Technical Report

Health Risk Assessment
For California Environmental Quality Act (CEQA)

Project Name:

FNC Farming Residential Project
Tulare, CA

Prepared for:

4Creeks, Inc.
Visalia, CA

Author:

Core Environmental Consulting
Clovis, CA

Lead Agency:

City of Tulare

Date of Preparation:

September 2024

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1 Executive Summary

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This technical report has been prepared to summarize the background, methodology, and results of a Health Risk Assessment (HRA) for the FNC Farming Residential project (Project) in Tulare, California. The Project proposes development of 556 units of low-density residential development, a community park, and a 7.8-acre rural residential remainder parcel on approximately 140.32 gross acres of land within an unincorporated area of the County of Tulare. The Project would also include annexation of the Project site into the City limits of the City of Tulare, a General Plan Amendment, pre-zoning of the property, and a subdivision map.

The Project is subject to the California Environmental Quality Act (CEQA), with City of Tulare (City) serving as the Lead Agency pursuant to the *CEQA Statute and Guidelines*[1] (CEQA Guidelines). An Initial Study was completed and subsequently a focused Environmental Impact Report (EIR) due to potentially significant biological and cultural impacts. The City issued comments requesting an HRA to assess the impact of construction diesel particulate matter (DPM) on nearby receptors; there were no other potentially-significant impacts expected for air quality or greenhouse gases.

The Project site is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD), which oversees the assessment of health risk associated with Toxic Air Contaminant (TAC) emissions from new development in the San Joaquin Valley Air Basin (SJVAB). SJVAPCD lays out a basic framework for understanding and assessing health risk, under CEQA, in its *Guidance for Assessing and Mitigating Air Quality Impacts*[2] (GAMAQI). Projects that would either place a new source of TAC in the vicinity of existing sensitive receptors, or would place new sensitive receptors in the vicinity of existing sources of TAC, must be assessed to determine whether the resulting health risk to sensitive receptors would exceed SJVAPCD established thresholds of significance for carcinogenic, acute, and chronic risk.

This HRA was prepared in accordance with the guidelines outlined in the Office of Environmental Health Hazard Assessment (OEHHA) *Guidance Manual for Preparation of Health Risk Assessments*[3], SJVAPCD Policy *APR 1906 – Framework for Performing Health Risk Assessments*[4], and SJVAPCD *Guidance for Air Dispersion Modeling*[5].

Construction health risk, associated with diesel particulate matter (DPM) emissions from construction vehicle and equipment use, was modeled using the CARB Hotspots Analysis and Reporting Program (HARP2) *Air Dispersion Modeling and Risk Tool*[6] (ADMRT). A mitigation measure (HRA-1 Tier 4 Engine Controls for off-road equipment) was incorporated to ensure calculated risks remain less than significant.

The results of this HRA demonstrate that the Project would result in construction health risk below the SJVAPCD thresholds of significance. Therefore, the Project would not expose sensitive receptors to substantial pollutant concentrations, and related impacts would be *less than significant with mitigation incorporated* according to the *CEQA Guidelines*.

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[1] (Association of Environmental Professionals, 2024)
[2] (San Joaquin Valley Air Pollution Control District, 2015)
[3] (Office of Environmental Health Hazard Asssessment, 2015)
[4] (San Joaquin Valley Air Pollution Control District, 2020)
[5] (San Joaquin Valley Air Pollution Control District, 2022a)
[6] (California Air Resources Board, 2022a)

2   Project Description

According to the *Initial Study for the FNC Farming Residential Project* prepared by 4Creeks, Inc.[7] (Initial Study), the Project proposes the construction of 556 single-family residential units and a 5.47-acre central park and pond on parcels 172-010-021, 172-010-022, and 184-020-010 as well as annexation of the 140.32-acre site into the City of Tulare. The Project also proposes the zoning of 7.8-acres of the site as Rural Residential, but the parcel will remain undeveloped at this time.

A Vicinity Map, Regional Location, and Conceptual Site Plan, from the Initial Study are included below as Figure 1, Figure 2, and Figure 3, respectively.

The Project site is located on the Southeast corner of Prosperity Avenue and Morrison Street within the City of Tulare Urban Development Boundary and Spere of Influence and the unincorporated area of Tulare County. The site is West of Road 126, East of Morrison Street, and South of Prosperity Avenue, approximately 2.87 miles Northeast of downtown Tulare. The site is topographically flat and is bounded by agricultural uses to the South and East, single-family housing to the North, and a single-family subdivision that is currently under construction to the West. The property was used for irrigated row crops until recently. Currently the Project Area is partially covered with a tarp or is bare ground after row crop removal, with annual grasses and herbaceous weeds in portions where there is no tarp cover. A small portion of the property is used for potted blueberry cultivation. The site also contains an on-site irrigation water supply, which includes a 0.5-acre pump station pond.

The 140.32-acre Project site is currently under Tulare County jurisdiction but has been included in the City of Tulare's Sphere of Influence according to the 2035 City of Tulare General Plan. The County has zoned the site as Exclusive Agriculture 20-Acre and 40-Acre minimum (AE-20, AE-40), and the City of Tulare has designated the site as Residential Estate (2.1-3 D.U./acre) and Rural Residential (0-2 D.U./acre). The applicant is proposing to pre-zone the majority of the subject property to R-1-5 Single-Family Residential, 5,000 sq. ft. minimum lot area zoning designation with an approximately 7.8-acre remainder to be zoned Rural Residential. The proposed pre-zoning will become effective upon annexation of the Project site into the City of Tulare.

The Project would result in onsite and offsite infrastructure improvements including new and relocated utilities, new residential streets, including the extension of North Oakmore Street. Morrison Street and Prosperity Avenue would be widened to their full planned right-of-way and curb, gutter, and sidewalk would be installed. The Project would require no demolition of any anchored structure, but there are approximately 33.9 acres of agricultural high tunnels that will be removed prior to construction.

Additionally, several roadway improvements to intersections surrounding the Project site may result which may include the installation of traffic signals, realignment or addition of traffic lanes, and/or addition of turn-lanes. Further analysis on potential traffic improvements and the potential impact of traffic delays is discussed in more detail in the Focused Environmental Impact Report (EIR) prepared for the proposed Project.

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[7] (4Creeks, Inc., 2024)

Surrounding land uses include:

- North: rural, single family housing; then agricultural

- South: agricultural; then low-density, rural, single-family housing

- East: agricultural

- West: currently vacant; then single-family housing and City of Tulare

Construction is currently expected to occur in five (5) phases; however, the exact timelines, along with final details of the fully-developed Project, are not yet known as they will depend on completing all required permits and incorporating all design considerations and conditions of approval.
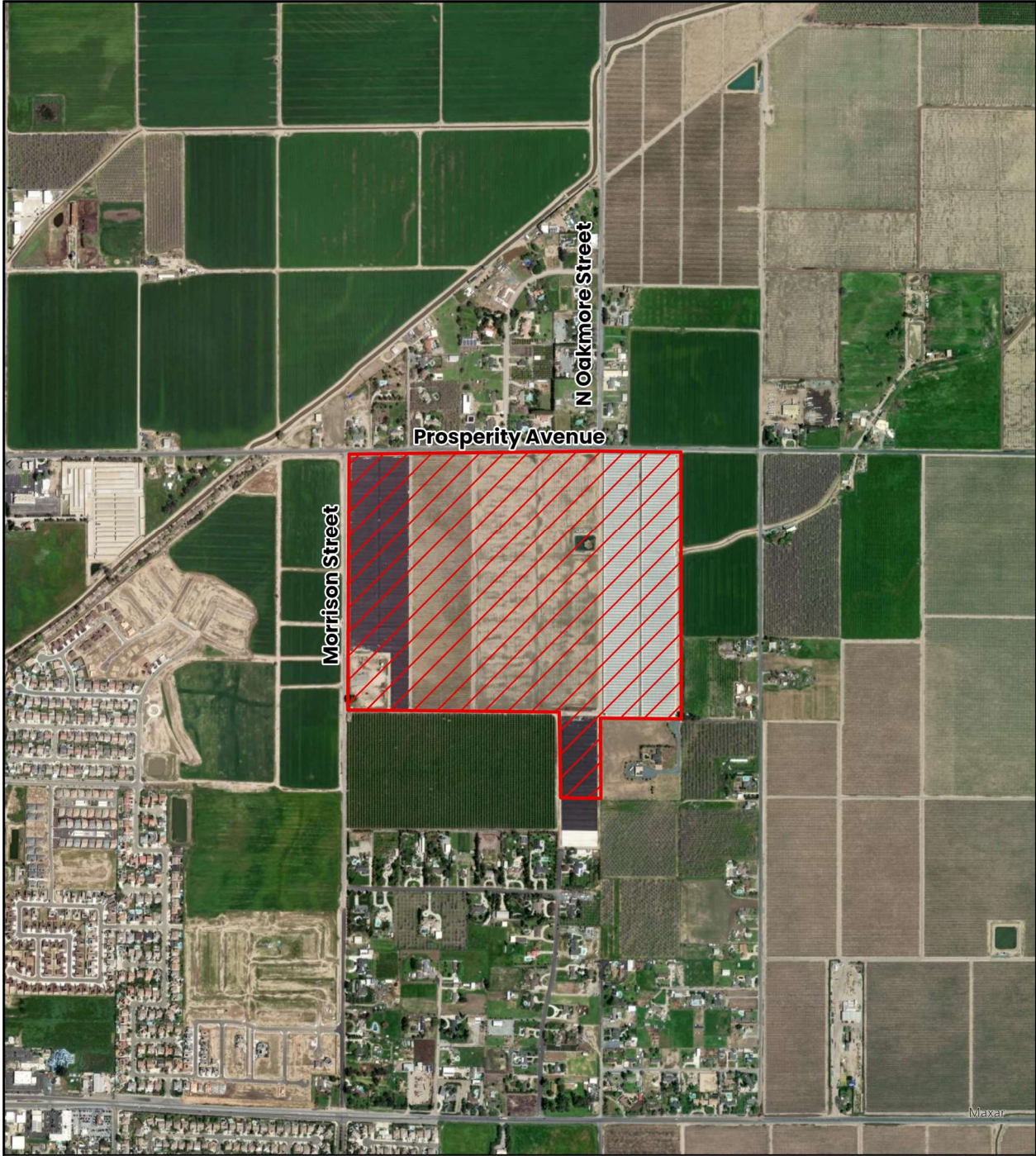
Vicinity Map

