

Air Quality Mitigation Plan Elk Grove Southeast Industrial Area Specific Plan



City of Elk Grove



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1 INTRODUCTION

This document presents the Air Quality Mitigation Plan (AQMP) for the Elk Grove Southeast Industrial Area Specific Plan (project). The project site for this AQMP comprises approximately 571 acres southeast of Grant Line Road (near its intersection with Waterman Road) and east of the Union Pacific Railroad (UPRR) tracks and State Route (SR) 99. The project site extends eastward past the intersection of Grant Line Road and Mosher Road, and extends southward to the Sacramento County Urban Services Boundary (USB) (see Exhibit 1). Additional details regarding the project, including proposed land uses are provided in Section 2, Project Description.

Development of the project would result in emissions of criteria air pollutants and ozone precursors (reactive organic gases [ROG] and nitrogen oxides [NO_x]) during both the construction and operational phases. Projects that are anticipated to exceed the operational thresholds of significance for ozone precursors would have significant impact and should apply feasible mitigation. The Sacramento Air Quality Management District (SMAQMD) recommends that an AQMP should include a goal to reduce ozone precursors by 35 percent for projects not considered in the State Implementation Plan (SIP). Consistent with Mitigation Measure 3.4-2 of the Elk Grove SOI Amendment and Multi-Sport Park Complex Supplemental Environmental Impact Report (Supplemental EIR) (City of Elk Grove 2020a), the purpose of this AQMP is to quantify project-generated emissions of ozone precursors and then describe feasible measures that could reduce ozone precursors by 35 percent.^{1,2}

To assist in the evaluation of air quality impacts, SMAQMD developed its Recommended Guidance for Land Use Emission Reductions Version 4.3 (for Operational Emissions) (Guidance) dated February 10, 2021 (SMAQMD 2021a). The Guidance outlines methods for estimating project-related operational emissions, establishing an emissions reduction target, and quantifying emission reductions associated with SMAQMD-approved reduction measures. This AQMP includes a description of the project and the methodology used to establish both an unmitigated and a mitigated emissions scenario. These scenarios are based on project-specific data and available, feasible mitigation measures. The emissions scenarios are then compared to emission reduction targets with a description of how the 35 percent reduction target for ROG and NO_x is achieved.

¹ As described in more detail in Section 3.2 below, while the 35 percent reduction target is based on the project's mobile sector emissions, the project may utilize mitigation from any sector to meet the target.

² After the original project was proposed, the City made minor adjustments to the anticipated land uses and the name of the project, now known as the Multi-Sport Complex and Southeast Industrial Annexation Specific Plan.

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

As described previously, the project site is southeast of Grant Line Road (near its intersection with Waterman Road) and east of the UPRR tracks and SR 99. The project site extends eastward past the intersection of Grant Line Road and Mosher Road, and extends southward to the Sacramento County USB (see Exhibit 1).

2.2 PROJECT SUMMARY

As shown in Exhibit 2 and listed in Table 2-1, the project is proposed to include a collection of industrial, commercial/retail, parks/open space, and mixed uses. The specific modeling assumptions and details for each land use are described in the following sections.

Land Use	Proposed Project (acres)
Parks and Open Space (P/OS)	64
Mixed Use (MU)	118
Light Industrial (LI)	212
Heavy Industrial (HI)	143
Regional Commercial (RC)	20
Existing City Right-of-Way ¹	14
Total	571

