	3.55	4.47	5.23	5.84	6.27	19.47
70-120 deg	20.06	20.05	19.57	20.10	20.02	6.48
130-180 deg	6.20	5.73	5.09	4.29	3.36	23.20
190-240 deg	3.56	4.47	5.23	5.84	6.27	19.47
250-300 deg	20.06	20.05	19.57	20.10	20.02	19.34
310-360 deg	18.06	11.25	10.21	4.29	3.36	2.54
Along Flow [m] (10 to 360 deg)						
10-60 deg	-9.73	-6.91	-1.33	-1.26	-1.15	-5.20
70-120 deg	-3.67	-2.03	-0.40	0.44	4.27	2.05
130-180 deg	2.77	5.42	3.95	4.36	4.65	4.10
190-240 deg	3.62	2.45	-3.91	-4.58	-5.12	-14.27
250-300 deg	-16.40	-18.02	-19.17	-20.54	-24.30	-25.74
310-360 deg	-26.40	-21.26	-21.59	-16.70	-16.42	-15.76
Across Flow [m] (10 to 360 deg)						
10-60 deg	-4.14	-4.55	-2.26	-2.01	-1.69	-10.91
70-120 deg	-9.95	-8.69	-7.17	-5.43	-11.51	-3.82
130-180 deg	-2.84	-3.43	-0.66	0.48	1.60	9.49
190-240 deg	3.66	4.55	2.26	2.01	1.69	10.91

AERMOD

250-300 deg	9.95	8.69	7.17	5.43	11.51	8.85
310-360 deg	5.92	5.96	3.23	2.36	-0.21	-2.77

Source ID: AR3_F

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	6.43	6.56	6.47	6.19	5.73	5.08
70-120 deg	4.29	3.36	6.14	3.55	4.46	10.42
130-180 deg	11.40	12.04	6.51	6.55	6.40	6.13
190-240 deg	11.81	6.56	6.47	6.19	5.73	5.08
250-300 deg	4.29	3.36	6.14	3.55	4.46	10.42
310-360 deg	11.40	6.18	5.39	5.80	6.04	6.09

Lengths [m] (10 to 360 deg)

10-60 deg	3.42	4.46	5.22	5.83	6.27	6.51
70-120 deg	6.55	6.40	11.07	6.44	6.57	12.26
130-180 deg	11.93	11.23	5.09	4.29	3.36	2.54
190-240 deg	7.54	4.46	5.22	5.83	6.27	6.51
250-300 deg	6.55	6.40	2.54	6.44	6.56	12.26
310-360 deg	11.93	5.63	3.07	2.11	1.09	0.24

Along Flow [m] (10 to 360 deg)

10-60 deg	-11.35	-3.00	4.52	-2.55	3.21	-1.80
70-120 deg	-1.33	-0.82	-0.36	-0.21	-1.00	3.07
130-180 deg	4.04	4.88	-1.85	0.51	-10.39	-10.57
190-240 deg	3.95	-1.45	-2.40	-3.28	-4.06	-4.71
250-300 deg	-5.22	-5.58	-10.71	-6.23	-6.47	-15.33
310-360 deg	-15.96	-12.52	-12.92	-12.84	-12.37	-11.63

Across Flow [m] (10 to 360 deg)

10-60 deg	-4.57	-3.19	1.07	-3.27	3.44	-2.95
70-120 deg	-2.65	-2.27	-0.44	-1.32	1.65	-4.97
130-180 deg	-3.34	-1.62	2.73	1.95	4.19	2.61
190-240 deg	6.79	3.19	3.28	3.27	3.16	2.95
250-300 deg	2.65	2.27	0.44	1.32	0.77	4.97
310-360 deg	3.34	4.45	3.30	1.27	-0.79	-2.84

Source ID: AR4_F

Source Pathway

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.44	6.56	6.47	4.68	5.73	5.08
70-120 deg	4.29	3.36	6.13	3.56	4.47	5.23
130-180 deg	5.84	6.27	6.51	6.56	6.04	6.09
190-240 deg	6.00	5.73	5.29	4.68	5.73	5.08
250-300 deg	4.29	3.36	6.13	3.56	4.47	5.23
310-360 deg	5.84	6.27	6.51	6.56	6.40	6.13
Lengths [m] (10 to 360 deg)						
10-60 deg	3.56	4.47	5.23	4.10	6.27	6.51
70-120 deg	6.56	6.40	11.06	6.45	6.57	6.47
130-180 deg	6.20	5.73	5.08	4.29	1.09	0.24
190-240 deg	1.29	2.31	3.25	4.10	6.27	6.51
250-300 deg	6.56	6.40	11.06	6.45	6.57	6.48
310-360 deg	6.20	5.73	5.08	4.29	3.36	2.55
Along Flow [m] (10 to 360 deg)						
10-60 deg	0.94	0.73	0.49	4.75	-0.01	-0.26
70-120 deg	-0.51	-0.74	-0.99	-1.12	-1.24	-2.64
130-180 deg	-1.37	-1.37	-3.58	-1.24	-7.27	-7.30
190-240 deg	-8.07	-8.59	-8.85	-8.84	-6.27	-6.25
250-300 deg	-6.05	-5.66	-10.07	-5.33	-5.32	-5.16
310-360 deg	-4.83	-2.36	-1.50	-3.05	-2.24	1.12
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.63	-1.13	-0.60	3.07	0.50	1.04
70-120 deg	1.54	2.00	1.19	0.17	0.54	3.11
130-180 deg	1.20	1.49	2.99	1.91	3.23	2.01
190-240 deg	0.74	-0.56	-1.85	-3.07	-0.50	-1.04
250-300 deg	-1.54	-2.00	-1.19	-0.17	-0.54	-0.88
310-360 deg	-1.20	-3.13	-2.99	-1.91	-2.04	-2.07

Source ID: AR5_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74

250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	20.02	19.34	18.06	19.46	5.09
70-120 deg	4.29	3.36	6.14	3.55	4.46	5.22
130-180 deg	5.83	6.27	6.51	6.55	20.05	6.14
190-240 deg	6.45	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.14	3.55	4.46	5.22
310-360 deg	5.83	6.27	6.51	6.55	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.21	22.53	21.16	19.15	18.28	6.51
70-120 deg	6.55	6.40	11.05	6.45	6.57	6.48
130-180 deg	6.20	5.73	5.09	4.29	23.23	2.54
190-240 deg	3.55	4.46	5.22	5.83	6.27	6.51
250-300 deg	6.55	6.40	11.05	6.45	6.57	6.48
310-360 deg	6.20	5.73	5.09	4.29	23.23	23.19
Along Flow [m] (10 to 360 deg)						
10-60 deg	-30.40	-30.35	-29.38	-27.51	-25.69	-4.32
70-120 deg	-4.01	-3.58	-7.99	-2.87	-2.57	-2.20
130-180 deg	-1.76	-1.26	4.45	5.43	4.91	0.84
190-240 deg	0.30	-0.24	-0.78	-1.29	-1.77	-2.19
250-300 deg	-2.54	-2.82	-3.06	-3.58	-3.99	-4.29
310-360 deg	-4.45	-4.47	-9.54	-9.72	-28.14	-29.53
Across Flow [m] (10 to 360 deg)						
10-60 deg	3.33	0.01	-3.31	-6.52	-9.54	-1.82
70-120 deg	-1.97	-2.07	-0.87	-2.08	-1.99	-1.83
130-180 deg	-1.63	-1.37	-3.98	-2.70	-9.56	-0.01
190-240 deg	0.36	0.71	1.04	1.35	1.61	1.82
250-300 deg	1.97	2.07	0.87	2.08	1.99	1.83
310-360 deg	1.63	1.37	3.98	2.70	9.56	6.54

Source ID: AR6_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	6.57	6.48	6.20	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	4.47	10.40

130-180 deg	11.38	12.02	6.51	6.56	6.40	6.14
190-240 deg	11.84	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.13	3.56	9.07	10.40
310-360 deg	11.38	12.02	6.51	6.55	6.40	6.14
Lengths [m] (10 to 360 deg)						
10-60 deg	3.55	4.47	5.23	5.84	6.27	6.51
70-120 deg	6.56	6.41	11.07	6.45	6.57	12.29
130-180 deg	11.95	11.25	5.09	4.29	3.36	2.55
190-240 deg	7.52	4.47	5.23	5.84	6.27	6.51
250-300 deg	6.56	6.41	2.54	6.45	12.24	12.29
310-360 deg	11.95	11.25	5.09	4.29	3.36	2.54
Along Flow [m] (10 to 360 deg)						
10-60 deg	-12.57	-4.20	-4.08	-3.84	-3.48	-3.01
70-120 deg	-2.46	-1.41	-1.21	-0.88	-0.56	2.81
130-180 deg	4.00	5.06	0.80	1.11	1.38	1.50
190-240 deg	5.05	-0.27	-1.16	-2.01	-2.80	-3.50
250-300 deg	-4.10	-5.00	-9.86	-5.57	-21.56	-15.09
310-360 deg	-15.95	-16.32	-13.32	-13.45	-13.16	-12.58
Across Flow [m] (10 to 360 deg)						
10-60 deg	-3.91	-2.73	-3.02	-3.23	-3.34	-3.35
70-120 deg	-3.25	-0.51	-1.39	-2.41	-1.96	-6.22
130-180 deg	-4.61	-2.87	0.24	0.82	1.37	1.89
190-240 deg	6.13	2.73	3.02	3.23	3.34	3.35
250-300 deg	3.25	0.51	1.39	2.41	5.11	6.22
310-360 deg	4.61	2.87	3.94	2.00	0.01	-1.98

Source ID: AR7_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	6.45	12.25	12.29	11.95	11.25	10.21
70-120 deg	8.86	3.36	6.13	3.56	6.56	6.47
130-180 deg	17.82	18.28	12.26	12.15	11.68	19.57
190-240 deg	20.10	12.24	12.28	11.96	11.26	10.23
250-300 deg	6.55	6.40	14.67	6.44	6.56	6.47
310-360 deg	17.82	18.28	12.26	6.55	6.40	6.14

Source Pathway

Lengths [m] (10 to 360 deg)

10-60 deg	3.55	9.10	10.40	11.38	12.02	12.29
70-120 deg	12.19	6.40	2.54	6.45	4.46	5.22
130-180 deg	18.06	17.84	10.23	8.88	7.27	14.67
190-240 deg	15.88	9.07	10.37	11.35	11.98	12.26
250-300 deg	4.29	3.36	19.57	3.55	4.46	5.22
310-360 deg	18.06	17.84	10.23	4.29	3.36	2.54

Along Flow [m] (10 to 360 deg)

10-60 deg	-11.61	-16.36	-18.15	-19.38	-20.02	-20.05
70-120 deg	-19.47	-16.92	-8.22	-16.87	-8.69	-8.53
130-180 deg	-14.23	-12.44	0.87	2.58	4.20	-2.87
190-240 deg	-2.87	4.76	3.86	2.85	1.75	0.59
250-300 deg	4.46	5.20	-2.82	5.03	4.24	3.31
310-360 deg	-3.83	-5.41	-11.10	-11.46	-11.47	-11.23

Across Flow [m] (10 to 360 deg)

10-60 deg	-1.58	7.36	5.11	2.71	0.22	-2.28
70-120 deg	-4.70	0.82	-0.20	-1.38	-2.56	-3.65
130-180 deg	-5.28	-5.47	-6.72	-5.49	-4.10	-6.97
190-240 deg	-6.82	0.43	1.95	3.41	4.77	5.99
250-300 deg	-2.19	-1.01	4.47	1.40	2.56	3.65
310-360 deg	5.28	5.47	6.72	3.55	1.88	0.15

Source ID: AR8_F

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	6.45	6.57	6.48	6.20	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	4.47	10.40
130-180 deg	11.39	6.27	6.51	6.56	6.40	6.14
190-240 deg	11.84	6.57	6.48	6.20	5.73	5.09
250-300 deg	4.29	3.36	6.13	3.56	4.47	10.40
310-360 deg	11.39	6.27	6.51	6.56	6.40	6.14

Lengths [m] (10 to 360 deg)

10-60 deg	3.56	4.47	5.23	5.84	6.27	6.51
70-120 deg	6.56	6.41	11.07	6.45	6.57	12.29
130-180 deg	11.95	5.73	5.09	4.29	3.36	2.55
190-240 deg	7.53	4.47	5.24	5.85	6.28	6.51

250-300 deg	6.56	6.41	2.54	6.45	6.57	12.29
310-360 deg	11.95	5.73	5.09	4.29	3.36	2.55
Along Flow [m] (10 to 360 deg)						
10-60 deg	-9.38	-1.14	-3.48	-3.29	-3.00	-2.62
70-120 deg	-2.16	-1.22	-1.13	-0.91	-0.70	2.55
130-180 deg	3.64	4.62	5.46	0.54	0.76	0.86
190-240 deg	4.40	-0.90	-3.98	-4.52	-4.92	-3.89
250-300 deg	-4.39	-5.19	-9.94	-5.54	-5.86	-14.84
310-360 deg	-15.60	-10.36	-10.55	-10.43	-9.99	-9.35
Across Flow [m] (10 to 360 deg)						
10-60 deg	-3.40	-1.67	-2.77	-2.88	-2.90	-2.83
70-120 deg	-2.68	0.11	-0.76	-1.76	-1.33	-5.62
130-180 deg	-4.08	-3.63	-2.28	1.12	1.56	1.97
190-240 deg	6.10	2.58	1.45	1.19	0.90	2.83
250-300 deg	2.68	-0.11	0.76	1.76	1.33	5.62
310-360 deg	4.08	3.63	2.28	0.85	-0.60	-2.03

Source ID: AR9_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	20.02	12.29	11.95	5.73	5.09
70-120 deg	4.29	3.36	6.13	3.56	6.56	6.47
130-180 deg	17.82	18.28	19.47	20.06	20.05	19.57
190-240 deg	20.10	20.02	19.33	18.06	17.84	6.51
250-300 deg	16.91	15.66	14.66	15.87	6.56	6.47
310-360 deg	17.82	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	22.54	10.40	11.39	6.27	6.51
70-120 deg	6.56	6.40	2.54	6.45	4.46	5.22
130-180 deg	18.06	17.84	17.64	22.65	23.23	14.66
190-240 deg	15.87	17.05	17.70	17.82	18.28	5.08
250-300 deg	20.06	20.05	19.57	20.10	4.46	5.22
310-360 deg	18.06	17.84	17.64	22.65	23.23	23.20
Along Flow [m] (10 to 360 deg)						
10-60 deg	-30.13	-30.34	-18.86	-20.24	-19.35	-19.85
70-120 deg	-19.75	-18.08	-9.37	-17.98	-9.72	-9.45