FNC Farming Subdivision

Tulare, CA

1 inch = 1,000 feet
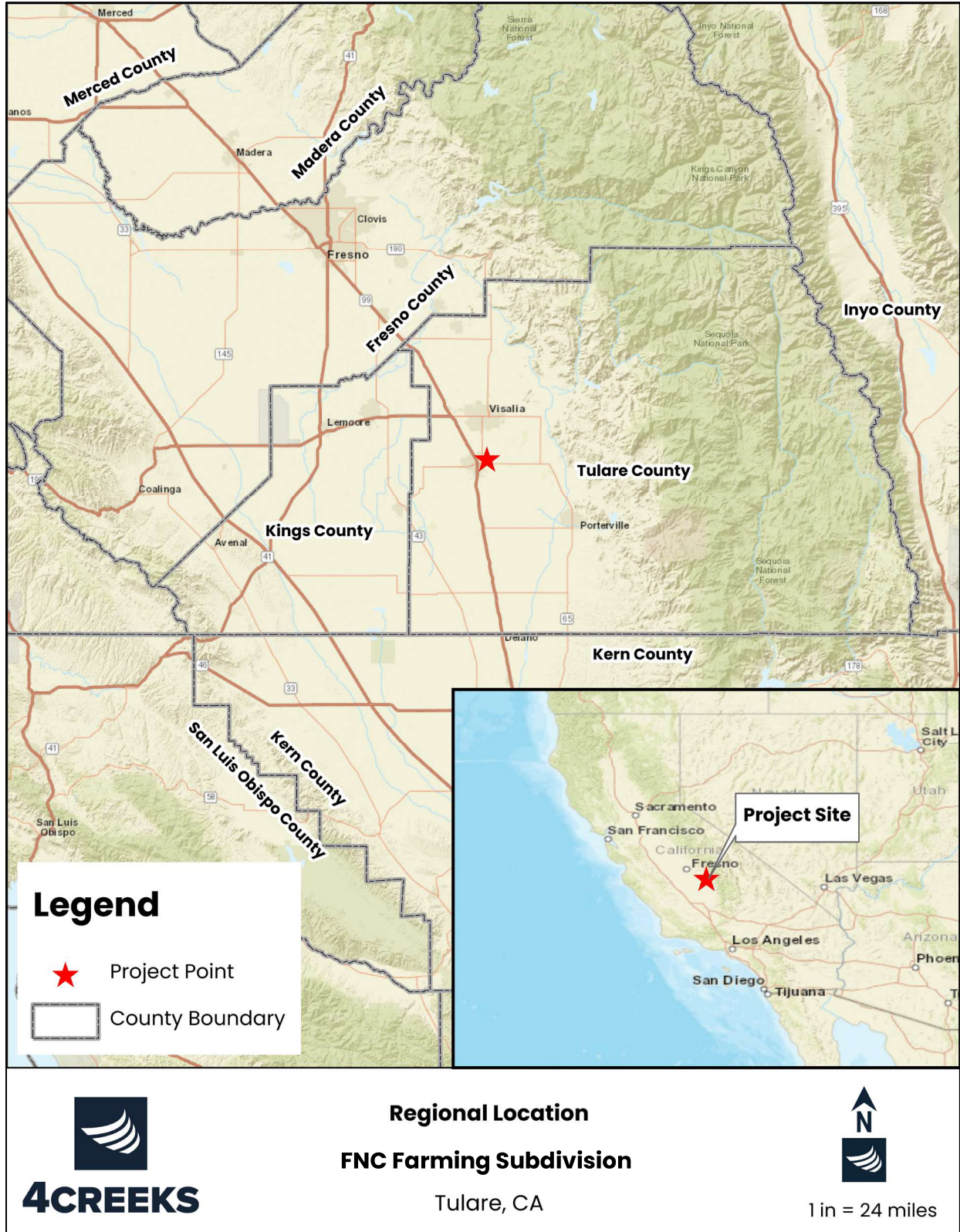
Figure 1. Vicinity Map
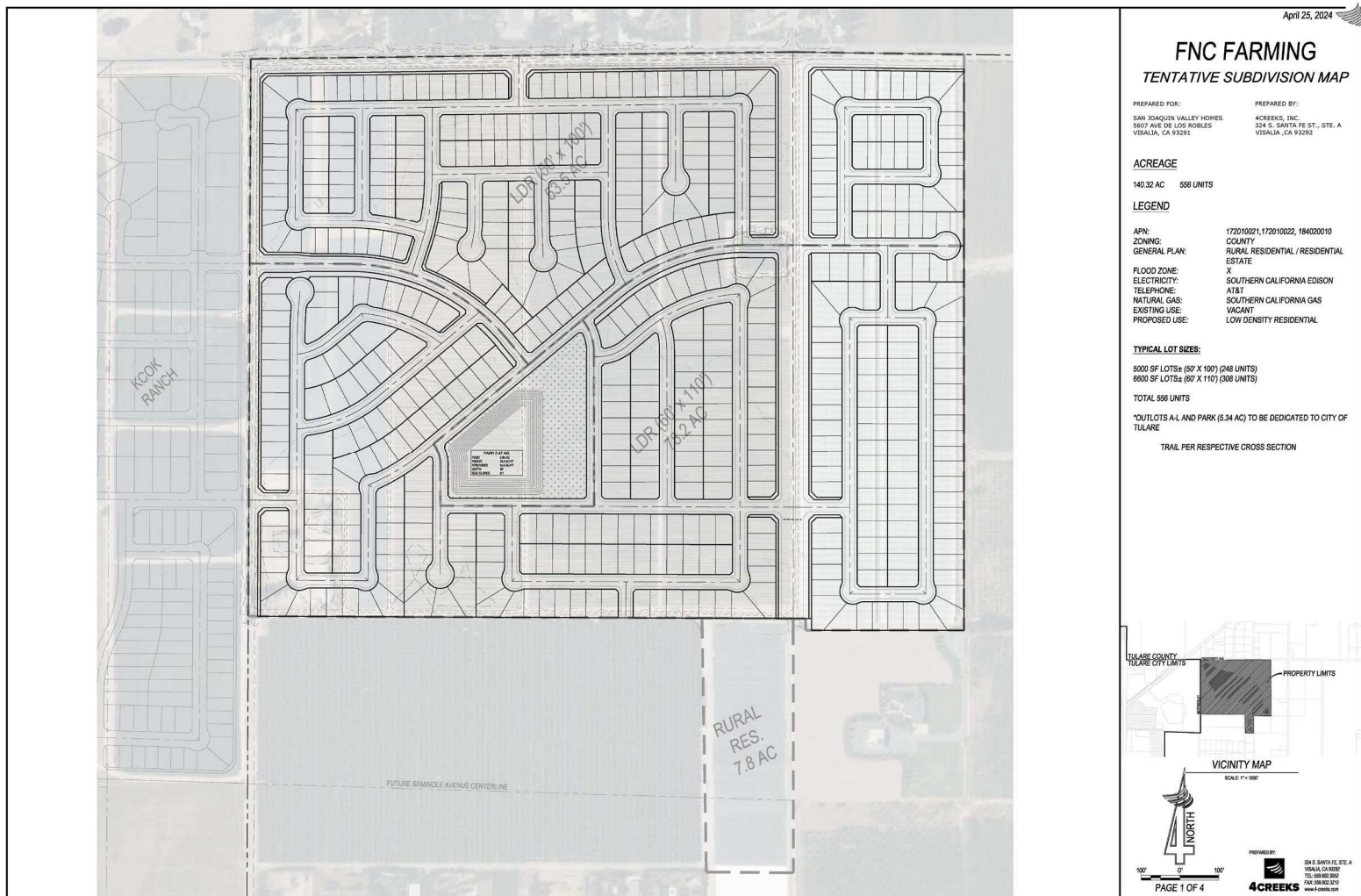
Figure 2. Regional Location Map

Figure 3: Conceptual Site Plan

3   Health Risk Assessment Setting

3.1   San Joaquin Valley Air Pollution Control District

The Project is located in the San Joaquin Valley Air Basin (SJVAB), which consists of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Air pollution in the SJVAB can be attributed to both human-related (anthropogenic) and natural (biogenic) activities that produce emissions.

Area and stationary sources within SJVAB are under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). An overview of important air pollutants, and SJVPACD roles in controlling them, is provided in the SJVAPCD *Guidance for Assessing and Mitigating Air Quality Impacts*[8] (GAMAQI), along with in-depth discussions on the meteorology and geography that contribute to unhealthy levels of air pollution. This HRA focuses on Toxic Air Contaminants (TAC).

Toxic Air Contaminants (TAC), as defined by the California Health & Safety Code (CH&SC) §44321, are listed in Appendices AI and AII in AB 2588 Air Toxic "Hot Spots" and Assessment Act's Emissions Inventory Criteria and Guideline Regulation document. Potential health impacts from TACs are generally categorized into two groups: carcinogenic (cancer causing) effects and non-carcinogenic (non-cancer-causing) effects.

The non-carcinogenic effects can be further divided into long-term (chronic) health effects such as birth defects, neurological damage, or genetic damage; and short- term (acute) effects such as eye irritation, respiratory irritation, and nausea. The California TAC list identifies about 700 plus pollutants. Carcinogenic and/or non-carcinogenic toxicity criteria have been established for a subset of these pollutants by OEHHA, as required by CH&SC §44360. TACs used in determining the potential exposure to the public should not be confused with the 189 Hazardous Air Pollutants (HAP) listed in the Clean Air Act.

SJVAPCD oversees the assessment of health risk associated with TAC emissions from new development in the SJVAB. SJVAPCD lays out a basic framework for understanding and assessing health risk, under CEQA, in the GAMAQI.

The location of a development project is a major factor in determining whether the project will result in localized air quality impacts. The potential for adverse air quality impacts increases as the distance between the source of emissions and receptors decreases. Receptors include sensitive receptors and worker receptors. Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (these sensitive land uses may also be referred to as sensitive receptors). Worker receptors refer to employees and locations where people work. Impacts on sensitive receptors are of particular concern, because they are the people most vulnerable to the effects of air pollution.