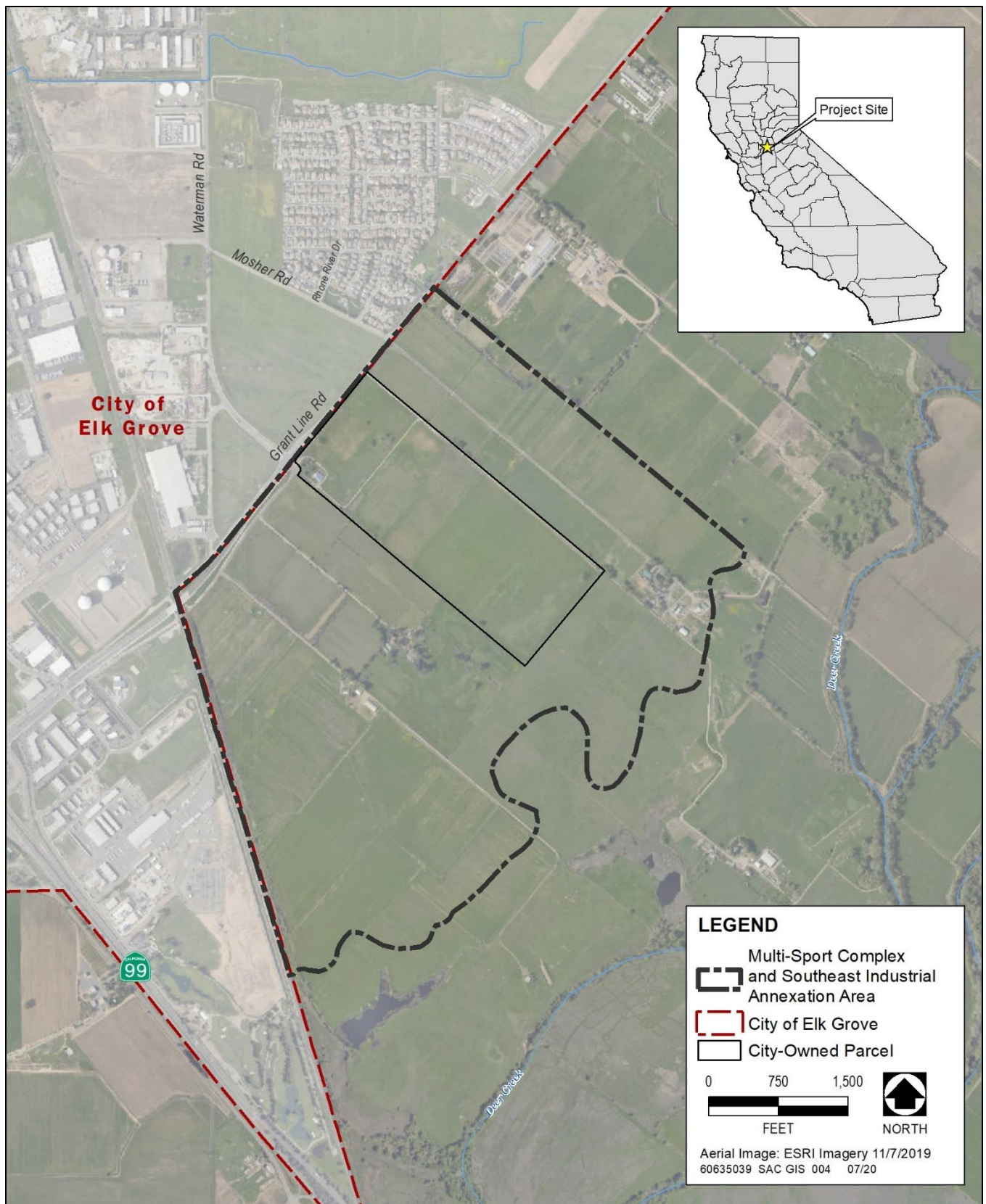
Note: ¹The acreage total for the 2019 SOIA EIR did not include the existing City rights-of-way, and so the total had shown as approximately 561, rather than 571 acres.

2.2.1 PARKS AND OPEN SPACE

The project includes development of approximately 64 acres of parks and open space (P/OS). For the purposes of the AQMP and modeling emissions using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, the representative land uses applied to this land use were Arena and City Park. The modeling includes 40 acres of the “Arena” land use and 20 acres as “City Park.” Four acres of preserved open space are currently anticipated. This preserved open space area would not be anticipated to have any emissions-generating activities and is not included in the modeling.

2.2.2 MIXED USE

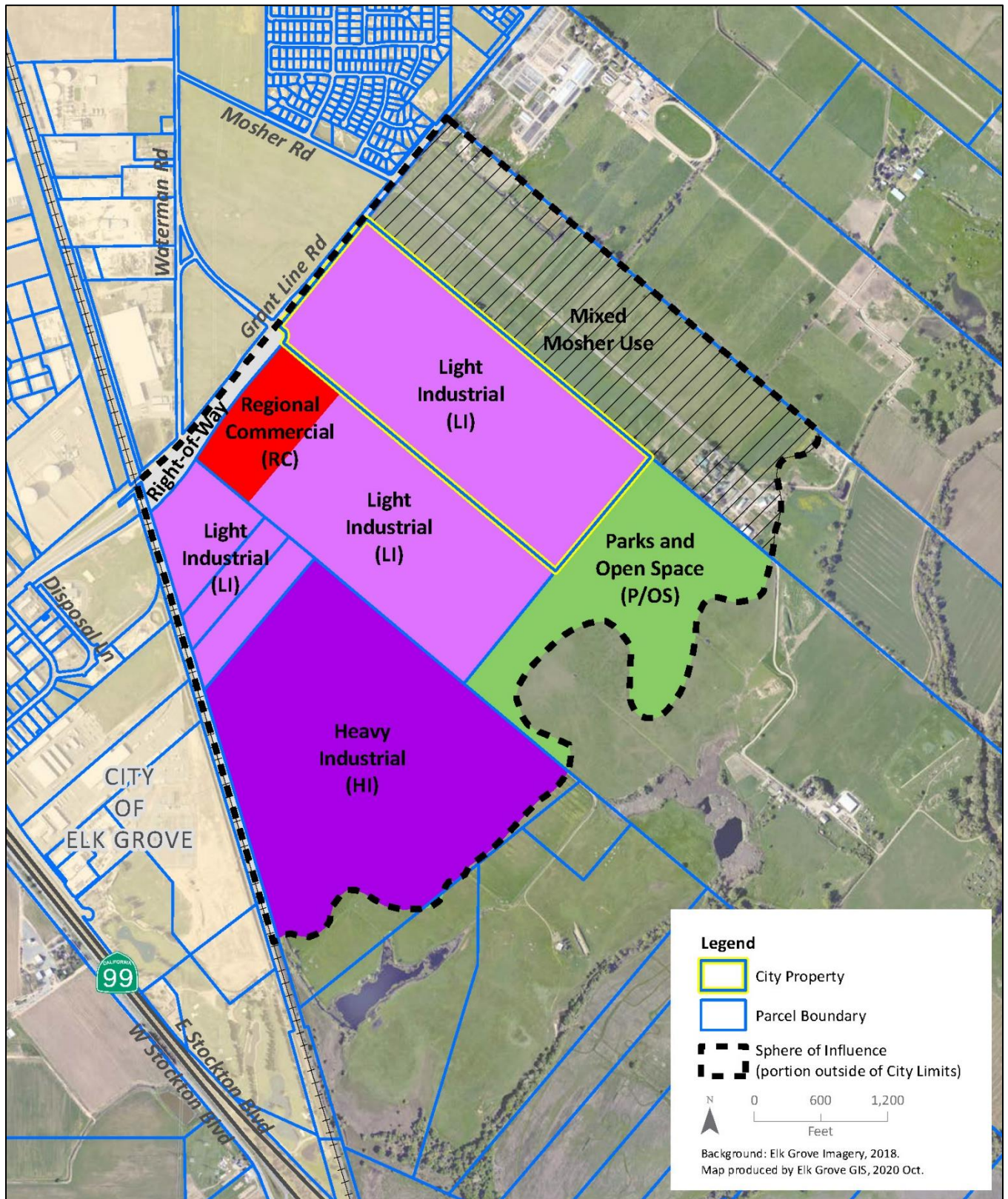
The project includes development of approximately 118 acres of mixed uses. The Mixed Use area would be evenly split between residential, office, and industrial land uses. The residential area of approximately 39.6 acres was assumed to have 238 single-family dwelling units. This was based on an assumed equivalent single family dwelling unit density of six units per acre. The representative land use chosen for the 39.6 acres of office space was Office Park. It was estimated that this portion of the Mixed Use area would consist of approximately 500,664 building square feet, based on a floor area ratio of 0.29. The representative land use chosen for the 39.6 acres of industrial space was Industrial Park. It was estimated that this portion of the Mixed Use area would consist of approximately 621,514 building square feet, based on a floor area ratio of 0.36.