130-180 deg	-15.02	-13.06	-10.71	-5.72	4.15	-2.72
190-240 deg	-2.52	-2.69	-2.77	-2.78	-2.69	4.65
250-300 deg	-2.28	-1.97	-1.67	-2.12	5.27	4.23
310-360 deg	-3.04	-4.78	-6.94	-16.93	-27.38	-29.01
Across Flow [m] (10 to 360 deg)						
10-60 deg	4.78	1.49	6.03	3.49	3.60	0.73
70-120 deg	-2.16	0.87	-0.35	-1.72	-3.10	-4.35
130-180 deg	-6.13	-6.45	-7.21	-10.58	-10.83	-8.12
190-240 deg	-7.93	-7.50	-6.85	-5.99	-4.14	-3.75
250-300 deg	0.42	2.72	4.61	5.41	3.10	4.35
310-360 deg	6.13	6.45	7.21	10.58	10.83	7.92

Source ID: AR10_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	20.10	20.02	19.33	18.06	19.46	10.21
70-120 deg	8.86	23.24	23.20	23.22	22.53	5.22
130-180 deg	11.38	12.02	12.29	20.06	20.05	19.58
190-240 deg	20.11	20.03	19.34	18.07	19.47	21.39
250-300 deg	22.66	23.24	23.20	23.22	22.53	21.16
310-360 deg	19.15	18.28	19.47	20.06	20.05	19.57
Lengths [m] (10 to 360 deg)						
10-60 deg	23.22	22.54	21.17	19.15	18.28	12.29
70-120 deg	12.19	20.05	19.58	20.11	20.03	6.47
130-180 deg	11.95	11.25	10.21	22.66	23.23	23.20
190-240 deg	23.22	22.53	21.16	19.15	18.28	19.47
250-300 deg	20.06	20.05	19.58	20.11	20.03	19.34
310-360 deg	18.06	19.47	21.39	22.66	23.23	23.20
Along Flow [m] (10 to 360 deg)						
10-60 deg	-31.43	-31.62	-30.85	-29.14	-27.43	-21.98
70-120 deg	-21.28	-19.94	-18.07	-16.44	-14.32	-19.13
130-180 deg	-19.95	-18.85	-17.17	-4.62	5.37	-1.45
190-240 deg	-0.18	1.10	2.34	3.52	3.73	2.51
250-300 deg	1.22	-0.11	-1.51	-3.67	-5.71	-3.23
310-360 deg	-3.66	-5.60	-7.91	-18.04	-28.60	-30.28

Source Pathway

Across Flow [m] (10 to 360 deg)

10-60 deg	4.81	1.30	-2.26	-5.75	-9.06	-2.81
70-120 deg	-5.56	-8.56	-10.15	-11.43	-12.37	-2.79
130-180 deg	-2.73	-5.18	-7.47	-11.25	-11.31	-8.28
190-240 deg	-6.39	-4.30	-2.09	0.19	2.46	4.66
250-300 deg	6.71	8.56	10.15	11.43	12.37	5.58
310-360 deg	6.61	7.46	8.07	11.25	11.31	8.18

Source ID: AR11_F

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	20.08	20.01	12.28	11.94	11.25	10.21
70-120 deg	8.86	3.36	6.13	3.56	9.10	5.22
130-180 deg	5.83	6.27	6.51	12.16	20.07	19.57
190-240 deg	20.10	20.02	19.34	11.96	11.26	10.23
250-300 deg	22.03	22.58	22.53	22.56	9.10	5.22
310-360 deg	5.83	6.27	6.51	12.16	20.07	19.57

Lengths [m] (10 to 360 deg)

10-60 deg	15.91	17.09	10.40	11.38	12.02	12.29
70-120 deg	12.19	6.40	11.07	6.45	12.25	6.47
130-180 deg	6.19	5.73	5.08	8.88	15.68	22.53
190-240 deg	22.56	21.91	20.59	11.35	11.99	12.26
250-300 deg	20.06	20.05	19.57	20.10	12.25	6.47
310-360 deg	6.19	5.73	5.08	8.88	15.68	14.67

Along Flow [m] (10 to 360 deg)

10-60 deg	-24.10	-26.16	-20.07	-21.37	-22.02	-22.00
70-120 deg	-21.31	-18.59	-18.20	-18.06	-17.37	-3.29
130-180 deg	-2.58	-1.79	-0.94	3.39	5.32	-1.48
190-240 deg	-0.20	1.08	2.33	4.84	3.74	2.53
250-300 deg	1.25	-0.08	-1.47	-3.62	5.12	-3.18
310-360 deg	-3.61	-3.94	-4.14	-12.27	-21.00	-21.72

Across Flow [m] (10 to 360 deg)

10-60 deg	4.87	1.36	5.67	2.92	0.08	-2.76
70-120 deg	-5.51	-0.30	-1.59	-3.00	-5.63	-3.29
130-180 deg	-3.25	-3.11	-2.88	-7.33	-11.35	-8.32
190-240 deg	-6.43	-4.35	-2.14	3.20	4.90	6.46

250-300 deg	6.35	8.19	9.79	11.08	5.63	3.29
310-360 deg	3.25	3.11	2.88	7.33	11.35	8.22

Source ID: AR12_F

Heights [m] (10 to 360 deg)

10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74

Widths [m] (10 to 360 deg)

10-60 deg	19.60	20.02	19.33	18.06	16.23	13.92
70-120 deg	6.55	3.36	6.14	3.55	4.46	6.48
130-180 deg	6.20	12.03	12.31	19.23	19.65	19.54
190-240 deg	19.60	20.02	19.33	18.06	16.23	13.92
250-300 deg	6.55	10.32	9.24	10.57	12.00	14.29
310-360 deg	6.20	16.65	18.22	19.23	19.65	19.54

Lengths [m] (10 to 360 deg)

10-60 deg	14.84	12.00	14.29	16.53	18.28	19.47
70-120 deg	4.29	6.40	2.54	6.44	6.57	5.22
130-180 deg	5.83	11.23	10.19	14.61	14.83	14.67
190-240 deg	14.84	12.00	14.29	16.53	18.28	19.47
250-300 deg	4.29	20.05	19.57	20.10	20.02	19.33
310-360 deg	5.83	15.85	15.39	14.61	14.83	14.67

Along Flow [m] (10 to 360 deg)

10-60 deg	-3.15	-7.26	-10.07	-12.58	-14.70	-16.38
70-120 deg	-9.66	-18.21	-9.84	-18.30	-18.62	-10.83
130-180 deg	-10.50	-21.44	-20.06	-15.76	-14.68	-13.19
190-240 deg	-11.69	-4.75	-4.22	-3.96	-3.58	-3.09
250-300 deg	5.37	-1.85	-1.20	-1.32	-1.40	-1.44
310-360 deg	4.67	3.59	2.40	1.14	-0.15	-1.48

Across Flow [m] (10 to 360 deg)

10-60 deg	10.07	8.61	8.22	7.59	6.72	5.66
70-120 deg	4.42	2.85	1.59	-2.45	-2.60	-2.91
130-180 deg	-4.29	-3.28	-6.05	-5.13	-7.01	-8.66
190-240 deg	-10.07	-8.61	-8.22	-7.59	-6.72	-5.66
250-300 deg	-4.42	-4.16	-3.14	-1.06	1.25	2.92
310-360 deg	4.29	0.98	3.10	5.13	7.01	8.66

Source ID: VD7_F

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74
250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	14.39	15.36	16.10	16.34
70-120 deg	16.09	15.35	14.35	15.40	14.27	13.61
130-180 deg	12.53	11.08	9.71	9.30	8.61	8.20
190-240 deg	10.53	12.54	9.79	11.32	16.10	16.35
250-300 deg	16.09	15.35	14.29	14.50	14.27	13.61
310-360 deg	12.53	11.08	9.71	4.27	3.35	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	16.33	16.01	15.21	14.36
70-120 deg	14.34	13.88	13.21	8.78	12.54	14.17
130-180 deg	15.37	16.10	16.35	16.09	15.35	14.29
190-240 deg	14.50	14.27	16.09	15.71	11.08	9.71
250-300 deg	9.30	8.61	8.20	10.53	12.54	14.17
310-360 deg	15.37	16.10	16.35	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-13.18	-12.77	-22.72	-24.54	-25.62	-25.93
70-120 deg	-25.44	-24.18	-22.30	-15.43	-1.80	-1.85
130-180 deg	-1.85	-1.79	-1.67	-1.51	-1.30	-1.10
190-240 deg	-1.32	-1.50	3.91	5.36	-1.76	-2.16
250-300 deg	-3.76	-5.24	-6.67	-8.84	-10.74	-12.32
310-360 deg	-13.52	-14.31	-14.67	-12.81	-13.18	-13.19
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.82	-3.53	8.43	6.12	3.73	1.23
70-120 deg	-1.31	-3.81	-6.25	-8.39	-5.63	-5.17
130-180 deg	-4.54	-3.78	-2.69	-0.89	0.93	2.57
190-240 deg	3.58	4.47	-6.14	-4.10	6.26	6.50
250-300 deg	6.54	6.37	6.05	5.93	5.63	5.17
310-360 deg	4.54	3.78	2.69	3.41	1.70	-2.57

Source ID: VD7_NF

Heights [m] (10 to 360 deg)						
10-60 deg	2.74	2.74	2.74	2.74	2.74	2.74
70-120 deg	2.74	2.74	2.74	2.74	2.74	2.74
130-180 deg	2.74	2.74	2.74	2.74	2.74	2.74
190-240 deg	2.74	2.74	2.74	2.74	2.74	2.74

250-300 deg	2.74	2.74	2.74	2.74	2.74	2.74
310-360 deg	2.74	2.74	2.74	2.74	2.74	2.74
Widths [m] (10 to 360 deg)						
10-60 deg	3.55	4.44	14.39	15.36	16.10	16.34
70-120 deg	16.09	15.35	14.35	15.40	14.27	13.61
130-180 deg	12.53	11.08	9.71	9.30	8.61	8.20
190-240 deg	10.53	12.54	9.79	11.32	16.10	16.35
250-300 deg	16.09	15.35	14.29	14.50	14.27	13.61
310-360 deg	12.53	11.08	9.71	4.27	3.35	8.20
Lengths [m] (10 to 360 deg)						
10-60 deg	6.40	6.52	16.33	16.01	15.21	14.36
70-120 deg	14.34	13.88	13.21	8.78	12.54	14.17
130-180 deg	15.37	16.10	16.35	16.09	15.35	14.29
190-240 deg	14.50	14.27	16.09	15.71	11.08	9.71
250-300 deg	9.30	8.61	8.20	10.53	12.54	14.17
310-360 deg	15.37	16.10	16.35	6.52	6.36	14.29
Along Flow [m] (10 to 360 deg)						
10-60 deg	-13.18	-12.77	-22.72	-24.54	-25.62	-25.93
70-120 deg	-25.44	-24.18	-22.30	-15.43	-1.80	-1.85
130-180 deg	-1.85	-1.79	-1.67	-1.51	-1.30	-1.10
190-240 deg	-1.32	-1.50	3.91	5.36	-1.76	-2.16
250-300 deg	-3.76	-5.24	-6.67	-8.84	-10.74	-12.32
310-360 deg	-13.52	-14.31	-14.67	-12.81	-13.18	-13.19
Across Flow [m] (10 to 360 deg)						
10-60 deg	-1.82	-3.53	8.43	6.12	3.73	1.23
70-120 deg	-1.31	-3.81	-6.25	-8.39	-5.63	-5.17
130-180 deg	-4.54	-3.78	-2.69	-0.89	0.93	2.57
190-240 deg	3.58	4.47	-6.14	-4.10	6.26	6.50
250-300 deg	6.54	6.37	6.05	5.93	5.63	5.17
310-360 deg	4.54	3.78	2.69	3.41	1.70	-2.57

Emission Rate Units for Output

For Concentration

Unit Factor:	1E6
Emission Unit Label:	GRAMS/SEC
Concentration Unit Label:	MICROGRAMS/M**3

Source Groups

Source Group ID:	List of Sources in Group (Source Range or Single Sources)
VD7_NF	VD7_NF
VD7_F	VD7_F
VD6_NF	VD6_NF
VD6_F	VD6_F
VD5_NF	VD5_NF
VD5_F	VD5_F
VD4_NF	VD4_NF
VD4_F	VD4_F
VD3_NF	VD3_NF
VD3_F	VD3_F
VD2_NF	VD2_NF
VD2_F	VD2_F
VD1_NF	VD1_NF
VD1_F	VD1_F
AR9_NF	AR9_NF

Source Pathway

Source Group ID: AR9_F	List of Sources in Group (Source Range or Single Sources)
	AR9_F

Source Group ID: AR8_NF	List of Sources in Group (Source Range or Single Sources)
	AR8_NF

Source Group ID: AR8_F	List of Sources in Group (Source Range or Single Sources)
	AR8_F

Source Group ID: AR7_NF	List of Sources in Group (Source Range or Single Sources)
	AR7_NF

Source Group ID: AR7_F	List of Sources in Group (Source Range or Single Sources)
	AR7_F

Source Group ID: AR6_NF	List of Sources in Group (Source Range or Single Sources)
	AR6_NF

Source Group ID: AR6_F	List of Sources in Group (Source Range or Single Sources)
	AR6_F

Source Group ID: AR5_NF	List of Sources in Group (Source Range or Single Sources)
	AR5_NF

Source Group ID: AR5_F	List of Sources in Group (Source Range or Single Sources)
	AR5_F

Source Group ID: AR4_NF	List of Sources in Group (Source Range or Single Sources)
	AR4_NF

Source Group ID: AR4_F	List of Sources in Group (Source Range or Single Sources)
	AR4_F

Source Group ID: AR3_NF	List of Sources in Group (Source Range or Single Sources)
	AR3_NF

Source Group ID: AR3_F	List of Sources in Group (Source Range or Single Sources)
	AR3_F

Source Group ID: AR2_NF	List of Sources in Group (Source Range or Single Sources)
	AR2_NF

Source Group ID: AR2_F	List of Sources in Group (Source Range or Single Sources)
	AR2_F

Source Pathway

Source Group ID: AR12_NF	List of Sources in Group (Source Range or Single Sources)
	AR12_NF

Source Group ID: AR12_F	List of Sources in Group (Source Range or Single Sources)
	AR12_F

Source Group ID: AR11_NF	List of Sources in Group (Source Range or Single Sources)
	AR11_NF

Source Group ID: AR11_F	List of Sources in Group (Source Range or Single Sources)
	AR11_F

Source Group ID: AR10_NF	List of Sources in Group (Source Range or Single Sources)
	AR10_NF

Source Group ID: AR10_F	List of Sources in Group (Source Range or Single Sources)
	AR10_F

Source Group ID: AR1_NF	List of Sources in Group (Source Range or Single Sources)
	AR1_NF

Source Group ID: AR1_F	List of Sources in Group (Source Range or Single Sources)
	AR1_F