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[8] (San Joaquin Valley Air Pollution Control District, 2015)

From a health risk perspective there are two types of land use projects that have the potential to cause long-term public health risk impacts:

Type A Projects: Land use projects that will place new toxic sources in the vicinity of existing receptors.

Type B Projects: Land use projects that will place new receptors in the vicinity of existing toxics sources.

Projects of either type must be assessed to determine whether the resulting health risk to sensitive receptors would exceed SJVAPCD established thresholds of significance for carcinogenic, non-carcinogenic acute, and non-carcinogenic chronic risk.

The OEHHA *Risk Assessment Guidelines* are the standards for estimating health risks. OEHHA is responsible for developing and providing toxicological and medical information relevant to decisions involving public health to state and local government agencies. Historically, state laws have required OEHHA to develop Risk Assessment Guidelines for estimating health risk associated with various sources of air pollution. Furthermore, the Children's Environmental Health Protection Act (SB 25, Escutia, 1999) requires OEHHA to biennially review risk assessment methods for air toxics, and related information, to ensure that they adequately protect infants and children.

The SJVAPCD risk management policy works in conjunction with the OEHHA *Risk Assessment Guidelines*. The SJVAPCD risk management policy further clarifies and provides guidance on the appropriate options to use, such as a longer exposure period and more conservative air dispersion modeling.

SJVAPCD staff members are considered leading statewide experts in the field of health risk assessment and have developed significant resources from guidance documents to database tools to assist other agencies, consultants, and regulated sources. Therefore, the SJVAPCD concludes that use of its risk management policy and the OEHHA *Risk Assessment Guidelines* is appropriate in determining significance within the environmental review process.

3.2   Thresholds of Significance

This HRA focuses on answering the following question from the Air Quality section of Appendix G in the *CEQA Guidelines*[9]:

3. Would the Project expose sensitive receptors to substantial pollutant concentrations?

The *CEQA Guidelines* state that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make a significance determination.

SJVAPCD has established the following thresholds of significance for risk exposure to TAC:

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[9] (Association of Environmental Professionals, 2024)

Table 1 SJVPACD Thresholds of Significance – Toxic Air Contaminants

CARCINOGENS	Maximally Exposed Individual risk equals or exceeds 20 in one million
NON CARCINOGENS	**Acute**: Hazard Index equals or exceeds 1 for the Maximally Exposed Individual
	Chronic: Hazard Index equals or exceeds 1 for the Maximally Exposed Individual

Source: (San Joaquin Valley Air Pollution Control District, 2015)

Therefore, if the calculated risk exposure from Project TAC emissions is below the SJVAPCD thresholds of significance, it can be concluded that the Project would not expose sensitive receptors to substantial pollutant concentrations and this impact would be considered less than significant under CEQA.

4   HRA Methodology

The Project could result in toxic air contaminant (TAC) emissions during construction and, to a limited extent, during operation. The primary TAC emissions resulting from Project construction would include diesel particulate matter (DPM), which consists of particulate matter 2.5 microns and smaller ($PM_{2.5}$) exhausted during the operation of on- and-off road diesel-fueled vehicles and equipment.

DPM is the particulate component of diesel exhaust and has been identified as a TAC by the California Air Resources Board (CARB) based on its potential exposures and health concerns. Epidemiological studies strongly suggest a relationship between occupational diesel exhaust exposure and lung cancer. A number of adverse acute and chronic effects have also been associated with exposure to diesel exhaust.[10]

Once operational, diesel-fueled vehicle and equipment use would be minimal and would not result in a substantial health risk. The Project includes residential units and a city park; thus, there are no other substantial sources of TAC expected during construction or operation. Additional health risk could occur from the use of household cleaners, commercial products, landscaping equipment, and a number of other area sources; however, determining the use of such TAC sources would be highly speculative, and the health risk impact from these sources would be less than significant because existing federal, state, and local regulations are enforced for the composition, use, and disposal of these hazardous materials. This HRA is thus focused on construction DPM.

Construction health risk was evaluated in the following steps:

1. Maximum (worst year) annual construction emissions of exhaust $PM_{2.5}$ were estimated using the *California Emissions Estimator Model*[11] (CalEEMod) (Version 2022.1). CalEEMod results are attached in Appendix A. The land uses described in the Project Description were input, consistent with the Initial Study, and default values were used for construction duration and equipment. Modeling the unmitigated construction DPM emissions resulted in estimated risk that could have exceeded the SJVPACD threshold of significance for carcinogens. Therefore, Mitigation Measure HRA-1 (see Mitigation section below) was applied in the CalEEMod analysis, and the mitigated DPM emissions were used for the ADMRT calculations described below.

2. The United States Environmental Protection Agency's (U.S. EPA) *American Meteorological Society/EPA Regulatory Model* (AERMOD) air dispersion model was used to model the annual downwind air concentration at nearby receptors, based on a normalized emission rate of one gram per second. Meteorological data was obtained from SJVAPCD (Visalia met site), along with required modeling parameters. Terrain was incorporated using built in tools. A total of 89 nearby receptors, all residences, were selected.

3. Normalized downwind air concentrations for each receptor were imported into the CARB Hotspots Analysis and Reporting Program (HARP2) *Air Dispersion Modeling and Risk Tool*[12] (ADMRT) and combined with the toxic emissions data (mitigated DPM emissions from the CalEEMod step described above) to estimate the ground level concentrations of DPM at each receptor.

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[10] (California Air Resources Board, 2024)
[11] (California Air Pollution Control Officers Association, 2022)
[12] (California Air Resources Board, 2022a)

4. Cancer risk and chronic and acute hazard indices were then estimated in ADMRT using SJVAPCD required exposure parameters and Project information.

Sensitive receptors include nearby residences to the north, east, and west, with the closest being approximately 40 meters north of the Project site perimeter. A total of 89 nearby receptors were selected for a representative analysis. SJVAPCD recommended parameters were used throughout. Results of the AERMOD modeling and ADMRT calculations are attached in Appendix B, along with a map of receptors.

Modeling input and output files will be made available to reviewing agencies upon request.

5   HRA Results

5.1   Construction Risk

Results of the construction risk assessments are compared to SJVAPCD thresholds of significance in the table below. The highest risk exposure occurred at receptor 3, approximately 40 meters north of the Project site.

Table 2 HRA Results Compared to SJVAPCD Thresholds of Significance

RISK	CARCINOGEN (risk in one million)	ACUTE HAZARD INDEX	CHRONIC HAZARD INDEX
Construction	9.4	n/a	n/a
Thresholds of Significance	20	1	1

Notes: *Hazard indices are for Maximally Exposed Individual.*
           Includes Tier 4 Engine Controls for Off-Road Diesel Equipment

Sources: *Appendix B HRA Results*

As shown in the Table above, construction risk would be below the SJVAPCD Thresholds of Significance. The results include implementation of Mitigation Measure HRA-1, described below. Therefore, consistent with the *CEQA Guidelines[13]*, the Project would not expose sensitive receptors to substantial pollutant concentrations, and this impact would be considered *less-than-significant with mitigation incorporated.*

As described in the Air Quality and Greenhouse Gas sections of the Initial Study, the Project would also comply with other regulatory requirements to reduce construction emissions, further reducing associated risks.

5.2   Mitigation

Modeling the unmitigated DPM emissions resulted in risk estimates that could exceed the SJVAPCD threshold of significance for carcinogens. Implementation of the following Mitigation Measure HRA-1 would reduce DPM emissions to a level that results in carcinogenic risk below the SJVAPCD threshold of significance.

>   ***Mitigation Measure HRA-1:*** *Implement Tier 4 Engine Controls for all off-road, diesel-fueled equipment during construction.*

Additionally, the use of Tier 4 engine controls is consistent with U.S. EPA, CARB, and SJVAPCD goals for implementing mitigation measures that directly reduce DPM emissions. According to the CalEEMod analysis, implementation of Mitigation Measure HRA-1 would reduce worst-year, annual DPM emissions by approximately 69%, thus reducing potential impacts to a less-than-significant level.

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[13] (Association of Environmental Professionals, 2024)

Unlike Tier 1 through Tier 3 engine controls, Tier 4 generally requires the addition of emissions control equipment even to new engines, such as a Diesel Particulate Filter (DPF).[14] The construction contractor(s) may decide implementation is not technically or economically feasible. Modeling indicated that only a 34% reduction[15] was required to keep cancer risk below the threshold of significance.

Tier 4 engine controls were selected as a health-conservative risk reduction measure to ensure that, regardless of whether additional reductions are implemented or slightly higher levels of DPM are produced, the health risk would remain well below the threshold.

Other measures were considered (lower-tier engine controls; Construction Clean Fleet) but were either not effective enough to achieve the required emissions reduction without also including Tier 4 controls (or component equipment such as diesel particulate filters, oxidative catalysts, etc.), or likely to be equally burdensome to the contractor(s) and agencies responsible for verifying. There are still a wide variety of alternative measures that could be selected and combined to achieve the required reduction, including but not limited to the following relevant options:

- **Electrification and/or Hybridization.** The construction contractor(s) could replace diesel-fueled equipment with electric and/or hybrid options.

- **Less diesel-fueled equipment and/or less operating hours.** The construction contractor(s) could require less equipment and/or less operating hours than included in the health-conservative CalEEMod default assumptions.

- **Use Newer Equipment or Clean Fuels.** Similar to the options above, the construction contractor(s) could use newer equipment or cleaner fuel equipment than included in the CalEEMod analysis.

If a different option is selected that Mitigation Measure HRA-1, an updated CalEEMod analysis should be performed, and reviewed by the Lead Agency (City), to demonstrate a reduction in DPM emissions (compared to the unmitigated emissions presented Appendix A of the Initial Study) of at least 34%. The selected control method(s) should be added as specifications to construction bid documents, along with a requirement to submit records of implementation to the Lead Agency before project closeout is approved. It is recommended that quarterly and/or annual reporting be required throughout construction as well.

Implementation of Mitigation Measure HRA-1 would ensure that carcinogenic health risk impacts from construction DPM would remain less than significant.

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[14] (California Air Pollution Control Officers Association, 2024)
[15] Calculated dividing the difference between threshold of significance and risk from unmitigated emissions by the risk from unmitigated emissions.

