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42428 Chisolm Trail, Murrieta CA 92562 phone 760-473-1253
www.ldnconsulting.net fax 760-689-4943

February 16, 2018

RCS Harmony Partners, LLC
c/o Mr. A David Kovach
2305 Historic Decatur Road, Suite 100
San Diego, CA 92106

RE: Global Climate Change Supplemental Letter – Harmony Grove Village South Residential Development (PDS2015-GPA-15-002) County of San Diego, CA

Background

This letter will serve to augment the DEIR's evaluation of the potential environmental impacts associated with the proposed Project's emissions of greenhouse gases (GHG) in response to the recent court decision described below and to the public comments received asserting that greater emission reductions should be required for new development. This Supplemental letter is based on information provided in the original GHG Study prepared by Helix Environmental Planning, dated April 2017 ("Global Climate Change Study") and other information found in the DEIR that was circulated for public review from April 20, 2017 to June 20, 2017.

During this public review period of the Project's Draft EIR, the Superior Court in Sierra Club v. County of San Diego, Case No. 2012-0101054/ Golden Door Properties LLC v. County of San Diego, Case No. 2016-0037402 (April 28, 2017) ruled that the 2016 Guidance Document and its "County Efficiency Metric" may not be used to provide the basis for CEQA review of GHG impacts for development proposals within the unincorporated County lands. Comments were also received objecting to the use of the "County Efficiency Metric." As a result, this Supplemental Letter was prepared to utilize the significance criteria in Appendix G of the CEQA Guidelines related to GHG emissions to evaluate the project's GHG emissions resulting from both the project's construction/vegetation and operational changes in emissions.

In addition, comments received during public review asserted that new development projects should provide significantly greater emission reductions than merely meeting a statewide target. Therefore, in response to these comments, the Project applicant has decided to reduce Project emissions to "net zero" (i.e., no net GHG emissions) by purchasing off-site carbon credits. The Project's commitment to achieve net zero GHG emissions, made enforceable through mitigation as described below, would be realized through the purchase

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Murrieta CA 92562
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and retirement of off-site carbon offsets; this framework would ensure that the project results in achieving carbon neutrality (i.e., no net GHG emissions)

The Global Climate Change Study originally concluded that, before the implementation of mitigation measures, the project would generate a total of approximately 3,682 Metric Tons (MT) CO2e from construction. Additionally, the study concluded that operationally, after the removal of the amortized annual construction emissions anticipated for the Project of 184 MT CO2e, the project would generate approximately 5,088 MT CO2e each year at full project buildout in the year 2021 with the incorporation of the project design features that are listed on EIR Table 2-1 as well as in EIR Chapter 7.0, List of Mitigation Measures and Project Design Features ("Project Design Features"); including installing only natural gas hearths, waste divergence, energy efficient appliances, and solar panels to off-set 100% energy use.

As concluded in the Global Climate Change Study, after analyzing and requiring all reasonable and feasible on-site mitigation measures for avoiding or reducing GHG-related impacts, it was determined that no additional mitigation measures were needed to achieve an efficiency ratio of 4.6 MT CO2e/year/service population and maintain a less-than-significant level of GHG emissions.

This Supplemental Letter concludes that, after incorporation of all current regulatory reductions and the design features (described below), the project would generate approximately 4,411 MT CO2e during construction. This is based upon the Global Climate Change Study construction emissions of 3,682 MT CO2e and a one-time vegetation loss during construction of 729 MT CO2e that is described in more detail below. Additionally, the Global Climate Change Study concluded that the project would generate 5,088 MT CO2e annually during operations at full buildout with the incorporation of the Project Design Features. Table 9 of the Global Climate Change Study shows total operational emissions of 5,272 MT CO2e, this included amortized construction emissions of 184 MT CO2e. The amortized construction emissions were removed because the project will purchase off-site carbon offsets to reduce the project's GHG emissions to achieve net zero when the emissions would occur, so no amortization is required.

One comment received during public review of the Draft GHG technical report identified an error in trip category lengths on Table 4.3 in Appendix A of EIR Appendix J. This was corrected in response to the comment and was used to produce this supplemental analysis and the revised data are included here as ***Attachment C***. It was concluded based on this modeling update that the operational emissions would be 5,222 MT CO2e annually at full

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42428 Chisolm Trail
Murrieta CA 92562
phone 760-473-1253

buildout with the incorporation of the Project Design Features as opposed to the original 5,088 MT CO2e. More detail on the updated operational emmisions is provided below.

As explained above, the project applicant has committed to reducing the Project's emissions to net zero by purchase and retire off-site carbon offsets to reduce the project's GHG emissions to net zero. This shall be required through Mitigation Measures GHG-1 and GHG-2.

The project applicant has committed to achieving carbon neutrality (i.e., no net GHG emissions). To reflect this commitment, mitigation measures GHG-1 and GHG-2 have been added to the Final EIR, which require the purchase of off-site carbon offsets. The project will purchase and retire GHG offsets to reduce the project's GHG emissions to net zero as described below.

Through the purchase of carbon credits, construction and operationally related GHG emissions the mitigated project would result in no net increase to the existing GHG emissions, the project would not have a substantial contribution to a cumulatively considerable GHG impact. The project's commitment to achieve net zero GHG emissions also ensures that the project would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing GHG emissions. In summary, with the projects additional commitment to purchase and retire off-site carbon offset credits to reduce the project's GHG emissions to net zero, the project would not result in a significant impact to global climate change.

CEQA Thresholds of Significance

A number of agencies throughout the state, including multiple air districts, have drafted and/or adopted varying threshold approaches and guidelines for analyzing GHG emissions and global climate change in CEQA documents. The State of California has developed guidelines to address the significance of climate change impacts based on Appendix G of the CEQA Guidelines, which contains two significance criteria for evaluating GHG emissions of a project.

A project would have a significant environmental impact if it would:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

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The two questions were intended to satisfy the Legislative directive in Public Resources Code Section 21083.05 that the effects of GHG emissions be analyzed under CEQA. Similarly (as indicated in the Global Climate Change Study), CEQA Guidelines Section 15064.4 states that the "determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." Section 15064.4(b) further states a lead agency should consider the following non-exclusive list of factors when assessing the significance of GHG emissions:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. The extent to which project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
3. The extent to which the project complies with regulations or requirements adopted to implement statewide, regional, or local plans for the reduction or mitigation for GHG emissions.

CEQA Guidelines Section 15064(h)(1) states that "the lead agency shall consider whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable." A cumulative impact may be significant when the project's incremental effect, though individually limited, is cumulatively considerable. As discussed above, climate change results from incremental contributions of GHG emissions on a global scale. The analysis contained herein relies upon Appendix G of the CEQA Guidelines as the threshold of the significance for evaluating the environmental effects of the GHG emissions of the project.

Discussion

Project buildout was anticipated to be in 2021 and the proposed start date for construction of the project was anticipated to begin in the 2018; the dates are retained because they result in conservative modeling as GHG emissions would improve over time as stricter regulations are adopted. The original construction emissions modeling contained in the Global Climate Change Study remains the same. The construction equipment, intensity, and duration will also remain the same and are based on the original modeling in the Global Climate Change Study.

Consistent with the above description, full operation of the Project also is not expected to occur until the year 2021. Therefore, at a minimum, the project would: be required to comply

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with the 2016 Title 24 Energy Code (which went into effect January 1, 2017); the 2016 CALGreen Building Code (Part 11 of Title 24);; and prepare a Construction and Demolition Debris Management Plan in compliance with Sections 68.508 through 68.518 of the County of San Diego Municipal Code (which requires 90 percent of inerts and 70 percent of all other materials to be recycled).

Vegetation, as it grows, collects carbon from the air and stores it in the leaves, stems, and roots. A project that changes the existing land use type, with respect to vegetation, can result in changes in CO_2 sequestration from the atmosphere. CalEEMod has general sequestration numbers that can be used to estimate the amount of CO_2 that either is gained or lost from vegetation-based sequestration, depending on the project.

The existing site conditions generally are non-native grass land, scrubs and a small mix of woodlands and riparian areas according to the project's Biological Technical Report (HELIX, April 2017). The project's Specific Plan provides for trees to be planted on slopes, along streets, within HOA open space areas, and around all perimeters of the project to visually buffer the community from view. Relatedly, site landscape shall require the approval of a Landscape Plan(s) from the County's Planning & Development Services Department; the plan(s) shall comply with the landscape provisions of the project's Specific Plan, County's Water Conservation in Landscape Ordinance, the Water Efficiency Landscape Design Manual, and other applicable regulatory standards. Native trees and shrubs, such as sycamores, oaks, madrone, currant and toyon as well as local apricot, lemon, orange, guava, and avocado, may be planted along parkways.

CalEEMod uses the IPCC's protocol for vegetation sequestration calculations. Based on this, the model estimates how much CO_2 newly planted trees will sequester and reports the sequestration as a one-time carbon-stock change. Per the IPCC, trees sequester CO_2 while they are actively growing and the one-time stock is based on a 20-year lifecycle. The IPCC concludes that a tree's ability to sequester carbon decreases significantly after 20 years and credit after 20 years is not applied. By this logic, removing trees in excess of 20 years and replacing them with the same number of comparable new trees would prolong the sequestration process.

During the construction phases, the project would remove approximately 80.4 acres of vegetation on the project site. Helix Environmental Planning incorporated the vegetation removal into CalEEMod. The results are provided in more detail in ***Attachment A*** to this report. As calculated by Helix Environmental Planning, the project's removal of existing

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vegetation on the 80.4 acres would result in approximately 729 MT CO_2e of sequestered carbon from vegetation. Therefore, the project's construction-related emissions would total approximately 4,411 MT CO_2e (3,682 plus 729) as shown in Table 1. According to the Project's Landscape Plans, the project also would plant a minimum of 2,045 new trees during the construction phase. Helix Environmental Planning incorporated the proposed tree plantings into CalEEMod. It should be noted, for purposes of this analysis, carbon sequestration credit for the new trees planted was not taken. For disclosure purposes only, CalEEMod estimates that the new tree plantings would sequester approximately 1,448 MT CO_2e.

The Global Climate Change Study utilized CalEEMod to determine the Project's operational emissions from area, energy, mobile, solid waste and water uses. The project's proposed land uses, as modeled within the Global Climate Change Study, are shown in Table 2 below. The Global Climate Change Study, identified the Project Design Features the project would implement to reduce GHG emissions during operations, such as: a 2 dual-port Level 2 EV charging station (serving 2 parking spaces) at the Center House, incorporating water conservation measures (including the 2016 CALGreen mandate to reduce water consumption by 20 percent), installation of the low-flow water features, and the use of drought-tolerant landscape as shown in the executive summary of the Global Climate Change Study.

For purposes of providing additional information to augment the findings of the Global Climate Change Study pertaining to the operational emissions of the Project, ConSol, a building energy efficiency consultant, was retained to calculate the residential energy demand for the project. ConSol modeled the energy demand of prototype residences with CEC's public-domain compliance software, known as California Building Energy Code Compliance – Residential. The objective of the ConSol report is to calculate the annual energy use with options that achieve: (i) compliance with the 2016 Title 24 Standards (California's Energy Code) and (ii) Zero Net Energy (ZNE) standards as defined in the California Energy Commission's (CEC's) 2015 Integrated Energy Policy Report. The ConSol analysis also calculates the estimated size of a rooftop solar photovoltaic (PV) system that would produce the amount of electricity required for each building to achieve 100% offsets of all fuel uses, based on Time Dependent Valuation (TDV) values, thus achieving ZNE.

The ConSol modeling uses the CEC's public-domain compliance software, California Building Energy Code Compliance – Residential (CBECC-Res), which calculates Title 24 compliance and annual energy use. The estimated energy use of each prototype was calculated for both a code-based compliance scenario and a Zero Net Energy attainment scenario. ConSol's report also separates both electrical and natural gas demand into regulated and unregulated loads. Regulated loads are attributed to sources such as heating, cooling and water heating.

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Unregulated loads are attributed to interior and exterior lighting, appliances, cooking and other plug loads. ConSol's report is provided as ***Attachment B*** to this report.

ConSol's ZNE attainment scenario, assumed that each of the residential prototypes was designed in accordance with the CEC's definition of ZNE. Based on ConSol's analysis, the project's residences can achieve ZNE through a combination of energy efficiency enhancements to the building envelope and regulated loads, and the provision of on-site solar. Therefore, the design feature to off-set 100% of the energy usage provided in the Global Climate Change Study is achievable. Additionally, according to ConSol's report, the project could also off-set all the natural gas energy use with an increased solar system. The Global Climate Change Study determined that the natural gas usage would result in approximately 308 MT CO2e. It should be noted, for purposes of providing a conservative analysis, ZNE credit for the reduction of natural gas emissions was not taken in this analysis.

For simplicity, a summary of the GHG emissions from the Global Climate Change Study is provided in Table 1 along with the sequestration emissions associated with vegetation removal, included as part of the construction emissions of the project. After incorporation of all reductions from the Global Climate Change Study and the Project Design Features, the project would generate a total of 4,411 MT CO2e during construction (based upon the original construction emissions modeling contained in the Global Climate Change Study and a one-time vegetation loss during construction of 729 MT CO2e).

As stated above, a comment received during public review of the Draft GHG technical report identified an error in trip category lengths on Table 4.3 in Appendix A of EIR Appendix J. This was corrected in response to the comment and was used to produce this supplemental analysis It was concluded based on modeling updates conducted in November 2017 that the operational emissions would be 5,222 MT CO2e annually at full buildout with the incorporation of the Project Design Features such as installing only natural gas hearths, waste divergence, energy efficient appliances, and solar panels to off-set 100% energy use. as opposed to the original 5,088 MT CO2e. The increase in operational emissions was due to a slight deviation in the project's mobile emissions from an adjustment on the trip length. The updated operational emissions are provided in Table 1 and the updated CalEEMod results are provided as ***Attachment C*** to this letter.

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Table 1: Expected Mitigated Operational Emissions Summary MT/Year[1]

CO_2e Generator	Total Project CO_2e Emissions (Metric Tons)
Operational Emissions Total after Reductions	**5,222[1]**
Total Construction Emissions and Vegetation Removal	**4,411[1,2]**

[1] Source: Harmony Grove Village South CalEEMod modeling update provided in Attachment C*, Helix Environmental Planning, November 2017

[2] Harmony Grove Village South Sequestration Memorandum, Helix Environmental Planning, August 2017

*Attachment C provides the following information:

1. Pages 1 through 45 reflect changes resulting from the correction made to the trip generation data shown in Table 4.3 and on; updated from Appendix A of EIR Appendix J.
2. The Emission Reduction Adjustments have been updated to reflect changes in item 1 above. This was Appendix B to EIR Appendix J.