Source: City of Elk Grove 2020a

Regional Location

Exhibit 1



Source: City of Elk Grove 2020a

Site Plan

Exhibit 2

2.2.3 LIGHT INDUSTRIAL

The project includes development of approximately 212 acres of light industrial uses. The representative land use chosen for this area was General Light Industry. It was estimated that this land use would consist of approximately 3,324,500 building square feet, based on a floor area ratio of 0.36.

2.2.4 HEAVY INDUSTRIAL

The project includes development of approximately 143 acres of heavy industrial uses. The representative land use chosen for this area was General Heavy Industry. It was estimated that this land use would consist of approximately 2,242,470 building square feet, based on a floor area ratio of 0.36.

2.2.5 REGIONAL COMMERCIAL

The project includes development of approximately 20 acres of regional commercial uses. The representative land use chosen for this area was Regional Shopping Center. It was estimated that this land use would consist of approximately 252,650 building square feet, based on a floor area ratio of 0.29.

3 METHODOLOGY

As described previously, the emission estimates and analysis in this AQMP were performed in accordance with SMAQMD Recommended Guidance for Land Use Emission Reductions Version 4.3 (for Operational Emissions) (SMAQMD 2021a) and discussions with SMAQMD staff. Consistent with the Guidance, long-term operational emissions of ozone precursors associated with area, energy, and mobile source emissions were estimated using CalEEMod, version 2016.3.2.

Area source emissions of ozone precursors include emissions from the use of landscaping and maintenance equipment, consumer products, and architectural coatings. Energy source emissions of ozone precursors include emissions from electricity and natural gas consumption. Mobile source emissions are associated with vehicle trips from residents, employees, and visitors.

In accordance with protocol for ozone precursors in the SMAQMD Guidance, CalEEMod is used to estimate the project's emissions with and without the incorporation of emissions reduction measures. This AQMP was prepared through the use of two CalEEMod run scenarios: an unmitigated emissions scenario, which does not account for emission reduction measures and uses CalEEMod defaults, and a mitigated emissions scenario, which accounts for emission reduction measures designed to reduce precursor emissions. The calculation to determine the amount of emissions that the project should mitigate, or the emission reduction target, was based on 35 percent of the annual mass emissions of ozone precursors released by the project's mobile sector. The two scenarios and the emissions reduction target are described in further detail below.