6   References

4Creeks, Inc. (2024). *Initial Study for the FNC Farming Residential Project.*

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Appendix A. CalEEMod Results

Prepared by Core Environmental Consulting:

Jesse Madsen, Owner, Principal Environmental Scientist
Clovis, CA

September 2024

FNC Farming Summary Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	FNC Farming
Construction Start Date	1/25/2025
Lead Agency	City of Tulare
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	1.90
Precipitation (days)	24.4
Location	36.22250929924985, -119.29890717919542
County	Tulare
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2747
EDFZ	9
Electric Utility	Eastside Power Authority
Gas Utility	Southern California Gas
App Version	2022.1.1.28

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	556	Dwelling Unit	127	1,084,200	6,512,348	—	1,879	—
City Park	5.47	Acre	5.47	0.00	214,446	214,446	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Un/Mit.	PM2.5E
Daily, Summer (Max)	—
Unmit.	1.14
Mit.	0.40
% Reduced	65%
Daily, Winter (Max)	—
Unmit.	1.26
Mit.	0.40
% Reduced	68%
Average Daily (Max)	—
Unmit.	0.76
Mit.	0.23
% Reduced	69%
Annual (Max)	—
Unmit.	0.14
Mit.	0.04
% Reduced	69%

6. Climate Risk Detailed Report

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

7. Health and Equity Details

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	79.0
Healthy Places Index Score for Project Location (b)	55.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

Appendix B. AERMOD and ADMRT Results

Prepared by Core Environmental Consulting:

Jesse Madsen, Owner, Principal Environmental Scientist
Clovis, CA

September 2024

FNC Farming Residential HRA
Appendix B - AERMOD/ADMRT Results
Receptor Map
September 2024

UTM North [m]

UTM East [m]
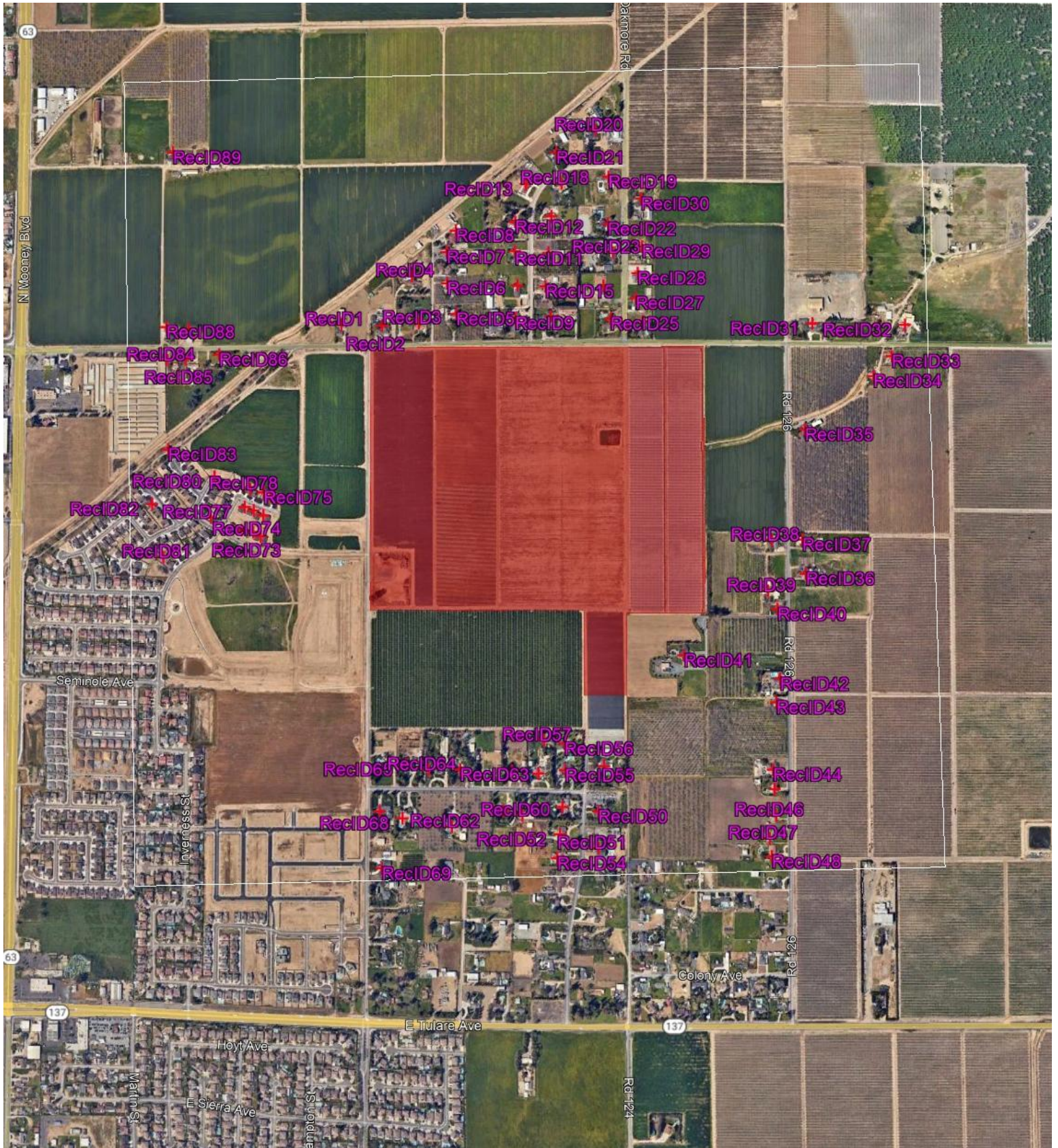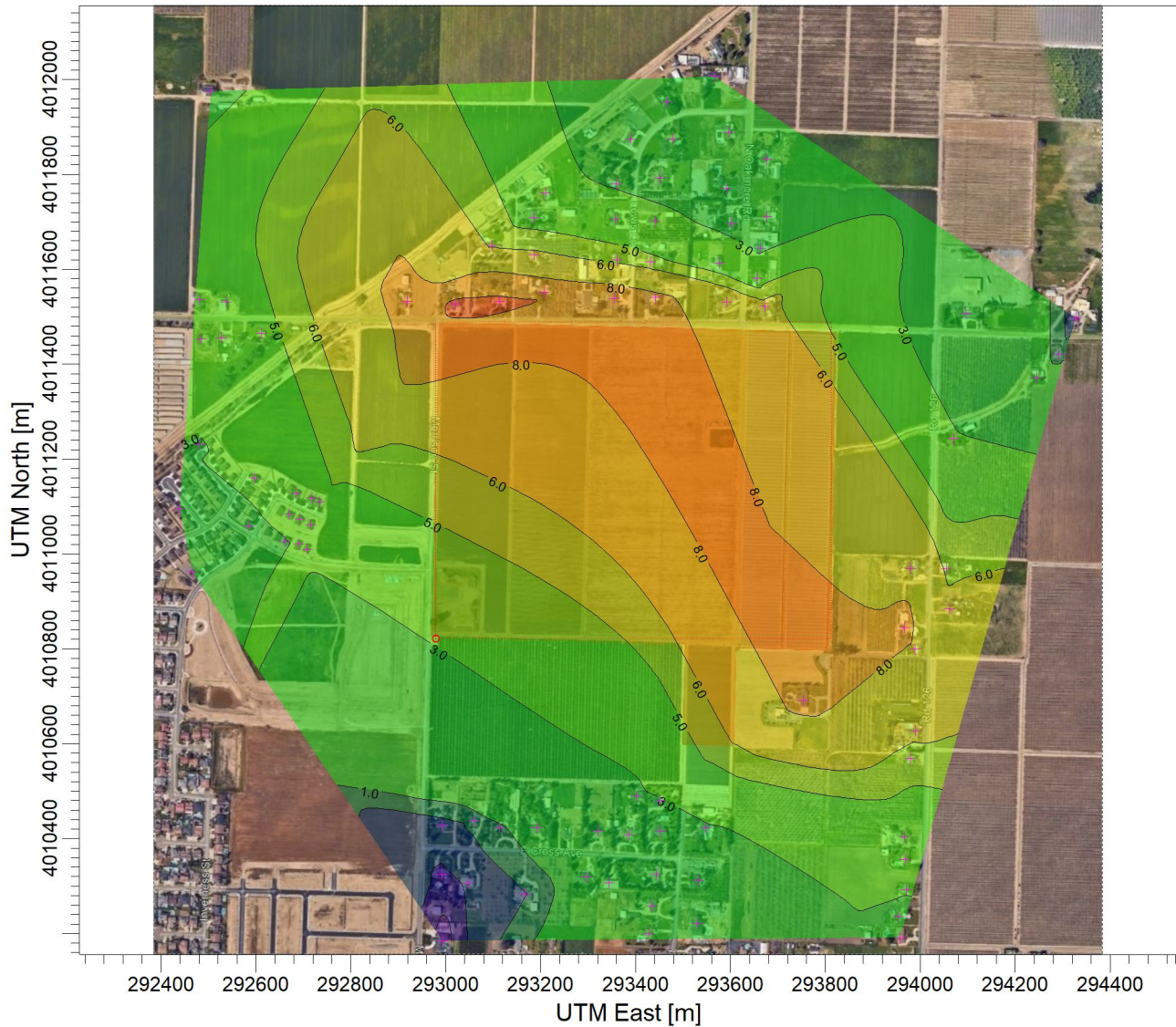
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 4 YEARS FOR SOURCE GROUP: AREA1   ug/m^3

Max: 10.5 [ug/m^3] at (293112.89, 4011531.96)

0.4	0.5	0.6	0.8	1.0	3.0	5.0	6.0	8.0	10.0	10.5
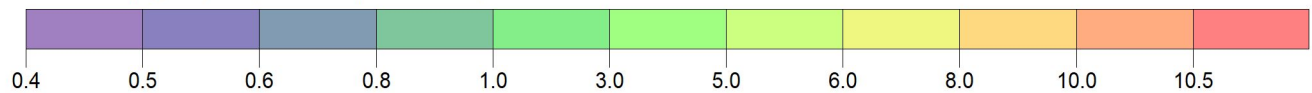
COMMENTS:	SOURCES: **1**	COMPANY NAME:	
	RECEPTORS: **89**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:14,546 0 ▬▬▬▬▬ 0.5 km	
	MAX: **10.5 ug/m^3**	DATE: **9/5/2024**	PROJECT NO.:

REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO	INHAL_RIS	SOIL_RISK	DERMAL_R
1	ALL		292918.9	4011533	7.74E-06	15YrCance	7.74E-06	0	0
2	ALL		293021	4011527	9.36E-06	15YrCance	9.36E-06	0	0
3	ALL		293112.9	4011532	9.40E-06	15YrCance	9.40E-06	0	0
4	ALL		293098	4011651	5.26E-06	15YrCance	5.26E-06	0	0
5	ALL		293207.2	4011552	8.22E-06	15YrCance	8.22E-06	0	0
6	ALL		293185.9	4011630	5.59E-06	15YrCance	5.59E-06	0	0
7	ALL		293186.6	4011708	4.02E-06	15YrCance	4.02E-06	0	0
8	ALL		293210.7	4011762	3.23E-06	15YrCance	3.23E-06	0	0
9	ALL		293354.2	4011538	8.34E-06	15YrCance	8.34E-06	0	0
10	ALL		293361.6	4011620	5.13E-06	15YrCance	5.13E-06	0	0
11	ALL		293357.6	4011706	3.45E-06	15YrCance	3.45E-06	0	0
12	ALL		293359.6	4011780	2.57E-06	15YrCance	2.57E-06	0	0
13	ALL		293389	4011875	1.79E-06	15YrCance	1.79E-06	0	0
14	ALL		293442.7	4011541	7.57E-06	15YrCance	7.57E-06	0	0
15	ALL		293431.8	4011616	4.81E-06	15YrCance	4.81E-06	0	0
16	ALL		293441.2	4011700	3.13E-06	15YrCance	3.13E-06	0	0
17	ALL		293450.6	4011792	2.13E-06	15YrCance	2.13E-06	0	0
18	ALL		293478.1	4011875	1.56E-06	15YrCance	1.56E-06	0	0
19	ALL		293595.9	4011888	1.23E-06	15YrCance	1.23E-06	0	0
20	ALL		293566.5	4012006	9.69E-07	15YrCance	9.69E-07	0	0
21	ALL		293466.7	4011953	1.27E-06	15YrCance	1.27E-06	0	0
22	ALL		293591.7	4011770	1.77E-06	15YrCance	1.77E-06	0	0
23	ALL		293602.7	4011697	2.27E-06	15YrCance	2.27E-06	0	0
24	ALL		293576.7	4011614	3.71E-06	15YrCance	3.71E-06	0	0
25	ALL		293592.5	4011532	6.52E-06	15YrCance	6.52E-06	0	0
26	ALL		293672.6	4011523	5.77E-06	15YrCance	5.77E-06	0	0
27	ALL		293656.9	4011582	3.66E-06	15YrCance	3.66E-06	0	0
28	ALL		293663.2	4011644	2.47E-06	15YrCance	2.47E-06	0	0
29	ALL		293675.7	4011711	1.79E-06	15YrCance	1.79E-06	0	0
30	ALL		293676.5	4011831	1.23E-06	15YrCance	1.23E-06	0	0
31	ALL		294096.4	4011508	9.49E-07	15YrCance	9.49E-07	0	0
32	ALL		294327.4	4011498	5.87E-07	15YrCance	5.87E-07	0	0
33	ALL		294292.3	4011421	7.96E-07	15YrCance	7.96E-07	0	0
34	ALL		294245.2	4011373	1.04E-06	15YrCance	1.04E-06	0	0
35	ALL		294070	4011243	2.84E-06	15YrCance	2.84E-06	0	0
36	ALL		294062	4010885	5.54E-06	15YrCance	5.54E-06	0	0
37	ALL		294055.5	4010970	5.25E-06	15YrCance	5.25E-06	0	0
38	ALL		293979.7	4010970	6.86E-06	15YrCance	6.86E-06	0	0
39	ALL		293966.7	4010845	7.60E-06	15YrCance	7.60E-06	0	0
40	ALL		293988.9	4010799	7.00E-06	15YrCance	7.00E-06	0	0

41	ALL	293753.9	4010691	7.69E-06	15YrCance	7.69E-06	0	0
42	ALL	293990.2	4010627	5.61E-06	15YrCance	5.61E-06	0	0
43	ALL	293979.7	4010569	5.04E-06	15YrCance	5.04E-06	0	0
44	ALL	293966.4	4010404	3.53E-06	15YrCance	3.53E-06	0	0
45	ALL	293969	4010356	3.17E-06	15YrCance	3.17E-06	0	0
46	ALL	293970.3	4010292	2.76E-06	15YrCance	2.76E-06	0	0
47	ALL	293953.3	4010236	2.42E-06	15YrCance	2.42E-06	0	0
48	ALL	293957.3	4010192	2.20E-06	15YrCance	2.20E-06	0	0
49	ALL	293548.7	4010423	2.55E-06	15YrCance	2.55E-06	0	0
50	ALL	293531.7	4010312	1.74E-06	15YrCance	1.74E-06	0	0
51	ALL	293530.4	4010222	1.35E-06	15YrCance	1.35E-06	0	0
52	ALL	293435.1	4010258	1.23E-06	15YrCance	1.23E-06	0	0
53	ALL	293443	4010325	1.51E-06	15YrCance	1.51E-06	0	0
54	ALL	293427.3	4010199	1.05E-06	15YrCance	1.05E-06	0	0
55	ALL	293452.1	4010415	2.05E-06	15YrCance	2.05E-06	0	0
56	ALL	293452.1	4010480	2.60E-06	15YrCance	2.60E-06	0	0
57	ALL	293401.2	4010489	2.40E-06	15YrCance	2.40E-06	0	0
58	ALL	293385.5	4010408	1.72E-06	15YrCance	1.72E-06	0	0
59	ALL	293320.3	4010416	1.49E-06	15YrCance	1.49E-06	0	0
60	ALL	293343.7	4010306	1.14E-06	15YrCance	1.14E-06	0	0
61	ALL	293296.8	4010319	1.06E-06	15YrCance	1.06E-06	0	0
62	ALL	293168.8	4010283	7.11E-07	15YrCance	7.11E-07	0	0
63	ALL	293192.3	4010423	1.07E-06	15YrCance	1.07E-06	0	0
64	ALL	293114	4010424	8.62E-07	15YrCance	8.62E-07	0	0
65	ALL	293059.2	4010438	7.65E-07	15YrCance	7.65E-07	0	0
66	ALL	292992.6	4010428	6.29E-07	15YrCance	6.29E-07	0	0
67	ALL	292991.3	4010325	5.08E-07	15YrCance	5.08E-07	0	0
68	ALL	293047.4	4010306	5.56E-07	15YrCance	5.56E-07	0	0
69	ALL	292993.9	4010185	4.03E-07	15YrCance	4.03E-07	0	0
70	ALL	292708.5	4011010	2.88E-06	15YrCance	2.88E-06	0	0
71	ALL	292715.9	4011061	3.40E-06	15YrCance	3.40E-06	0	0
72	ALL	292734.3	4011109	4.02E-06	15YrCance	4.02E-06	0	0
73	ALL	292690.1	4011021	2.82E-06	15YrCance	2.82E-06	0	0
74	ALL	292691.9	4011074	3.27E-06	15YrCance	3.27E-06	0	0
75	ALL	292717.7	4011118	3.89E-06	15YrCance	3.89E-06	0	0
76	ALL	292660.6	4011026	2.63E-06	15YrCance	2.63E-06	0	0
77	ALL	292669.8	4011083	3.13E-06	15YrCance	3.13E-06	0	0
78	ALL	292684.5	4011128	3.60E-06	15YrCance	3.60E-06	0	0
79	ALL	292585	4011060	2.37E-06	15YrCance	2.37E-06	0	0
80	ALL	292596.1	4011161	3.03E-06	15YrCance	3.03E-06	0	0
81	ALL	292465.2	4010964	1.45E-06	15YrCance	1.45E-06	0	0
82	ALL	292439.4	4011096	1.87E-06	15YrCance	1.87E-06	0	0
83	ALL	292481.8	4011231	2.62E-06	15YrCance	2.62E-06	0	0
84	ALL	292483.6	4011454	3.14E-06	15YrCance	3.14E-06	0	0