Receptor Pathway

Receptor Networks

Note: Terrain Elavations and Flagpole Heights for Network Grids are in Page RE2 - 1 (If applicable)
Generated Discrete Receptors for Multi-Tier (Risk) Grid and Receptor Locations for Fenceline Grid are in Page RE3 - 1 (If applicable)

Discrete Receptors

Discrete Cartesian Receptors

Record Number	X-Coordinate [m]	Y-Coordinate [m]	Group Name (Optional)	Terrain Elevations	Flagpole Heights [m] (Optional)
1	593866.27	4250156.41	Freeway	26.64	
2	593880.31	4250170.66	Freeway	26.63	
3	593894.34	4250184.91	Freeway	26.62	
4	593908.37	4250199.16	Freeway	26.59	
5	593922.41	4250213.40	Freeway	26.59	
6	593936.44	4250227.65	Freeway	26.56	
7	593950.48	4250241.90	Freeway	26.52	
8	593964.51	4250256.15	Freeway	26.52	
9	593978.55	4250270.40	Freeway	26.50	
10	593992.58	4250284.65	Freeway	26.49	
11	594006.61	4250298.90	Freeway	26.52	
12	594020.65	4250313.15	Freeway	26.49	
13	594034.68	4250327.40	Freeway	26.48	
14	594048.72	4250341.65	Freeway	26.48	
15	594062.75	4250355.90	Freeway	26.44	
16	594076.78	4250370.15	Freeway	26.41	
17	594090.82	4250384.40	Freeway	26.38	
18	594104.85	4250398.65	Freeway	26.36	
19	594118.89	4250412.90	Freeway	26.39	
20	594132.92	4250427.15	Freeway	26.34	
21	594146.95	4250441.40	Freeway	26.32	
22	594160.99	4250455.64	Freeway	26.33	
23	594175.02	4250469.89	Freeway	26.30	
24	594189.06	4250484.14	Freeway	26.30	
25	594203.09	4250498.39	Freeway	26.27	
26	594217.12	4250512.64	Freeway	26.24	
27	594231.16	4250526.89	Freeway	26.25	
28	594245.19	4250541.14	Freeway	26.22	
29	594259.23	4250555.39	Freeway	26.22	
30	594273.26	4250569.64	Freeway	26.22	

31	594250.00	4250617.28	Freeway	25.79
32	594235.96	4250603.03	Freeway	25.76
33	594221.93	4250588.78	Freeway	25.54
34	594207.90	4250574.53	Freeway	25.74
35	594193.86	4250560.28	Freeway	25.66
36	594179.83	4250546.03	Freeway	25.61
37	594165.79	4250531.78	Freeway	25.68
38	594151.76	4250517.53	Freeway	25.59
39	594137.73	4250503.28	Freeway	25.72
40	594123.69	4250489.03	Freeway	25.76
41	594109.66	4250474.78	Freeway	25.55
42	594095.62	4250460.53	Freeway	25.76
43	594081.59	4250446.28	Freeway	25.77
44	594067.56	4250432.03	Freeway	25.70
45	594053.52	4250417.78	Freeway	25.80
46	594039.49	4250403.54	Freeway	25.70
47	594025.45	4250389.29	Freeway	25.84
48	594011.42	4250375.04	Freeway	25.91
49	593997.39	4250360.79	Freeway	25.74
50	593983.35	4250346.54	Freeway	25.89
51	593969.32	4250332.29	Freeway	25.92
52	593955.28	4250318.04	Freeway	25.95
53	593941.25	4250303.79	Freeway	26.42
54	593927.22	4250289.54	Freeway	26.52
55	593913.18	4250275.29	Freeway	26.56
56	593899.15	4250261.04	Freeway	26.58
57	593885.11	4250246.79	Freeway	26.60
58	593871.08	4250232.54	Freeway	26.64
59	593857.05	4250218.29	Freeway	26.65
60	593843.01	4250204.04	Freeway	26.65
61	593398.00	4249715.00	UCART1	27.50
62	593448.00	4249715.00	UCART1	26.78
63	593498.00	4249715.00	UCART1	26.08
64	593548.00	4249715.00	UCART1	26.14
65	593598.00	4249715.00	UCART1	26.23
66	593648.00	4249715.00	RESIDENT	26.20
67	593698.00	4249715.00	RESIDENT	26.09
68	593748.00	4249715.00	RESIDENT	26.07

69	593798.00	4249715.00	RESIDENT	26.17
70	593848.00	4249715.00	RESIDENT	25.98
71	593898.00	4249715.00	UCART1	25.84
72	593948.00	4249715.00	UCART1	25.33
73	593998.00	4249715.00	UCART1	25.22
74	594048.00	4249715.00	UCART1	25.11
75	594098.00	4249715.00	UCART1	25.00
76	594148.00	4249715.00	UCART1	24.88
77	594198.00	4249715.00	UCART1	24.78
78	594248.00	4249715.00	UCART1	24.67
79	594298.00	4249715.00	UCART1	24.58
80	594348.00	4249715.00	UCART1	24.48
81	594398.00	4249715.00	UCART1	24.44
82	594448.00	4249715.00	UCART1	24.32
83	594498.00	4249715.00	UCART1	24.22
84	594548.00	4249715.00	UCART1	24.14
85	594598.00	4249715.00	UCART1	24.07
86	594648.00	4249715.00	UCART1	23.97
87	594698.00	4249715.00	UCART1	23.86
88	594748.00	4249715.00	UCART1	24.38
89	594798.00	4249715.00	UCART1	24.22
90	594848.00	4249715.00	UCART1	24.13
91	594898.00	4249715.00	UCART1	24.05
92	594948.00	4249715.00	UCART1	23.91
93	594998.00	4249715.00	UCART1	23.77
94	595048.00	4249715.00	UCART1	24.16
95	595098.00	4249715.00	UCART1	24.03
96	595148.00	4249715.00	UCART1	23.92
97	595198.00	4249715.00	UCART1	23.75
98	595248.00	4249715.00	UCART1	23.64
99	595298.00	4249715.00	UCART1	23.52
100	595348.00	4249715.00	UCART1	23.31
101	595398.00	4249715.00	UCART1	23.21
102	595448.00	4249715.00	UCART1	23.10
103	595498.00	4249715.00	UCART1	22.98
104	595548.00	4249715.00	UCART1	22.76
105	595598.00	4249715.00	UCART1	22.91
106	593398.00	4249765.00	UCART1	27.12

107	593448.00	4249765.00	UCART1	27.42
108	593498.00	4249765.00	UCART1	26.84
109	593548.00	4249765.00	UCART1	26.20
110	593598.00	4249765.00	UCART1	26.29
111	593648.00	4249765.00	RESIDENT	26.29
112	593698.00	4249765.00	RESIDENT	26.14
113	593748.00	4249765.00	RESIDENT	26.05
114	593798.00	4249765.00	RESIDENT	26.10
115	593848.00	4249765.00	RESIDENT	26.00
116	593898.00	4249765.00	UCART1	25.81
117	593948.00	4249765.00	UCART1	25.36
118	593998.00	4249765.00	UCART1	25.25
119	594048.00	4249765.00	UCART1	25.13
120	594098.00	4249765.00	UCART1	25.02
121	594148.00	4249765.00	UCART1	24.92
122	594198.00	4249765.00	UCART1	24.83
123	594248.00	4249765.00	UCART1	24.72
124	594298.00	4249765.00	UCART1	24.61
125	594348.00	4249765.00	UCART1	24.53
126	594398.00	4249765.00	UCART1	24.48
127	594448.00	4249765.00	UCART1	24.36
128	594498.00	4249765.00	UCART1	24.26
129	594548.00	4249765.00	UCART1	24.18
130	594598.00	4249765.00	UCART1	24.11
131	594648.00	4249765.00	UCART1	24.02
132	594698.00	4249765.00	UCART1	23.90
133	594748.00	4249765.00	UCART1	24.40
134	594798.00	4249765.00	UCART1	24.26
135	594848.00	4249765.00	UCART1	24.18
136	594898.00	4249765.00	UCART1	24.10
137	594948.00	4249765.00	UCART1	23.99
138	594998.00	4249765.00	UCART1	23.86
139	595048.00	4249765.00	UCART1	24.19
140	595098.00	4249765.00	UCART1	24.04
141	595148.00	4249765.00	UCART1	23.90
142	595198.00	4249765.00	UCART1	23.72
143	595248.00	4249765.00	UCART1	23.63
144	595298.00	4249765.00	UCART1	23.52

145	595348.00	4249765.00	UCART1	23.33
146	595398.00	4249765.00	UCART1	23.22
147	595448.00	4249765.00	UCART1	23.15
148	595498.00	4249765.00	UCART1	23.00
149	595548.00	4249765.00	UCART1	22.80
150	595598.00	4249765.00	UCART1	22.94
151	593398.00	4249815.00	UCART1	27.18
152	593448.00	4249815.00	UCART1	27.30
153	593498.00	4249815.00	UCART1	27.45
154	593548.00	4249815.00	UCART1	27.01
155	593598.00	4249815.00	UCART1	26.34
156	593648.00	4249815.00	RESIDENT	26.42
157	593698.00	4249815.00	RESIDENT	26.24
158	593748.00	4249815.00	RESIDENT	26.21
159	593798.00	4249815.00	RESIDENT	26.06
160	593848.00	4249815.00	RESIDENT	25.94
161	593898.00	4249815.00	UCART1	25.87
162	593948.00	4249815.00	UCART1	25.40
163	593998.00	4249815.00	UCART1	25.29
164	594048.00	4249815.00	UCART1	25.17
165	594098.00	4249815.00	UCART1	25.07
166	594148.00	4249815.00	UCART1	24.97
167	594198.00	4249815.00	UCART1	24.88
168	594248.00	4249815.00	UCART1	24.77
169	594298.00	4249815.00	UCART1	24.66
170	594348.00	4249815.00	UCART1	24.57
171	594398.00	4249815.00	UCART1	24.51
172	594448.00	4249815.00	UCART1	24.40
173	594498.00	4249815.00	UCART1	24.32
174	594548.00	4249815.00	UCART1	24.22
175	594598.00	4249815.00	UCART1	24.14
176	594648.00	4249815.00	UCART1	24.06
177	594698.00	4249815.00	UCART1	23.95
178	594748.00	4249815.00	UCART1	24.51
179	594798.00	4249815.00	UCART1	24.35
180	594848.00	4249815.00	UCART1	24.23
181	594898.00	4249815.00	UCART1	24.21
182	594948.00	4249815.00	UCART1	24.09

183	594998.00	4249815.00	UCART1	23.90
184	595048.00	4249815.00	UCART1	24.26
185	595098.00	4249815.00	UCART1	24.13
186	595148.00	4249815.00	UCART1	23.97
187	595198.00	4249815.00	UCART1	23.82
188	595248.00	4249815.00	UCART1	23.70
189	595298.00	4249815.00	UCART1	23.56
190	595348.00	4249815.00	UCART1	23.39
191	595398.00	4249815.00	UCART1	23.25
192	595448.00	4249815.00	UCART1	23.17
193	595498.00	4249815.00	UCART1	23.04
194	595548.00	4249815.00	UCART1	22.83
195	595598.00	4249815.00	UCART1	22.97
196	593398.00	4249865.00	UCART1	27.45
197	593448.00	4249865.00	UCART1	27.19
198	593498.00	4249865.00	UCART1	27.17
199	593548.00	4249865.00	UCART1	27.40
200	593598.00	4249865.00	UCART1	26.66
201	593648.00	4249865.00	RESIDENT	26.37
202	593698.00	4249865.00	RESIDENT	26.37
203	593748.00	4249865.00	RESIDENT	26.39
204	593798.00	4249865.00	RESIDENT	26.18
205	593848.00	4249865.00	RESIDENT	26.06
206	593898.00	4249865.00	UCART1	25.95
207	593948.00	4249865.00	UCART1	25.43
208	593998.00	4249865.00	UCART1	25.32
209	594048.00	4249865.00	UCART1	25.21
210	594098.00	4249865.00	UCART1	25.11
211	594148.00	4249865.00	UCART1	25.02
212	594198.00	4249865.00	UCART1	24.91
213	594248.00	4249865.00	UCART1	24.80
214	594298.00	4249865.00	UCART1	24.70
215	594348.00	4249865.00	UCART1	24.58
216	594398.00	4249865.00	UCART1	24.55
217	594448.00	4249865.00	UCART1	24.44
218	594498.00	4249865.00	UCART1	24.36
219	594548.00	4249865.00	UCART1	24.27
220	594598.00	4249865.00	UCART1	24.18

221	594648.00	4249865.00	UCART1	24.10
222	594698.00	4249865.00	UCART1	23.99
223	594748.00	4249865.00	UCART1	24.54
224	594798.00	4249865.00	UCART1	24.43
225	594848.00	4249865.00	UCART1	24.31
226	594898.00	4249865.00	UCART1	24.26
227	594948.00	4249865.00	UCART1	24.13
228	594998.00	4249865.00	UCART1	23.93
229	595048.00	4249865.00	UCART1	24.36
230	595098.00	4249865.00	UCART1	24.19
231	595148.00	4249865.00	UCART1	24.04
232	595198.00	4249865.00	UCART1	23.93
233	595248.00	4249865.00	UCART1	23.74
234	595298.00	4249865.00	UCART1	23.61
235	595348.00	4249865.00	UCART1	23.43
236	595398.00	4249865.00	UCART1	23.31
237	595448.00	4249865.00	UCART1	23.24
238	595498.00	4249865.00	UCART1	23.09
239	595548.00	4249865.00	UCART1	22.88
240	595598.00	4249865.00	UCART1	22.99
241	593398.00	4249915.00	UCART1	27.39
242	593448.00	4249915.00	UCART1	26.86
243	593498.00	4249915.00	UCART1	27.07
244	593548.00	4249915.00	UCART1	27.15
245	593598.00	4249915.00	UCART1	27.35
246	593648.00	4249915.00	UCART1	26.41
247	593698.00	4249915.00	RESIDENT	26.42
248	593748.00	4249915.00	RESIDENT	26.62
249	593798.00	4249915.00	RESIDENT	26.27
250	593848.00	4249915.00	RESIDENT	26.02
251	593898.00	4249915.00	RESIDENT	25.91
252	593948.00	4249915.00	UCART1	25.48
253	593998.00	4249915.00	UCART1	25.40
254	594048.00	4249915.00	UCART1	25.30
255	594098.00	4249915.00	UCART1	25.18
256	594148.00	4249915.00	UCART1	25.08
257	594198.00	4249915.00	UCART1	24.97
258	594248.00	4249915.00	UCART1	24.86