3.1 UNMITIGATED EMISSIONS SCENARIO

As described in more detail in Section 2.2, Project Summary, the proposed land uses, their sizes, and associated building square footage were entered into CalEEMod for the buildout year 2035. Since the project would be operational after January 1, 2020, the unmitigated emissions scenario CalEEMod run includes an update to the CalEEMod energy consumption defaults to consider implementation of the 2019 Title 24 Building Energy Efficiency Standards. CalEEMod default energy consumption for land uses are based on the 2016 Title 24 Building Energy Efficiency Standards. It is estimated that the 2019 Title 24 standards would result in energy consumption reduction of 53 percent for single-family housing and 30 percent for nonresidential buildings as compared to those buildings built under the 2016 standards (CEC 2018). In addition, based on discussions with SMAQMD staff, the unmitigated emissions scenario CalEEMod run also updates the volatile organic compounds (VOC) content for residential and nonresidential interior and exterior coatings from 100 grams per liter (g/L) to 75 g/L based on the average regional VOC content identified in the 2019 SMAQMD emissions inventory (SMAQMD 2021b).

The emissions from the unmitigated emissions scenario run were used to establish the AQMP reduction target for the project, as shown in Table 3-1. In accordance with SMAQMD recommendations, the emission reduction targets were based on the annual mass emissions released by the project's mobile sector.

3.2 MITIGATED EMISSIONS SCENARIO

In accordance with SMAQMD Guidance, in order to achieve the reduction target for ozone precursor emissions, the project's emissions were re-run in CalEEMod with application of the project's emission reduction measures and CalEEMod on-model measures to reflect project-specific parameters. While the reduction target is based on mobile sector emissions, the project may utilize mitigation measures for any sector to meet the target. As such, the project's emission reduction measures include application of CalEEMod's on-model measures for traffic and project design features applicable to energy-related emissions reductions.

To determine the efficacy of the CalEEMod on-model traffic tab measures, the applicable CalEEMod project setting for the project was determined to be Low Density Suburban. As described in the California Air Pollution

Control Officers (CAPCOA) guidance document on emissions mitigation strategies, Quantifying Greenhouse Gas Mitigation Measures (CAPCOA Guidance), a suburban project is characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb) (CAPCOA 2010).

Additional on-site and off-site mitigation measures were recommended and included to meet the 35 percent reduction target. The specific measures applied in this run are described in more detail in Section 4, Emission Reduction Measures.

3.3 EMISSIONS REDUCTION TARGET

Based on the proposed land uses and CalEEMod defaults with the adjustments described in Section 3.1.1, the project would generate approximately 46.08 tons of ROG and 42.12 tons of NO_x per year. The annual vehicle miles traveled (VMT) for the unmitigated emissions scenario is 97,091,767. Table 3-1 summarizes the unmitigated emissions in tons per year and the emissions reduction target for each pollutant. See Appendix A for detailed assumptions, modeling parameters, and outputs.

Source	ROG	NO _x
	tons per year	
Area	38.90	0.03
Energy	1.22	11.05
Mobile	5.97	31.04
Total	46.08	42.12
Emissions Reduction Target ¹	2.09	10.86

Notes: ROG = reactive organic gases; NO_x = nitrogen oxides
¹ Emission reductions targets calculated using 35 percent of the project's mobile source emissions.

As shown in Table 2-1, to achieve the 35 percent reduction target, the project's ROG and NO_x emissions would need to be reduced by 2.09 and 10.86 tons per year, respectively.

4 EMISSION REDUCTION MEASURES AND RESULTS

This section presents a detailed discussion of each measure that would reduce the project's ozone precursor emissions. The specific on-model emission reduction measures and measures included within the Elk Grove Sphere of Influence Amendment and Multi-Sport Park Complex EIR and the Elk Grove Multi-Sport Complex and Southeast Industrial Area Supplemental EIR used to conduct the mitigated emissions scenario are described below. This section also presents the reductions achieved via the on-model reduction measures and measures included in the EIR and Supplemental EIR.

4.1 CALEEMOD ON-MODEL REDUCTION MEASURES

4.1.1 INCREASE DIVERSITY OF LAND USES (LUT-3)

Measure Description: The project is designed or located in an area with variety of land use types within proximity of each other (mixed use). SMAQMD recognizes that having different types of land uses near one another can decrease VMT since trips between land use types are shorter and may be accommodated by non-auto modes of transport. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.

Applicability: Since the project proposes a collection of industrial, commercial/retail, parks/open space, and mixed uses (residential, commercial, and industrial) in the same area, it was assumed that the project would have at least three of the following on-site or off-site within a quarter mile: residential development, retail development, park/open space, or office.

Enforceability: The land use mix, inclusive of a range of land uses comprised of industrial, mixed use, parks and open space, and commercial, are defined per the Land Use Plan within the Specific Plan itself, as well as considered in the EIR and Supplemental EIR. Development projects will be reviewed for consistency with the Specific Plan and assumptions in the EIR and Supplemental EIR when determining whether CEQA review is sufficient to support approvals at the project level or whether any additional CEQA review or revisions to the existing CEQA documentation may be necessary.

4.1.2 IMPROVE PEDESTRIAN NETWORK (SDT-1)

Measure Description: The project will provide a pedestrian access network that internally links all uses and connects to all existing or planned external streets and pedestrian facilities contiguous with the project site. The project will minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, landscaping, and slopes that impede pedestrian circulation will be avoided.

Applicability: Since the project proposes a collection of industrial, commercial/retail, parks/open space, and mixed uses (residential, commercial, and industrial), it was assumed that the project would have at least three of the following on-site or off-site within a quarter mile: residential development, retail development, park/open space, or office.