After analyzing and applying all reasonable and feasible on-site project design features and strategies recommended by CARB in the Scoping Plan Second Update, provided in ***Attachment D*** of this report, Project applicant has determined that additional off-site mitigation measures can further reduce impacts from GHG emissions to a less-than-significant level, through the purchase of off-site carbon offset credits.

In November 2017, CARB released *California's 2017 Climate Change Scoping Plan* (*Second Update*) for public review and comment (CARB, 2017). CARB's Governing Board adopted the *Second Update* in December 2017. Appendix B of Scoping Plan Second Update identified examples of on-site project design features, mitigation measures and direct regional investments that may be utilized to minimize GHG emissions from land use development projects. CARB states that Appendix B "should be viewed as a general reference document;" it "should not be interpreted as official guidance or as dictating requirements." CARB also provides the following caveat:

> "[n]ot all of the listed local measures or CEQA measures listed will be relevant to, or appropriate for, a given area or project. Nothing in the Scoping Plan or this appendix limits the discretion conferred to lead agencies in determining the appropriate level and type of mitigation, so long as their decisions are supportable by evidence in the record as required by CEQA. There is no 'one size fits all' solution and different policies will be more suitable in urban and suburban areas versus rural areas, among other considerations."

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Attachment D to this Supplemental Letter provides an assessment of the mitigation measures referenced in Appendix B of Scoping Plan Second Update as applied to the Project. After analyzing and applying all of the reasonable and feasible on-site project design features and strategies recommended by CARB in the Scoping Plan Second Update, the County has determined that, additional off-site measures can further reduce impacts from GHG emissions to a less-than-significant level, through the purchase of off-site carbon offset credits. In order to be conservative, no emission reductions were taken for any project design features described in ***Attachment D*** to this Report that was added or augmented from what was identified in the Global Climate Change Study.

CARB recommended that lead agencies prioritize on-site design features and direct investments in GHG reductions in the vicinity of the project to help generate real demand side benefits and local jobs. However, CARB also recognized that it may be appropriate to mitigate project emissions through purchasing and retiring carbon credits issued by a recognized and reputable, accredited carbon registry when on site measures or regional investments are infeasible or non-effective. Similarly, the CEQA Guidelines Section 15126.4(c) recognizes that in appropriate situations, off-site mitigation, which may include purchased offsets, may be used as mitigation for GHG emissions.

The project shall be conditioned to implement the following mitigation measures:

GHG-1 Prior to issuance of the first grading permit, the applicant shall provide evidence to the County of San Diego (County) Planning & Development Services (PDS) that they have purchased and retired carbon credits, in the amount of 4,411 MT CO2e (note: this number reflects all the construction-related GHG emissions after applying all Project Design Features and reductions along with a one-time vegetation loss) pursuant to the performance standards and requirements described below. Construction emissions include all grading, site preparation, vegetation removal, worker trips, building construction and architectural coatings related to GHG emissions.

i. The carbon offsets that are purchased to reduce GHG emissions as described in this measure shall achieve real, permanent, quantifiable, verifiable, and enforceable reductions as set forth in Cal. Health & Saf. Code Section 38562(d)(1).

ii. One carbon offset credit shall mean the past reduction or sequestration of one metric ton of carbon dioxide equivalent that is "not otherwise required" (CEQA Guidelines section 15126.4(c)(3)).

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42428 Chisolm Trail
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iii. Carbon offsets shall be purchased through a CARB-approved registry, such as the Climate Action Reserve, American Carbon Registry, or Verified Carbon Standard. If no CARB-approved registry is in existence, then the applicant or its designee shall purchase off-site carbon offset credits from any other reputable registry or entity, to the satisfaction of the Director of PDS.

iv. The County will consider, to the satisfaction of the Director of PDS, the following geographic priorities for GHG reduction features, and off-site carbon offset projects: 1) project design features/on-site reduction measures; 2) off-site within the unincorporated areas of the County of San Diego; 3) off-site within the County of San Diego; 4) off-site within the State of California; 5) off-site within the United States; and 6) off-site internationally.

GHG-2 Prior to the County's issuance of building permits for each implementing Site Plan ("D" Designator), the project applicant or designee shall provide evidence to PDS (consisting of documentation from the issuing registry or a County-approved third party verifier) that the Project applicant or designee has purchased and retired carbon offsets for the incremental portion of the project within the Site Plan in a quantity sufficient to offset, for a 30- year period, the operational GHG emissions from that incremental amount of development to net zero, consistent with the performance standards and requirements set forth below.

The amount of carbon offsets required for each implementing Site Plan shall be based on the GHG emissions for each land use within the implementing Site Plan, as identified in the Table 2 below. The project's operational emissions would be 5,222 MT CO2e at the time of full buildout. Therefore, the project shall be required to reduce the annual emissions by 5,222 MT CO2e/year for a 30-year period (project life) or a total of 156,660 MT CO2e. The "project life" is 30 years, which is consistent with the methodology used by the South Coast Air Quality Management District's GHG guidance (SCAQMD 2008). The project applicant shall include in each implementing Site Plan a tabulation that identifies the overall carbon offsets required to mitigate the entire project's GHG emissions, the amount of carbon offsets purchased to date, and the remaining carbon offsets required to reduce the project's emissions to net zero.

i. The carbon offsets that are purchased to reduce GHG emissions as described in this measure shall achieve real, permanent, quantifiable, verifiable, and enforceable reductions as set forth in Cal. Health & Saf. Code Section 38562(d)(1).

ii. One carbon offset credit shall mean the past reduction or sequestration of one metric ton of carbon dioxide equivalent that is "not otherwise required" (CEQA Guidelines section 15126.4(c)(3)).

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iii. Carbon offsets shall be purchased through a CARB-approved registry, such as the Climate Action Reserve, American Carbon Registry, or Verified Carbon Standard. If no CARB-approved registry is in existence, then the applicant or its designee shall purchase off-site carbon offset credits from any other reputable registry or entity to the satisfaction of the Director of PDS.

iv. The County will consider, to the satisfaction of the Director of PDS, the following geographic priorities for GHG reduction features, and off-site carbon offset projects: 1) project design features/on-site reduction measures; 2) off-site within the unincorporated areas of the County of San Diego; 3) off-site within the County of San Diego; 4) off-site within the State of California; 5) off-site within the United States; and 6) off-site internationally.

Table 2 represents the proposed project operational emissions by individual land use category following implementation of project-specific GHG reduction features based on the updated CalEEMod modeling conducted by Helix Environmental Planning, November 2017. The emissions for each land use are taken directly from the CalEEMod outputs.

Table 2: Operational GHG Emissions and Off-Site Carbon Offsets per Land Use[1]

CO_2e Generator	Single Family CO_2e Emissions (Metric Tons)	Multi Family CO_2e Emissions (Metric Tons)	Center House CO_2e Emissions (Metric Tons)	Park CO_2e Emissions (Metric Tons)	WTWRF Generators CO_2e Emissions (Metric Tons)
Area	135.55	182.60	3.51	7.02	--
Electricity	--	--	--	--	--
Natural Gas	182.47	123.23	0.47	--	--
Mobile Emissions	1,792.20	2,414.36	-	--	--
Waste	25.74	13.60	0.60	0.01	--
Water	79.17	106.65	2.31	5.35	--
WTWRF Operations	--	--	--	--	147.0[2]
Total with Reductions	**2,215.13**	**2,840.44**	**6.89**	**12.39**	**147.00**
Percent of Emissions	**42.42%**	**54.40%**	**0.13%**	**0.24%**	**2.82%**
Carbon Offset Needed	**2,215.13**	**2,840.44**	**6.89**	**12.39**	**147.00**
Number of Units	**193**	**260**	**1**	**1**	**1**
Carbon Offset per Unit/Use	**11.48**	**10.92**	**6.89**	**12.39**	**147.00**

[1] Source: Harmony Grove Village South CalEEMod modeling update, HELIX, November 2017; see EIR Tables 2.7-3 and 2.7-4.
[2] Emissions are based on annual usage per CalEEMod (HELIX, 2017).

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Relative to operational emissions, new technological improvements, scientific advancements, improvements in fuel efficiency or other similar advancements could potentially result in a greater reduction in the total MT CO2E operational emissions being realized from the Project. An Updated Operational Emissions Report may be prepared at the Project applicant's election, subject to the requirements described herein, that demonstrates based on substantial evidence that greater GHG efficiencies occur due to such advancements or improvements in fuel efficiency or other similar advancements that has resulted in a greater reduction in the total MT CO2E operational emissions of the Project than what was evaluated in the Project's certified Final EIR.

The Updated Operational Emissions Report shall be prepared by a County-approved, qualified air quality and greenhouse gas technical specialist and shall be based upon calculations that utilize a County approved model or methodology. The calculations shall be based upon an emissions inventory of the project's operational emissions, including emissions from mobile sources, energy, area sources, water consumption, and solid waste. The County may reduce the amount of GHG credits required to be purchased at the next site plan approval phase and the associated building permits issued per that subsequent site plan, if the County Director of PDS approves the Updated Operational Emissions Report, has determined that the applicant has demonstrated by substantial evidence that changes in State regulation or law, or other increased building efficiencies have reduced the total MTCO2E emitted by the project and the reduction to the total carbon offsets, is consistent with the project commitment to achieve and maintain carbon neutrality (i.e., net zero emissions) for the 30-year life of the project. This reduction if approved will be included in the tabulation provided by the Project applicant to the County Director of PDS with each implementing Site Plan.

All the Project Design Features are identified in Subchapter 2.7 of the EIR, as revised, and shall be applied. (See also EIR Table 1-2, Project Design Features, as well as in EIR Chapter 7.0, List of Mitigation Measures and Project Design Features.)

Plan Consistency Evaluation

Because the project would not increase net GHG emissions above existing levels following implementation of the Project Design Features and mitigation measures GHG-1 through GHG-2, above, the project would not conflict with any local or state plans, policies, or regulations adopted for the purpose of reducing GHG emissions. However, for information purposes, the following provides additional discussion of plans, policies, and regulations adopted for the purpose of reducing GHG emissions and the determination that the project does not conflict with such plans, policies, or regulations.

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Consistency with Relevant General Plan Policies

This discussion analyzes the project's potential to conflict with an applicable plan. The County of San Diego's General Plan contains various goals, policies, and objectives related to the reduction of GHG emissions and global climate change. The project's consistency with specific General Plan Conservation and Open Space Element policies is provided below in Table 3.

Table 3: County General Plan Policies

Policy	Project Consistency
COS14.3 Sustainable Development. Require design of residential subdivisions and nonresidential development through "green" and sustainable land development practices to conserve energy, water, open space, and natural resources.	*Consistent*. As discussed, the Project includes many Project Design Features to reduce energy and water use.
COS14.7 Alternative Energy Sources for Development Projects. Encourage development projects that use energy recovery, photovoltaic, and wind energy.	*Consistent*. Renewable energy would supply 100 percent of the Project's electricity needs through the required installation of rooftop solar PV panels (a photovoltaic solar system) on all residential units and the Center House, within the Project site, as well as the WTWRF if located within the Project site.
COS14.10 Low Emission Construction Vehicles and Equipment. Require County contractors and encourage other developers to use low-emission construction vehicles and equipment to improve air quality and reduce GHG emissions.	*Consistent*. All project-related construction equipment would be required to meet Tier 3 emissions standards.
COS15.1 Design and Construction of New Buildings. Require that new buildings be designed and constructed in accordance with "green building" programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of GHGs and toxic air contaminants.	*Consistent*. The Project proposes sustainability and efficiency features consistent with Title 24, Part 6 of the California Code of Regulations (2016) requirements.
COS15.4 Title 24 Energy Standards. Require development to minimize energy impacts from new buildings in accordance with or exceeding Title 24 energy standards.	*Consistent*. The Project proposes implementing energy efficiency features that would meet 2016 Title 24 standards.
COS17.1 Reduction of Solid Waste Materials. Reduce GHG emissions and future landfill capacity needs through reduction, reuse, or recycling of all types of solid waste that is generated. Divert solid waste from landfills in compliance with State law.	*Consistent*. Areas for storage and collection of recyclables and yard waste would be provided.
COS17.2 Construction and Demolition Waste. Require recycling, reduction and reuse of construction and demolition debris.	*Consistent*. The Project would prepare a Construction Debris Management Plan that complies with Section 68.508-68.518 of the County Municipal Code and would divert at least 90 percent of inerts and 70 percent of construction waste from landfills through reuse and recycling.

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Consistency with SANDAG's San Diego Forward: The Regional Plan

Regarding consistency with SANDAG's RTP/SCS, the project would include site design elements and project design features developed to support the policy objectives of the RTP and SB 375. The Project would implement land use and design measures that would create an environment that promotes alternative mode choice (e.g., pedestrian/bicycle networks and proximity to bus routes). The design of the project is based on a compact neighborhood design, where pedestrian and bicycle path provide access to the community facilities such as parks and clubhouse as well as the proposed bike lane and pathway.

As a design feature, the developer will provide to all homeowners an informative brochure to educate homeowners regarding water conservation measures, recycling, location of the electric vehicle charging stations and conduits, location of outdoor electric outlets to promote using electrical lawn and garden equipment, and location of nearby resources such as dining and entertainment venues, small commercial centers, and civic uses to reduce vehicle miles traveled. The Project will encourage daily physical activity associated with walking and bicycling, by providing public riding and hiking trails as well as creating a public place for the community to gather and have access to cultural activities at the proposed park and Center House, which will include many health and physical training activities. The project will include sidewalks/pathways throughout the site. Given the preservation of approximately 70% of the project site as open space, the proposed trail system will allow the future residents to enjoy the preserve and open space areas while engaging in physical activity and recreational benefits.

Conclusion

With implementation of the identified design features described in the EIR and with the addition of GHG-1 and GHG-2 described above, the project's net GHG emissions would be reduced to zero. With the incorporation of the project design features that will be conditions of approval for the Project and mitigation measures GHG-1 and -2, the project would have no net increase in GHG emissions, as compared to the existing environmental setting (see CEQA Guidelines Section 15064.4(b)(1)). Because the mitigated project would have no net increase in the GHG emissions level, the project would not generate GHG emissions that may have a significant impact on the environment. Further, the project would not result in a considerable contribution to cumulative global GHG emissions. The project would not conflict with any adopted and applicable local or state plans, policies or regulations to reduce GHG emissions.

Ldn Consulting, Inc.
42428 Chisolm Trail
Murrieta CA 92562
phone 760-473-1253

The project complies with the CARB's Second Update to the Scoping Plan, which states that "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective."

Sincerely,
Ldn Consulting, Inc.