259	594298.00	4249915.00	UCART1	24.76
260	594348.00	4249915.00	UCART1	24.65
261	594398.00	4249915.00	UCART1	24.59
262	594448.00	4249915.00	UCART1	24.48
263	594498.00	4249915.00	UCART1	24.40
264	594548.00	4249915.00	UCART1	24.30
265	594598.00	4249915.00	UCART1	24.22
266	594648.00	4249915.00	UCART1	24.14
267	594698.00	4249915.00	UCART1	24.01
268	594748.00	4249915.00	UCART1	24.61
269	594798.00	4249915.00	UCART1	24.54
270	594848.00	4249915.00	UCART1	24.40
271	594898.00	4249915.00	UCART1	24.27
272	594948.00	4249915.00	UCART1	24.16
273	594998.00	4249915.00	UCART1	23.99
274	595048.00	4249915.00	UCART1	24.40
275	595098.00	4249915.00	UCART1	24.23
276	595148.00	4249915.00	UCART1	24.07
277	595198.00	4249915.00	UCART1	23.92
278	595248.00	4249915.00	UCART1	23.76
279	595298.00	4249915.00	UCART1	23.63
280	595348.00	4249915.00	UCART1	23.53
281	595398.00	4249915.00	UCART1	23.39
282	595448.00	4249915.00	UCART1	23.31
283	595498.00	4249915.00	UCART1	23.14
284	595548.00	4249915.00	UCART1	23.06
285	595598.00	4249915.00	UCART1	23.03
286	593398.00	4249965.00	RESIDENT	27.12
287	593448.00	4249965.00	RESIDENT	27.20
288	593498.00	4249965.00	RESIDENT	26.88
289	593548.00	4249965.00	UCART1	26.85
290	593598.00	4249965.00	UCART1	27.18
291	593648.00	4249965.00	UCART1	27.27
292	593698.00	4249965.00	RESIDENT	26.39
293	593748.00	4249965.00	RESIDENT	26.45
294	593798.00	4249965.00	RESIDENT	26.12
295	593848.00	4249965.00	RESIDENT	25.99
296	593898.00	4249965.00	RESIDENT	25.83

297	593948.00	4249965.00	UCART1	25.52
298	593998.00	4249965.00	UCART1	25.42
299	594048.00	4249965.00	UCART1	25.32
300	594098.00	4249965.00	UCART1	25.22
301	594148.00	4249965.00	UCART1	25.11
302	594198.00	4249965.00	UCART1	25.01
303	594248.00	4249965.00	UCART1	24.90
304	594298.00	4249965.00	UCART1	24.81
305	594348.00	4249965.00	UCART1	24.70
306	594398.00	4249965.00	UCART1	24.61
307	594448.00	4249965.00	UCART1	24.51
308	594498.00	4249965.00	UCART1	24.44
309	594548.00	4249965.00	UCART1	24.35
310	594598.00	4249965.00	UCART1	24.26
311	594648.00	4249965.00	UCART1	24.18
312	594698.00	4249965.00	UCART1	24.07
313	594748.00	4249965.00	UCART1	24.71
314	594798.00	4249965.00	UCART1	24.61
315	594848.00	4249965.00	UCART1	24.46
316	594898.00	4249965.00	UCART1	24.33
317	594948.00	4249965.00	UCART1	24.26
318	594998.00	4249965.00	UCART1	24.06
319	595048.00	4249965.00	UCART1	24.38
320	595098.00	4249965.00	UCART1	24.27
321	595148.00	4249965.00	UCART1	24.11
322	595198.00	4249965.00	UCART1	23.93
323	595248.00	4249965.00	UCART1	23.78
324	595298.00	4249965.00	UCART1	23.65
325	595348.00	4249965.00	UCART1	23.52
326	595398.00	4249965.00	UCART1	23.43
327	595448.00	4249965.00	UCART1	23.31
328	595498.00	4249965.00	UCART1	23.21
329	595548.00	4249965.00	UCART1	23.16
330	595598.00	4249965.00	UCART1	23.03
331	593398.00	4250015.00	RESIDENT	27.29
332	593448.00	4250015.00	RESIDENT	27.05
333	593498.00	4250015.00	RESIDENT	27.23
334	593548.00	4250015.00	UCART1	27.09

335	593598.00	4250015.00	UCART1	26.71
336	593648.00	4250015.00	UCART1	27.02
337	593698.00	4250015.00	UCART1	27.18
338	593748.00	4250015.00	UCART1	26.37
339	593798.00	4250015.00	RESIDENT	25.95
340	593848.00	4250015.00	RESIDENT	26.10
341	593898.00	4250015.00	RESIDENT	25.76
342	593948.00	4250015.00	UCART1	25.56
343	593998.00	4250015.00	UCART1	25.46
344	594048.00	4250015.00	UCART1	25.35
345	594098.00	4250015.00	UCART1	25.24
346	594148.00	4250015.00	UCART1	25.14
347	594198.00	4250015.00	UCART1	25.04
348	594248.00	4250015.00	UCART1	24.94
349	594298.00	4250015.00	UCART1	24.83
350	594348.00	4250015.00	UCART1	24.71
351	594398.00	4250015.00	UCART1	24.64
352	594448.00	4250015.00	UCART1	24.56
353	594498.00	4250015.00	UCART1	24.47
354	594548.00	4250015.00	UCART1	24.39
355	594598.00	4250015.00	UCART1	24.30
356	594648.00	4250015.00	UCART1	24.23
357	594698.00	4250015.00	UCART1	24.12
358	594748.00	4250015.00	UCART1	24.79
359	594798.00	4250015.00	UCART1	24.65
360	594848.00	4250015.00	UCART1	24.53
361	594898.00	4250015.00	UCART1	24.45
362	594948.00	4250015.00	UCART1	24.32
363	594998.00	4250015.00	UCART1	24.13
364	595048.00	4250015.00	UCART1	24.40
365	595098.00	4250015.00	UCART1	24.27
366	595148.00	4250015.00	UCART1	24.11
367	595198.00	4250015.00	UCART1	23.97
368	595248.00	4250015.00	UCART1	23.81
369	595298.00	4250015.00	UCART1	23.67
370	595348.00	4250015.00	UCART1	23.51
371	595398.00	4250015.00	UCART1	23.39
372	595448.00	4250015.00	UCART1	23.29

373	595498.00	4250015.00	UCART1	23.20
374	595548.00	4250015.00	UCART1	23.15
375	595598.00	4250015.00	UCART1	23.06
376	593398.00	4250065.00	RESIDENT	26.92
377	593448.00	4250065.00	RESIDENT	27.29
378	593498.00	4250065.00	RESIDENT	27.09
379	593548.00	4250065.00	RESIDENT	27.29
380	593598.00	4250065.00	RESIDENT	27.01
381	593648.00	4250065.00	RESIDENT	26.43
382	593698.00	4250065.00	UCART1	26.83
383	593748.00	4250065.00	UCART1	27.10
384	593798.00	4250065.00	UCART1	26.24
385	593848.00	4250065.00	UCART1	26.17
386	593898.00	4250065.00	UCART1	25.81
387	593948.00	4250065.00	UCART1	25.60
388	593998.00	4250065.00	UCART1	25.49
389	594048.00	4250065.00	UCART1	25.39
390	594098.00	4250065.00	UCART1	25.28
391	594148.00	4250065.00	UCART1	25.18
392	594198.00	4250065.00	UCART1	25.08
393	594248.00	4250065.00	UCART1	24.99
394	594298.00	4250065.00	UCART1	24.88
395	594348.00	4250065.00	UCART1	24.77
396	594398.00	4250065.00	UCART1	24.69
397	594448.00	4250065.00	UCART1	24.61
398	594498.00	4250065.00	UCART1	24.52
399	594548.00	4250065.00	UCART1	24.44
400	594598.00	4250065.00	UCART1	24.35
401	594648.00	4250065.00	UCART1	24.29
402	594698.00	4250065.00	UCART1	24.19
403	594748.00	4250065.00	UCART1	24.81
404	594798.00	4250065.00	UCART1	24.69
405	594848.00	4250065.00	UCART1	24.59
406	594898.00	4250065.00	UCART1	24.54
407	594948.00	4250065.00	UCART1	24.37
408	594998.00	4250065.00	UCART1	24.25
409	595048.00	4250065.00	UCART1	24.39
410	595098.00	4250065.00	UCART1	24.25

411	595148.00	4250065.00	UCART1	24.09
412	595198.00	4250065.00	UCART1	23.97
413	595248.00	4250065.00	UCART1	23.82
414	595298.00	4250065.00	UCART1	23.70
415	595348.00	4250065.00	UCART1	23.54
416	595398.00	4250065.00	UCART1	23.39
417	595448.00	4250065.00	UCART1	23.36
418	595498.00	4250065.00	UCART1	23.32
419	595548.00	4250065.00	UCART1	23.16
420	595598.00	4250065.00	UCART1	23.15
421	593398.00	4250115.00	RESIDENT	27.30
422	593448.00	4250115.00	RESIDENT	27.02
423	593498.00	4250115.00	RESIDENT	27.03
424	593548.00	4250115.00	RESIDENT	27.12
425	593598.00	4250115.00	RESIDENT	26.95
426	593648.00	4250115.00	RESIDENT	26.72
427	593698.00	4250115.00	UCART1	26.39
428	593748.00	4250115.00	UCART1	26.76
429	593798.00	4250115.00	UCART1	27.02
430	593848.00	4250115.00	UCART1	26.27
431	593898.00	4250115.00	UCART1	25.90
432	593948.00	4250115.00	UCART1	25.63
433	593998.00	4250115.00	UCART1	25.52
434	594048.00	4250115.00	UCART1	25.42
435	594098.00	4250115.00	UCART1	25.31
436	594148.00	4250115.00	UCART1	25.22
437	594198.00	4250115.00	UCART1	25.12
438	594248.00	4250115.00	UCART1	25.03
439	594298.00	4250115.00	UCART1	24.94
440	594348.00	4250115.00	UCART1	24.83
441	594398.00	4250115.00	UCART1	24.73
442	594448.00	4250115.00	UCART1	24.65
443	594498.00	4250115.00	UCART1	24.56
444	594548.00	4250115.00	UCART1	24.48
445	594598.00	4250115.00	UCART1	24.40
446	594648.00	4250115.00	UCART1	24.33
447	594698.00	4250115.00	UCART1	24.25
448	594748.00	4250115.00	UCART1	24.78

449	594798.00	4250115.00	UCART1	24.70
450	594848.00	4250115.00	RESIDENT	24.62
451	594898.00	4250115.00	RESIDENT	24.50
452	594948.00	4250115.00	RESIDENT	24.44
453	594998.00	4250115.00	UCART1	24.31
454	595048.00	4250115.00	UCART1	24.49
455	595098.00	4250115.00	UCART1	24.27
456	595148.00	4250115.00	UCART1	24.16
457	595198.00	4250115.00	UCART1	23.97
458	595248.00	4250115.00	UCART1	23.91
459	595298.00	4250115.00	UCART1	23.75
460	595348.00	4250115.00	UCART1	23.60
461	595398.00	4250115.00	UCART1	23.49
462	595448.00	4250115.00	UCART1	23.43
463	595498.00	4250115.00	UCART1	23.31
464	595548.00	4250115.00	UCART1	23.24
465	595598.00	4250115.00	UCART1	23.18
466	593398.00	4250165.00	RESIDENT	27.34
467	593448.00	4250165.00	RESIDENT	27.00
468	593498.00	4250165.00	RESIDENT	27.03
469	593548.00	4250165.00	RESIDENT	26.93
470	593598.00	4250165.00	RESIDENT	26.72
471	593648.00	4250165.00	RESIDENT	26.62
472	593698.00	4250165.00	UCART1	26.24
473	593748.00	4250165.00	UCART1	26.39
474	593798.00	4250165.00	UCART1	26.67
475	593848.00	4250165.00	UCART1	26.96
476	593898.00	4250165.00	UCART1	26.15
477	593948.00	4250165.00	UCART1	25.77
478	593998.00	4250165.00	UCART1	25.58
479	594048.00	4250165.00	UCART1	25.49
480	594098.00	4250165.00	UCART1	25.39
481	594148.00	4250165.00	UCART1	25.28
482	594198.00	4250165.00	UCART1	25.17
483	594248.00	4250165.00	UCART1	25.08
484	594298.00	4250165.00	UCART1	24.92
485	594348.00	4250165.00	UCART1	24.88
486	594398.00	4250165.00	UCART1	24.79

487	594448.00	4250165.00	UCART1	24.71
488	594498.00	4250165.00	UCART1	24.61
489	594548.00	4250165.00	UCART1	24.54
490	594598.00	4250165.00	UCART1	24.46
491	594648.00	4250165.00	UCART1	24.39
492	594698.00	4250165.00	UCART1	24.33
493	594748.00	4250165.00	UCART1	24.80
494	594798.00	4250165.00	UCART1	24.71
495	594848.00	4250165.00	RESIDENT	24.65
496	594898.00	4250165.00	RESIDENT	24.89
497	594948.00	4250165.00	RESIDENT	25.19
498	594998.00	4250165.00	UCART1	24.49
499	595048.00	4250165.00	UCART1	24.45
500	595098.00	4250165.00	UCART1	24.27
501	595148.00	4250165.00	UCART1	24.17
502	595198.00	4250165.00	UCART1	24.07
503	595248.00	4250165.00	UCART1	23.89
504	595298.00	4250165.00	UCART1	23.78
505	595348.00	4250165.00	UCART1	23.68
506	595398.00	4250165.00	UCART1	23.57
507	595448.00	4250165.00	UCART1	23.45
508	595498.00	4250165.00	UCART1	23.34
509	595548.00	4250165.00	RESIDENT	23.26
510	595598.00	4250165.00	RESIDENT	23.23
511	593398.00	4250215.00	RESIDENT	27.15
512	593448.00	4250215.00	RESIDENT	27.02
513	593498.00	4250215.00	RESIDENT	26.71
514	593548.00	4250215.00	RESIDENT	26.50
515	593598.00	4250215.00	RESIDENT	26.33
516	593648.00	4250215.00	UCART1	26.18
517	593698.00	4250215.00	UCART1	25.98
518	593748.00	4250215.00	UCART1	25.83
519	593798.00	4250215.00	UCART1	25.94
520	593848.00	4250215.00	UCART1	26.63
521	593898.00	4250215.00	UCART1	26.87
522	593948.00	4250215.00	UCART1	26.24
523	593998.00	4250215.00	UCART1	25.93
524	594048.00	4250215.00	UCART1	25.74