As discussed in Section 3, "Infrastructure and Circulation," of the Specific Plan, the project includes a proposed trail connection to the northwest that will utilize the existing Grant Line Road overcrossing at the railroad tracks to allow for pedestrian and bike connections to pass below Grant Line Road to connect to Waterman Road and the powerline trail north of the project site. In addition, as provided in Figure 4, "Roadway Cross Sections," of the Specific Plan, arterial and commercial collector roadways proposed for the project area include pedestrian sidewalk zones with buffers from the vehicle travel lanes. The balance of the project site will be served by a Typical Commercial Collector Section. This section includes a two-way left turn lane throughout to better

facilitate future driveway locations. Both sections include Class II Bikeway facilities and separated and attached sidewalks for non-vehicular circulation. In addition, when related land uses are located across the street from one another or there is a pedestrian and trail connection, the project will implement mid-block crossings, where feasible. Mid-block pedestrian crossings will provide high-visibility markings, which could include, but are not limited to rectangular rapid-flashing beacons, pedestrian refuge islands, high-visibility crosswalks, in-street and overhead signs, in-pavement flashers, advance stop/yield lines, and parking restrictions near crosswalks. The project is also proposing installation of off-street trails facilities in the instances where roadway segments are consolidated to create larger building sites (e.g., removal of Road A southwest of Waterman/Road B). As such, the applicable setting for this measure was selected to be “project and connecting off-site” pedestrian network improvements.

Enforceability: The Specific Plan comprehensively identifies backbone transportation improvements and the approach to financing and implementing those improvements (see Sections 3.2 and 5.4 in particular). As described in Section 5.4.4 of the Specific Plan, “Developer Responsibilities,” to the extent an infrastructure improvement is required for a project seeking entitlement under the Specific Plan and is not included within an applicable fee program or an in-lieu payment, developers will be responsible for constructing their fair-share improvements for infrastructure and circulation, including but not limited to pedestrian improvements. Prior to issuance of building permits, Project Building Plans shall demonstrate how proposed projects under the Specific Plan will include pedestrian network improvements within the project site and connecting off-site, to the satisfaction of the City of Elk Grove Planning Division.

4.1.3 PROVIDE TRAFFIC CALMING MEASURES (SDT-2)

Measure Description: The project provides traffic calming measures to encourage people to walk or bike instead of using a vehicle. Project design includes pedestrian/bicycle safety and traffic calming measures beyond existing City requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips with traffic calming features. Street traffic calming features may include on street parking, planter strips with street trees, chicanes, horizontal shifts (lane centerline that curves or shifts), bollards, rumble strips, woonerfs, and others. Intersection traffic calming measures may include marked crosswalks, count-down signal timers, curb extensions, channelization islands, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, traffic circles or mini-circles, and others.

Applicability: The analysis assumed that the project would include traffic calming features for 75 percent of all intersections. Based on a comparison of industrial and non-industrial areas in the region, it was assumed that intersection density would be approximately 86 percent less in the industrial area compared to the non-industrial area on a per-acre basis. Thus, the 75 percent assumption was based on the relative proportion of intersections within and outside of the anticipated industrial acreages for the project. The City’s Roadway Fee Program, which applies to all development within the City and provides a fair-share funding mechanism towards facility improvement and expansion necessary to serve new development, is being updated to include the project site. In addition, the project includes a Transportation Master Plan, which identifies on-site circulation elements, including on-site roadway alignments, on-site typical sections, and proposed intersection improvements for the project site (City of Elk Grove 2020b).

Enforceability: The Specific Plan comprehensively identifies backbone transportation improvements and the approach to financing and implementing those improvements (see Sections 3.2 and 5.4 in particular). As described in Section 5.4.4, “Developer Responsibilities,” of the Specific Plan, to the extent an infrastructure improvement is required for a particular development and is not included within an applicable fee program or an in-lieu payment, individual developers shall be responsible for constructing their fair share improvements at their sole expense. Examples include but are not limited to local streets and intersections. Where feasible, bollards at intersections will be installed. However, due to the light and heavy industrial land uses proposed within the Specific Plan Area, bollards may not be feasible due to off-tracking from truck trailers. In lieu of bollards, a decorative pattern at curb returns will be installed to create a bulb-out with a low profile that doubles as a truck apron to reduce corner radii. In order to protect pedestrian crossings (consistent with SDT-1 above), the Specific

Plan Area will also implement safety measures such as advance stop/yield lines, rectangular rapid flashing beacons, and in-pavement flashers at the intersections. Prior to issuance of building permits, Project Building Plans shall be reviewed by the Traffic Engineering Section of the City of Elk Grove's Public Works Department for consistency with the Transportation Master Plan and the goals and objectives identified in the City's Traffic Congestion Management Program.