85	ALL	292527.8	4011456	3.42E-06	15YrCance	3.42E-06	0	0
86	ALL	292612.6	4011465	4.06E-06	15YrCance	4.06E-06	0	0
87	ALL	292537.1	4011531	3.44E-06	15YrCance	3.44E-06	0	0
88	ALL	292481.8	4011537	3.11E-06	15YrCance	3.11E-06	0	0

```
**
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 12.0.0
** Lakes Environmental Software Inc.
** Date: 9/4/2024
** File: C:\Lakes\AERMOD View\FNC Farming\FNC Farming.ADI
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\FNC Farming\FNC Farming.isc
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   POLLUTID OTHER
   RUNORNOT RUN
   ERRORFIL "FNC Farming.err"
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION AREA1       AREA       292979.000  4010822.000       89.250
** DESCRSRC Construction
** Source Parameters **
   SRCPARAM AREA1        1.7977E-06     4.000   834.000   667.000     0.000
0.000
   SRCGROUP AREA1     AREA1
SO FINISHED
**
**************************************
** AERMOD Receptor Pathway
**************************************
**
**
RE STARTING
** DESCRREC "" ""
   DISCCART    292918.88   4011532.75   90.82    90.82
```

```
DISCCART      293020.99    4011527.25    90.69    90.69
DISCCART      293112.89    4011531.96    90.84    90.84
DISCCART      293097.97    4011650.57    90.66    90.66
DISCCART      293207.15    4011552.39    90.69    90.69
DISCCART      293185.94    4011630.15    90.65    90.65
DISCCART      293186.63    4011708.40    90.88    90.88
DISCCART      293210.67    4011761.81    90.95    90.95
DISCCART      293354.22    4011538.14    90.69    90.69
DISCCART      293361.57    4011620.26    90.76    90.76
DISCCART      293357.56    4011706.39    91.01    91.01
DISCCART      293359.56    4011779.84    91.23    91.23
DISCCART      293388.95    4011874.62    91.22    91.22
DISCCART      293442.74    4011540.90    90.68    90.68
DISCCART      293431.75    4011616.31    90.74    90.74
DISCCART      293441.17    4011700.36    90.98    90.98
DISCCART      293450.60    4011792.27    91.63    91.63
DISCCART      293478.09    4011874.75    91.46    91.46
DISCCART      293595.92    4011888.10    91.46    91.46
DISCCART      293566.50    4012006.20    91.58    91.58
DISCCART      293466.73    4011952.78    91.44    91.44
DISCCART      293591.66    4011769.63    91.25    91.25
DISCCART      293602.66    4011697.36    91.16    91.16
DISCCART      293576.74    4011614.09    91.00    91.00
DISCCART      293592.45    4011531.60    90.93    90.93
DISCCART      293672.58    4011522.96    90.92    90.92
DISCCART      293656.87    4011581.88    91.01    91.01
DISCCART      293663.15    4011643.94    91.19    91.19
DISCCART      293675.72    4011710.71    91.24    91.24
DISCCART      293676.51    4011830.90    91.48    91.48
DISCCART      294096.35    4011507.52    91.30    91.30
DISCCART      294327.42    4011498.28    92.08    92.08
DISCCART      294292.30    4011420.64    91.79    91.79
DISCCART      294245.16    4011372.57    91.79    91.79
DISCCART      294069.97    4011243.08    91.48    91.48
DISCCART      294061.98    4010885.03    90.63    90.63
DISCCART      294055.45    4010969.88    90.73    90.73
DISCCART      293979.74    4010969.88    90.32    90.32
DISCCART      293966.69    4010844.57    90.30    90.30
DISCCART      293988.88    4010798.88    90.25    90.25
DISCCART      293753.93    4010690.54    90.33    90.33
DISCCART      293990.19    4010626.58    90.31    90.31
DISCCART      293979.74    4010569.15    89.98    89.98
DISCCART      293966.39    4010404.31    89.43    89.43
DISCCART      293969.01    4010356.01    89.40    89.40
DISCCART      293970.31    4010292.05    89.25    89.25
DISCCART      293953.34    4010235.92    89.12    89.12
DISCCART      293957.26    4010191.54    89.08    89.08
DISCCART      293548.68    4010422.58    89.19    89.19
DISCCART      293531.71    4010311.63    88.88    88.88
DISCCART      293530.41    4010221.56    88.75    88.75
```

```
   DISCCART       293435.12     4010258.11     88.60     88.60
   DISCCART       293442.95     4010324.68     89.15     89.15
   DISCCART       293427.29     4010199.37     88.66     88.66
   DISCCART       293452.09     4010414.75     89.51     89.51
   DISCCART       293452.09     4010480.02     89.37     89.37
   DISCCART       293401.18     4010489.16     89.08     89.08
   DISCCART       293385.52     4010408.22     89.42     89.42
   DISCCART       293320.25     4010416.06     89.08     89.08
   DISCCART       293343.74     4010306.41     89.00     89.00
   DISCCART       293296.75     4010319.46     88.95     88.95
   DISCCART       293168.83     4010282.91     89.16     89.16
   DISCCART       293192.32     4010422.58     89.18     89.18
   DISCCART       293114.00     4010423.89     89.19     89.19
   DISCCART       293059.18     4010438.25     88.99     88.99
   DISCCART       292992.61     4010427.80     88.87     88.87
   DISCCART       292991.30     4010324.68     88.71     88.71
   DISCCART       293047.43     4010306.41     88.91     88.91
   DISCCART       292993.91     4010185.01     88.43     88.43
   DISCCART       292708.49     4011009.73     89.59     89.59
   DISCCART       292715.87     4011061.35     89.53     89.53
   DISCCART       292734.30     4011109.28     89.53     89.53
   DISCCART       292690.06     4011020.79     89.43     89.43
   DISCCART       292691.90     4011074.25     89.62     89.62
   DISCCART       292717.71     4011118.49     89.52     89.52
   DISCCART       292660.57     4011026.32     89.60     89.60
   DISCCART       292669.78     4011083.47     89.73     89.73
   DISCCART       292684.53     4011127.71     89.89     89.89
   DISCCART       292584.99     4011059.51     89.53     89.53
   DISCCART       292596.05     4011160.89     89.66     89.66
   DISCCART       292465.17     4010963.65     89.13     89.13
   DISCCART       292439.36     4011096.37     88.69     88.69
   DISCCART       292481.76     4011230.94     89.71     89.71
   DISCCART       292483.60     4011453.99     89.66     89.66
   DISCCART       292527.84     4011455.83     89.49     89.49
   DISCCART       292612.64     4011465.05     89.62     89.62
   DISCCART       292537.06     4011531.41     90.05     90.05
   DISCCART       292481.76     4011536.94     90.04     90.04
   DISCCART       292504.75     4011975.56     90.92     90.92
RE FINISHED
**
***************************************
** AERMOD Meteorology Pathway
***************************************
**
**
ME STARTING
   SURFFILE visalia-muni-93144\Visalia_07-10.SFC
   PROFFILE visalia-muni-93144\Visalia_07-10.PFL
   SURFDATA 93144 2007 Visalia
   UAIRDATA 23230 2007 OAKLAND/WSO_AP
```

```
    PROFBASE 89.0 METERS
ME FINISHED
**
**************************************
** AERMOD Output Pathway
**************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
    PLOTFILE ANNUAL AREA1 "FNC Farming.AD\AN00G001.PLT" 31
    SUMMFILE "FNC Farming.sum"
OU FINISHED


  *** Message Summary For AERMOD Model Setup ***

  --------- Summary of Total Messages --------

 A Total of             0 Fatal Error Message(s)
 A Total of             1 Warning Message(s)
 A Total of             0 Informational Message(s)


    ******** FATAL ERROR MESSAGES ********
              ***   NONE   ***



    ********   WARNING MESSAGES   ********
 ME W187     151       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET


 *********************************
 *** SETUP Finishes Successfully ***
 *********************************


♠ *** AERMOD - VERSION 23132  ***   *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc                  ***          09/04/24
 *** AERMET - VERSION  21112 ***    ***
                     ***        16:55:07


                              PAGE    1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

                                 ***     MODEL SETUP OPTIONS SUMMARY
 ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - -

 ** Model Options Selected:
```

```
      * Model Uses Regulatory DEFAULT Options
      * Model Is Setup For Calculation of Average CONCentration Values.
      * NO GAS DEPOSITION Data Provided.
      * NO PARTICLE DEPOSITION Data Provided.
      * Model Uses NO DRY DEPLETION. DDPLETE  =  F
      * Model Uses NO WET DEPLETION. WETDPLT  =  F
      * Stack-tip Downwash.
      * Model Accounts for ELEVated Terrain Effects.
      * Use Calms Processing Routine.
      * Use Missing Data Processing Routine.
      * No Exponential Decay.
      * Model Uses RURAL Dispersion Only.
      * ADJ_U*   - Use ADJ_U* option for SBL in AERMET
      * CCVR_Sub - Meteorological data includes CCVR substitutions
      * TEMP_Sub - Meteorological data includes TEMP substitutions
      * Model Assumes No FLAGPOLE Receptor Heights.
      * The User Specified a Pollutant Type of: OTHER

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:      1 Source(s);      1 Source Group(s); and      89
Receptor(s)

              with:      0 POINT(s), including
                         0 POINTCAP(s) and      0 POINTHOR(s)
               and:      0 VOLUME source(s)
               and:      1 AREA type source(s)
               and:      0 LINE source(s)
               and:      0 RLINE/RLINEXT source(s)
               and:      0 OPENPIT source(s)
               and:      0 BUOYANT LINE source(s) with a total of      0 line(s)
               and:      0 SWPOINT source(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  21112

 **Output Options Selected:
        Model Outputs Tables of ANNUAL Averages by Receptor
        Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
        Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and
Missing Hours
```

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) =   89.00 ; Decay
Coef. =   0.000   ; Rot. Angle =   0.0
                    Emission Units = GRAMS/SEC   ;
Emission Rate Unit Factor =   0.10000E+07
                    Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =   3.5 MB of RAM.

 **Input Runstream File: aermod.inp

 **Output Print File: aermod.out

 **Detailed Error/Message File: FNC Farming.err

 **File for Summary of Results: FNC Farming.sum

↟ *** AERMOD - VERSION 23132 ***   *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc   ***   09/04/24
 *** AERMET - VERSION 21112 ***   ***
                     ***   16:55:07

                              PAGE   2
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

                                  *** AREA SOURCE DATA ***

             NUMBER EMISSION RATE COORD (SW CORNER) BASE   RELEASE X-DIM
Y-DIM   ORIENT.   INIT.   URBAN EMISSION RATE AIRCRAFT
   SOURCE   PART. (GRAMS/SEC   X   Y   ELEV.   HEIGHT OF AREA
OF AREA OF AREA   SZ   SOURCE SCALAR VARY
     ID   CATS. /METER**2)   (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS) (DEG.) (METERS)   BY
 -
 -

 AREA1   0   0.17977E-05 292979.0 4010822.0   89.2   4.00   834.00
667.00   0.00   0.00   NO   NO
↟ *** AERMOD - VERSION 23132 ***   *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc   ***   09/04/24
 *** AERMET - VERSION 21112 ***   ***
                     ***   16:55:07