525	594098.00	4250215.00	UCART1	25.71
526	594148.00	4250215.00	UCART1	25.71
527	594198.00	4250215.00	UCART1	25.51
528	594248.00	4250215.00	UCART1	25.51
529	594298.00	4250215.00	UCART1	25.42
530	594348.00	4250215.00	UCART1	25.14
531	594398.00	4250215.00	UCART1	25.05
532	594448.00	4250215.00	UCART1	24.97
533	594498.00	4250215.00	UCART1	24.90
534	594548.00	4250215.00	UCART1	24.82
535	594598.00	4250215.00	UCART1	24.76
536	594648.00	4250215.00	UCART1	24.67
537	594698.00	4250215.00	UCART1	24.84
538	594748.00	4250215.00	UCART1	24.85
539	594798.00	4250215.00	UCART1	24.74
540	594848.00	4250215.00	RESIDENT	24.86
541	594898.00	4250215.00	RESIDENT	25.06
542	594948.00	4250215.00	RESIDENT	24.96
543	594998.00	4250215.00	UCART1	24.58
544	595048.00	4250215.00	UCART1	24.42
545	595098.00	4250215.00	UCART1	24.27
546	595148.00	4250215.00	UCART1	24.13
547	595198.00	4250215.00	UCART1	24.05
548	595248.00	4250215.00	UCART1	23.89
549	595298.00	4250215.00	UCART1	23.84
550	595348.00	4250215.00	UCART1	23.69
551	595398.00	4250215.00	UCART1	23.58
552	595448.00	4250215.00	UCART1	23.45
553	595498.00	4250215.00	UCART1	23.32
554	595548.00	4250215.00	RESIDENT	23.21
555	595598.00	4250215.00	RESIDENT	23.22
556	593398.00	4250265.00	RESIDENT	27.30
557	593448.00	4250265.00	RESIDENT	27.14
558	593498.00	4250265.00	RESIDENT	26.94
559	593548.00	4250265.00	RESIDENT	26.55
560	593598.00	4250265.00	RESIDENT	26.37
561	593648.00	4250265.00	UCART1	26.54
562	593698.00	4250265.00	UCART1	26.49

563	593748.00	4250265.00	UCART1	26.44
564	593798.00	4250265.00	UCART1	26.44
565	593848.00	4250265.00	UCART1	26.81
566	593898.00	4250265.00	UCART1	26.53
567	593948.00	4250265.00	UCART1	26.86
568	593998.00	4250265.00	UCART1	25.65
569	594298.00	4250265.00	UCART1	25.52
570	594348.00	4250265.00	UCART1	25.47
571	594398.00	4250265.00	UCART1	25.44
572	594448.00	4250265.00	UCART1	25.39
573	594498.00	4250265.00	UCART1	25.29
574	594548.00	4250265.00	UCART1	25.21
575	594598.00	4250265.00	UCART1	25.17
576	594648.00	4250265.00	UCART1	25.14
577	594698.00	4250265.00	UCART1	25.06
578	594748.00	4250265.00	UCART1	25.00
579	594798.00	4250265.00	UCART1	24.87
580	594848.00	4250265.00	UCART1	24.79
581	594898.00	4250265.00	UCART1	24.70
582	594948.00	4250265.00	UCART1	24.66
583	594998.00	4250265.00	UCART1	24.61
584	595048.00	4250265.00	UCART1	24.55
585	595098.00	4250265.00	UCART1	24.48
586	595148.00	4250265.00	UCART1	24.43
587	595198.00	4250265.00	UCART1	24.15
588	595248.00	4250265.00	UCART1	23.86
589	595298.00	4250265.00	UCART1	23.80
590	595348.00	4250265.00	UCART1	23.71
591	595398.00	4250265.00	RESIDENT	23.68
592	595448.00	4250265.00	RESIDENT	23.50
593	595498.00	4250265.00	RESIDENT	23.58
594	595548.00	4250265.00	UCART1	23.20
595	595598.00	4250265.00	UCART1	23.18
596	593398.00	4250315.00	RESIDENT	27.41
597	593448.00	4250315.00	RESIDENT	27.21
598	593498.00	4250315.00	RESIDENT	26.79
599	593548.00	4250315.00	RESIDENT	26.62
600	593598.00	4250315.00	RESIDENT	26.46

601	593648.00	4250315.00	UCART1	26.47
602	593698.00	4250315.00	UCART1	26.47
603	593748.00	4250315.00	UCART1	26.54
604	593798.00	4250315.00	UCART1	26.46
605	593848.00	4250315.00	UCART1	26.70
606	593898.00	4250315.00	UCART1	26.53
607	593948.00	4250315.00	UCART1	26.15
608	593998.00	4250315.00	UCART1	26.77
609	594048.00	4250315.00	UCART1	25.80
610	594298.00	4250315.00	UCART1	25.39
611	594348.00	4250315.00	UCART1	25.36
612	594398.00	4250315.00	UCART1	25.33
613	594448.00	4250315.00	UCART1	25.31
614	594498.00	4250315.00	UCART1	25.25
615	594548.00	4250315.00	UCART1	25.16
616	594598.00	4250315.00	UCART1	25.09
617	594648.00	4250315.00	UCART1	25.07
618	594698.00	4250315.00	UCART1	25.04
619	594748.00	4250315.00	UCART1	24.92
620	594798.00	4250315.00	UCART1	24.93
621	594848.00	4250315.00	UCART1	24.84
622	594898.00	4250315.00	UCART1	24.72
623	594948.00	4250315.00	UCART1	24.63
624	594998.00	4250315.00	UCART1	24.54
625	595048.00	4250315.00	UCART1	24.40
626	595098.00	4250315.00	UCART1	24.29
627	595148.00	4250315.00	UCART1	24.21
628	595198.00	4250315.00	UCART1	24.04
629	595248.00	4250315.00	UCART1	23.89
630	595298.00	4250315.00	UCART1	23.81
631	595348.00	4250315.00	UCART1	23.67
632	595398.00	4250315.00	RESIDENT	23.71
633	595448.00	4250315.00	RESIDENT	23.63
634	595498.00	4250315.00	RESIDENT	23.41
635	595548.00	4250315.00	UCART1	23.35
636	595598.00	4250315.00	UCART1	23.17
637	593398.00	4250365.00	RESIDENT	27.16
638	593448.00	4250365.00	RESIDENT	27.17

639	593498.00	4250365.00	RESIDENT	26.83
640	593548.00	4250365.00	RESIDENT	26.64
641	593598.00	4250365.00	RESIDENT	26.44
642	593648.00	4250365.00	UCART1	26.35
643	593698.00	4250365.00	UCART1	26.67
644	593748.00	4250365.00	UCART1	26.46
645	593798.00	4250365.00	UCART1	26.54
646	593848.00	4250365.00	UCART1	25.70
647	593898.00	4250365.00	UCART1	26.47
648	593948.00	4250365.00	UCART1	26.16
649	593998.00	4250365.00	UCART1	25.83
650	594048.00	4250365.00	UCART1	26.74
651	594098.00	4250365.00	UCART1	25.67
652	594298.00	4250365.00	UCART1	25.29
653	594348.00	4250365.00	UCART1	25.29
654	594398.00	4250365.00	UCART1	25.20
655	594448.00	4250365.00	UCART1	25.17
656	594498.00	4250365.00	UCART1	25.13
657	594548.00	4250365.00	UCART1	25.07
658	594598.00	4250365.00	UCART1	25.00
659	594648.00	4250365.00	UCART1	24.95
660	594698.00	4250365.00	UCART1	24.93
661	594748.00	4250365.00	UCART1	24.87
662	594798.00	4250365.00	UCART1	24.88
663	594848.00	4250365.00	UCART1	24.80
664	594898.00	4250365.00	UCART1	24.71
665	594948.00	4250365.00	UCART1	24.60
666	594998.00	4250365.00	UCART1	24.51
667	595048.00	4250365.00	UCART1	24.39
668	595098.00	4250365.00	UCART1	24.31
669	595148.00	4250365.00	UCART1	24.21
670	595198.00	4250365.00	UCART1	24.03
671	595248.00	4250365.00	UCART1	23.90
672	595298.00	4250365.00	UCART1	23.79
673	595348.00	4250365.00	UCART1	23.72
674	595398.00	4250365.00	UCART1	23.64
675	595448.00	4250365.00	UCART1	23.47
676	595498.00	4250365.00	UCART1	23.37

677	595548.00	4250365.00	UCART1	23.41
678	595598.00	4250365.00	UCART1	23.18
679	593398.00	4250415.00	RESIDENT	27.50
680	593448.00	4250415.00	RESIDENT	27.24
681	593498.00	4250415.00	RESIDENT	26.64
682	593548.00	4250415.00	RESIDENT	26.63
683	593598.00	4250415.00	RESIDENT	26.46
684	593648.00	4250415.00	UCART1	26.39
685	593698.00	4250415.00	UCART1	26.67
686	593748.00	4250415.00	UCART1	26.57
687	593798.00	4250415.00	UCART1	27.01
688	593848.00	4250415.00	UCART1	25.42
689	593898.00	4250415.00	UCART1	26.50
690	593948.00	4250415.00	UCART1	25.90
691	593998.00	4250415.00	UCART1	26.08
692	594048.00	4250415.00	UCART1	25.72
693	594098.00	4250415.00	UCART1	26.66
694	594148.00	4250415.00	UCART1	25.69
695	594298.00	4250415.00	UCART1	25.20
696	594348.00	4250415.00	UCART1	25.18
697	594398.00	4250415.00	UCART1	25.12
698	594448.00	4250415.00	UCART1	25.08
699	594498.00	4250415.00	UCART1	25.00
700	594548.00	4250415.00	UCART1	24.98
701	594598.00	4250415.00	UCART1	24.91
702	594648.00	4250415.00	UCART1	24.84
703	594698.00	4250415.00	UCART1	24.80
704	594748.00	4250415.00	UCART1	24.76
705	594798.00	4250415.00	UCART1	24.84
706	594848.00	4250415.00	UCART1	24.77
707	594898.00	4250415.00	UCART1	24.68
708	594948.00	4250415.00	UCART1	24.57
709	594998.00	4250415.00	UCART1	24.50
710	595048.00	4250415.00	UCART1	24.38
711	595098.00	4250415.00	UCART1	24.28
712	595148.00	4250415.00	UCART1	24.21
713	595198.00	4250415.00	UCART1	24.11
714	595248.00	4250415.00	RESIDENT	23.89

715	595298.00	4250415.00	RESIDENT	23.78
716	595348.00	4250415.00	RESIDENT	23.70
717	595398.00	4250415.00	RESIDENT	23.66
718	595448.00	4250415.00	RESIDENT	23.48
719	595498.00	4250415.00	RESIDENT	23.39
720	595548.00	4250415.00	UCART1	23.38
721	595598.00	4250415.00	UCART1	23.16
722	593398.00	4250465.00	RESIDENT	27.64
723	593448.00	4250465.00	RESIDENT	27.19
724	593498.00	4250465.00	RESIDENT	26.74
725	593548.00	4250465.00	RESIDENT	26.80
726	593598.00	4250465.00	RESIDENT	26.66
727	593648.00	4250465.00	UCART1	26.50
728	593698.00	4250465.00	UCART1	26.51
729	593748.00	4250465.00	UCART1	26.47
730	593798.00	4250465.00	UCART1	27.14
731	593848.00	4250465.00	UCART1	25.44
732	593898.00	4250465.00	UCART1	26.45
733	593948.00	4250465.00	UCART1	26.13
734	593998.00	4250465.00	UCART1	26.20
735	594048.00	4250465.00	UCART1	26.24
736	594098.00	4250465.00	UCART1	25.65
737	594148.00	4250465.00	UCART1	26.62
738	594198.00	4250465.00	UCART1	25.60
739	594298.00	4250465.00	UCART1	25.07
740	594348.00	4250465.00	UCART1	25.08
741	594398.00	4250465.00	UCART1	25.05
742	594448.00	4250465.00	UCART1	24.99
743	594498.00	4250465.00	UCART1	24.92
744	594548.00	4250465.00	UCART1	24.86
745	594598.00	4250465.00	UCART1	24.77
746	594648.00	4250465.00	UCART1	24.72
747	594698.00	4250465.00	UCART1	24.69
748	594748.00	4250465.00	UCART1	24.65
749	594798.00	4250465.00	UCART1	24.82
750	594848.00	4250465.00	UCART1	24.75
751	594898.00	4250465.00	UCART1	24.62
752	594948.00	4250465.00	UCART1	24.53

753	594998.00	4250465.00	UCART1	24.45
754	595048.00	4250465.00	UCART1	24.34
755	595098.00	4250465.00	UCART1	24.26
756	595148.00	4250465.00	UCART1	24.18
757	595198.00	4250465.00	UCART1	24.15
758	595248.00	4250465.00	RESIDENT	23.98
759	595298.00	4250465.00	RESIDENT	24.72
760	595348.00	4250465.00	RESIDENT	23.85
761	595398.00	4250465.00	RESIDENT	23.77
762	595448.00	4250465.00	RESIDENT	23.61
763	595498.00	4250465.00	RESIDENT	23.37
764	595548.00	4250465.00	UCART1	23.37
765	595598.00	4250465.00	UCART1	23.10
766	593398.00	4250515.00	RESIDENT	27.83
767	593448.00	4250515.00	RESIDENT	27.28
768	593498.00	4250515.00	RESIDENT	27.02
769	593548.00	4250515.00	RESIDENT	26.73
770	593598.00	4250515.00	RESIDENT	26.75
771	593648.00	4250515.00	UCART1	26.42
772	593698.00	4250515.00	UCART1	26.45
773	593748.00	4250515.00	UCART1	26.64
774	593798.00	4250515.00	UCART1	26.59
775	593848.00	4250515.00	UCART1	26.46
776	593898.00	4250515.00	UCART1	26.32
777	593948.00	4250515.00	UCART1	26.25
778	593998.00	4250515.00	UCART1	26.11
779	594048.00	4250515.00	UCART1	26.13
780	594098.00	4250515.00	UCART1	26.03
781	594148.00	4250515.00	UCART1	25.60
782	594198.00	4250515.00	UCART1	26.58
783	594248.00	4250515.00	UCART1	25.58
784	594298.00	4250515.00	UCART1	25.69
785	594348.00	4250515.00	UCART1	25.67
786	594398.00	4250515.00	UCART1	25.66
787	594448.00	4250515.00	UCART1	25.61
788	594498.00	4250515.00	UCART1	25.54
789	594548.00	4250515.00	UCART1	25.47
790	594598.00	4250515.00	UCART1	25.46