4.2 EMISSION REDUCTION MEASURES INCLUDED IN THE SUPPLEMENTAL EIR

4.2.1 EXCEED TITLE 24 (BE-1)

Measure Description: This measure requires new construction projects to comply with California's Green Building Standards (CALGreen) Tier 1 standards, including a 15-percent improvement over minimum Title 24 Part 6 Building Energy Efficiency Standards. This measure requires new development in the City of Elk Grove to meet and exceed CALGreen and Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6, of the California Code of Regulations). CALGreen and the Building Energy Efficiency standards together serve to ensure that new buildings built in California meet increasingly efficient energy standards to conserve energy and water, reduce waste, and improve indoor and outdoor air quality.

Applicability: As described in the Supplemental EIR, projects will demonstrate compliance with the City's Climate Action Plan Measure BE-4, which requires compliance with CalGreen Tier 1 standards, including a 15-percent improvement over minimum Title 24, Part 6 Building Energy Efficiency Standards per Mitigation Measure 3.8-1a. Since building permits will be issued subsequent to January 1, 2020, projects proposed under the Specific Plan will provide a level of efficiency at least that of Tier 1 of the 2016 CalGreen Code, or baseline of the current CalGreen Code, whichever is more efficient. Thus, the analysis utilized the CalEEMod energy mitigation screen to select a 15-percent improvement over Title 24 standards.

Enforceability: Consistent with Mitigation Measure 3.8-1a of the Supplemental EIR, prior to issuance of building permits, Project Building Plans shall demonstrate compliance with the City's Climate Action Plan Measure BE-4, to the satisfaction of the City of Elk Grove Planning Division. In addition, implementation of SMAQMD Tier 1 BMP 1 (as described in Section 4.2.2) cannot be counted towards meeting the 15-percent improvement over Title 24 standards as required by this measure.

4.2.2 IMPLEMENTATION OF SMAQMD TIER 1 BMP 1 (PROJECTS SHALL BE DESIGNED AND CONSTRUCTED WITHOUT NATURAL GAS INFRASTRUCTURE)

Measure Description: This measure requires that projects shall be designed and constructed without natural gas infrastructure.

Applicability: As described in the Supplemental EIR, the City of Elk Grove shall require, as a part of plans for development within the Specific Plan Area, the implementation of the SMAQMD BMP 1, or equivalent on-site or off-site mitigation, as applicable.

In order to apply this project design feature in the mitigated emissions scenario, all natural gas consumption was removed for the CalEEMod energy screen. In order to account for the increased electricity consumption that would result from the reduction in natural gas usage, electricity consumption was increased accordingly assuming a conversion factor of 1 kilowatt-hour for 3.142 kilo-British thermal units (kBtu). In addition, since electricity consumption would increase with implementation of this measure, the analysis also accounted for the increase in NO_x emissions generated within the Sacramento Federal Nonattainment Area (SFNA) using the NO_x intensity factor developed by SMAQMD and Sacramento Municipal Utility District (SMUD) (SMAQMD 2015). Further, Supplemental EIR Mitigation Measure 3.8-1b also requires that all projects meet current CalGreen Tier 2 standards, except all electric vehicle capable spaces shall instead be electric-vehicle ready. While this measure was not a quantified emissions reduction, this measure would further reduce mobile-source emissions, including ROG and NO_x.

Enforceability: Consistent with Mitigation Measure 3.8-1b of the Supplemental EIR, the City of Elk Grove requires, as a part of plans for development within the Specific Plan Area, the implementation of the SMAQMD BMP 1, as applicable. Projects within the Specific Plan Area will not extend or access natural gas services unless a project requires natural gas as part of its operation. In the event that natural gas is required, a change to the Specific Plan is required and the plans for development will include equivalent on-site or off-site mitigation measures. If equivalent on-site or off-site mitigation is used in-lieu of Mitigation Measure 3.8-1b, it must be demonstrated that the proposed measures would achieve an equivalent or greater reduction in the ozone precursor emissions rate.

4.3 REDUCTIONS ACHIEVED BY THE ON-MODEL REDUCTION MEASURES AND EIR MEASURES

Based on the on-model traffic reduction measures (described in Section 4.1) and emission reduction measures included in the EIR and SEIR (described in Section 4.2), the ROG and NO_x emission reductions achieved are shown below in Table 4-1. The annual VMT for the mitigated emissions scenario is 87,625,319, demonstrating an achievement of 9.75 percent in VMT reduction. This reduction does not exceed the maximum VMT reduction values achievable for this land use region (low density suburban). See Appendix A for detailed assumptions, modeling parameters, and outputs.

Table 4-1: Mitigated Emissions Scenario and Reductions Achieved		
Source	ROG	NO_x
	tons per year	
Area	38.90	0.03
Energy ^{1,3}	0.00	1.80
Mobile	5.74	29.96
Total	44.64	31.78
Reductions Achieved^{2,3}	1.44	10.33
Additional Reductions Required	0.65	0.53

Notes: Totals may not add due to rounding. ROG = reactive organic gases; NO_x = nitrogen oxides

¹ Energy-related ROG emissions avoided due to elimination of natural gas consumption per implementation of SMAQMD Tier 1 BMP 1 (see Section 4.2.2 above).