Jeremy Louden, Principal

References

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CAPCOA. (August 2010). *Quantifying Greenhouse Gas Mitigation Measures.*
CARB. (2017). *California's Climate Change Scoping Plan.* Retrieved from https://www.arb.ca.gov/cc/scopingplan/revised2017spu.pdf
HELIX. (April 2017). *Harmony Grove Village South Biological Technical Report.*

Attachments

Attachment A: Harmony Grove Village South Energy Report (ConSol)
Attachment B: Sequestration Calcualation and Memorandom (Helix, 2017)
Attachment C: Updated CalEEMod modeling results (Helix, 2017)
Attachment D: Climate Change Scoping Plan Recommend Mitigation Measures

ATTACHMENT A

HARMONY GROVE VILLAGE SOUTH PROJECT

SEQUESTRATION ANALYSIS - HELIX

Memorandum

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

Date: August 31, 2017

To: David Kovach, Kovach Group of Companies

Cc:

From: Joanne Dramko, AICP, HELIX Environmental Planning, Inc.
Victor Ortiz, HELIX Environmental Planning, Inc.

Subject: Sequestration Analysis for the Harmony Grove Village South Project

HELIX Proj. No.: KOV-01

Message:

Development under the Project would result in changes in CO_2 sequestration from the atmosphere, first by removing existing vegetation on site and second by the planting of new trees. To ensure the Project GHG emissions are fully offset to zero, emissions from this land use change have been estimated according to the Intergovernmental Panel on Climate Change (IPCC) protocol for carbon accumulation. The one-time loss through the removal of existing vegetation is estimated by multiplying the acreage of vegetated land to be removed by CO_2 accumulation rates published by the IPCC. Table 1, *One-Time Carbon Loss Through Land Use Change*, presents the estimate of CO_2 released into the atmosphere through the removal of existing vegetation. Vegetated acreages were obtained from Table 2.3-4 of the DEIR.

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

HELIX Environmental Planning

Table 1
ONE-TIME CARBON LOSS THROUGH LAND USE CHANGE

Vegetation Community	Acres Impacted[1]	CO_2 Accumulation per Acre (MT CO_2/acre)[2]	Total CO_2 Lost (MT)
Non-native vegetation (11000)	0.9	6.2	5.6
Disturbed habitat (11300)	3.9	4.3	16.8
Diegan coastal sage scrub (32500)	10.4	14.3	148.7
Coastal sage-chaparral transition (37G00)	4.5	14.3	64.4
Southern mixed chaparral (37121)	15.6	14.3	223.1
Non-native grassland (42200)	44.2	4.3	190.5
Southern [willow] riparian forest (61300)	0.71	111	78.8
Coast live oak woodland (71160)	0.2	6.2	1.2
		TOTAL	**729.1**

Notes:
[1] Table 2.3-4 of the DEIR
[2] CalEEMod Appendix A

Planting trees will sequester CO_2 and is considered to result in a one-time carbon-stock change. Trees sequester CO_2 while they are actively growing. Total sequestered CO_2 is calculated by multiplying the number of trees by the annual CO_2 accumulation rate per year and the total active growing period. Table 2, *Carbon Sequestered by New Trees*, presents the estimate of CO_2 to be sequestered by the new trees planted on the project site. The number of new trees was provided by the landscape architect for the Project (Project Design Consultants 2017). Note that this estimate includes tree plantings only and does not account for other re-vegetation that the Project would provide; therefore, the estimate of CO_2 sequestration is conservative. The CO_2 accumulation rate and active growing period were obtained from the IPCC protocol.

Table 2
CARBON SEQUESTERED BY NEW TREES

New Trees[1]	MT CO_2 Accumulated per Tree per Year[2]	Active Growing Period (years)	Total CO_2 Sequestered (MT)
2,045	0.0354	20	1,448

Notes:
[1] Project Design Consultants, Harmony Grove Village South Carbon Sequestration Analysis, August 2017.
[2] CalEEMod Appendix A

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

As demonstrated in Tables 1 and 2, development of the Project would result in the one-time loss of 729 MT CO_2 and the additional sequestration of 1,448 MT CO_2 through the planting of new trees. The Project's change in vegetation would result in a net carbon sink sequestering an additional 719 MT CO_2 over the life of the Project.

Sincerely,

Victor Ortiz
Air Quality Specialist

Joanne M. Dramko
Senior Technical Specialist

ATTACHMENT B

HARMONY GROVE VILLAGE SOUTH

BUILDING ANALYSIS - CONSOL

HARMONY GROVE VILLAGE SOUTH

Building Analysis (August 2017)

An estimation of annual energy use and PV production for two sample residential buildings designed to comply with 2016 California Energy Code and the California Energy Commission's Zero Net Energy definition from the 2015 Integrated Energy Policy Report.

CONSOL

Contents

EXECUTIVE SUMMARY

This report analyzes a sample design for a single-family residence (SFR) and a sample design for a multi-family residence (MFR), representing a typical home and a typical multi-family building, for the proposed Harmony Grove Village South (HGVS) master planned community in North San Diego County. Sample residences are used for this analysis as building plans have yet to be developed for the site.

The objective of this report is to calculate the annual energy use when each building is configured with options that achieve: (i) compliance with the 2016 Title 24 Standards (California's Energy Code) and (ii) Zero Net Energy (ZNE) as defined in the California Energy Commission's (CEC's) 2015 Integrated Energy Policy Report (2015 IEPR). This analysis also calculates the estimated size of a rooftop solar photovoltaic (PV) system that would produce the amount of electricity required for each building to achieve ZNE. In this analysis, total estimated annual energy use (in kWh and therms) was calculated for each of the prototype residences. This estimate includes "regulated loads" (space heating, space cooling, and water heating) and "unregulated loads," such as plug-in uses, which are not regulated by Title 24.

The sample building configuration used in this analysis for the single-family detached residence is a 1,815 square foot, two-story home. The multi-family residence is a 22,950 square foot, three-story building, with 15 flat units. The plans for all buildings were taken from ConSol's library of building plans[1].

As a result of discussion between ConSol and the client, it was decided not to model a prototype similar to the HGVS Center House. The Center House is proposed to be a 5,000 square foot, single story community use building, which would mean moderate estimated energy consumption and plenty of roof space for a PV system to offset energy use. Being a public building means there is the possibility of using parking areas for solar canopies if need be. It was assumed, with the information available at this time, that the building should be able to easily meet a ZNE requirement.

Residential Assessment

Methods and Assumptions

After reviewing the conceptual plans and the specifications for the proposed buildings in the Harmony Grove Village South (HGVS) community, ConSol chose prototype buildings to model from their library of plans. ConSol chose to model a 2 story 1,815 sf single family home, and a 3 story, 15 unit multi-family building. The prototype single family home was selected to represent an average residential product type available in HGVS community. A 2 story house of this size would give a conservative estimate of meeting the energy consumption of the home with a rooftop PV system. In other words, an 1800 square foot 2

[1]The HGVS community would result in a variety of detached, single-family residential product types that may range from approximately 1,300 to 2,700 square feet. The prototype residence studied in this report was selected to represent an average residential product type, providing a reasonable representation of building energy consumption for purposes of the community's environmental analysis and specifically the estimation of the community's greenhouse gas emissions in the utilized modeling platform (the California Emissions Estimator Model). Similarly, the 22,950 sf, 15 unit multi-family building studied in this report was selected to represent a multi-family building product type in the community's development plan that will present challenges for reaching ZNE.

story home may have somewhat less roof space available for solar than a one story home of the same size, and less than a larger 2 story home. The assumption is that if this home can accommodate enough rooftop PV, then some of the less challenging home designs will easily meet the ZNE requirement. The size of the prototype home also provides a reasonable representation of typical building energy consumption for the purposes of the HGVS environmental analysis.

The prototype multi-family building was selected to represent one of the multi-family building configurations within the HGVS community. The multi-family prototype modeled represents a more challenging building design, with regards to reaching ZNE. A 3 story, 15 unit building has a small amount of roof space in relation to a larger number of individual living units within the building. In other words, 15 individual units means each unit will have its own appliances, heating and cooling, etc., as opposed to a building of the same size which might contain 6 or 8 townhomes, having fewer appliances, etc. The assumption is that if this multi-family building can accommodate enough rooftop PV to reach ZNE, then some of the less challenging multi-family designs will easily meet the ZNE requirement. The configuration of this building also provides a reasonable representation of typical multi-family building energy consumption for the purposes of the HGVS environmental analysis.

ConSol modeled the prototype residences using the CEC's public-domain compliance software, California Building Energy Code Compliance – Residential (CBECC-Res), which calculates Title 24 compliance and annual energy use. The residential building was modeled in Climate Zone 10 (Escondido).

In the software, the unregulated loads are set inputs determined by the CEC and based upon standard occupancy assumptions. These assumptions are detailed in the *HERS Technical Manual*[2] and the more recent *Plug Loads and Lighting Modeling* study.[3] Because these calculations cannot be modified by the user, CBECC produced the same unregulated energy use for both the home modeled to comply with the 2016 Standards and the home modeled to reach ZNE. The rounding function in the software causes slight differences in the total kWh from one model to the other, but these differences are not significant.

ConSol modeled the buildings using energy efficiency features that California builders are most likely to use to achieve compliance with the 2016 BEES. The features used in the calculations were selected based on common industry practices, ConSol's experience with builder preferences, and cost-effectiveness. Code compliance is based on the CEC's 2016 Time Dependent Valuation (TDV) energy metric. Time Dependent Valuation energy assigns greater value to electricity produced or consumed at peak periods. This report will refer to Proposed Design TDV energy, which is the projected TDV energy consumed by the residence when modeling the proposed features thereby increasing the energy efficiency of the building. The Proposed Design TDV energy will be compared to the Standard Design TDV energy, which is the projected TDV energy consumed by the building when the residence meets the prescriptive requirements listed in Table 150.1-A (Package A) of the 2016 California Energy Code. For a building to be code compliant, the proposed design TDV energy must be less than the standard design TDV energy.

[2] http://www.energy.ca.gov/2008publications/CEC-400-2008-012/CEC-400-2008-012-CMF.PDF
[3] http://www.bwilcox.com/BEES/docs/Rubin%20-%202016%20T24CASE%20Report%20-%20Plug%20Load%20and%20Ltg%20Modeling%20-%20June%202016.pdf

The prototype residence was modeled using the 2016 TDV values. The 2019 code is proposing different TDV values that may cause an increase in the PV system size needed to reach ZNE. During development and build-out, the project should consider additional information regarding the achievement of ZNE as it becomes available.

An additional model was created to achieve compliance with the ZNE definition in the 2015 IEPR. An estimated increased efficiency above the 2016 code is intended to represent efficiency improvements likely to be included in a Zero Net Energy home design. In this report, an 11% increase in the TDV efficiency of the ZNE model over the model that meets the 2016 code is shown and represents an assumption of the energy efficiency requirements that may be seen in the next code cycle (2019 Title 24, Part 6). The site energy was calculated for the 2016 code compliant and the ZNE residences in kWh and therms.

Using the CBECC-Res software, an Energy Design Rating (EDR) was calculated for each prototype residence to demonstrate that the building is designed to reach ZNE. The EDR is a type of rating that compares the regulated energy consumption, unregulated energy consumption, and annual PV production of a proposed home to the reference home (a 2006 IECC compliant home). An EDR of 100 means that a proposed home uses the same energy as a 2006 IECC compliant home and an EDR of zero meets the CEC's definition of a ZNE home. All energy measurements (consumption and production) are measured in TDV. To achieve ZNE on a residence, the EDR of the efficiency features must be less than the EDR of the PV system (i.e., the sum of the efficiency EDR and renewable EDR must be equal to or less than zero).

CBECC can separately analyze the energy efficiency of a building for scenarios in which it is facing north, south, east, or west. This is called a cardinal orientation analysis and it can be used to determine the "worst case" (uses most energy) orientation. ConSol used the worst-case orientation to determine the energy features required to achieve compliance for all orientations. The worst-case orientation also represents the most amount of energy the sample building would consume.

For each building analyzed, the first column in Table 1 and Table 3 represents the building energy efficiency requirements needed to comply with the 2016 code**.** The second column, in each of those same tables, represents the building energy efficiency requirements needed to achieve ZNE prior to the addition of the PV system. Features that are highlighted in yellow represent a change from the features listed in the 2016 code compliance configuration. Tables 2 and 4 show the site energy uses and PV sizing requirements necessary for the home to reach ZNE.

For the PV sizing on each building, standard 285 watt panels and standard central inverters were used in the analysis. In each CBECC model, the PV system was sized for the worst-case building orientation, as stated above, consuming the greatest amount of energy. All panels are assumed to be facing south (180°) to give the PV system size required to meet ZNE. It is important to note that if the residence is built in orientations other than the one reviewed, the PV system size would likely be different. A typical neighborhood will have houses facing in a variety of directions; therefore, the roof planes available for solar panel installation could also be facing a variety of directions. It is still possible for any given home to reach ZNE, regardless of which direction the home faces; however, annual solar generation will vary depending on the directional attributes of the installed solar panels. In some cases, the size of the solar system for a

given house may be larger than the system identified by the model for the prototype residence (e.g., if some panels need to be installed facing north, east or west). In some cases, the size of the solar system could be smaller than the system identified by the model (e.g., if the house is facing an orientation where energy use is lower and there is south or west facing roof available for PV panel installation). In each analysis, given the orientation of the building and the actual roof design of the sample residence, an example is given of how the PV system size may differ from the size the CBECC model calculates.

*Another consideration is to utilize more efficient, higher wattage PV panels which will reduce the number of panels needed, thus reducing the roof area needed, to achieve the required annual kWh production. For example, using 305 watt panels instead of 285 watt panels will reduce the number of panels needed to achieve the same kWh annual production.

Estimated Energy Consumption – 1,815 Square Foot / 2-Story / Single Family

CBECC-Res estimates an annual site energy consumption for the 1,815 square foot house in Escondido (Climate Zone 10) that complies with the 2016 code of 1,106 kWh and 176 therms for the regulated loads and 5,448 kWh and 17 therms for the unregulated loads. This equates to a total annual site energy consumption of 6,554 kWh and 193 therms for the 2016 code compliant residence. The energy consumption of the home designed to achieve ZNE is calculated to be 1,009 kWh and 151 therms for regulated loads and 5,448 kWh and 17 therms for the unregulated loads. This equates to a total annual site energy consumption of 6,457 kWh and 168 therms for the ZNE residence (these figures can be seen in Table 2). While conservatively not reflected in the model, it is reasonable to anticipate future decreases in the calculated energy use of unregulated loads as the CEC (and others) adopt regulations and programs to minimize the energy consumption of appliances and other plug loads.

The CBECC-Res software calculates the TDV energy use of the residence to verify that the proposed design complies with the current code. As previously mentioned, for a residence to be code compliant, the proposed design TDV energy must be equal to or less than the standard design TDV energy. In this analysis, the home designed to comply with the 2016 Standards has a TDV energy of 44.84 kTDV/ft^2-yr. This is a 0.2% (0.07 kTDV/ft^2-yr) improvement over the standard design. The TDV energy use for the home designed to achieve ZNE is calculated to be 39.82 kTDV/ft^2-yr, an 11.3% (5.09 kTDV/ft^2-yr) improvement over the 2016 code standard design.