                              PAGE   3
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

                                  *** SOURCE IDs DEFINING SOURCE GROUPS ***

```
 SRCGROUP ID                                             SOURCE IDs
 -----------                                             ----------


  AREA1      AREA1        ,
♠ *** AERMOD - VERSION 23132  ***    *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc                         ***          09/04/24
 *** AERMET - VERSION  21112 ***    ***
                        ***          16:55:07


                               PAGE   4
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*


                                        *** DISCRETE CARTESIAN RECEPTORS ***
                                        (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
                                                      (METERS)


     ( 292918.9, 4011532.8,      90.8,      90.8,      0.0);          ( 293021.0,
4011527.2,      90.7,      90.7,      0.0);
     ( 293112.9, 4011532.0,      90.8,      90.8,      0.0);          ( 293098.0,
4011650.6,      90.7,      90.7,      0.0);
     ( 293207.1, 4011552.4,      90.7,      90.7,      0.0);          ( 293185.9,
4011630.1,      90.6,      90.6,      0.0);
     ( 293186.6, 4011708.4,      90.9,      90.9,      0.0);          ( 293210.7,
4011761.8,      91.0,      91.0,      0.0);
     ( 293354.2, 4011538.1,      90.7,      90.7,      0.0);          ( 293361.6,
4011620.3,      90.8,      90.8,      0.0);
     ( 293357.6, 4011706.4,      91.0,      91.0,      0.0);          ( 293359.6,
4011779.8,      91.2,      91.2,      0.0);
     ( 293389.0, 4011874.6,      91.2,      91.2,      0.0);          ( 293442.7,
4011540.9,      90.7,      90.7,      0.0);
     ( 293431.8, 4011616.3,      90.7,      90.7,      0.0);          ( 293441.2,
4011700.4,      91.0,      91.0,      0.0);
     ( 293450.6, 4011792.3,      91.6,      91.6,      0.0);          ( 293478.1,
4011874.8,      91.5,      91.5,      0.0);
     ( 293595.9, 4011888.1,      91.5,      91.5,      0.0);          ( 293566.5,
4012006.2,      91.6,      91.6,      0.0);
     ( 293466.7, 4011952.8,      91.4,      91.4,      0.0);          ( 293591.7,
4011769.6,      91.2,      91.2,      0.0);
     ( 293602.7, 4011697.4,      91.2,      91.2,      0.0);          ( 293576.7,
4011614.1,      91.0,      91.0,      0.0);
     ( 293592.5, 4011531.6,      90.9,      90.9,      0.0);          ( 293672.6,
4011523.0,      90.9,      90.9,      0.0);
     ( 293656.9, 4011581.9,      91.0,      91.0,      0.0);          ( 293663.1,
4011643.9,      91.2,      91.2,      0.0);
     ( 293675.7, 4011710.7,      91.2,      91.2,      0.0);          ( 293676.5,
4011830.9,      91.5,      91.5,      0.0);
     ( 294096.3, 4011507.5,      91.3,      91.3,      0.0);          ( 294327.4,
4011498.3,      92.1,      92.1,      0.0);
     ( 294292.3, 4011420.6,      91.8,      91.8,      0.0);          ( 294245.2,
```

4011372.6,   91.8,   91.8,   0.0);
     (294070.0, 4011243.1,   91.5,   91.5,   0.0);   (294062.0,
4010885.0,   90.6,   90.6,   0.0);
     (294055.5, 4010969.9,   90.7,   90.7,   0.0);   (293979.7,
4010969.9,   90.3,   90.3,   0.0);
     (293966.7, 4010844.6,   90.3,   90.3,   0.0);   (293988.9,
4010798.9,   90.2,   90.2,   0.0);
     (293753.9, 4010690.5,   90.3,   90.3,   0.0);   (293990.2,
4010626.6,   90.3,   90.3,   0.0);
     (293979.7, 4010569.1,   90.0,   90.0,   0.0);   (293966.4,
4010404.3,   89.4,   89.4,   0.0);
     (293969.0, 4010356.0,   89.4,   89.4,   0.0);   (293970.3,
4010292.0,   89.2,   89.2,   0.0);
     (293953.3, 4010235.9,   89.1,   89.1,   0.0);   (293957.3,
4010191.5,   89.1,   89.1,   0.0);
     (293548.7, 4010422.6,   89.2,   89.2,   0.0);   (293531.7,
4010311.6,   88.9,   88.9,   0.0);
     (293530.4, 4010221.6,   88.8,   88.8,   0.0);   (293435.1,
4010258.1,   88.6,   88.6,   0.0);
     (293443.0, 4010324.7,   89.1,   89.1,   0.0);   (293427.3,
4010199.4,   88.7,   88.7,   0.0);
     (293452.1, 4010414.8,   89.5,   89.5,   0.0);   (293452.1,
4010480.0,   89.4,   89.4,   0.0);
     (293401.2, 4010489.2,   89.1,   89.1,   0.0);   (293385.5,
4010408.2,   89.4,   89.4,   0.0);
     (293320.2, 4010416.1,   89.1,   89.1,   0.0);   (293343.7,
4010306.4,   89.0,   89.0,   0.0);
     (293296.8, 4010319.5,   89.0,   89.0,   0.0);   (293168.8,
4010282.9,   89.2,   89.2,   0.0);
     (293192.3, 4010422.6,   89.2,   89.2,   0.0);   (293114.0,
4010423.9,   89.2,   89.2,   0.0);
     (293059.2, 4010438.2,   89.0,   89.0,   0.0);   (292992.6,
4010427.8,   88.9,   88.9,   0.0);
     (292991.3, 4010324.7,   88.7,   88.7,   0.0);   (293047.4,
4010306.4,   88.9,   88.9,   0.0);
     (292993.9, 4010185.0,   88.4,   88.4,   0.0);   (292708.5,
4011009.7,   89.6,   89.6,   0.0);
     (292715.9, 4011061.3,   89.5,   89.5,   0.0);   (292734.3,
4011109.3,   89.5,   89.5,   0.0);
     (292690.1, 4011020.8,   89.4,   89.4,   0.0);   (292691.9,
4011074.2,   89.6,   89.6,   0.0);
     (292717.7, 4011118.5,   89.5,   89.5,   0.0);   (292660.6,
4011026.3,   89.6,   89.6,   0.0);
     (292669.8, 4011083.5,   89.7,   89.7,   0.0);   (292684.5,
4011127.7,   89.9,   89.9,   0.0);
     (292585.0, 4011059.5,   89.5,   89.5,   0.0);   (292596.0,
4011160.9,   89.7,   89.7,   0.0);
     (292465.2, 4010963.6,   89.1,   89.1,   0.0);   (292439.4,
4011096.4,   88.7,   88.7,   0.0);
     (292481.8, 4011230.9,   89.7,   89.7,   0.0);   (292483.6,

```
4011454.0,       89.7,       89.7,       0.0);
   ( 292527.8, 4011455.8,       89.5,       89.5,       0.0);         ( 292612.6,
4011465.0,       89.6,       89.6,       0.0);
   ( 292537.1, 4011531.4,       90.0,       90.0,       0.0);         ( 292481.8,
4011536.9,       90.0,       90.0,       0.0);
   ( 292504.8, 4011975.6,       90.9,       90.9,       0.0);
```

                              PAGE   5
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

                                   *** METEOROLOGICAL DAYS SELECTED FOR
PROCESSING ***
                                          (1=YES; 0=NO)

        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
        1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

         NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON
WHAT IS INCLUDED IN THE DATA FILE.

                         *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED
CATEGORIES ***
                                          (METERS/SEC)

                         1.54,   3.09,   5.14,   8.23,
10.80,
```

 *** MODELOPTs:     RegDFAULT  CONC   ELEV   RURAL   ADJ_U*


                                *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL
DATA ***

   Surface file:    visalia-muni-93144\Visalia_07-10.SFC
                 Met Version:   21112
   Profile file:    visalia-muni-93144\Visalia_07-10.PFL

   Surface format: FREE

   Profile format: FREE

   Surface station no.:     93144              Upper air station no.:     23230
              Name: VISALIA                                  Name:
OAKLAND/WSO_AP
              Year:    2007                                  Year:    2007

 First 24 hours of scalar data
 YR MO DY JDY HR     H0      U*      W*   DT/DZ ZICNV ZIMCH  M-O LEN    Z0   BOWEN
ALBEDO  REF WS    WD      HT    REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
 07 01 01   1 01 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  277.1    2.0
 07 01 01   1 02 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  276.1    2.0
 07 01 01   1 03 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  276.1    2.0
 07 01 01   1 04  -11.5  0.137 -9.000 -9.000 -999.  121.     20.5  0.02   0.79
1.00    2.36  123.   10.0  274.1    2.0
 07 01 01   1 05 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  273.1    2.0
 07 01 01   1 06   -6.3  0.100 -9.000 -9.000 -999.   75.     14.3  0.02   0.79
1.00    1.76  122.   10.0  273.1    2.0
 07 01 01   1 07  -11.5  0.137 -9.000 -9.000 -999.  121.     20.5  0.02   0.79
1.00    2.36  125.   10.0  272.1    2.0
 07 01 01   1 08  -19.9  0.200 -9.000 -9.000 -999.  214.     43.8  0.02   0.79
0.63    3.36  143.   10.0  274.1    2.0
 07 01 01   1 09   -3.6  0.174 -9.000 -9.000 -999.  175.    134.1  0.02   0.79
0.35    2.86  147.   10.0  275.1    2.0
 07 01 01   1 10    8.7  0.192  0.218  0.011   43.  201.    -73.0  0.02   0.79
0.26    2.86  141.   10.0  276.1    2.0
 07 01 01   1 11   16.3  0.248  0.321  0.012   73.  296.    -84.4  0.03   0.79
0.22    3.36  184.   10.0  276.1    2.0
 07 01 01   1 12   20.2 -9.000 -9.000 -9.000  140. -999. -99999.0  0.02   0.79
0.21    0.00    0.   10.0  276.1    2.0
 07 01 01   1 13   20.5  0.182  0.472  0.012  185.  187.    -26.7  0.03   0.79

```
0.21    2.36  163.   10.0  278.1    2.0
 07 01 01   1 14   16.9  0.212  0.471  0.011  223.  234.    -51.0  0.03   0.79
0.22    2.86  169.   10.0  279.1    2.0
 07 01 01   1 15   52.0  0.226  0.810  0.012  368.  258.    -20.0  0.03   0.79
0.25    2.86  162.   10.0  281.1    2.0
 07 01 01   1 16   10.8  0.132  0.482  0.012  375.  119.    -19.3  0.02   0.79
0.35    1.76  224.   10.0  282.1    2.0
 07 01 01   1 17 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
0.61    0.00    0.   10.0  280.1    2.0
 07 01 01   1 18  -11.7  0.139 -9.000 -9.000 -999.  125.     21.3  0.02   0.79
1.00    2.36   17.   10.0  278.1    2.0
 07 01 01   1 19  -11.6  0.138 -9.000 -9.000 -999.  123.     20.9  0.02   0.79
1.00    2.36   34.   10.0  278.1    2.0
 07 01 01   1 20 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  277.1    2.0
 07 01 01   1 21 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  276.1    2.0
 07 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  274.1    2.0
 07 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  274.1    2.0
 07 01 01   1 24 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.02   0.79
1.00    0.00    0.   10.0  274.1    2.0


  First hour of profile data
  YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
  07 01 01 01   10.0 1 -999.  -99.00   277.2   99.0  -99.00  -99.00