² Emission reductions achieved compared to results in Table 3-1

³ NO_x emissions reductions achieved take into account an increase of 1.80 tons of additional NO_x emissions under the mitigated scenario due to the increase in electricity consumption due to implementation of SMAQMD BMP 1, which requires that projects are designed and constructed without natural gas consumption. While the additional electricity generation may not actually occur within the Sacramento Valley Air Basin or under the jurisdiction of the SMAQMD (e.g., SMUD purchases power outside the SMAQMD), the analysis conservatively assumed the emissions would be generated within the SFNA.

As shown in Table 4-1, implementation of the on-model traffic reduction measures and measures included within the EIR would not achieve the emission reduction targets. There would be a shortfall of approximately 0.65 and 0.53 ton per year of ROG and NO_x, respectively. Thus, additional measures would be required to achieve the Specific Plan Area emission reduction targets described in Section 3.3. These measures are detailed in Section 5, below.

5 ADDITIONAL REDUCTION MEASURES

This section describes additional measures that would be required and implemented by future projects within the Specific Plan Area to meet the emission reduction targets described in Section 3.3.

5.1 PUBLIC USES - PARTICIPATION IN SMUD COMMERCIAL SOLARSHARES® PROGRAM AND/OR ON-SITE RENEWABLE ENERGY

Measure Description: Public uses within the parks/open space land uses of the project area shall enroll in the SMUD Commercial SolarShares® program or meet 100 percent of their electricity demand through on-site renewable energy, such as solar panels. SMUD’s Commercial SolarShares® program is sourced from Total Green-e® Energy Certified New Renewables (SMUD 2020). Renewable energy facilities, such as solar photovoltaic panels, provide a clean source of renewable energy that does not result in operational generation of greenhouse gas emissions or ozone precursors.

Applicability. As shown in the SMUD NO_x Intensity Analysis (SMAQMD 2015), renewable energy sources do not generate NO_x emissions. Therefore, if projects enroll in the SMUD Commercial SolarShares® Program and/or install on-site solar such that 100 percent of their electricity needs are met with renewable energy, the associated NO_x emissions from electricity would be avoided.

As shown in more detail in Appendix A, assuming an energy consumption rate of 21.86 kWh per thousand-square feet (consistent with the representative land use of “Arena” selected for the project), if approximately 838 building square feet would enroll in the SMUD Commercial SolarShares® Program or ensure that 100 percent of their electricity needs are met with on-site solar, the emissions reductions achieved would be approximately 0.53 tons of NO_x emission reduction per year and bridge the gap of the additional NO_x reductions required, as shown in Table 4-1.

Enforceability: The City of Elk Grove shall ensure that at least 18,328.88 megawatt-hours (MWh) per year of the energy consumption from public facilities within the project area shall enroll in the SMUD Commercial SolarShares® Program and/or meet 100 percent of their electricity needs through on-site solar.

5.2 NON-RESIDENTIAL USES – USE OF SUPER-COMPLIANT VOC PAINT

Measure Description: The City of Elk Grove would require and encourage the use of super-compliant VOC paints for the nonresidential components of the project. Architectural coatings are products that are applied to stationary structures and their accessories. They include house paints, stains, industrial maintenance coatings, traffic coatings, and many other products. When these coatings are applied, VOCs are emitted from the coatings and from the solvents that are used for thinning the coatings and cleaning up application equipment. Low- and Super-Compliant VOC paints are manufactured and sold by numerous companies. Super-compliant architectural coatings and industrial maintenance coatings are products that meet a VOC standard of less than 10 g/L.

Applicability. Nonresidential development projects would be required to utilize architectural coatings that meet a VOC standard of less than 10 g/L for interior and exterior coatings. As a condition of approval, Project Building Plans for nonresidential development shall submit technical data sheets and a brief summary indicating the VOC content of any architectural coatings proposed to be applied. In addition, the City of Elk Grove would send annual notifications to remind businesses and interested parties that they are required to utilize super-compliant VOC paints.

As shown in more detail in Appendix A, implementation of this measure would result in an additional emission reduction of approximately 2.62 ROG per year. However, since implementation of this measure cannot be guaranteed in perpetuity, this AQMP does not rely on the use of this measure to meet the emissions reduction target.

5.3 PREFERRED TREE MIX

Measure Description: Use landscaping that will improve air quality through the use of low biogenic VOC emitting trees. The SMAQMD Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan includes emissions from natural sources, including biogenic volatile organic compound (BVOC) emissions from plants and trees in the region. Tree species can be categorized as low, medium, and high BVOC emitting trees (SMAQMD 2017). The Sacramento Tree Foundation (STF) has developed a list of preferred tree species (STF 2015).

Plants emit many different BVOCs, and vegetative emissions are about three times more reactive than VOC emissions from motor vehicles (Karlik and Pittenger 2012). BVOC emissions are based on the emission rate of the tree species and the size of the canopy, so larger plants would have greater emissions. Some tree species, such as oak and poplar, have a VOC emission rate of 70 micrograms/grams/hour (AC Trees 2014). This is significantly more than low BVOC emitting trees, such as birch and cedar, which have an emissions rate of 5 to 11 micrograms/grams/hour (AC Trees 2014). Studies for the Sacramento planning region estimate that urban forest-related changes (i.e., planting low BVOC trees) would help meet air quality goals, achieving as much as 8 percent of the required reductions in VOCs (Center for Urban Forest Research 2007).