791	594648.00	4250515.00	UCART1	25.37
792	594698.00	4250515.00	UCART1	25.30
793	594748.00	4250515.00	UCART1	25.24
794	594798.00	4250515.00	UCART1	24.79
795	594848.00	4250515.00	UCART1	24.67
796	594898.00	4250515.00	UCART1	24.59
797	594948.00	4250515.00	UCART1	24.47
798	594998.00	4250515.00	UCART1	24.36
799	595048.00	4250515.00	UCART1	24.30
800	595098.00	4250515.00	UCART1	24.21
801	595148.00	4250515.00	UCART1	24.13
802	595198.00	4250515.00	UCART1	24.16
803	595248.00	4250515.00	RESIDENT	23.92
804	595298.00	4250515.00	RESIDENT	23.72
805	595348.00	4250515.00	RESIDENT	23.76
806	595398.00	4250515.00	RESIDENT	23.57
807	595448.00	4250515.00	RESIDENT	23.54
808	595498.00	4250515.00	RESIDENT	23.54
809	595548.00	4250515.00	UCART1	23.41
810	595598.00	4250515.00	UCART1	23.07
811	593398.00	4250565.00	RESIDENT	27.79
812	593448.00	4250565.00	RESIDENT	27.47
813	593498.00	4250565.00	RESIDENT	27.16
814	593548.00	4250565.00	RESIDENT	27.03
815	593598.00	4250565.00	RESIDENT	26.88
816	593648.00	4250565.00	RESIDENT	26.41
817	593698.00	4250565.00	RESIDENT	26.43
818	593748.00	4250565.00	RESIDENT	26.52
819	593798.00	4250565.00	UCART1	26.45
820	593848.00	4250565.00	UCART1	26.38
821	593898.00	4250565.00	UCART1	26.26
822	593948.00	4250565.00	UCART1	26.36
823	593998.00	4250565.00	UCART1	25.74
824	594048.00	4250565.00	UCART1	26.44
825	594098.00	4250565.00	UCART1	26.32
826	594148.00	4250565.00	UCART1	26.10
827	594198.00	4250565.00	UCART1	25.65
828	594248.00	4250565.00	UCART1	26.52

829	594298.00	4250565.00	UCART1	25.69
830	594348.00	4250565.00	UCART1	25.55
831	594398.00	4250565.00	UCART1	25.52
832	594448.00	4250565.00	UCART1	25.44
833	594498.00	4250565.00	UCART1	25.37
834	594548.00	4250565.00	UCART1	25.31
835	594598.00	4250565.00	UCART1	25.25
836	594648.00	4250565.00	UCART1	25.24
837	594698.00	4250565.00	UCART1	25.13
838	594748.00	4250565.00	UCART1	25.15
839	594798.00	4250565.00	UCART1	24.73
840	594848.00	4250565.00	UCART1	24.63
841	594898.00	4250565.00	UCART1	24.50
842	594948.00	4250565.00	UCART1	24.40
843	594998.00	4250565.00	UCART1	24.29
844	595048.00	4250565.00	UCART1	24.20
845	595098.00	4250565.00	UCART1	24.11
846	595148.00	4250565.00	UCART1	24.04
847	595198.00	4250565.00	UCART1	24.09
848	595248.00	4250565.00	UCART1	23.86
849	595298.00	4250565.00	UCART1	23.74
850	595348.00	4250565.00	UCART1	23.66
851	595398.00	4250565.00	UCART1	23.53
852	595448.00	4250565.00	UCART1	23.45
853	595498.00	4250565.00	UCART1	23.41
854	595548.00	4250565.00	UCART1	23.34
855	595598.00	4250565.00	UCART1	23.04
856	593398.00	4250615.00	RESIDENT	27.52
857	593448.00	4250615.00	RESIDENT	27.44
858	593498.00	4250615.00	RESIDENT	27.32
859	593548.00	4250615.00	RESIDENT	27.23
860	593598.00	4250615.00	RESIDENT	27.14
861	593648.00	4250615.00	RESIDENT	26.77
862	593698.00	4250615.00	RESIDENT	26.70
863	593748.00	4250615.00	RESIDENT	26.48
864	593798.00	4250615.00	UCART1	26.45
865	593848.00	4250615.00	UCART1	26.36
866	593898.00	4250615.00	UCART1	26.18

867	593948.00	4250615.00	UCART1	26.89
868	593998.00	4250615.00	UCART1	26.62
869	594048.00	4250615.00	UCART1	26.04
870	594098.00	4250615.00	UCART1	26.27
871	594148.00	4250615.00	UCART1	26.07
872	594198.00	4250615.00	UCART1	26.10
873	594248.00	4250615.00	UCART1	25.80
874	594298.00	4250615.00	UCART1	26.46
875	594348.00	4250615.00	UCART1	25.42
876	594398.00	4250615.00	UCART1	25.40
877	594448.00	4250615.00	UCART1	25.30
878	594498.00	4250615.00	UCART1	25.23
879	594548.00	4250615.00	UCART1	25.19
880	594598.00	4250615.00	UCART1	25.18
881	594648.00	4250615.00	UCART1	25.15
882	594698.00	4250615.00	UCART1	25.02
883	594748.00	4250615.00	UCART1	25.04
884	594798.00	4250615.00	UCART1	24.69
885	594848.00	4250615.00	UCART1	24.59
886	594898.00	4250615.00	UCART1	24.46
887	594948.00	4250615.00	UCART1	24.36
888	594998.00	4250615.00	UCART1	24.27
889	595048.00	4250615.00	UCART1	24.15
890	595098.00	4250615.00	UCART1	24.03
891	595148.00	4250615.00	UCART1	23.95
892	595198.00	4250615.00	RESIDENT	23.98
893	595248.00	4250615.00	RESIDENT	23.84
894	595298.00	4250615.00	RESIDENT	23.74
895	595348.00	4250615.00	RESIDENT	23.65
896	595398.00	4250615.00	RESIDENT	23.54
897	595448.00	4250615.00	RESIDENT	23.44
898	595498.00	4250615.00	RESIDENT	23.32
899	595548.00	4250615.00	UCART1	23.29
900	595598.00	4250615.00	UCART1	23.05
901	593398.00	4250665.00	RESIDENT	27.54
902	593448.00	4250665.00	RESIDENT	27.40
903	593498.00	4250665.00	RESIDENT	27.31
904	593548.00	4250665.00	RESIDENT	27.13

905	593598.00	4250665.00	RESIDENT	27.04
906	593648.00	4250665.00	RESIDENT	27.10
907	593698.00	4250665.00	RESIDENT	26.87
908	593748.00	4250665.00	RESIDENT	26.60
909	593798.00	4250665.00	UCART1	26.53
910	593848.00	4250665.00	UCART1	26.46
911	593898.00	4250665.00	UCART1	26.39
912	593948.00	4250665.00	UCART1	27.34
913	593998.00	4250665.00	UCART1	26.88
914	594048.00	4250665.00	UCART1	26.49
915	594098.00	4250665.00	UCART1	26.48
916	594148.00	4250665.00	UCART1	26.21
917	594198.00	4250665.00	UCART1	26.10
918	594248.00	4250665.00	UCART1	26.02
919	594298.00	4250665.00	UCART1	25.69
920	594348.00	4250665.00	UCART1	26.41
921	594398.00	4250665.00	UCART1	25.36
922	594448.00	4250665.00	UCART1	25.18
923	594498.00	4250665.00	UCART1	25.14
924	594548.00	4250665.00	UCART1	25.09
925	594598.00	4250665.00	UCART1	25.11
926	594648.00	4250665.00	UCART1	25.03
927	594698.00	4250665.00	UCART1	24.93
928	594748.00	4250665.00	UCART1	24.91
929	594798.00	4250665.00	UCART1	24.66
930	594848.00	4250665.00	UCART1	24.54
931	594898.00	4250665.00	UCART1	24.46
932	594948.00	4250665.00	UCART1	24.33
933	594998.00	4250665.00	UCART1	24.22
934	595048.00	4250665.00	UCART1	24.14
935	595098.00	4250665.00	UCART1	24.01
936	595148.00	4250665.00	UCART1	23.92
937	595198.00	4250665.00	RESIDENT	23.91
938	595248.00	4250665.00	RESIDENT	23.58
939	595298.00	4250665.00	RESIDENT	23.42
940	595348.00	4250665.00	RESIDENT	23.92
941	595398.00	4250665.00	RESIDENT	23.89
942	595448.00	4250665.00	RESIDENT	23.69

943	595498.00	4250665.00	RESIDENT	23.63
944	595548.00	4250665.00	UCART1	23.19
945	595598.00	4250665.00	UCART1	23.09
946	593398.00	4250715.00	RESIDENT	27.60
947	593448.00	4250715.00	RESIDENT	27.45
948	593498.00	4250715.00	RESIDENT	27.28
949	593548.00	4250715.00	RESIDENT	27.31
950	593598.00	4250715.00	RESIDENT	27.40
951	593648.00	4250715.00	RESIDENT	26.97
952	593698.00	4250715.00	RESIDENT	26.92
953	593748.00	4250715.00	RESIDENT	26.54
954	593798.00	4250715.00	UCART1	26.55
955	593848.00	4250715.00	UCART1	26.49
956	593898.00	4250715.00	UCART1	26.39
957	593948.00	4250715.00	UCART1	26.46
958	593998.00	4250715.00	UCART1	26.39
959	594048.00	4250715.00	UCART1	26.26
960	594098.00	4250715.00	UCART1	26.46
961	594148.00	4250715.00	UCART1	26.38
962	594198.00	4250715.00	UCART1	26.48
963	594248.00	4250715.00	UCART1	26.12
964	594298.00	4250715.00	UCART1	25.99
965	594348.00	4250715.00	UCART1	25.51
966	594398.00	4250715.00	UCART1	26.34
967	594448.00	4250715.00	UCART1	25.13
968	594498.00	4250715.00	UCART1	25.00
969	594548.00	4250715.00	UCART1	24.98
970	594598.00	4250715.00	UCART1	24.95
971	594648.00	4250715.00	UCART1	24.93
972	594698.00	4250715.00	UCART1	24.84
973	594748.00	4250715.00	UCART1	24.78
974	594798.00	4250715.00	UCART1	24.64
975	594848.00	4250715.00	UCART1	24.48
976	594898.00	4250715.00	UCART1	24.38
977	594948.00	4250715.00	UCART1	24.27
978	594998.00	4250715.00	UCART1	24.15
979	595048.00	4250715.00	UCART1	24.06
980	595098.00	4250715.00	UCART1	23.94

981	595148.00	4250715.00	UCART1	23.88
982	595198.00	4250715.00	RESIDENT	23.78
983	595248.00	4250715.00	RESIDENT	23.28
984	595298.00	4250715.00	RESIDENT	23.01
985	595348.00	4250715.00	RESIDENT	23.46
986	595398.00	4250715.00	RESIDENT	23.64
987	595448.00	4250715.00	RESIDENT	23.43
988	595498.00	4250715.00	RESIDENT	23.42
989	595548.00	4250715.00	UCART1	23.33
990	595598.00	4250715.00	UCART1	21.31
991	593398.00	4250765.00	RESIDENT	27.64
992	593448.00	4250765.00	RESIDENT	27.50
993	593498.00	4250765.00	RESIDENT	27.44
994	593548.00	4250765.00	RESIDENT	27.53
995	593598.00	4250765.00	RESIDENT	27.25
996	593648.00	4250765.00	RESIDENT	26.93
997	593698.00	4250765.00	RESIDENT	26.90
998	593748.00	4250765.00	RESIDENT	26.65
999	593798.00	4250765.00	UCART1	26.56
1,000	593848.00	4250765.00	UCART1	26.49
1,001	593898.00	4250765.00	UCART1	26.37
1,002	593948.00	4250765.00	UCART1	26.57
1,003	593998.00	4250765.00	UCART1	26.42
1,004	594048.00	4250765.00	UCART1	26.24
1,005	594098.00	4250765.00	UCART1	26.56
1,006	594148.00	4250765.00	UCART1	26.34
1,007	594198.00	4250765.00	UCART1	26.58
1,008	594248.00	4250765.00	UCART1	26.25
1,009	594298.00	4250765.00	UCART1	26.19
1,010	594348.00	4250765.00	UCART1	25.87
1,011	594398.00	4250765.00	UCART1	25.24
1,012	594448.00	4250765.00	UCART1	26.28
1,013	594498.00	4250765.00	UCART1	25.01
1,014	594548.00	4250765.00	UCART1	24.84
1,015	594598.00	4250765.00	UCART1	24.81
1,016	594648.00	4250765.00	UCART1	24.79
1,017	594698.00	4250765.00	UCART1	24.75
1,018	594748.00	4250765.00	UCART1	24.68

1,019	594798.00	4250765.00	UCART1	24.55
1,020	594848.00	4250765.00	UCART1	24.39
1,021	594898.00	4250765.00	UCART1	24.29
1,022	594948.00	4250765.00	UCART1	24.19
1,023	594998.00	4250765.00	UCART1	24.10
1,024	595048.00	4250765.00	UCART1	24.00
1,025	595098.00	4250765.00	UCART1	23.89
1,026	595148.00	4250765.00	UCART1	23.81
1,027	595198.00	4250765.00	UCART1	23.53
1,028	595248.00	4250765.00	UCART1	23.80
1,029	595298.00	4250765.00	UCART1	23.84
1,030	595348.00	4250765.00	UCART1	23.45
1,031	595398.00	4250765.00	UCART1	21.44
1,032	595448.00	4250765.00	UCART1	22.54
1,033	595498.00	4250765.00	UCART1	23.31
1,034	595548.00	4250765.00	UCART1	23.62
1,035	595598.00	4250765.00	UCART1	23.49
1,036	593398.00	4250815.00	RESIDENT	27.51
1,037	593448.00	4250815.00	RESIDENT	27.35
1,038	593498.00	4250815.00	RESIDENT	27.37
1,039	593548.00	4250815.00	RESIDENT	27.35
1,040	593598.00	4250815.00	RESIDENT	27.04
1,041	593648.00	4250815.00	RESIDENT	26.86
1,042	593698.00	4250815.00	RESIDENT	26.79
1,043	593748.00	4250815.00	RESIDENT	26.69
1,044	593798.00	4250815.00	UCART1	26.67
1,045	593848.00	4250815.00	UCART1	26.60
1,046	593898.00	4250815.00	UCART1	26.52
1,047	593948.00	4250815.00	UCART1	26.58
1,048	593998.00	4250815.00	UCART1	26.50
1,049	594048.00	4250815.00	UCART1	26.04
1,050	594098.00	4250815.00	UCART1	26.57
1,051	594148.00	4250815.00	UCART1	26.41
1,052	594198.00	4250815.00	UCART1	26.54
1,053	594248.00	4250815.00	UCART1	26.32
1,054	594298.00	4250815.00	UCART1	26.27
1,055	594348.00	4250815.00	UCART1	25.29
1,056	594398.00	4250815.00	UCART1	25.24