  F indicates top of profile (=1) or below (=0)
♠ *** AERMOD - VERSION 23132  ***   *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc                  ***        09/04/24
 *** AERMET - VERSION  21112 ***   ***
                   ***         16:55:07
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PAGE   7

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

              *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   4
YEARS FOR SOURCE GROUP: AREA1      ***
                           INCLUDING SOURCE(S):     AREA1        ,

                                    *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                 ** CONC OF OTHER     IN MICROGRAMS/M**3
             **

      X-COORD (M)   Y-COORD (M)      CONC                      X-COORD (M)
Y-COORD (M)       CONC
```

- -
- -

292918.88	4011532.75	8.62679		293020.99	
4011527.25	10.42879				
293112.89	4011531.96	10.47392		293097.97	
4011650.57	5.86050				
293207.15	4011552.39	9.15602		293185.94	
4011630.15	6.22396				
293186.63	4011708.40	4.48418		293210.67	
4011761.81	3.60063				
293354.22	4011538.14	9.29079		293361.57	
4011620.26	5.71999				
293357.56	4011706.39	3.84146		293359.56	
4011779.84	2.86039				
293388.95	4011874.62	1.99024		293442.74	
4011540.90	8.43585				
293431.75	4011616.31	5.35858		293441.17	
4011700.36	3.48984				
293450.60	4011792.27	2.37857		293478.09	
4011874.75	1.73333				
293595.92	4011888.10	1.36945		293566.50	
4012006.20	1.07977				
293466.73	4011952.78	1.41496		293591.66	
4011769.63	1.96688				
293602.66	4011697.36	2.53452		293576.74	
4011614.09	4.13544				
293592.45	4011531.60	7.26158		293672.58	
4011522.96	6.43385				
293656.87	4011581.88	4.07414		293663.15	
4011643.94	2.75040				
293675.72	4011710.71	1.99101		293676.51	
4011830.90	1.37377				
294096.35	4011507.52	1.05715		294327.42	
4011498.28	0.65371				
294292.30	4011420.64	0.88708		294245.16	
4011372.57	1.15823				
294069.97	4011243.08	3.16671		294061.98	
4010885.03	6.16804				
294055.45	4010969.88	5.84490		293979.74	
4010969.88	7.64143				
293966.69	4010844.57	8.46799		293988.88	
4010798.88	7.80271				
293753.93	4010690.54	8.56984		293990.19	
4010626.58	6.25126				
293979.74	4010569.15	5.61122		293966.39	
4010404.31	3.92888				
293969.01	4010356.01	3.53685		293970.31	
4010292.05	3.07792				
293953.34	4010235.92	2.69682		293957.26	
4010191.54	2.45097				

```
        293548.68    4010422.58         2.84636                      293531.71
4010311.63        1.94125
        293530.41    4010221.56         1.50561                      293435.12
4010258.11        1.36956
        293442.95    4010324.68         1.68137                      293427.29
4010199.37        1.16480
        293452.09    4010414.75         2.28940                      293452.09
4010480.02        2.89528
        293401.18    4010489.16         2.67330                      293385.52
4010408.22        1.91580
        293320.25    4010416.06         1.66215                      293343.74
4010306.41        1.27229
        293296.75    4010319.46         1.17753                      293168.83
4010282.91        0.79180
        293192.32    4010422.58         1.19440                      293114.00
4010423.89        0.95999
        293059.18    4010438.25         0.85232                      292992.61
4010427.80        0.70043
        292991.30    4010324.68         0.56645                      293047.43
4010306.41        0.61901
        292993.91    4010185.01         0.44851                      292708.49
4011009.73        3.20630
        292715.87    4011061.35         3.79315                      292734.30
4011109.28        4.48114
        292690.06    4011020.79         3.13756                      292691.90
4011074.25        3.64225
        292717.71    4011118.49         4.33766                      292660.57
4011026.32        2.93145
        292669.78    4011083.47         3.49252                      292684.53
4011127.71        4.00595
        292584.99    4011059.51         2.63545                      292596.05
4011160.89        3.37440
```

PAGE   8
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

               *** THE ANNUAL AVERAGE CONCENTRATION   VALUES AVERAGED OVER   4
YEARS FOR SOURCE GROUP: AREA1   ***
                     INCLUDING SOURCE(S):   AREA1   ,

                         *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                     ** CONC OF OTHER   IN MICROGRAMS/M**3
          **

```
     X-COORD (M)   Y-COORD (M)        CONC                           X-COORD (M)
Y-COORD (M)       CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - -
       292465.17    4010963.65        1.61776                          292439.36
4011096.37       2.08500
       292481.76    4011230.94        2.91444                          292483.60
4011453.99       3.49773
       292527.84    4011455.83        3.81192                          292612.64
4011465.05       4.52751
       292537.06    4011531.41        3.83105                          292481.76
4011536.94       3.46546
       292504.75    4011975.56        2.27977
```

♠ *** AERMOD - VERSION 23132 ***   *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc   ***   09/04/24
 *** AERMET - VERSION 21112 ***   ***
                        ***   16:55:07

                              PAGE   9
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

                              *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER   4 YEARS ***

                              ** CONC OF OTHER   IN MICROGRAMS/M**3
            **

                    NETWORK
GROUP ID   AVERAGE CONC   RECEPTOR (XR, YR, ZELEV,
ZHILL, ZFLAG) OF TYPE GRID-ID
- -
- - - - - - - - - - - - - - - - -

AREA1   1ST HIGHEST VALUE IS   10.47392 AT (293112.89, 4011531.96,   90.84,
   90.84,   0.00) DC
         2ND HIGHEST VALUE IS   10.42879 AT (293020.99, 4011527.25,   90.69,
   90.69,   0.00) DC
         3RD HIGHEST VALUE IS   9.29079 AT (293354.22, 4011538.14,   90.69,
   90.69,   0.00) DC
         4TH HIGHEST VALUE IS   9.15602 AT (293207.15, 4011552.39,   90.69,
   90.69,   0.00) DC
         5TH HIGHEST VALUE IS   8.62679 AT (292918.88, 4011532.75,   90.82,
   90.82,   0.00) DC
         6TH HIGHEST VALUE IS   8.56984 AT (293753.93, 4010690.54,   90.33,
   90.33,   0.00) DC
         7TH HIGHEST VALUE IS   8.46799 AT (293966.69, 4010844.57,   90.30,
   90.30,   0.00) DC

```
          8TH HIGHEST VALUE IS         8.43585 AT (  293442.74,  4011540.90,    90.68,
    90.68,    0.00)  DC
          9TH HIGHEST VALUE IS         7.80271 AT (  293988.88,  4010798.88,    90.25,
    90.25,    0.00)  DC
         10TH HIGHEST VALUE IS         7.64143 AT (  293979.74,  4010969.88,    90.32,
    90.32,    0.00)  DC


  *** RECEPTOR TYPES:  GC = GRIDCART
                       GP = GRIDPOLR
                       DC = DISCCART
                       DP = DISCPOLR
♠ *** AERMOD - VERSION 23132  ***    *** C:\Lakes\AERMOD View\FNC Farming\FNC
Farming.isc                    ***         09/04/24
 *** AERMET - VERSION  21112 ***    ***
                       ***          16:55:07

                              PAGE  10
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of          0 Fatal Error Message(s)
 A Total of          1 Warning Message(s)
 A Total of      10959 Informational Message(s)

 A Total of      35064 Hours Were Processed

 A Total of       9719 Calm Hours Identified

 A Total of       1240 Missing Hours Identified (  3.54 Percent)


    ******** FATAL ERROR MESSAGES ********
            ***  NONE  ***


    ********   WARNING MESSAGES   ********
ME W187    151       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET


    *********************************
    *** AERMOD Finishes Successfully ***
    *********************************
```

HARP Project Summary Report 9/4/2024 6:29:25 PM

PROJECT INFORMATION
HARP Version: 22118
Project Name: FNC FARMING
Project Output Directory: C:\Users\geniu\OneDrive\Desktop\24007 - FNC Farming
HRA\HARP2 (ADMRT)\FNC FARMING
HARP Database: NA

FACILITY INFORMATION
Origin
X (m):0
Y (m):0
Zone:1
No. of Sources:0
No. of Buildings:0

EMISSION INVENTORY
No. of Pollutants:1
No. of Background Pollutants:0

Emissions

ScrID	StkID	ProID	PolID	PolAbbrev	
Multi	Annual Ems	MaxHr Ems	MWAF		
	(lbs/yr)	(lbs/hr)			
1	0	0	9901	DieselExhPM	1
	257.4	0	1		

Background

PolID	PolAbbrev	Conc (ug/m^3)	MWAF

Ground level concentration files (\glc\)

9901MAXHR.txt
9901PER.txt

POLLUTANT HEALTH INFORMATION
Health Database: C:\HARP2\Tables\HEALTH17320.mdb
Health Table Version: HEALTH22013
Official: True

PolID	PolAbbrev	InhCancer	OralCancer	AcuteREL	
InhChronicREL	OralChronicREL	InhChronic8HRREL			
9901	DieselExhPM	1.1			5

```
***AIR DISPERSION MODELING INFORMATION***
Versions used in HARP.  All executables were obtained from USEPA's Support Center
for Regulatory Atmospheric Modeling website (http://www.epa.gov/scram001/)
AERMOD: 18081
AERMAP: 18081
BPIPPRM: 04274
AERPLOT: 13329

***METEOROLOGICAL INFORMATION***
Version:
Surface File:
Profile File:
Surface Station:
Upper Station:
On-Site Station:

***LIST OF AIR DISPERSION FILES***
AERMOD Input File:
AERMOD Output File:
AERMOD Error File:
Plotfile list
_____

***LIST OF RISK ASSESSMENT FILES***
Health risk analysis files (\hra\)
_____
Construction HRACancerRisk.csv
Construction HRACancerRiskSumByRec.csv
Construction HRAGLCList.csv
Construction HRAHRAInput.hra
Construction HRANCAcuteRisk.csv
Construction HRANCAcuteRiskSumByRec.csv
Construction HRANCChronicRisk.csv
Construction HRANCChronicRiskSumByRec.csv
Construction HRAOutput.txt
Construction HRAPathwayRec.csv
Construction HRAPolDB.csv

Spatial averaging files (\sa\)
_____
```