PV Sizing to meet ZNE – 1,815 Square Foot / 2-Story / Single Family

ConSol also used the CBECC-Res software to determine the required PV system size needed to achieve ZNE as defined in the 2015 IEPR. The PV system was sized in the CBECC model using the worst-case building orientation, which represents the largest PV system required to achieve ZNE. The inputs used assume standard efficiency panels with all PV panels facing south.

As shown in Table 2, the system configuration for this prototype residence requires a 4.9 kW PV system to reach ZNE. Also shown in Table 2, the prototype residence has an efficiency EDR of 37.5 while the PV system has an EDR of 38.3. A minimum of 8,118 kWh of annual PV production is needed for the residence

to be ZNE. Standard 285-watt panels and a standard central inverter were used to calculate the PV system size. More efficient panels, however, may be used to achieve ZNE if the minimum annual PV production is achieved.

To meet the required production, seventeen standard 285-watt panels (approx. 5.5 ft x 3.5 ft) are needed if they are all facing south. This equates to approximately 327.25 square feet of south facing roof area. The California Fire Code (Section 605.11) dictates that PV arrays must be a minimum of three feet from the ridge, have one-and-a-half-foot clearance on each side of the array, as well as one-and-a-half-foot clearance from hips and valleys. If the required roof area is unavailable on south facing roofs, additional PV panels can be located on remaining roof orientations to meet the minimum required yearly production. If additional roof orientations are used, the PV system size may need to be increased due to PV production being proportional to orientation, as described above. For example, the prototype residence analyzed in this report does not have enough roof space facing south to accommodate 17 (seventeen) standard solar panels. The assessment of the prototype home showed that 7 (seven) PV panels installed on the south facing roof plane, 10 (ten) PV panels on the west facing roof plane and an additional 2 (two) PV panels on the east facing roof plane would give an annual production of 8,251 kWh / year, allowing the home to reach ZNE.

A 2 story, approximately 1,800 square foot home has a smaller roof footprint than other possible single family home designs and represents the challenge of a smaller roof accommodating enough solar for the home to be ZNE. In developing a plan for ZNE homes or a ZNE community, it is important to design buildings with adequate solar roof areas. During the building design phase, it is recommended that builders be mindful of roof penetrations (vents, chimneys, skylights, etc.) in roof surfaces where the PV system will be located to maximize the roof area available for solar. A possible option for roof penetrations is to locate those penetrations in the clearance areas required by the Fire Code.

The analysis provided in this report demonstrates the energy efficiency features and PV system size that would need to be included in the construction of a single-family residence, similar in size to the sample building, in Climate Zone 10 (Escondido), to achieve ZNE. The building plans used for the sample residence are representative of an entry-level single-family residence. Single-family residences of varying sizes likely would have different energy profiles and therefore, different PV requirements to meet the ZNE definition.

PV Sizing to cover site electric use only – 1,815 Square Foot / 2-Story / Single Family

When the same single-family home is modeled to size the PV system to only cover the electric load of the building, the required PV system size would be 3.2 kW, consisting of 11 standard 285 watt solar panels, all facing south, and producing a minimum of 5,301 kWh / year. The prototype single-family building analyzed for this report could accommodate a 3.4 kW system, with 7 panels facing south and 5 panels facing west, to produce an estimated 5,365 kWh / year, thereby meeting the electric use of the building.

*Another consideration is to utilize more efficient, higher wattage PV panels which will reduce the number of panels needed, thus reducing the roof area needed, to achieve the required annual kWh production. For example, using 305 watt panels instead of 285 watt panels will reduce the number of panels needed to achieve the same kWh annual production.

TABLE 1: 2016 CALIFORNIA ENERGY CODE AND ZNE COMPLIANCE OPTIONS

Harmony Grove Village South Escondido Climate Zone 10 1815 Sqft / 2-Story / 15.5% Glazing	2016 Building Features	ZNE Building Features
Run	**Base**	**Base w/ PV (ZNE)**
File Number	**0**	**1**
Software	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)
Compliance Margins		
Worst Case % Above Code (2016 Code)	**0.2%**	**11.3%**
Worst Case Magin Above Code (2016 Code) - kTDV	**0.07**	**5.09**
Proposed Design Budget	**44.84**	**39.82**
Envelope: Opaque Surfaces		
Wall Insulation - 2x6 Exterior Walls	R-21+R4	R-21+R4
Wall Insulation - 2x6 Interior Garage Walls	R-21	R-21
Insulated Entry Door(s)	N/A	N/A
Wall Insulation - 2x6 Exterior Garage Walls	R-0+R4	R-0+R4
Attic Insulation - Flat Portions	R-38	R-38
Attic Insulation - At Furnace Platform	R-21	R-21
Floor Insulation - Above Garage	R-19	R-19
Insulation Installation [Verification] - QII	Required	Required
Air Infiltration [Testing] - Blower Door	5.0 ACH	5.0 ACH
Roofing Material	Tile	Tile
Roofing Properties (Reflectance / Emittance)	0.10 / 0.85	0.10 / 0.85
Below Roof Deck Insulation	R-13	**R-19**
Ventilated Attic (Yes / No)	Yes	Yes
Envelope: Glazing (U-Factor / SHGC)		
Horizontal Slider	0.32 / 0.25	0.32 / 0.25
Single Hung	0.32 / 0.25	0.32 / 0.25
Fixed	0.32 / 0.25	0.32 / 0.25
Patio Door	0.32 / 0.25	0.32 / 0.25
French Door	0.32 / 0.25	0.32 / 0.25
HVAC: Space Heating, Cooling Systems		
Space Heating Type	Furnace	Furnace
Space Heating Efficiency (AFUE)	0.80	**0.92**
Space Cooling Type	ACSplit	ACSplit
Space Cooling Efficiency (SEER / EER)	14 / 12.2	**15 / 13.0**
SEER [Verification]	N/A	**Required**
EER [Verification]	Required	Required
Refrigerant Charge [Verification/Testing]	Required	Required
Fan Watt Draw [Testing]	0.58 W/cfm	0.58 W/cfm
Adequate Airflow [Testing]	350 cfm/ton	350 cfm/ton
HVAC: Duct System		
Duct Insulation R-Value	R-8	R-8
Duct Location	Attic	Attic
Buried Ducts [Verification]	N/A	N/A
Low Leakage (Tight) Ducts [Testing]	Required @ 5%	Required @ 5%
HVAC: Mechanical Ventilation		
Minimum Whole-House Ventilation, Continuous	63 cfm	63 cfm
Ventilation System Type	Exhaust	Exhaust
Ventilation System Efficiency (cfm / W/cfm)	63 / 0.25	63 / 0.25
Water Heating		
Water Heater Type	Tankless	Tankless
Water Heater Efficiency (EF)	0.82	**0.95**
Fuel Source	Natural Gas	Natural Gas
Distribution Type	Standard	Standard

Table 2: SITE ENERGY USES AND PV sizing

Harmony Grove Village South Escondido Climate Zone 10 1815 Sqft / 2-Story / 15.5% Glazing	2016 Building Features	ZNE Building Features
Run	**Base**	**Base w/ PV (ZNE)**
File Number	**0**	**1**
Software	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)
Regulated Loads from CBEEC Log File (Space Heating, Cooling & Water Heating)		
kWh	1,106	1,009
Therms	176	151
Unregulated Loads from CBECC Log File (Inside & Exterior Lighting, Appliance & Cook, Plug Loads)		
Interior Lighting kWh	453	453
Appliance & Cooking kWh	2,173	2,173
Plug Load kWh	2,717	2,717
Exterior Lighting kWh	105	105
Appliance & Cooking Therms	17	17
Total kWh	6,554	6,457
Total Therms	193	167
Final EDR of Proposed Design w/ PV		-1.0
PV Sizing (kW)		4.9
PV Production kWH		8,118
PV Production TDV		107.8
PV Production EDR		53.3
Proposed Design TDV		105.8
Proposed Design EDR		52.3

Estimated Energy Consumption – 22,950 Square Foot / 3-Story / 15-Plex

CBECC-Res estimates the annual site energy consumption for the 22,950 square foot multi-family building in Escondido (Climate Zone 10) that meets the 2016 code is 14,353 kWh and 1,488 therms for the regulated loads and 61,775 kWh and 209 therms for the unregulated loads. This equates to a total annual site energy consumption of 76,128 kWh and 1,697 therms for the 2016 code compliant residence. The energy consumption of the residence designed to achieve ZNE is calculated to be 12,523 kWh and 1,427 therms for regulated loads and 61,775 kWh and 209 therms for the unregulated loads. This equates to a total annual site energy consumption of 74,298 kWh and 1,636 therms for the ZNE residence (these figures can be seen in Table 4).

The CBECC-Res software calculates the TDV energy use of the multi-family residence to verify that the proposed design complies with the current code. As previously mentioned, for a residence to be code compliant, the proposed design TDV energy must be equal to or less than the standard design TDV energy. In this analysis, the residence designed to meet the 2016 code has a TDV energy of 36.92 kTDV/ft²-yr. This is a 0.8% (0.31 kTDV/ft²-yr) improvement over the standard design. The TDV energy use for the residence designed to achieve ZNE is calculated to be 32.49 kTDV/ft²-yr, a 12.7% (4.72 kTDV/ft²-yr) improvement over the 2016 code standard design.

PV Sizing to meet ZNE – 22,950 Square Foot / 3-Story / 15-Plex

ConSol also used the CBECC-Res software to determine the required PV system size needed to achieve ZNE as defined in the 2015 IEPR. The PV system was sized in the CBECC model using the worst-case building orientation, which represents the largest PV system required to achieve ZNE; and the inputs used assume standard efficiency panels with all PV panels facing south.

As shown in Table 4, the system configuration for this prototype residence requires a 53 kW PV system to reach ZNE. The prototype residence has an EDR of 37.5 while the PV system has an EDR of 38.3 (see Table 2). A minimum of 87,804 kWh of annual PV production is needed for the residence to be ZNE. Standard 285-watt panels and a standard central inverter were used to calculate the PV system size. More efficient panels, however, may be used to achieve ZNE if the minimum annual PV production is achieved.

To meet the required production, one hundred and eighty six (186) standard 285-watt panels (approx. 5.5 ft x 3.5 ft) are needed, if all panels are facing 180°. This equates to approximately 3,580.5 square feet of south facing roof area. The California Fire Code (Section 605.11) dictates that PV arrays must be a minimum of three feet from the ridge, have one-and-a-half-foot clearance on each side of the array, as well as one-and-a-half-foot clearance from hips and valleys. If the required roof area is unavailable on south facing roofs, additional PV panels can be located on remaining roof orientations to meet the minimum required yearly production. If additional roof orientations are used, the PV system size may need to be increased due to PV production being proportional to orientation, as described above. For example, the prototype residence analyzed in this report would not be able to accommodate any solar panels facing south. An alternate configuration of 110 solar panels facing west (270°) and 105 solar panels facing east (90°) is possible, and

would produce an estimated 88,005 kWh / year, thereby meeting the minimum PV production required for the building to be ZNE.

The analysis provided in this report demonstrates the energy efficiency features and PV system size that would need to be included in the construction of a multi-family residence, similar in size to the sample building, in Climate Zone 10 (Escondido), to reach the current working definition of ZNE. The building plans used for the prototype residence are representative of a 3 story 15 unit, multi-family residence; multi-family buildings of varying sizes likely would have different energy profiles and therefore different PV requirements to meet the ZNE definition.

PV Sizing to cover site electric use only – 22,950 Square Foot / 3-Story / 15-Plex

When the model for the same multi-family building is run to size the PV system to only cover the electric load of the building, the required PV system size would be 36 kW, consisting of 126 standard 285 watt solar panels, all facing south, and producing a minimum of 59,640 kWh / year. The prototype multi-family building analyzed for this report could accommodate a 41.6 kW system, with 80 panels facing west and 66 panels facing east to produce an estimated 59,864 kWh / year, thereby meeting the electric use of the building.

*Another consideration is to utilize more efficient, higher wattage PV panels which will reduce the number of panels needed, thus reducing the roof area needed, to achieve the required annual kWh production. For example, using 305 watt panels instead of 285 watt panels will reduce the number of panels needed to achieve the same kWh annual production.

Table 3: 2016 California Energy CODE and ZNE COMPLANCE OPTIONS

Harmony Grove Village South Escondido Climate Zone 10 22,950 Sqft / 3-Story / 15-Plex / 11.8% Glazing	2016 Building Features	ZNE Building Features
Run	**Base**	**Base w/ PV (ZNE)**
File Number	**0**	**1**
Software	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)
Compliance Margins		
Worst Case % Above Code (2016 Code)	**0.8%**	**12.7%**
Worst Case Magin Above Code (2016 Code) - kTDV	**0.31**	**4.72**
Proposed Design Budget	**36.92**	**32.49**
Envelope: Opaque Surfaces		
Wall Insulation - 2x6 Exterior Walls	R-21+R4	R-21+R4
Insulated Entry Door(s)	R-5	R-5
Wall Insulation - 2x6 Exterior Garage Walls	R-0+R4	R-0+R4
Attic Insulation - Flat Portions	R-38	R-38
Floor Insulation - Above Garage	R-19	**R-30**
Floor Insulation - Between Zones	R-0	R-0
Insulation Installation [Verification] - QII	Required	Required
Air Infiltration [Testing] - Blower Door	7.0 ACH	7.0 ACH
Roofing Material	Tile	Tile
Roofing Properties (Reflectance / Emittance)	0.10 / 0.85	0.10 / 0.85
Below Roof Deck Insulation	R-13	**R-19**
Ventilated Attic (Yes / No)	Yes	Yes
Envelope: Glazing (U-Factor / SHGC)		
Horizontal Slider	0.31 / 0.22	0.31 / 0.22
Single Hung	0.31 / 0.22	0.31 / 0.22
Fixed	0.31 / 0.22	0.31 / 0.22
Patio Door	0.31 / 0.22	0.31 / 0.22
French Door	0.31 / 0.22	0.31 / 0.22
HVAC: Space Heating, Cooling Systems		
Space Heating Type	Furnace	Furnace
Space Heating Efficiency (AFUE)	0.80	0.80
Space Cooling Type	ACSplit	ACSplit
Space Cooling Efficiency (SEER / EER)	14 / 11.7	**15 / 13.0**
SEER [Verification]	N/A	**Required**
EER [Verification]	N/A	**Required**
Refrigerant Charge [Verification/Testing]	Required	Required
Fan Watt Draw [Testing]	0.58 W/cfm	0.58 W/cfm
Adequate Airflow [Testing]	350 cfm/ton	350 cfm/ton
HVAC: Duct System		
Duct Insulation R-Value	R-4.2	R-4.2
Duct Location	Cond. Space	Cond. Space
Low Leakage (Tight) Ducts [Testing]	Total Leakage <= 12.0% or Leakage to Outdoors <= 5.0%	Total Leakage <= 12.0% or Leakage to Outdoors <= 5.0%
HVAC: Mechanical Ventilation		
Minimum Whole-House Ventilation, Continuous	End Unit - 84 cfm Int. Unit - 71 cfm	End Unit - 84 cfm Int. Unit - 71 cfm
Ventilation System Type	Exhaust	Exhaust
Ventilation System Efficiency (cfm / W/cfm)	End Unit - 75 / 0.25 Int. Unit - 71 / 0.25	End Unit - 75 / 0.25 Int. Unit - 71 / 0.25
Water Heating		
Water Heater Type	Tankless	Tankless
Water Heater Efficiency (EF)	0.82	**0.95**
Fuel Source	Natural Gas	Natural Gas
Distribution Type	Standard	**Pipe Insulation, All Line (HERS Req'd)**