1,057	594448.00	4250815.00	UCART1	25.47
1,058	594498.00	4250815.00	UCART1	26.25
1,059	594548.00	4250815.00	UCART1	25.02
1,060	594598.00	4250815.00	UCART1	24.66
1,061	594648.00	4250815.00	UCART1	24.65
1,062	594698.00	4250815.00	UCART1	24.58
1,063	594748.00	4250815.00	UCART1	24.53
1,064	594798.00	4250815.00	UCART1	24.51
1,065	594848.00	4250815.00	UCART1	24.41
1,066	594898.00	4250815.00	UCART1	24.29
1,067	594948.00	4250815.00	UCART1	24.17
1,068	594998.00	4250815.00	UCART1	24.02
1,069	595048.00	4250815.00	UCART1	23.91
1,070	595098.00	4250815.00	UCART1	23.83
1,071	595148.00	4250815.00	UCART1	23.60
1,072	595198.00	4250815.00	UCART1	21.64
1,073	595248.00	4250815.00	UCART1	23.36
1,074	595298.00	4250815.00	UCART1	23.92
1,075	595348.00	4250815.00	UCART1	23.86
1,076	595398.00	4250815.00	UCART1	23.75
1,077	595448.00	4250815.00	UCART1	23.67
1,078	595498.00	4250815.00	UCART1	23.53
1,079	595548.00	4250815.00	UCART1	23.53
1,080	595598.00	4250815.00	UCART1	23.50
1,081	593398.00	4250865.00	RESIDENT	27.47
1,082	593448.00	4250865.00	RESIDENT	27.40
1,083	593498.00	4250865.00	RESIDENT	27.19
1,084	593548.00	4250865.00	RESIDENT	27.17
1,085	593598.00	4250865.00	RESIDENT	27.05
1,086	593648.00	4250865.00	RESIDENT	27.00
1,087	593698.00	4250865.00	RESIDENT	26.92
1,088	593748.00	4250865.00	RESIDENT	26.73
1,089	593798.00	4250865.00	UCART1	26.65
1,090	593848.00	4250865.00	UCART1	26.66
1,091	593898.00	4250865.00	UCART1	26.45
1,092	593948.00	4250865.00	UCART1	26.58
1,093	593998.00	4250865.00	UCART1	25.97
1,094	594048.00	4250865.00	UCART1	25.80

1,095	594098.00	4250865.00	UCART1	26.40
1,096	594148.00	4250865.00	UCART1	26.39
1,097	594198.00	4250865.00	UCART1	26.39
1,098	594248.00	4250865.00	UCART1	26.28
1,099	594298.00	4250865.00	UCART1	26.13
1,100	594348.00	4250865.00	UCART1	25.54
1,101	594398.00	4250865.00	UCART1	25.26
1,102	594448.00	4250865.00	UCART1	25.98
1,103	594498.00	4250865.00	UCART1	25.67
1,104	594548.00	4250865.00	UCART1	26.02
1,105	594598.00	4250865.00	UCART1	23.96
1,106	594648.00	4250865.00	UCART1	23.67
1,107	594698.00	4250865.00	UCART1	23.32
1,108	594748.00	4250865.00	UCART1	22.93
1,109	594798.00	4250865.00	UCART1	23.17
1,110	594848.00	4250865.00	UCART1	24.11
1,111	594898.00	4250865.00	UCART1	24.42
1,112	594948.00	4250865.00	UCART1	24.29
1,113	594998.00	4250865.00	UCART1	24.12
1,114	595048.00	4250865.00	UCART1	24.13
1,115	595098.00	4250865.00	UCART1	24.18
1,116	595148.00	4250865.00	UCART1	24.18
1,117	595198.00	4250865.00	UCART1	24.29
1,118	595248.00	4250865.00	UCART1	24.22
1,119	595298.00	4250865.00	UCART1	24.13
1,120	595348.00	4250865.00	UCART1	24.02
1,121	595398.00	4250865.00	UCART1	23.81
1,122	595448.00	4250865.00	UCART1	23.70
1,123	595498.00	4250865.00	UCART1	23.69
1,124	595548.00	4250865.00	RESIDENT	23.69
1,125	595598.00	4250865.00	RESIDENT	23.60
1,126	593398.00	4250915.00	RESIDENT	27.47
1,127	593448.00	4250915.00	RESIDENT	27.44
1,128	593498.00	4250915.00	RESIDENT	27.36
1,129	593548.00	4250915.00	RESIDENT	27.20
1,130	593598.00	4250915.00	RESIDENT	27.08
1,131	593648.00	4250915.00	RESIDENT	27.23
1,132	593698.00	4250915.00	RESIDENT	26.97

1,133	593748.00	4250915.00	RESIDENT	26.84
1,134	593798.00	4250915.00	UCART1	26.68
1,135	593848.00	4250915.00	UCART1	26.59
1,136	593898.00	4250915.00	UCART1	26.38
1,137	593948.00	4250915.00	UCART1	26.14
1,138	593998.00	4250915.00	UCART1	26.24
1,139	594048.00	4250915.00	UCART1	26.23
1,140	594098.00	4250915.00	UCART1	26.25
1,141	594148.00	4250915.00	UCART1	26.35
1,142	594198.00	4250915.00	UCART1	26.31
1,143	594248.00	4250915.00	UCART1	26.27
1,144	594298.00	4250915.00	UCART1	26.14
1,145	594348.00	4250915.00	UCART1	26.25
1,146	594398.00	4250915.00	UCART1	26.12
1,147	594448.00	4250915.00	UCART1	25.86
1,148	594498.00	4250915.00	UCART1	25.41
1,149	594548.00	4250915.00	UCART1	23.50
1,150	594598.00	4250915.00	UCART1	26.18
1,151	594648.00	4250915.00	UCART1	24.93
1,152	594698.00	4250915.00	UCART1	24.54
1,153	594748.00	4250915.00	UCART1	24.76
1,154	594798.00	4250915.00	UCART1	24.48
1,155	594848.00	4250915.00	UCART1	24.72
1,156	594898.00	4250915.00	UCART1	24.47
1,157	594948.00	4250915.00	UCART1	24.29
1,158	594998.00	4250915.00	UCART1	24.26
1,159	595048.00	4250915.00	UCART1	24.22
1,160	595098.00	4250915.00	UCART1	24.22
1,161	595148.00	4250915.00	UCART1	24.29
1,162	595198.00	4250915.00	UCART1	24.49
1,163	595248.00	4250915.00	UCART1	24.39
1,164	595298.00	4250915.00	UCART1	24.35
1,165	595348.00	4250915.00	UCART1	24.29
1,166	595398.00	4250915.00	UCART1	24.15
1,167	595448.00	4250915.00	UCART1	24.02
1,168	595498.00	4250915.00	UCART1	23.83
1,169	595548.00	4250915.00	RESIDENT	23.85
1,170	595598.00	4250915.00	RESIDENT	23.77

1,171	593398.00	4250965.00	RESIDENT	27.44
1,172	593448.00	4250965.00	RESIDENT	27.40
1,173	593498.00	4250965.00	RESIDENT	27.28
1,174	593548.00	4250965.00	RESIDENT	27.22
1,175	593598.00	4250965.00	RESIDENT	27.07
1,176	593648.00	4250965.00	RESIDENT	27.35
1,177	593698.00	4250965.00	RESIDENT	26.95
1,178	593748.00	4250965.00	RESIDENT	26.82
1,179	593798.00	4250965.00	UCART1	26.60
1,180	593848.00	4250965.00	UCART1	26.52
1,181	593898.00	4250965.00	UCART1	26.32
1,182	593948.00	4250965.00	UCART1	26.23
1,183	593998.00	4250965.00	UCART1	26.30
1,184	594048.00	4250965.00	UCART1	26.02
1,185	594098.00	4250965.00	UCART1	26.03
1,186	594148.00	4250965.00	UCART1	26.31
1,187	594198.00	4250965.00	UCART1	26.32
1,188	594248.00	4250965.00	UCART1	26.25
1,189	594298.00	4250965.00	UCART1	26.16
1,190	594348.00	4250965.00	UCART1	26.13
1,191	594398.00	4250965.00	UCART1	25.99
1,192	594448.00	4250965.00	UCART1	25.65
1,193	594498.00	4250965.00	UCART1	25.13
1,194	594548.00	4250965.00	UCART1	23.48
1,195	594598.00	4250965.00	UCART1	25.97
1,196	594648.00	4250965.00	UCART1	26.28
1,197	594698.00	4250965.00	UCART1	25.05
1,198	594748.00	4250965.00	UCART1	24.86
1,199	594798.00	4250965.00	UCART1	24.57
1,200	594848.00	4250965.00	UCART1	24.71
1,201	594898.00	4250965.00	UCART1	24.50
1,202	594948.00	4250965.00	UCART1	24.44
1,203	594998.00	4250965.00	UCART1	24.40
1,204	595048.00	4250965.00	UCART1	24.33
1,205	595098.00	4250965.00	UCART1	24.35
1,206	595148.00	4250965.00	UCART1	24.36
1,207	595198.00	4250965.00	UCART1	24.61
1,208	595248.00	4250965.00	UCART1	24.42

1,209	595298.00	4250965.00	UCART1	24.23
1,210	595348.00	4250965.00	UCART1	24.17
1,211	595398.00	4250965.00	UCART1	24.28
1,212	595448.00	4250965.00	UCART1	24.20
1,213	595498.00	4250965.00	UCART1	24.02
1,214	595548.00	4250965.00	RESIDENT	23.99
1,215	595598.00	4250965.00	RESIDENT	23.85
1,216	593398.00	4251015.00	UCART1	27.73
1,217	593448.00	4251015.00	UCART1	27.68
1,218	593498.00	4251015.00	UCART1	27.63
1,219	593548.00	4251015.00	UCART1	27.56
1,220	593598.00	4251015.00	UCART1	27.63
1,221	593648.00	4251015.00	RESIDENT	27.26
1,222	593698.00	4251015.00	RESIDENT	26.77
1,223	593748.00	4251015.00	RESIDENT	26.67
1,224	593798.00	4251015.00	UCART1	26.46
1,225	593848.00	4251015.00	UCART1	26.49
1,226	593898.00	4251015.00	UCART1	26.57
1,227	593948.00	4251015.00	UCART1	26.19
1,228	593998.00	4251015.00	UCART1	26.00
1,229	594048.00	4251015.00	UCART1	26.28
1,230	594098.00	4251015.00	UCART1	26.40
1,231	594148.00	4251015.00	UCART1	25.86
1,232	594198.00	4251015.00	UCART1	25.54
1,233	594248.00	4251015.00	UCART1	25.49
1,234	594298.00	4251015.00	UCART1	25.40
1,235	594348.00	4251015.00	UCART1	25.14
1,236	594398.00	4251015.00	UCART1	25.20
1,237	594448.00	4251015.00	UCART1	25.61
1,238	594498.00	4251015.00	UCART1	25.18
1,239	594548.00	4251015.00	UCART1	25.13
1,240	594598.00	4251015.00	UCART1	25.29
1,241	594648.00	4251015.00	UCART1	26.01
1,242	594698.00	4251015.00	UCART1	26.26
1,243	594748.00	4251015.00	UCART1	24.81
1,244	594798.00	4251015.00	UCART1	24.89
1,245	594848.00	4251015.00	UCART1	24.90
1,246	594898.00	4251015.00	UCART1	24.85

1,247	594948.00	4251015.00	UCART1	25.03
1,248	594998.00	4251015.00	UCART1	24.93
1,249	595048.00	4251015.00	UCART1	24.59
1,250	595098.00	4251015.00	UCART1	24.56
1,251	595148.00	4251015.00	UCART1	24.54
1,252	595198.00	4251015.00	UCART1	24.48
1,253	595248.00	4251015.00	UCART1	24.34
1,254	595298.00	4251015.00	UCART1	24.15
1,255	595348.00	4251015.00	UCART1	23.99
1,256	595398.00	4251015.00	UCART1	24.13
1,257	595448.00	4251015.00	UCART1	24.03
1,258	595498.00	4251015.00	UCART1	24.02
1,259	595548.00	4251015.00	RESIDENT	23.99
1,260	595598.00	4251015.00	RESIDENT	23.75
1,261	593398.00	4251065.00	UCART1	27.62
1,262	593448.00	4251065.00	UCART1	27.52
1,263	593498.00	4251065.00	UCART1	27.58
1,264	593548.00	4251065.00	UCART1	27.39
1,265	593598.00	4251065.00	UCART1	26.95
1,266	593648.00	4251065.00	UCART1	27.19
1,267	593698.00	4251065.00	UCART1	26.93
1,268	593748.00	4251065.00	UCART1	26.63
1,269	593798.00	4251065.00	UCART1	26.70
1,270	593848.00	4251065.00	UCART1	26.85
1,271	593898.00	4251065.00	UCART1	26.66
1,272	593948.00	4251065.00	UCART1	25.46
1,273	593998.00	4251065.00	UCART1	26.50
1,274	594048.00	4251065.00	UCART1	26.31
1,275	594098.00	4251065.00	UCART1	26.33
1,276	594148.00	4251065.00	UCART1	25.78
1,277	594198.00	4251065.00	UCART1	25.21
1,278	594248.00	4251065.00	UCART1	24.49
1,279	594298.00	4251065.00	UCART1	24.30
1,280	594348.00	4251065.00	UCART1	25.21
1,281	594398.00	4251065.00	UCART1	25.33
1,282	594448.00	4251065.00	UCART1	23.80
1,283	594498.00	4251065.00	UCART1	25.24
1,284	594548.00	4251065.00	UCART1	24.89

1,285	594598.00	4251065.00	UCART1	25.42	
1,286	594648.00	4251065.00	UCART1	25.07	
1,287	594698.00	4251065.00	UCART1	25.71	
1,288	594748.00	4251065.00	UCART1	26.18	
1,289	594798.00	4251065.00	UCART1	25.83	
1,290	594848.00	4251065.00	UCART1	24.72	
1,291	594898.00	4251065.00	UCART1	25.13	
1,292	594948.00	4251065.00	UCART1	25.29	
1,293	594998.00	4251065.00	UCART1	24.96	
1,294	595048.00	4251065.00	UCART1	24.62	
1,295	595098.00	4251065.00	UCART1	24.38	
1,296	595148.00	4251065.00	UCART1	24.27	
1,297	595198.00	4251065.00	UCART1	24.13	
1,298	595248.00	4251065.00	UCART1	23.99	
1,299	595298.00	4251065.00	UCART1	23.89	
1,300	595348.00	4251065.00	UCART1	23.79	
1,301	595398.00	4251065.00	UCART1	23.76	
1,302	595448.00	4251065.00	UCART1	23.68	
1,303	595498.00	4251065.00	UCART1	23.73	
1,304	595548.00	4251065.00	UCART1	23.60	
1,305	595598.00	4251065.00	UCART1	23.18	

Plant Boundary Receptors

Cartesian Plant Boundary

Primary

Record Number	X-Coordinate [m]	Y-Coordinate [m]	Group Name (Optional)	Terrain Elevations	Flagpole Heights [m] (Optional)
1	593974.94	4250223.06	FENCEPRI	26.05	
2	594250.36	4250491.04	FENCEPRI	25.59	
3	594274.63	4250467.76	FENCEPRI	25.09	
4	594275.12	4250229.50	FENCEPRI	25.29	