Applicability: Consistent with the SMAQMD and STF goals, landscaping provided for the Specific Plan Area shall prohibit the use of liquidambar and eucalyptus trees that produce smog-forming compounds and exclusively use the SMAQMD and STF preferred tree list. These requirements for planted tree species will be included as a condition of approval for projects developed under the Specific Plan. As CalEEMod defaults do not include assumptions for BVOC emissions from trees and thus were not included in the unmitigated emissions of the project, this AQMP does not rely on the use of this measure to meet the emissions reduction target.

5.4 PARKING LOT SHADE STRUCTURES OR TREE SHADES

Measure Description: In addition to running exhaust emissions of ozone precursors that are emitted from vehicle tailpipes while traveling on the road, ROG emissions (in the form of hydrocarbons [HC]) are also emitted as a result of diurnal evaporation and hot soak evaporation. Diurnal evaporative HC emissions occur when rising ambient temperatures cause fuel evaporation from vehicles sitting throughout the day. These losses are from leaks in the system, fuel hoses, and connectors, as a result of the breakthrough vapors from the carbon canister. Hot soak HC evaporative emissions begin immediately from heated fuels after a car stops its engine operation and continue until the fuel tank reaches ambient temperature. Therefore, by lowering parking lot temperatures through the use of parking lot shade structures or increasing tree shade, evaporative emissions of HC from parked cars can be reduced.

Applicability. The City of Elk Grove shall encourage tree shade or shade structures in parking lots for development projects. Based on a study by the Center of Urban Forest Research, which assesses compliance of 50 percent shade requirement over parking lots during a warm period in August in Sacramento, simulated HC emissions were estimated to be 0.85 tons per day less than an 8 percent canopy cover base case (Center for Urban Forest 2002). As such, implementation of tree shades or shade structures can prove to be a beneficial emission reduction measure. However, since the efficacy of the measure depends on several variables, including daily temperatures, amount of fuel in fuel tanks, height and species of the trees or height of the shade structures, this AQMP does not rely on the use of this measure to meet the emissions reduction target.

5.5 PURCHASE OF ROG EMISSION REDUCTION CREDITS

Measure Description: Require the purchase of ROG emission reduction credits or offsets. An emissions offset is a reduction in pollution from an existing source of air pollution within the SMAQMD. It is an emission reduction credit that compensates for an emission increase of an affected pollutant from a source. Consistent with SMAQMD Rule 204 – Emission Reduction Credits, emission reduction credits shall be real, enforceable,

permanent, quantifiable, and additional. In other words, they are required to be beyond any reduction that would have otherwise been required by law.

Applicability: The City of Elk Grove shall purchase 0.65 ton of ROG emission reduction credits generated at the closest available source to the Specific Plan Area. This amount of emission reduction was achieved from a source within the City of Elk Grove, located at 10144 Waterman Road, Elk Grove, California, approximately 0.43 mile from the project boundary. At the time of writing this document, the ERC is available for purchase from the current certificate owner.

Enforceability: The City of Elk Grove shall pre-purchase 0.65 ton of ROG emission reduction credits prior to issuance of the first building permit for a development project under the Specific Plan. The emission reduction credits shall be donated to air quality benefit pursuant to Section 306 of SMAQMD Rule 204 – Emission Reduction Credits.

5.6 REDUCTIONS ACHIEVED BY THE ADDITIONAL REDUCTION MEASURE

As shown in Table 4-1 above, additional reduction measures would be required to reduce the remaining 0.65 and 0.53 ton per year of ROG and NO_x, respectively. Implementation of the measures requiring participation in SMUD’s Commercial SolarShares® program and/or on-site solar for public uses within the project area (described in Section 5.1) and the purchase of ROG emission reduction credits (described in Section 5.5) would achieve the emission reduction targets specified in this AQMP. Table 5-1 demonstrates the reductions achieved from the additional reduction measures.

Table 5-1: Additional Reduction Measures Summary		
Source	ROG	NO_x
	tons per year	
Additional Reductions Required	0.65	0.53
Participation in SMUD’s Commercial SolarShares® program and/or On-Site Solar ¹	--	0.53
Pre-Purchase of ROG Emission Reduction Credits	0.65	--
Remaining Reductions Required	0	0
Notes: ROG = reactive organic gases; NO _x = nitrogen oxides		
¹ Calculated based upon a minimum of 18,328.88 MWh of the electricity demand per year sourced from renewable energy sources via on-site solar and/or participation in the SMUD Commercial SolarShares® program.		

6 CONCLUSION

As shown in Table 5-1, the required emission reduction targets would be achieved with implementation of the measures recommended in this AQMP. Further, implementation of the measures not quantified for the purposes of this AQMP, such as the use of super-compliant VOC paints, planting of low BVOC tree species, installation of electric vehicle ready spaces, and installation of parking lot shade structures would further reduce ROG and NO_x emissions in the project area and within the SFNA.

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APPENDIX A