Table 4: SITE ENERGY USES AND PV sizing

Harmony Grove Village South Escondido Climate Zone 10 22,950 Sqft / 3-Story / 15-Plex / 11.8% Glazing	2016 Building Features	ZNE Building Features
Run	Base	Base w/ PV (ZNE)
File Number	0	1
Software	CBECC-Res 2016.2.1 (868)	CBECC-Res 2016.2.1 (868)
Regulated Loads from CBEEC Log File (Space Heating, Cooling & Water Heating)		
kWh	14,353	12,523
Therms	1,488	1,427
Unregulated Loads from CBECC Log File (Inside & Exterior Lighting, Appliance & Cook, Plug Loads)		
Interior Lighting kWh	5,733	5,733
Appliance & Cooking kWh	24,314	24,315
Plug Load kWh	30,388	30,388
Exterior Lighting kWh	1,340	1,340
Appliance & Cooking Therms	209	209
Total kWh	76,127	74,299
Total Therms	1,697	1,635
Final EDR of Proposed Design w/ PV		-0.7
PV Sizing (kW)		53.0
PV Production kWH		87,804
PV Production TDV		92.2
PV Production EDR		56.9
Proposed Design TDV		91.0
Proposed Design EDR		56.2

ATTACHMENT C

HARMONY GROVE VILLAGE SOUTH PROJECT

UPDATED CALEEMOD MODELING RESULTS (Corrected Pages to Attachment A of the Global Climate Change Study) AND VEHICLE EMISSION REDUCTIONS – HELIX

Attachment C provides the following information:

1. Pages 1 through 45 reflect changes resulting from the correction made to the trip generation data shown in Table 4.3 and on; updated from Appendix A of EIR Appendix J.
2. The Emission Reduction Adjustments have been updated to reflect changes in item 1 above. This was Appendix B to EIR Appendix J.

Harmony Grove Village South

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	46.00	Space	0.41	18,400.00	0
City Park	1.50	Acre	1.50	65,340.00	0
Condo/Townhouse	260.00	Dwelling Unit	16.25	260,000.00	744
Single Family Housing	193.00	Dwelling Unit	62.66	347,400.00	552
Strip Mall	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2021
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on input from Kovach (dated 02-27-2017)

Off-road Equipment -

Off-road Equipment - typical equipment used for the backbone infrastructure phase

Off-road Equipment - Based on input from Moffatt & Nichol

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Crusher added to process Blasing debris

Trips and VMT -

Grading -

Architectural Coating - Low-VOC coatings per design feature

Vehicle Trips - Trip generation based on LLG2014; trip length based on LLG2016.

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Construction Off-road Equipment Mitigation -

Area Mitigation - Natural Gas hearths and low-VOC coatings per design features

Energy Mitigation - CalEEMod default is 2008 T24. 2013 is 25% improved over 2008. 2016 is 28% improved over 2013. (1-.25)*(1-.28)=54% - 46% improvement

Water Mitigation -

Waste Mitigation -

Operational Off-Road Equipment - WTWRF generator sets

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00

tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	1,550.00	262.00
tblConstructionPhase	NumDays	1,550.00	589.00
tblConstructionPhase	NumDays	155.00	65.00
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	60.00	65.00
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/30/2020	3/31/2020
tblConstructionPhase	PhaseEndDate	7/4/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/28/2019	6/30/2019
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	9/28/2018	9/30/2018
tblConstructionPhase	PhaseEndDate	3/29/2019	3/31/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblConstructionPhase	PhaseStartDate	7/1/2019	4/1/2019
tblConstructionPhase	PhaseStartDate	4/1/2020	7/1/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00

tblProjectCharacteristics	OperationalYear	2014	2021
tblVehicleTrips	CC_TL	7.30	7.88
tblVehicleTrips	CC_TL	7.30	7.88
tblVehicleTrips	CC_TL	7.30	7.88
tblVehicleTrips	CNW_TL	7.30	7.88
tblVehicleTrips	CNW_TL	7.30	7.88
tblVehicleTrips	CNW_TL	7.30	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	HO_TL	7.50	7.88
tblVehicleTrips	HO_TL	7.50	7.88
tblVehicleTrips	HS_TL	7.30	7.88
tblVehicleTrips	HS_TL	7.30	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	ST_TR	1.59	0.00
tblVehicleTrips	ST_TR	7.16	9.93
tblVehicleTrips	ST_TR	10.08	9.93
tblVehicleTrips	ST_TR	42.04	0.00
tblVehicleTrips	SU_TR	1.59	0.00
tblVehicleTrips	SU_TR	6.07	9.93
tblVehicleTrips	SU_TR	8.77	9.93
tblVehicleTrips	SU_TR	20.43	0.00
tblVehicleTrips	WD_TR	1.59	0.00
tblVehicleTrips	WD_TR	6.59	9.93
tblVehicleTrips	WD_TR	9.57	9.93
tblVehicleTrips	WD_TR	44.32	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2571	2.5760	1.9592	2.9200e-003	0.5963	0.1344	0.7307	0.3252	0.1245	0.4497	0.0000	263.4093	263.4093	0.0756	0.0000	264.9973
2019	0.9145	7.7422	8.0294	0.0162	0.7449	0.3819	1.1268	0.2413	0.3585	0.5998	0.0000	1,330.0340	1,330.0340	0.2136	0.0000	1,334.5198
2020	0.5716	4.1474	5.5395	0.0119	0.4512	0.2049	0.6560	0.1213	0.1930	0.3143	0.0000	925.7016	925.7016	0.1109	0.0000	928.0311
2021	3.0949	2.8710	4.1013	8.6600e-003	0.3014	0.1418	0.4431	0.0809	0.1327	0.2136	0.0000	673.4264	673.4264	0.1001	0.0000	675.5289
Total	**4.8381**	**17.3365**	**19.6294**	**0.0398**	**2.0937**	**0.8629**	**2.9567**	**0.7686**	**0.8088**	**1.5774**	**0.0000**	**3,192.5712**	**3,192.5712**	**0.5003**	**0.0000**	**3,203.0771**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2571	2.5760	1.9592	2.9200e-003	0.2734	0.1344	0.4078	0.1477	0.1245	0.2722	0.0000	263.4090	263.4090	0.0756	0.0000	264.9970
2019	0.9145	7.7422	8.0294	0.0162	0.5898	0.3819	0.9717	0.1770	0.3585	0.5355	0.0000	1,330.0330	1,330.0330	0.2136	0.0000	1,334.5189
2020	0.5716	4.1474	5.5395	0.0119	0.4512	0.2049	0.6560	0.1213	0.1930	0.3143	0.0000	925.7011	925.7011	0.1109	0.0000	928.0306
2021	3.0949	2.8710	4.1013	8.6600e-003	0.3014	0.1418	0.4431	0.0809	0.1327	0.2136	0.0000	673.4259	673.4259	0.1001	0.0000	675.5285
Total	**4.8381**	**17.3365**	**19.6294**	**0.0398**	**1.6158**	**0.8629**	**2.4787**	**0.5268**	**0.8088**	**1.3356**	**0.0000**	**3,192.5690**	**3,192.5690**	**0.5003**	**0.0000**	**3,203.0749**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**22.83**	**0.00**	**16.17**	**31.46**	**0.00**	**15.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	32.2773	0.4246	38.3867	0.0139		4.9380	4.9380		4.9379	4.9379	467.9298	201.7382	669.6681	0.4372	0.0368	690.2581
Energy	0.0482	0.4117	0.1754	2.6300e-003		0.0333	0.0333		0.0333	0.0333	0.0000	1,322.6341	1,322.6341	0.0432	0.0158	1,328.4343
Mobile	2.2553	4.4400	22.3150	0.0629	4.3077	0.0706	4.3782	1.1521	0.0651	1.2172	0.0000	4,305.6929	4,305.6929	0.1628	0.0000	4,309.1120
Offroad	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Waste						0.0000	0.0000		0.0000	0.0000	71.3107	0.0000	71.3107	4.2143	0.0000	159.8119
Water						0.0000	0.0000		0.0000	0.0000	9.4812	202.0455	211.5267	0.9819	0.0247	239.7970
Total	**34.6737**	**6.0995**	**61.8352**	**0.0811**	**4.3077**	**5.0855**	**9.3931**	**1.1521**	**5.0799**	**6.2320**	**548.7217**	**6,179.0647**	**6,727.7864**	**5.8469**	**0.0773**	**6,874.5248**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.1238	0.0389	3.3731	1.8000e-004		0.0410	0.0410		0.0408	0.0408	0.0000	326.6201	326.6201	0.0115	5.8900e-003	328.6863
Energy	0.0308	0.2628	0.1120	1.6800e-003		0.0212	0.0212		0.0212	0.0212	0.0000	304.3124	304.3124	5.8300e-003	5.5800e-003	306.1644
Mobile	2.2553	4.4400	22.3150	0.0629	4.3077	0.0706	4.3782	1.1521	0.0651	1.2172	0.0000	4,305.6929	4,305.6929	0.1628	0.0000	4,309.1120
Offroad	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Waste						0.0000	0.0000		0.0000	0.0000	17.8277	0.0000	17.8277	1.0536	0.0000	39.9530
Water						0.0000	0.0000		0.0000	0.0000	7.5849	163.2919	170.8768	0.7855	0.0197	193.4867
Total	**5.5028**	**5.5649**	**26.7582**	**0.0664**	**4.3077**	**0.1764**	**4.4841**	**1.1521**	**0.1707**	**1.3228**	**25.4126**	**5,246.8712**	**5,272.2839**	**2.0267**	**0.0312**	**5,324.5138**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**84.40**	**22.26**	**58.28**	**20.15**	**0.00**	**97.39**	**52.73**	**0.00**	**97.50**	**79.47**	**95.37**	**17.46**	**23.82**	**65.47**	**59.62**	**24.69**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2018	9/30/2018	5	65	
2	Backbone Infrastructure	Trenching	10/1/2018	3/31/2019	5	130	
3	Grading	Grading	4/1/2019	6/30/2019	5	65	
4	Bridge Construction	Building Construction	4/1/2019	3/31/2020	5	262	
5	Building Construction	Building Construction	7/1/2019	9/30/2021	5	589	
6	Paving	Paving	5/1/2021	9/30/2021	5	109	
7	Architectural Coating	Architectural Coating	5/1/2021	9/30/2021	5	109	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 162.5

Acres of Paving: 0

Residential Indoor: 1,229,985; Residential Outdoor: 409,995; Non-Residential Indoor: 106,338; Non-Residential Outdoor: 35,446 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crushing/Proc. Equipment	1	8.00	85	0.78
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Backbone Infrastructure	Forklifts	1	8.00	89	0.20
Backbone Infrastructure	Off-Highway Trucks	2	8.00	400	0.38
Backbone Infrastructure	Other Material Handling Equipment	1	8.00	167	0.40
Backbone Infrastructure	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Backbone Infrastructure	Trenchers	1	8.00	80	0.50
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41

Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Bridge Construction	Cranes	2	7.00	226	0.29
Bridge Construction	Forklifts	1	8.00	89	0.20
Bridge Construction	Generator Sets	2	8.00	84	0.74
Bridge Construction	Pumps	1	8.00	84	0.74
Bridge Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Bridge Construction	Welders	0	8.00	46	0.45
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Backbone Infrastructure	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Construction	9	293.00	63.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	293.00	63.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	59.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5872	0.0000	0.5872	0.3228	0.0000	0.3228	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1615	1.6298	1.3206	1.5000e-003		0.0877	0.0877		0.0815	0.0815	0.0000	135.7510	135.7510	0.0380	0.0000	136.5480
Total	**0.1615**	**1.6298**	**1.3206**	**1.5000e-003**	**0.5872**	**0.0877**	**0.6748**	**0.3228**	**0.0815**	**0.4043**	**0.0000**	**135.7510**	**135.7510**	**0.0380**	**0.0000**	**136.5480**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991
Total	**1.8400e-003**	**2.4400e-003**	**0.0229**	**6.0000e-005**	**5.2100e-003**	**4.0000e-005**	**5.2500e-003**	**1.3900e-003**	**4.0000e-005**	**1.4200e-003**	**0.0000**	**4.4945**	**4.4945**	**2.2000e-004**	**0.0000**	**4.4991**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2642	0.0000	0.2642	0.1452	0.0000	0.1452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1615	1.6298	1.3206	1.5000e-003		0.0877	0.0877		0.0815	0.0815	0.0000	135.7508	135.7508	0.0380	0.0000	136.5479
Total	**0.1615**	**1.6298**	**1.3206**	**1.5000e-003**	**0.2642**	**0.0877**	**0.3519**	**0.1452**	**0.0815**	**0.2268**	**0.0000**	**135.7508**	**135.7508**	**0.0380**	**0.0000**	**136.5479**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991
Total	**1.8400e-003**	**2.4400e-003**	**0.0229**	**6.0000e-005**	**5.2100e-003**	**4.0000e-005**	**5.2500e-003**	**1.3900e-003**	**4.0000e-005**	**1.4200e-003**	**0.0000**	**4.4945**	**4.4945**	**2.2000e-004**	**0.0000**	**4.4991**

3.3 Backbone Infrastructure - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7411	119.7411	0.0373	0.0000	120.5239
Total	**0.0924**	**0.9419**	**0.5982**	**1.3100e-003**		**0.0467**	**0.0467**		**0.0429**	**0.0429**	**0.0000**	**119.7411**	**119.7411**	**0.0373**	**0.0000**	**120.5239**

3.3 Backbone Infrastructure - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263
Total	**1.4000e-003**	**1.8600e-003**	**0.0174**	**5.0000e-005**	**3.9700e-003**	**3.0000e-005**	**4.0000e-003**	**1.0500e-003**	**3.0000e-005**	**1.0800e-003**	**0.0000**	**3.4227**	**3.4227**	**1.7000e-004**	**0.0000**	**3.4263**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7409	119.7409	0.0373	0.0000	120.5237
Total	**0.0924**	**0.9419**	**0.5982**	**1.3100e-003**		**0.0467**	**0.0467**		**0.0429**	**0.0429**	**0.0000**	**119.7409**	**119.7409**	**0.0373**	**0.0000**	**120.5237**