Intermediate

Record Number	X-Coordinate [m]	Y-Coordinate [m]	Group Name (Optional)	Terrain Elevations	Flagpole Heights [m] (Optional)
1	594009.37	4250256.56	FENCEINT	26.09	
2	594043.80	4250290.06	FENCEINT	26.05	
3	594078.22	4250323.55	FENCEINT	25.98	
4	594112.65	4250357.05	FENCEINT	25.82	
5	594147.08	4250390.55	FENCEINT	25.75	

6	594181.51	4250424.05	FENCEINT	25.63	
7	594215.93	4250457.54	FENCEINT	25.53	
8	594274.73	4250420.11	FENCEINT	25.19	
9	594274.83	4250372.46	FENCEINT	25.27	
10	594274.92	4250324.80	FENCEINT	25.39	
11	594275.02	4250277.15	FENCEINT	25.52	
12	594232.24	4250228.58	FENCEINT	25.33	
13	594189.35	4250227.66	FENCEINT	25.60	
14	594146.47	4250226.74	FENCEINT	25.78	
15	594103.59	4250225.82	FENCEINT	25.79	
16	594060.71	4250224.90	FENCEINT	25.74	
17	594017.82	4250223.98	FENCEINT	25.80	

Receptor Groups

Record Number	Group ID	Group Description
1	FENCEPRI	Cartesian plant boundary Primary Receptors
2	FENCEINT	Cartesian plant boundary Intermediate Receptors
3	RESIDENT	Receptors generated from Uniform Cartesian Grid
4	UCART1	Receptors generated from Uniform Cartesian Grid
5	Freeway	Freeway Receptors

Meteorology Pathway

Met Input Data

Surface Met Data

Filename: 724828_2017-2021_AdjU.sfc
Format Type: Default AERMET format

Profile Met Data

Filename: 724828_2017-2021_AdjU.PFL
Format Type: Default AERMET format

Wind Speed

☐ Wind Speeds are Vector Mean (Not Scalar Means)

Wind Direction

Rotation Adjustment [deg]:

Potential Temperature Profile

Base Elevation above MSL (for Primary Met Tower): 10.00 [m]

Meteorological Station Data

Stations	Station No.	Year	X Coordinate [m]	Y Coordinate [m]	Station Name
Surface Upper Air		2017 2017			OAKLAND/WSO AP

Data Period

Data Period to Process

Start Date: 1/1/2017 Start Hour: 1 End Date: 12/31/2021 End Hour: 24

Wind Speed Categories

Stability Category	Wind Speed [m/s]	Stability Category	Wind Speed [m/s]
A	1.54	D	8.23
B	3.09	E	10.8
C	5.14	F	No Upper Bound

Output Pathway

Tabular Printed Outputs

Short Term Averaging Period	RECTABLE Highest Values Table										MAXTABLE Maximum Values Table	DAYTABLE Daily Values Table
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
1	☑	☐	☐	☐	☐	☐	☐	☑	☐	☐		No

Contour Plot Files (PLOTFILE)

Path for PLOTFILES: VACA ARGES HCA BULDING UNITIZED_3.AD

Averaging Period	Source Group ID	High Value	File Name
1	AR10_F	1st	01H1G001.PLT
1	AR10_NF	1st	01H1G002.PLT
1	AR11_F	1st	01H1G003.PLT
1	AR11_NF	1st	01H1G004.PLT
1	AR12_F	1st	01H1G005.PLT
1	AR12_NF	1st	01H1G006.PLT
1	AR1_F	1st	01H1G007.PLT
1	AR1_NF	1st	01H1G008.PLT
1	AR2_F	1st	01H1G009.PLT
1	AR2_NF	1st	01H1G010.PLT
1	AR3_F	1st	01H1G011.PLT
1	AR3_NF	1st	01H1G012.PLT
1	AR4_F	1st	01H1G013.PLT
1	AR4_NF	1st	01H1G014.PLT
1	AR5_F	1st	01H1G015.PLT
1	AR5_NF	1st	01H1G016.PLT
1	AR6_F	1st	01H1G017.PLT
1	AR6_NF	1st	01H1G018.PLT
1	AR7_F	1st	01H1G019.PLT
1	AR7_NF	1st	01H1G020.PLT
1	AR8_F	1st	01H1G021.PLT
1	AR8_NF	1st	01H1G022.PLT
1	AR9_F	1st	01H1G023.PLT
1	AR9_NF	1st	01H1G024.PLT
1	VD1_F	1st	01H1G025.PLT
1	VD1_NF	1st	01H1G026.PLT
1	VD2_F	1st	01H1G027.PLT
1	VD2_NF	1st	01H1G028.PLT
1	VD3_F	1st	01H1G029.PLT
1	VD3_NF	1st	01H1G030.PLT
1	VD4_F	1st	01H1G031.PLT
1	VD4_NF	1st	01H1G032.PLT
1	VD5_F	1st	01H1G033.PLT
1	VD5_NF	1st	01H1G034.PLT

Output Pathway

1	VD6_F	1st	01H1G035.PLT
1	VD6_NF	1st	01H1G036.PLT
1	VD7_F	1st	01H1G037.PLT
1	VD7_NF	1st	01H1G038.PLT
1	AR10_F	8th	01H8G001.PLT
1	AR10_NF	8th	01H8G002.PLT
1	AR11_F	8th	01H8G003.PLT
1	AR11_NF	8th	01H8G004.PLT
1	AR12_F	8th	01H8G005.PLT
1	AR12_NF	8th	01H8G006.PLT
1	AR1_F	8th	01H8G007.PLT
1	AR1_NF	8th	01H8G008.PLT
1	AR2_F	8th	01H8G009.PLT
1	AR2_NF	8th	01H8G010.PLT
1	AR3_F	8th	01H8G011.PLT
1	AR3_NF	8th	01H8G012.PLT
1	AR4_F	8th	01H8G013.PLT
1	AR4_NF	8th	01H8G014.PLT
1	AR5_F	8th	01H8G015.PLT
1	AR5_NF	8th	01H8G016.PLT
1	AR6_F	8th	01H8G017.PLT
1	AR6_NF	8th	01H8G018.PLT
1	AR7_F	8th	01H8G019.PLT
1	AR7_NF	8th	01H8G020.PLT
1	AR8_F	8th	01H8G021.PLT
1	AR8_NF	8th	01H8G022.PLT
1	AR9_F	8th	01H8G023.PLT
1	AR9_NF	8th	01H8G024.PLT
1	VD1_F	8th	01H8G025.PLT
1	VD1_NF	8th	01H8G026.PLT
1	VD2_F	8th	01H8G027.PLT
1	VD2_NF	8th	01H8G028.PLT
1	VD3_F	8th	01H8G029.PLT
1	VD3_NF	8th	01H8G030.PLT
1	VD4_F	8th	01H8G031.PLT
1	VD4_NF	8th	01H8G032.PLT
1	VD5_F	8th	01H8G033.PLT
1	VD5_NF	8th	01H8G034.PLT
1	VD6_F	8th	01H8G035.PLT
1	VD6_NF	8th	01H8G036.PLT
1	VD7_F	8th	01H8G037.PLT
1	VD7_NF	8th	01H8G038.PLT

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR1_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	119.07751	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	2/10/2018, 17
1-HR	8TH	88.98666	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	10/9/2017, 2

Concentration - Source Group: AR1_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	2261.83732	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	9/26/2020, 20
1-HR	8TH	2232.79722	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	12/18/2018, 3

Concentration - Source Group: AR10_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	230.06328	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	12/16/2017, 8
1-HR	8TH	209.59008	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	5/8/2021, 24

Concentration - Source Group: AR10_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	2814.19130	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	1/18/2019, 19
1-HR	8TH	2785.29937	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	12/30/2017, 18

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR11_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	285.01368	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	6/16/2018, 20
1-HR	8TH	200.72854	ug/m^3	594275.02	4250277.15	25.52	0.00	25.52	12/16/2017, 24

Concentration - Source Group: AR11_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	4393.20463	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	2/20/2019, 20
1-HR	8TH	3972.66645	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	4/10/2019, 21

Concentration - Source Group: AR12_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	166.94176	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	2/20/2017, 23
1-HR	8TH	107.18529	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	3/27/2019, 9

Concentration - Source Group: AR12_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3161.91003	ug/m^3	594298.00	4250315.00	25.39	0.00	25.39	5/11/2017, 23
1-HR	8TH	3083.49305	ug/m^3	594298.00	4250315.00	25.39	0.00	25.39	3/25/2020, 20

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR2_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	135.15925	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	2/9/2020, 6
1-HR	8TH	130.39537	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	12/4/2017, 8

Concentration - Source Group: AR2_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	2443.41123	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	10/25/2019, 22
1-HR	8TH	2390.66525	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	10/18/2021, 20

Concentration - Source Group: AR3_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	179.51956	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	10/27/2019, 6
1-HR	8TH	162.29760	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	10/25/2020, 21

Concentration - Source Group: AR3_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	1833.62875	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	12/10/2021, 2
1-HR	8TH	1769.25083	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	2/25/2017, 21

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR4_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	173.72108	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	10/8/2017, 21
1-HR	8TH	149.47863	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	10/9/2017, 1

Concentration - Source Group: AR4_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	2860.04634	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	1/13/2020, 3
1-HR	8TH	2281.41009	ug/m^3	594274.92	4250324.80	25.39	0.00	25.39	2/12/2021, 22

Concentration - Source Group: AR5_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	140.07119	ug/m^3	594215.93	4250457.54	25.53	0.00	25.53	6/16/2018, 20
1-HR	8TH	72.81993	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	2/9/2020, 8

Concentration - Source Group: AR5_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	2884.24578	ug/m^3	594147.08	4250390.55	25.75	0.00	25.75	3/20/2019, 2
1-HR	8TH	2487.49773	ug/m^3	594148.00	4250415.00	25.69	0.00	25.69	4/15/2019, 2

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR6_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	117.95372	ug/m^3	594215.93	4250457.54	25.53	0.00	25.53	6/16/2018, 20
1-HR	8TH	63.17708	ug/m^3	594189.35	4250227.66	25.60	0.00	25.60	10/25/2020, 23

Concentration - Source Group: AR6_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3436.70070	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	9/17/2020, 22
1-HR	8TH	3051.64702	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	8/23/2020, 21

Concentration - Source Group: AR7_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	287.78767	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	1/27/2021, 1
1-HR	8TH	222.02830	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	2/17/2017, 12

Concentration - Source Group: AR7_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3401.75173	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	2/18/2017, 3
1-HR	8TH	3307.79812	ug/m^3	594181.51	4250424.04	25.63	0.00	25.63	9/18/2019, 1

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: AR8_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	207.08551	ug/m^3	594274.73	4250420.11	25.19	0.00	25.19	2/18/2018, 13
1-HR	8TH	82.44293	ug/m^3	594274.63	4250467.76	25.09	0.00	25.09	3/1/2018, 15

Concentration - Source Group: AR8_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3807.90982	ug/m^3	594274.73	4250420.11	25.19	0.00	25.19	2/27/2017, 21
1-HR	8TH	3286.07937	ug/m^3	594274.73	4250420.11	25.19	0.00	25.19	2/12/2021, 22

Concentration - Source Group: AR9_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	247.15407	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	12/16/2017, 6
1-HR	8TH	220.65845	ug/m^3	594274.83	4250372.46	25.27	0.00	25.27	10/1/2017, 23

Concentration - Source Group: AR9_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	6236.09100	ug/m^3	594274.73	4250420.11	25.19	0.00	25.19	3/19/2019, 23
1-HR	8TH	5884.57411	ug/m^3	594274.73	4250420.11	25.19	0.00	25.19	4/8/2017, 4

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: VD1_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	269.35084	ug/m^3	594060.71	4250224.90	25.74	0.00	25.74	5/7/2017, 10
1-HR	8TH	234.22616	ug/m^3	594060.71	4250224.90	25.74	0.00	25.74	12/5/2017, 13

Concentration - Source Group: VD1_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3712.16624	ug/m^3	594060.71	4250224.90	25.74	0.00	25.74	12/24/2019, 18
1-HR	8TH	3658.70191	ug/m^3	594060.71	4250224.90	25.74	0.00	25.74	1/15/2019, 4

Concentration - Source Group: VD2_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	232.85472	ug/m^3	594043.79	4250290.05	26.05	0.00	26.05	1/18/2017, 18
1-HR	8TH	179.48585	ug/m^3	594043.79	4250290.05	26.05	0.00	26.05	1/17/2017, 19

Concentration - Source Group: VD2_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3795.21392	ug/m^3	594043.79	4250290.05	26.05	0.00	26.05	1/21/2018, 20
1-HR	8TH	3537.30656	ug/m^3	594060.71	4250224.90	25.74	0.00	25.74	12/31/2019, 3

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: VD3_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	118.99449	ug/m^3	594048.72	4250341.65	26.48	0.00	26.48	1/27/2021, 1
1-HR	8TH	68.73017	ug/m^3	594148.00	4250115.00	25.22	0.00	25.22	10/8/2017, 24

Concentration - Source Group: VD3_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3478.10005	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	2/22/2021, 8
1-HR	8TH	3195.93168	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	2/6/2018, 23

Concentration - Source Group: VD4_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	108.11238	ug/m^3	594198.00	4250165.00	25.17	0.00	25.17	10/27/2019, 7
1-HR	8TH	70.56111	ug/m^3	594198.00	4250165.00	25.17	0.00	25.17	10/27/2019, 4

Concentration - Source Group: VD4_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3797.27582	ug/m^3	594146.47	4250226.74	25.78	0.00	25.78	12/27/2020, 17
1-HR	8TH	3046.02978	ug/m^3	594146.47	4250226.74	25.78	0.00	25.78	2/3/2018, 1

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: VD5_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	271.25908	ug/m^3	594275.02	4250277.15	25.52	0.00	25.52	1/20/2019, 17
1-HR	8TH	204.43924	ug/m^3	594275.02	4250277.15	25.52	0.00	25.52	6/5/2020, 21

Concentration - Source Group: VD5_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	4836.35580	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	3/14/2019, 6
1-HR	8TH	4701.09054	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	10/16/2020, 7

Concentration - Source Group: VD6_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	343.24504	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	2/9/2020, 3
1-HR	8TH	306.81928	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	1/18/2021, 11

Concentration - Source Group: VD6_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	4187.63261	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	12/5/2019, 9
1-HR	8TH	4114.70143	ug/m^3	594232.24	4250228.58	25.33	0.00	25.33	1/24/2017, 7

Results Summary

C:\AERMOD Projs\Vaca Arges Site B Unitized\Vaca Arges Site B Unitize

Concentration - Source Group: VD7_F

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	324.69622	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	1/19/2021, 4
1-HR	8TH	287.69732	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	1/19/2021, 12

Concentration - Source Group: VD7_NF

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	3728.47071	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	1/18/2017, 1
1-HR	8TH	3644.55368	ug/m^3	594103.59	4250225.82	25.79	0.00	25.79	2/8/2021, 1