3.3 Backbone Infrastructure - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263
Total	**1.4000e-003**	**1.8600e-003**	**0.0174**	**5.0000e-005**	**3.9700e-003**	**3.0000e-005**	**4.0000e-003**	**1.0500e-003**	**3.0000e-005**	**1.0800e-003**	**0.0000**	**3.4227**	**3.4227**	**1.7000e-004**	**0.0000**	**3.4263**

3.3 Backbone Infrastructure - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2035	114.2035	0.0361	0.0000	114.9623
Total	**0.0816**	**0.8021**	**0.5639**	**1.2700e-003**		**0.0395**	**0.0395**		**0.0364**	**0.0364**	**0.0000**	**114.2035**	**114.2035**	**0.0361**	**0.0000**	**114.9623**

3.3 Backbone Infrastructure - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022
Total	**1.2600e-003**	**1.6700e-003**	**0.0156**	**5.0000e-005**	**3.8500e-003**	**3.0000e-005**	**3.8800e-003**	**1.0200e-003**	**3.0000e-005**	**1.0500e-003**	**0.0000**	**3.1989**	**3.1989**	**1.5000e-004**	**0.0000**	**3.2022**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2033	114.2033	0.0361	0.0000	114.9621
Total	**0.0816**	**0.8021**	**0.5639**	**1.2700e-003**		**0.0395**	**0.0395**		**0.0364**	**0.0364**	**0.0000**	**114.2033**	**114.2033**	**0.0361**	**0.0000**	**114.9621**

3.3 Backbone Infrastructure - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022
Total	**1.2600e-003**	**1.6700e-003**	**0.0156**	**5.0000e-005**	**3.8500e-003**	**3.0000e-005**	**3.8800e-003**	**1.0200e-003**	**3.0000e-005**	**1.0500e-003**	**0.0000**	**3.1989**	**3.1989**	**1.5000e-004**	**0.0000**	**3.2022**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2819	0.0000	0.2819	0.1169	0.0000	0.1169	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1590	1.7614	1.3094	2.0100e-003		0.0814	0.0814		0.0749	0.0749	0.0000	180.1829	180.1829	0.0570	0.0000	181.3801
Total	**0.1590**	**1.7614**	**1.3094**	**2.0100e-003**	**0.2819**	**0.0814**	**0.3633**	**0.1169**	**0.0749**	**0.1918**	**0.0000**	**180.1829**	**180.1829**	**0.0570**	**0.0000**	**181.3801**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362
Total	**1.7000e-003**	**2.2600e-003**	**0.0211**	**6.0000e-005**	**5.2100e-003**	**4.0000e-005**	**5.2500e-003**	**1.3900e-003**	**4.0000e-005**	**1.4200e-003**	**0.0000**	**4.3319**	**4.3319**	**2.1000e-004**	**0.0000**	**4.3362**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1269	0.0000	0.1269	0.0526	0.0000	0.0526	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1590	1.7614	1.3094	2.0100e-003		0.0814	0.0814		0.0749	0.0749	0.0000	180.1827	180.1827	0.0570	0.0000	181.3799
Total	**0.1590**	**1.7614**	**1.3094**	**2.0100e-003**	**0.1269**	**0.0814**	**0.2083**	**0.0526**	**0.0749**	**0.1275**	**0.0000**	**180.1827**	**180.1827**	**0.0570**	**0.0000**	**181.3799**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362
Total	**1.7000e-003**	**2.2600e-003**	**0.0211**	**6.0000e-005**	**5.2100e-003**	**4.0000e-005**	**5.2500e-003**	**1.3900e-003**	**4.0000e-005**	**1.4200e-003**	**0.0000**	**4.3319**	**4.3319**	**2.1000e-004**	**0.0000**	**4.3362**

3.5 Bridge Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0689	340.0689	0.0655	0.0000	341.4450
Total	**0.2948**	**2.8800**	**2.2056**	**3.8700e-003**		**0.1621**	**0.1621**		**0.1546**	**0.1546**	**0.0000**	**340.0689**	**340.0689**	**0.0655**	**0.0000**	**341.4450**

3.5 Bridge Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	0.4453	0.7322	1.4700e-003	0.0404	6.6900e-003	0.0471	0.0116	6.1600e-003	0.0177	0.0000	127.1286	127.1286	9.5000e-004	0.0000	127.1485
Worker	0.0756	0.1002	0.9348	2.8500e-003	0.2314	1.6800e-003	0.2331	0.0615	1.5600e-003	0.0631	0.0000	192.3389	192.3389	9.2200e-003	0.0000	192.5326
Total	**0.1323**	**0.5455**	**1.6670**	**4.3200e-003**	**0.2718**	**8.3700e-003**	**0.2802**	**0.0731**	**7.7200e-003**	**0.0808**	**0.0000**	**319.4675**	**319.4675**	**0.0102**	**0.0000**	**319.6811**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0685	340.0685	0.0655	0.0000	341.4445
Total	**0.2948**	**2.8800**	**2.2056**	**3.8700e-003**		**0.1621**	**0.1621**		**0.1546**	**0.1546**	**0.0000**	**340.0685**	**340.0685**	**0.0655**	**0.0000**	**341.4445**

3.5 Bridge Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0567	0.4453	0.7322	1.4700e-003	0.0404	6.6900e-003	0.0471	0.0116	6.1600e-003	0.0177	0.0000	127.1286	127.1286	9.5000e-004	0.0000	127.1485
Worker	0.0756	0.1002	0.9348	2.8500e-003	0.2314	1.6800e-003	0.2331	0.0615	1.5600e-003	0.0631	0.0000	192.3389	192.3389	9.2200e-003	0.0000	192.5326
Total	**0.1323**	**0.5455**	**1.6670**	**4.3200e-003**	**0.2718**	**8.3700e-003**	**0.2802**	**0.0731**	**7.7200e-003**	**0.0808**	**0.0000**	**319.4675**	**319.4675**	**0.0102**	**0.0000**	**319.6811**

3.5 Bridge Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9573	110.9573	0.0212	0.0000	111.4031
Total	**0.0875**	**0.8626**	**0.7137**	**1.2800e-003**		**0.0464**	**0.0464**		**0.0442**	**0.0442**	**0.0000**	**110.9573**	**110.9573**	**0.0212**	**0.0000**	**111.4031**

3.5 Bridge Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0177	0.1251	0.2333	4.8000e-004	0.0133	1.9800e-003	0.0153	3.8100e-003	1.8200e-003	5.6300e-003	0.0000	40.9868	40.9868	3.0000e-004	0.0000	40.9931
Worker	0.0236	0.0309	0.2883	9.4000e-004	0.0764	5.5000e-004	0.0769	0.0203	5.1000e-004	0.0208	0.0000	60.9048	60.9048	2.8900e-003	0.0000	60.9656
Total	**0.0413**	**0.1560**	**0.5216**	**1.4200e-003**	**0.0897**	**2.5300e-003**	**0.0922**	**0.0241**	**2.3300e-003**	**0.0264**	**0.0000**	**101.8916**	**101.8916**	**3.1900e-003**	**0.0000**	**101.9587**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9571	110.9571	0.0212	0.0000	111.4030
Total	**0.0875**	**0.8626**	**0.7137**	**1.2800e-003**		**0.0464**	**0.0464**		**0.0442**	**0.0442**	**0.0000**	**110.9571**	**110.9571**	**0.0212**	**0.0000**	**111.4030**

3.5 Bridge Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0177	0.1251	0.2333	4.8000e-004	0.0133	1.9800e-003	0.0153	3.8100e-003	1.8200e-003	5.6300e-003	0.0000	40.9868	40.9868	3.0000e-004	0.0000	40.9931
Worker	0.0236	0.0309	0.2883	9.4000e-004	0.0764	5.5000e-004	0.0769	0.0203	5.1000e-004	0.0208	0.0000	60.9048	60.9048	2.8900e-003	0.0000	60.9656
Total	**0.0413**	**0.1560**	**0.5216**	**1.4200e-003**	**0.0897**	**2.5300e-003**	**0.0922**	**0.0241**	**2.3300e-003**	**0.0264**	**0.0000**	**101.8916**	**101.8916**	**3.1900e-003**	**0.0000**	**101.9587**

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5210	154.5210	0.0376	0.0000	155.3105
Total	**0.1552**	**1.3837**	**1.1299**	**1.7700e-003**		**0.0848**	**0.0848**		**0.0798**	**0.0798**	**0.0000**	**154.5210**	**154.5210**	**0.0376**	**0.0000**	**155.3105**

3.6 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0380	0.2984	0.4906	9.8000e-004	0.0270	4.4800e-003	0.0315	7.7400e-003	4.1200e-003	0.0119	0.0000	85.1826	85.1826	6.4000e-004	0.0000	85.1960
Worker	0.0507	0.0671	0.6264	1.9100e-003	0.1551	1.1300e-003	0.1562	0.0412	1.0400e-003	0.0423	0.0000	128.8768	128.8768	6.1800e-003	0.0000	129.0066
Total	**0.0887**	**0.3655**	**1.1170**	**2.8900e-003**	**0.1821**	**5.6100e-003**	**0.1877**	**0.0490**	**5.1600e-003**	**0.0541**	**0.0000**	**214.0594**	**214.0594**	**6.8200e-003**	**0.0000**	**214.2026**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5208	154.5208	0.0376	0.0000	155.3104
Total	**0.1552**	**1.3837**	**1.1299**	**1.7700e-003**		**0.0848**	**0.0848**		**0.0798**	**0.0798**	**0.0000**	**154.5208**	**154.5208**	**0.0376**	**0.0000**	**155.3104**

3.6 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0380	0.2984	0.4906	9.8000e-004	0.0270	4.4800e-003	0.0315	7.7400e-003	4.1200e-003	0.0119	0.0000	85.1826	85.1826	6.4000e-004	0.0000	85.1960
Worker	0.0507	0.0671	0.6264	1.9100e-003	0.1551	1.1300e-003	0.1562	0.0412	1.0400e-003	0.0423	0.0000	128.8768	128.8768	6.1800e-003	0.0000	129.0066
Total	**0.0887**	**0.3655**	**1.1170**	**2.8900e-003**	**0.1821**	**5.6100e-003**	**0.1877**	**0.0490**	**5.1600e-003**	**0.0541**	**0.0000**	**214.0594**	**214.0594**	**6.8200e-003**	**0.0000**	**214.2026**

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1514**	**302.1514**	**0.0736**	**0.0000**	**303.6973**

3.6 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0712	0.5043	0.9404	1.9500e-003	0.0537	7.9800e-003	0.0617	0.0154	7.3400e-003	0.0227	0.0000	165.2082	165.2082	1.2200e-003	0.0000	165.2339
Worker	0.0951	0.1245	1.1619	3.7900e-003	0.3078	2.2400e-003	0.3100	0.0818	2.0700e-003	0.0839	0.0000	245.4932	245.4932	0.0117	0.0000	245.7381
Total	**0.1663**	**0.6289**	**2.1024**	**5.7400e-003**	**0.3615**	**0.0102**	**0.3717**	**0.0971**	**9.4100e-003**	**0.1066**	**0.0000**	**410.7014**	**410.7014**	**0.0129**	**0.0000**	**410.9720**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1510**	**302.1510**	**0.0736**	**0.0000**	**303.6969**

3.6 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0712	0.5043	0.9404	1.9500e-003	0.0537	7.9800e-003	0.0617	0.0154	7.3400e-003	0.0227	0.0000	165.2082	165.2082	1.2200e-003	0.0000	165.2339
Worker	0.0951	0.1245	1.1619	3.7900e-003	0.3078	2.2400e-003	0.3100	0.0818	2.0700e-003	0.0839	0.0000	245.4932	245.4932	0.0117	0.0000	245.7381
Total	**0.1663**	**0.6289**	**2.1024**	**5.7400e-003**	**0.3615**	**0.0102**	**0.3717**	**0.0971**	**9.4100e-003**	**0.1066**	**0.0000**	**410.7014**	**410.7014**	**0.0129**	**0.0000**	**410.9720**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9104	224.9104	0.0542	0.0000	226.0482
Total	**0.1846**	**1.6907**	**1.6124**	**2.6100e-003**		**0.0931**	**0.0931**		**0.0875**	**0.0875**	**0.0000**	**224.9104**	**224.9104**	**0.0542**	**0.0000**	**226.0482**

3.6 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0499	0.3078	0.6720	1.4500e-003	0.0400	5.3400e-003	0.0453	0.0114	4.9200e-003	0.0164	0.0000	122.7641	122.7641	9.1000e-004	0.0000	122.7831
Worker	0.0674	0.0870	0.8199	2.8200e-003	0.2291	1.6900e-003	0.2308	0.0609	1.5700e-003	0.0624	0.0000	179.6661	179.6661	8.3500e-003	0.0000	179.8416
Total	**0.1173**	**0.3948**	**1.4918**	**4.2700e-003**	**0.2690**	**7.0300e-003**	**0.2761**	**0.0723**	**6.4900e-003**	**0.0788**	**0.0000**	**302.4302**	**302.4302**	**9.2600e-003**	**0.0000**	**302.6247**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9101	224.9101	0.0542	0.0000	226.0479
Total	**0.1846**	**1.6907**	**1.6124**	**2.6100e-003**		**0.0931**	**0.0931**		**0.0875**	**0.0875**	**0.0000**	**224.9101**	**224.9101**	**0.0542**	**0.0000**	**226.0479**

3.6 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0499	0.3078	0.6720	1.4500e-003	0.0400	5.3400e-003	0.0453	0.0114	4.9200e-003	0.0164	0.0000	122.7641	122.7641	9.1000e-004	0.0000	122.7831
Worker	0.0674	0.0870	0.8199	2.8200e-003	0.2291	1.6900e-003	0.2308	0.0609	1.5700e-003	0.0624	0.0000	179.6661	179.6661	8.3500e-003	0.0000	179.8416
Total	**0.1173**	**0.3948**	**1.4918**	**4.2700e-003**	**0.2690**	**7.0300e-003**	**0.2761**	**0.0723**	**6.4900e-003**	**0.0788**	**0.0000**	**302.4302**	**302.4302**	**9.2600e-003**	**0.0000**	**302.6247**

3.7 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0671	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8063	106.8063	0.0345	0.0000	107.5317
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0676**	**0.6900**	**0.7822**	**1.2200e-003**		**0.0363**	**0.0363**		**0.0334**	**0.0334**	**0.0000**	**106.8063**	**106.8063**	**0.0345**	**0.0000**	**107.5317**

3.7 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464
Total	**1.9300e-003**	**2.4900e-003**	**0.0235**	**8.0000e-005**	**6.5600e-003**	**5.0000e-005**	**6.6000e-003**	**1.7400e-003**	**4.0000e-005**	**1.7900e-003**	**0.0000**	**5.1414**	**5.1414**	**2.4000e-004**	**0.0000**	**5.1464**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0671	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8062	106.8062	0.0345	0.0000	107.5316
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0676**	**0.6900**	**0.7822**	**1.2200e-003**		**0.0363**	**0.0363**		**0.0334**	**0.0334**	**0.0000**	**106.8062**	**106.8062**	**0.0345**	**0.0000**	**107.5316**

3.7 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464
Total	**1.9300e-003**	**2.4900e-003**	**0.0235**	**8.0000e-005**	**6.5600e-003**	**5.0000e-005**	**6.6000e-003**	**1.7400e-003**	**4.0000e-005**	**1.7900e-003**	**0.0000**	**5.1414**	**5.1414**	**2.4000e-004**	**0.0000**	**5.1464**

3.8 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.7040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0119	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353
Total	**2.7159**	**0.0832**	**0.0991**	**1.6000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**13.9152**	**13.9152**	**9.5000e-004**	**0.0000**	**13.9353**

3.8 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426
Total	**7.5900e-003**	**9.7900e-003**	**0.0923**	**3.2000e-004**	**0.0258**	**1.9000e-004**	**0.0260**	**6.8500e-003**	**1.8000e-004**	**7.0300e-003**	**0.0000**	**20.2229**	**20.2229**	**9.4000e-004**	**0.0000**	**20.2426**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.7040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0119	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353
Total	**2.7159**	**0.0832**	**0.0991**	**1.6000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**13.9152**	**13.9152**	**9.5000e-004**	**0.0000**	**13.9353**

3.8 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426
Total	**7.5900e-003**	**9.7900e-003**	**0.0923**	**3.2000e-004**	**0.0258**	**1.9000e-004**	**0.0260**	**6.8500e-003**	**1.8000e-004**	**7.0300e-003**	**0.0000**	**20.2229**	**20.2229**	**9.4000e-004**	**0.0000**	**20.2426**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.2553	4.4400	22.3150	0.0629	4.3077	0.0706	4.3782	1.1521	0.0651	1.2172	0.0000	4,305.6929	4,305.6929	0.1628	0.0000	4,309.1120
Unmitigated	2.2553	4.4400	22.3150	0.0629	4.3077	0.0706	4.3782	1.1521	0.0651	1.2172	0.0000	4,305.6929	4,305.6929	0.1628	0.0000	4,309.1120

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Condo/Townhouse	2,581.80	2,581.80	2581.80	6,575,137	6,575,137
Parking Lot	0.00	0.00	0.00		
Single Family Housing	1,916.49	1,916.49	1916.49	4,880,775	4,880,775
Strip Mall	0.00	0.00	0.00		
Total	4,498.29	4,498.29	4,498.29	11,455,912	11,455,912

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	7.88	7.88	7.88	33.00	48.00	19.00	66	28	6
Condo/Townhouse	7.88	7.88	7.88	41.60	18.80	39.60	86	11	3
Parking Lot	7.88	7.88	7.88	0.00	0.00	0.00	0	0	0
Single Family Housing	7.88	7.88	7.88	41.60	18.80	39.60	86	11	3
Strip Mall	7.88	7.88	7.88	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.512811	0.073496	0.191363	0.130940	0.036084	0.005147	0.012550	0.023118	0.001871	0.002053	0.006546	0.000576	0.003444

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	845.8687	845.8687	0.0341	7.0400e-003	848.7674
NaturalGas Mitigated	0.0308	0.2628	0.1120	1.6800e-003		0.0212	0.0212		0.0212	0.0212	0.0000	304.3124	304.3124	5.8300e-003	5.5800e-003	306.1644
NaturalGas Unmitigated	0.0482	0.4117	0.1754	2.6300e-003		0.0333	0.0333		0.0333	0.0333	0.0000	476.7654	476.7654	9.1400e-003	8.7400e-003	479.6669

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	5.33712e+006	0.0288	0.2459	0.1047	1.5700e-003		0.0199	0.0199		0.0199	0.0199	0.0000	284.8092	284.8092	5.4600e-003	5.2200e-003	286.5425
Strip Mall	11450	6.0000e-005	5.6000e-004	4.7000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6110	0.6110	1.0000e-005	1.0000e-005	0.6147
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	3.58567e+006	0.0193	0.1652	0.0703	1.0500e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.3452	191.3452	3.6700e-003	3.5100e-003	192.5097
Total		**0.0482**	**0.4117**	**0.1754**	**2.6200e-003**		**0.0333**	**0.0333**		**0.0333**	**0.0333**	**0.0000**	**476.7654**	**476.7654**	**9.1400e-003**	**8.7400e-003**	**479.6669**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.39866e+006	0.0183	0.1566	0.0666	1.0000e-003		0.0127	0.0127		0.0127	0.0127	0.0000	181.3653	181.3653	3.4800e-003	3.3300e-003	182.4691
Strip Mall	8690	5.0000e-005	4.3000e-004	3.6000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.4637	0.4637	1.0000e-005	1.0000e-005	0.4666
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2.29525e+006	0.0124	0.1058	0.0450	6.8000e-004		8.5500e-003	8.5500e-003		8.5500e-003	8.5500e-003	0.0000	122.4833	122.4833	2.3500e-003	2.2500e-003	123.2288
Total		**0.0308**	**0.2628**	**0.1120**	**1.6800e-003**		**0.0212**	**0.0212**		**0.0212**	**0.0212**	**0.0000**	**304.3124**	**304.3124**	**5.8400e-003**	**5.5900e-003**	**306.1644**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.12689e+006	368.2782	0.0148	3.0700e-003	369.5402
Parking Lot	16192	5.2917	2.1000e-004	4.0000e-005	5.3098
Single Family Housing	1.37498e+006	449.3569	0.0181	3.7400e-003	450.8967
Strip Mall	70200	22.9420	9.2000e-004	1.9000e-004	23.0206
Total		**845.8687**	**0.0340**	**7.0400e-003**	**848.7674**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.1238	0.0389	3.3731	1.8000e-004		0.0410	0.0410		0.0408	0.0408	0.0000	326.6201	326.6201	0.0115	5.8900e-003	328.6863
Unmitigated	32.2773	0.4246	38.3867	0.0139		4.9380	4.9380		4.9379	4.9379	467.9298	201.7382	669.6681	0.4372	0.0368	690.2581

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0323					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7188					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	28.4240	0.3856	35.0154	0.0137		4.9194	4.9194		4.9193	4.9193	467.9298	196.2430	664.1728	0.4318	0.0368	684.6510
Landscaping	0.1022	0.0389	3.3714	1.8000e-004		0.0186	0.0186		0.0186	0.0186	0.0000	5.4953	5.4953	5.3300e-003	0.0000	5.6072
Total	**32.2773**	**0.4246**	**38.3867**	**0.0139**		**4.9380**	**4.9380**		**4.9379**	**4.9379**	**467.9298**	**201.7382**	**669.6681**	**0.4372**	**0.0368**	**690.2581**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2704					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7188					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0325	0.0000	1.7700e-003	0.0000		0.0224	0.0224		0.0222	0.0222	0.0000	321.1248	321.1248	6.1500e-003	5.8900e-003	323.0791
Landscaping	0.1022	0.0389	3.3714	1.8000e-004		0.0186	0.0186		0.0186	0.0186	0.0000	5.4953	5.4953	5.3300e-003	0.0000	5.6072
Total	**3.1238**	**0.0389**	**3.3731**	**1.8000e-004**		**0.0410**	**0.0410**		**0.0408**	**0.0408**	**0.0000**	**326.6201**	**326.6201**	**0.0115**	**5.8900e-003**	**328.6863**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	170.8768	0.7855	0.0197	193.4867
Unmitigated	211.5267	0.9819	0.0247	239.7970

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.78722	6.4891	2.6000e-004	5.0000e-005	6.5114
Condo/Townhouse	16.94 / 10.6796	116.2365	0.5565	0.0140	132.2487
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12.5747 / 7.92755	86.2833	0.4131	0.0104	98.1692
Strip Mall	0.370363 / 0.226996	2.5177	0.0122	3.0000e-004	2.8677
Total		**211.5267**	**0.9819**	**0.0247**	**239.7970**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.46929	5.3348	2.1000e-004	4.0000e-005	5.3531
Condo/Townhouse	13.552 / 8.77981	93.8466	0.4451	0.0112	106.6524
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	10.0598 / 6.51732	69.6631	0.3304	8.2800e-003	79.1689
Strip Mall	0.29629 / 0.186616	2.0324	9.7300e-003	2.4000e-004	2.3123
Total		**170.8768**	**0.7855**	**0.0197**	**193.4867**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.8277	1.0536	0.0000	39.9530
Unmitigated	71.3107	4.2143	0.0000	159.8119

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.13	0.0264	1.5600e-003	0.0000	0.0591
Condo/Townhouse	119.6	24.2777	1.4348	0.0000	54.4079
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	226.32	45.9409	2.7150	0.0000	102.9566
Strip Mall	5.25	1.0657	0.0630	0.0000	2.3883
Total		**71.3107**	**4.2143**	**0.0000**	**159.8119**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.0325	6.6000e-003	3.9000e-004	0.0000	0.0148
Condo/Townhouse	29.9	6.0694	0.3587	0.0000	13.6020
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	56.58	11.4852	0.6788	0.0000	25.7391
Strip Mall	1.3125	0.2664	0.0158	0.0000	0.5971
Total		**17.8277**	**1.0536**	**0.0000**	**39.9530**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Generator Sets	2	8.00	260	84	0.74	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Generator Sets	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Total	**0.0929**	**0.8232**	**0.9580**	**1.7100e-003**		**0.0436**	**0.0436**		**0.0436**	**0.0436**	**0.0000**	**146.9539**	**146.9539**	**7.5000e-003**	**0.0000**	**147.1114**

10.0 Vegetation

MOBILE SOURCE EMISSION REDUCTION ADJUSTMENTS FOR HARMONY GROVE VILLAGE SOUTH PROJECT

Methodology for Calculating Reduction Credits for the Project with Design Features

Transportation-related emissions reductions would be achieved through mandatory regulations applicable to all vehicle emissions within the state and are not attributable to specific GHG reduction features of the Project. Energy-related emissions reductions would be achieved partly through state regulations, goals, and policies.

As summarized in Table 1, reduction credits are based on the CARB Scoping Plan reductions for sector-specific activity. For example, Pavley II reductions counted towards the 2020 target is 4 MMT CO_2e and projected 2020 unmitigated transportation-related emissions is 168.2 MMT CO_2e, therefore the reduction is 2.38 percent (4 MMT CO_2e/168.2 MMT CO_2e). This percentage reduction can be applied to the Project's transportation emissions.

Table 1
SCOPING PLAN GHG EMISSION REDUCTIONS
(ANNUAL MMTCO_2e)

Statewide Land Use-Adjusted 2020 GHG Emissions Inventory[1]		AB 32 Scoping Plan GHG Emission Reductions[2]		Percent Reduction
Sector	**Emissions**	**Measure**	**Emissions Reduction**	
Transportation	168.2	Pavley II	4.0	2.38

Source: CARB 2014
[1] From CARB's 2020 BAU Forecast
[2] From CARB's Greenhouse Gas Reductions from Ongoing, Adopted and Foreseeable Scoping Plan Measures

Methodology for Calculating Unmitigated and Mitigated Mobile Emissions

The County of San Diego allows the Project to apply GHG reduction credits for Pavley II towards the Project. Therefore, adjustments were made to the CalEEMod model outputs to account for the allowable reduction as shown in Table 2.

Table 2
UNCORRECTED AND CORRECTED CALEEMOD OUTPUTS FOR PROJECT EMISSIONS - MOBILE
(ANNUAL MT CO_2e)

Source	Project Emissions (uncorrected)	Project Emissions (corrected)[1]
Mobile Emissions	4,309.11	4,206.56

Notes:
All model results include built in emission reductions for Pavley I regulations (model default).
[1] Includes reduction of 2.38% for Pavely II regulations

ATTACHMENT D

ASSESSMENT OF MITIGATION MEASURES

RECOMMENDED BY THE CALIFORNIA AIR RESOURCES BOARD

TO REDUCE GREENHOUSE GAS EMISSIONS

Appendix B of *California's 2017 Climate Change Scoping Plan* (November 2017) is a reference document prepared by the California Air Resources Board (CARB) regarding mitigation measures that could be required of individual projects under the California Environmental Quality Act (CEQA), if feasible, when the local jurisdiction is the lead agency.

CARB states that the appendix "should be viewed as a general reference document;" it "should not be interpreted as official guidance or as dictating requirements." CARB relatedly notes that "[n]ot all of the listed local measures or CEQA measures listed will be relevant to, or appropriate for, a given area or project. Nothing in the Scoping Plan or this appendix limits the discretion conferred to lead agencies in determining the appropriate level and type of mitigation, so long as their decisions are supportable by evidence in the record as required by CEQA. There is no 'one size fits all' solution and different policies will be more suitable in urban and suburban areas versus rural areas, among other considerations."

The purpose of this attachment is to assess the potential applicability of CARB's identified mitigation measures to the Project. Where potentially applicable, this attachment then discusses whether the Project implements the identified mitigation measures and/or other comparable strategies designed to reduce greenhouse gas emissions. As illustrated by the tabular analysis that follows, the Project implements a wide range of strategies that will reduce greenhouse gas emissions on the Project site and within the County of San Diego.

Evaluation of the Project's Utilization of Mitigation Measures
Identified by The California Air Resources Board in Appendix B of the 2017 Scoping Plan Update

Mitigation Options	Project Evaluation
Construction	
Enforce idling time restrictions for construction vehicles	*Consistent*. As a matter of regulatory compliance, construction equipment shall be operated in accordance with the California Air Resources Board's (CARB) Airborne Toxic Control Measure (ATCM) that limits diesel-fueled commercial motor vehicle idling. In accordance with the subject ATCM (see Cal. Code Regs., tit. 13, §2485), the drivers of diesel-fueled commercial motor vehicles meeting certain specifications shall not idle the vehicle's primary diesel engine for longer than five minutes at any location. The ATCM requires the owners and motor carriers that own or dispatch such vehicles to ensure compliance with the ATCM requirements. For additional information, please see https://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm.
Require construction vehicles to operate with the highest tier engines commercially available	*Consistent*. Tier III or higher construction equipment will be used, with the exception of concrete/industrial saws, generator sets, welders, air compressors, or construction equipment where Tier III or higher is not available.
Divert and recycle construction and demolition waste, and use locally-sourced building materials with a high recycled material content to the greatest extent feasible	*Consistent*. As a matter of regulatory compliance, the Project would comply with the County of San Diego's ordinance regarding the disposal of construction and demolition debris. The subject ordinance requires that 90% of inert materials and 70% of all other materials associated with construction and demolition activities be recycled. The ordinance also requires the preparation and submittal of a Construction and Demolition Debris Management Plan and a refundable Performance Guarantee prior to building permit issuance. For additional information, please see http://www.sandiegocounty.gov/dpw/recycling/cdhome.html.

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Minimize tree removal, and mitigate indirect GHG emissions increases that occur due to vegetation removal, loss of sequestration, and soil disturbance	*Consistent.* In order to increase the net number of trees in the county, the Project will plant a minimum of 2,045 trees at build out within the project site as referenced within the Landscape Plan, which is equivalent to more than 4 trees per unit. Mitigation Measure GHG-1 requires the Project to purchase and retire carbon offsets in a quantity sufficient to offset 100 percent of the Project's GHG emissions that are associated with vegetation removal. Finally, the Specific Plan discusses the Project's use of vegetation that is drought-tolerant, native and regionally appropriate, criteria that complies with the guidelines set forth in the County's Water Conservation and Landscape Design Manual.
Utilize existing grid power for electric energy rather than operating temporary gasoline/diesel powered generators	*Consistent.* To the extent practicable and feasible, electricity will be used to power appropriate types and categories of construction equipment (e.g., hand tools). As a PDF, the applicant will develop and provide to all homeowners an informative brochure to educate homeowners regarding water conservation measures, recycling, location of the electric vehicle charging stations, location of outdoor electric outlets to promote using electrical lawn and garden equipment, and location of nearby resources such as dining and entertainment venues, small commercial centers, and civic uses to reduce vehicle miles traveled.
Increase use of electric and renewable fuel powered construction equipment and require renewable diesel fuel where commercially available	*Consistent.* To the extent practicable and feasible, electric and renewable fuel powered construction equipment will be utilized.
Require diesel equipment fleets to be lower emitting than any current emission standard	*Consistent.* To the extent practicable and feasible, diesel equipment fleets that exceed existing emissions standards will be utilized when commercially available in the San Diego region.
Operation	
Comply with lead agency's standards for mitigating transportation impacts under SB 743	*Not Applicable.* The Governor's Office of Planning and Research (OPR) has not yet adopted amendments to the State CEQA Guidelines pursuant to Senate Bill (SB) 743. Additionally, the

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	County of San Diego has not adopted guidelines or guidance regarding the implementation of SB 743 at the jurisdictional level, and its obligation to do so will be triggered upon completion of OPR's amendment process to the State CEQA Guidelines.
Require on-site EV charging capabilities for parking spaces serving the project to meet jurisdiction-wide EV proliferation goals	*Consistent.* The Project would install a 2 dual-port Level 2EV charging station (serving 2 parking spaces) at the public community center.
Allow for new construction to install fewer on-site parking spaces than required by local municipal building code, if appropriate[1] [1] This is not to be confused with the Americans with Disabilities Act (ADA) requirements or other minimum parking requirements for dedicating space to clean air vehicles and/or EV charging infrastructure.	*Not Applicable.*
Dedicate on-site parking for shared vehicles	*Consistent*. As a matter of regulatory compliance, the Project would comply with Section 5.106.5.2 of the 2016 California Green Building Standards Code (CALGreen Code), which requires the provision of designated parking for shared vehicles.
Provide adequate, safe, convenient, and secure on-site bicycle parking and storage in multi-family residential projects and in non-residential projects	*Consistent*. As discussed in the Specific Plan, the Project would provide bicycle parking facilities and bicycle circulation improvements to encourage the use of bicycles (See also ***Improvement Plans***.)
Provide on- and off-site safety improvements for bike, pedestrian, and transit connections, and/or implement relevant improvements identified in an applicable bicycle and/or pedestrian master plan	*Consistent.* The Project would provide infrastructure (e.g., bike lanes and multi-purpose/multi-use trails) and related amenities for bicyclists and pedestrians that is intended to facilitate the creation of integrated, walkable neighborhood. Additionally, the Project site is located within 5 miles to public transit opportunities. The SPRINTER Nordahl Road Station with shuttle partnering through NCTD and the Palomar Medical Center and park and ride options provide multi-modal transportation options. There are no designated bicycle routes designated for this segment per the Mobility Element, however, Country Club Drive and other internal

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	project roadways may be painted with "sharrows" to indicate that bicyclists do share the roadway with vehicles. Marked crosswalks connecting the east and west sides of Country Club Drive would be located from each of the Project entries to the future multi-use trail on the west side of the road to accommodate pedestrians/equestrians in crossing the road.
Require on-site renewable energy generation	*Consistent*. The Project will enhance efficiencies in the building envelopes and the utilization of on-site renewable energy sources (i.e., rooftop solar). Renewable energy would supply 100 percent of the Project's electricity needs through the required installation of rooftop solar PV panels (a photovoltaic solar system) on all residential units and the Center House within the Project site.
Prohibit wood-burning fireplaces in new development, and require replacement of wood-burning fireplaces for renovations over a certain size developments	*Consistent.* As discussed in the Specific Plan, all fireplaces installed in the Project's residential development areas must be natural gas or equivalent non-wood burning fireplaces.
Require cool roofs and "cool parking" that promotes cool surface treatment for new parking facilities as well as existing surface lots undergoing resurfacing	*Consistent*. The Project's parking facilities will be required to comply with the County's Parking Design Manual that requires parking areas to minimize the heat island effect that results from asphalt and/or large building block surfaces such as parking lots. The Project's parking facilities will achieve cooling benefits through the implementation of cool roof design with special roof tiles and radiant barrier insulation. Additionally, the Project's parking facilities will be required to comply the vegetation requirements of the Parking Design Manual, that are mindful of the need to provide shading and reduce the formation of urban heat islands. Building design includes roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows. Trees, other landscaping features and other buildings are sited in such a way as to maximize shade in the summer and maximize solar access to walls and windows in the winter.
Require solar-ready roofs	*Consistent*. As discussed above, the Project's residential development would utilize rooftop solar to achieve emission

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	reductions.
Require organic collection in new developments	*Consistent*. The Project will work with the local waste collection services to provide areas for storage and collection of recyclables and yard waste for each residence
Require low-water landscaping in new developments. Require water efficient landscape maintenance to conserve water and reduce landscape waste.	*Consistent*. The Project's landscape and irrigation plans shall be submitted to the County of San Diego for review and approval prior to the start of construction. Such plans are required to comply with the County's Water Conservation Landscaping Ordinance, the Water Efficient Landscape Design Manual, and other enumerated requirements.
Achieve Zero Net Energy performance targets prior to dates required by CALGreen	*Consistent*. The project has incorporated design features that would increase building efficiencies beyond what the current building code requirements by applying a number of sustainable building design elements to the project. For example: High-Efficiency HVAC system, Sealed (tight) air ducts that minimize heating and cooling HVAC losses, tankless water heaters.
Require new construction, including municipal building construction, to achieve third-party green building certifications, such as the GreenPoint Rated program or the LEED rating system	*Consistent*. Many of the Project's design features are consistent with the types of green building strategies recommended by GreenPoint and LEED.
Require the design of bike lanes to connect to the regional bicycle network	*Consistent*. The Project would provide infrastructure (e.g., designated bike lanes and multi-purpose/multi-use trails) and related amenities for bicyclists and pedestrians that is intended to facilitate the creation of integrated, walkable neighborhood. There are no designated bicycle routes designated for this segment per the Mobility Element, however, Country Club Drive and other internal project roadways may be painted with "sharrows" to indicate that bicyclists do share the roadway with vehicles. Marked crosswalks connecting the east and west sides of Country Club Drive would be located at the Project entries to the future multi-use trail on the west side of the road to accommodate pedestrians/equestrians in crossing the road. Additionally, the Project site is located within distance to public transit opportunities.

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	The SPRINTER Nordahl Road Station with shuttle partnering through NCTD and the Palomar Medical Center and park and ride options provide multi-modal transportation options.
Expand urban forestry and green infrastructure in new land development	*Consistent*. The proposed project will increase the amount of vegetation on the site through landscaping slopes and commons areas per the landscape plans. As discussed above, in order to increase the net number of trees in the county, the Project would include the installation of a minimum of 2,045 trees within the project site which is equivalent to more than 4 trees per unit. In addition, the Project will construct a public park and several private parks on site which will include landscaping and trees. A series of Integrated Management Practices will be utilized to capture, collect and treat project storm water as close to the source as practical. A 5-6-foot wide public pathway along the east side of Country Club Drive will be included in the Project. Additionally, a 10-foot wide (cleared) trail easement is located along the west side of Country Club Drive (for future construction of a public trail by others), consistent with the County's Community Trails Master Plan. This trail will cross over Country Club Drive at the southern entrance to HGVS and continue along the northwestern property boundary. It will provide connections to the subregional and regional trail system to the south. Additional rural trail connections are provided on the Project site between the Lake Hodges Trail and the primitive Elfin Forest Trail.
Require preferential parking spaces for park and ride to incentivize carpooling, vanpooling, commuter bus, electric vehicles, and rail service use	*Consistent*. As a matter of regulatory compliance, the Project would comply with Section 5.106.5.2 of the 2016 CALGreen Code, which requires the provision of designated parking for shared vehicles and clean air vehicles.
Require a transportation management plan for specific plans which establishes a numeric target for non-SOV travel and overall VMT	*Consistent. Not applicable*
Develop a rideshare program targeting commuters to major employment centers	*Consistent*. The HOA will work with SANDAG to provide informational materials on rideshare programs like icommute. As a PDF, the applicant will develop and provide to all homeowners

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	an informative brochure to educate homeowners regarding water conservation measures, recycling, location of the electric vehicle charging stations, location of outdoor electric outlets to promote using electrical lawn and garden equipment, and location of nearby resources such as dining and entertainment venues, commercial centers, and civic uses to reduce VMT.
Require the design of bus stops/shelters/express lanes in new developments to promote the usage of mass-transit	*Not applicable. There is currently no bus route adjacent to or nearby the project site.*
Require gas outlets in residential backyards for use with outdoor cooking appliances such as gas barbeques if natural gas service is available	*Consistent*. The Project would provide natural gas outlets in all residential backyards and within the common areas of multi-family development areas.
Require the installation of electrical outlets on the exterior walls of both the front and back of residences to promote the use of electric landscape maintenance equipment	*Consistent*. The Project would provide electrical outlets in all residential backyards and within the common areas of multi-family development areas.
Require the design of the electric boxes in new residential unit garages to promote electric vehicle usage	*Consistent.* The Project would plumb for EV charging station for every residential unit.
Require electric vehicle charging station (Conductive/inductive) and signage for non-residential developments	*Consistent.* The Project would install a 2 dual-port EV Level 2 charging station (serving 2 parking spaces) at the Community Center with signage.
Provide electric outlets to promote the use of electric landscape maintenance equipment to the extent feasible on parks and public/quasi-public lands	*Consistent.* Not applicable.
Require each residential unit to be "solar ready," including installing the appropriate hardware and proper structural engineering	*Consistent*. As discussed above, the Project's residential development would utilize rooftop solar.
Require the installation of energy conserving appliances such as on-demand tank-less water heaters and whole-house fans	*Consistent.* The Project design features include a number of sustainable building design elements that includes tank-less water.
Require each residential and commercial building equip buildings with energy efficient AC units and heating systems with programmable thermostats/timers	*Consistent.* The Project design features include a number of sustainable building design elements that includes energy efficient AC units and heating systems with programmable

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	thermostats/timers.
Require large-scale residential developments and commercial buildings to report energy use, and set specific targets for per-capita energy use	*Not Applicable*.
Require each residential and commercial building to utilize low flow water fixtures such as low flow toilets and faucets	*Consistent.* As a matter of regulatory compliance, the Project would install low flow water fixtures in the project.
Require the use of energy-efficient lighting for all street, parking, and area lighting	*Consistent.* As a matter of regulatory compliance, the Project would be required to use energy efficient fixtures and bulbs in all common outdoor areas.
Require the landscaping design for parking lots to utilize tree cover	*Consistent*. The Project's parking facilities will be required to comply with the County's Parking Design Manual that provides measures that require parking areas to minimize the heat island effect that results from asphalt and/or large building block surfaces such as parking lots. Additionally, the Project's parking facilities will be required to comply with the vegetation requirements of the Parking Design Manual, that also provide measures for shading to reduce the formation of urban heat islands.
Incorporate water retention in the design of parking lots and landscaping	*Consistent.* The Project would install stormwater detention basins, bio-retention areas, permeable pavers and other best management practices described in the Drainage Study (Preliminary CEQA Drainage Study, April 2017 by Project Design Consultants) and Major Stormwater Management Plan (Major Stormwater Quality Management Plan and Hydromodification Study (Major SWQMP) April 2017 by Project Design Consultants), which will contribute to the proposed project being hydrologically invisible. The project proposes and will be required to implement the site design measures and/or source control BMPs and/or treatment control BMPs to reduce potential pollutants to the maximum extent practicable from entering storm water runoff: Refer also to the County of San Diego Water Conservation in Landscaping Ordinance and the Water Efficient Landscape Design Manual for current information regarding irrigation requirements. Irrigation

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	requirements are provided in Section 86.709 of the Water Conservation in Landscaping Ordinance and Section E of the Landscape Design Manual.
Require the development project to propose an off-site mitigation project which should generate carbon credits equivalent to the anticipated GHG emission reductions. This would be implemented via an approved protocol for carbon credits from California Air Pollution Control Officers Association (CAPCOA), the California Air Resources Board, or other similar entities determined acceptable by the local air district	*Consistent*: the Project would purchase and retire carbon offsets that reduce the Project's construction and operational emissions to zero. The carbon offsets would need to be issued by: (i) the Climate Action Reserve, the American Carbon Registry, and the Verified Carbon Standard, (ii) any registry approved by CARB to act as a registry under the State's cap-and-trade program, or (iii) if no registry is in existence as identified in options (i) and (ii), above, then any other reputable registry or entity that issues carbon offsets.
Require the project to purchase carbon credits from the CAPCOA GHG Reduction Exchange Program, American Carbon Registry (ACR), Climate Action Reserve (CAR) or other similar carbon credit registry determined to be acceptable by the local air district	*Consistent*: As discussed above, require the Project to purchase carbon offsets in a quantity that is sufficient to reduce the Project's GHG emissions to zero over a 30-year period.
Encourage the applicant to consider generating or purchasing local and California-only carbon credits as the preferred mechanism to implement its off-site mitigation measure for GHG emissions and that will facilitate the State's efforts in achieving the GHG emission reduction goal	*Consistent*: As discussed above, require the Project to purchase carbon offsets in a quantity that is sufficient to reduce the Project's GHG emissions to zero over a 30-year period. It is anticipated that the Project will utilize a portfolio of carbon offsets that secure reductions in GHG emissions within the State of California, United States and beyond.