Interoffice Memo

DATE: September 9, 2021 **PHONE:** (909) 387-4110

FROM: **ANTHONY DELUCA,** SENIOR PLANNER AD
Land Use Services Department

TO: **HONORABLE PLANNING COMMISSION**

SUBJECT: **PROJECT NUMBER: PROJ-2021-00019/PROJ-2021-00079; RESURGENCE SOLAR I & II (AGENDA ITEM #2)**

Since the distribution of the staff report, Staff has received additional comments regarding the above-referenced project.

The correspondence is attached for your consideration.

From:	Alisha C. Pember
To:	Planning Commission Comments; DeLuca, Anthony
Cc:	Christina Caro; Kendra Hartmann
Subject:	Comments on Agenda Item No. #2: Proposed NextEra Resurgence Solar I & II Project (Project No. PROJ-2021-00019/PROJ-2021-00079)
Date:	Thursday, September 9, 2021 7:54:11 AM
Attachments:	5142-006acp - Resurgence Solar 9.9.21 PC Comments with Exhibits A-B.pdf

Good morning,

Please find attached **Comments on Agenda Item No. #2: Proposed NextEra Resurgence Solar I & II Project (Project No. PROJ-2021-00019/PROJ-2021-00079)** and **Exhibits A-B**.

We are also providing a Dropbox link containing supporting references:
https://www.dropbox.com/sh/2dmln6mo2j2xu5c/AAAg0MTz8tAyduOLrDTS6w3Sa?dl=0

If you have any questions, please contact Kendra Hartmann.

Thank you.

Alisha Pember

Alisha C. Pember
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
(650) 589-1660 voice, Ext. 24
apember@adamsbroadwell.com

ADAMS BROADWELL JOSEPH & CARDOZO
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037
TEL: (650) 589-1660
FAX: (650) 589-5062
khartmann@adamsbroadwell.com

SACRAMENTO OFFICE
520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721
TEL: (916) 444-6201
FAX: (916) 444-6209

KEVIN T. CARMICHAEL
CHRISTINA M. CARO
JAVIER J. CASTRO
THOMAS A. ENSLOW
KELILAH D. FEDERMAN
ANDREW J. GRAF
TANYA A. GULESSERIAN
KENDRA D. HARTMANN*
DARIEN K. KEY
RACHAEL E. KOSS
AIDAN P. MARSHALL
TARA C. MESSING

Of Counsel
MARC D. JOSEPH
DANIEL L. CARDOZO

*Not admitted in California.
Licensed in Colorado.*

September 9, 2021

Via Electronic Submission Only

Chair Jonathan Weldy
Honorable Members of the San Bernardino County Planning Commission
County Government Center
Covington Chambers
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415
Email: PlanningCommissionComments@lus.sbcounty.gov

Anthony DeLuca
Senior Planner
Land Use Services Department
San Bernardino County
15900 Smoke Tree St., Suite 131
Hesperia, CA 92345
Email: Anthony.deluca@lus.sbcounty.gov

Re: Comments on Agenda Item No. #2: Proposed NextEra Resurgence Solar I & II Project (Project No. PROJ-2021-00019/PROJ-2021-00079)

Dear Chair Weldy, Commissioners, Mr. DeLuca:

On behalf of Citizens for Responsible Solar ("Citizens"), we submit these comments on Agenda Item #2, the Resurgence Solar I & II Project ("Project"), which seeks two Conditional Use Permits ("CUPs") to decommission an existing 150-MW solar thermal facility and construct a 150-MW solar photovoltaic ("PV") facility, a 150-MW battery energy storage system ("BESS"), and associated infrastructure. The County proposes to exempt the Project from environmental review under the

California Environmental Quality Act[1] ("CEQA") in reliance on a Class 2 categorical exemption, which exempts from CEQA review projects involving the "replacement or reconstruction" of existing utility systems or facilities that require only "negligible or no expansion of capacity," provided the project has been determined not to have a significant effect on the environment.[2]

The Project is proposed by Resurgence Solar I, LLC, a Subsidiary of NextEra Energy Resources Development, LLC ("Applicant"), and is proposed to be located at 41100 U.S. Highway 395, Boron, CA 93516 in San Bernardino County ("County"), California on approximately 1,172 acres of land including Assessor Parcel Numbers ("APN"): 0491-101-16, 0491-101-17, 0491-101-18, 0491-101-19, 0491-101-38, 0491-151-39, 491-151-40, 0498-171-05, 0498-171-06. The Project includes the decommissioning and demolition of the existing 150-MW SEGS III-VII solar thermal facility, the construction of a new 150 MW solar PV facility and associated infrastructure necessary to generate up to a combined 150 MW of renewable electrical energy, and construction of a 150-MW Battery Energy Storage System ("BESS") that, according to the Project Description, "would consist of lithium-ion battery technology that would be used to either control electric frequency or store energy from the solar project."[3] Electrical power generated by the Project would be supplied under a long-term contract interconnecting to Southern California Edison-owned switchyard equipment located onsite.[4]

Our review of the Staff Report and accompanying technical reports demonstrates that the Project has potentially significant environmental impacts that the County failed to disclose or mitigate, and does not qualify for a Class 2 exemption or any other CEQA exemption. As described more fully below, the proposed solar PV facility involves an entirely different type of technology than the existing solar thermal plant, and the addition of the BESS will represent a fundamental change in capacity from the previous energy generating plant on the Project site. The Project thus fails to meet Class 2's facial requirements that to be found exempt, a project must involve "substantially the same purpose and capacity as the structure replaced."[5]

---

[1] Pub. Res. Code ("PRC") §§ 21000 et seq.; 14 Cal. Code Regs. ("CCR" or "CEQA Guidelines") §§ 15000 et seq.
[2] 14 CCR §§ 15300, 15302.
[3] San Bernardino County Project Notice, Project Number: PROJ-2021-00019, p. 3.
[4] *Id.*, p. 1.
[5] 14 CCR § 15302.

Furthermore, categorical exemptions necessarily include an implied finding that the project has no significant effect on the environment. Public agencies utilizing such exemptions must support their determination with substantial evidence.[6] The record shows, however, that the Project will result in potentially significant impacts that were not disclosed or analyzed by the County before it concluded that the Project is exempt from CEQA review. An environmental impact report ("EIR") is required to analyze and mitigate these impacts.

Finally, even if the Project qualified for a categorical exemption, substantial evidence supports a fair argument that the Project has potentially significant environmental impacts due to unusual circumstances and the cumulative impacts of successive projects in the area. These impacts render any categorical exemption inapplicable.[7] As described below, unusual circumstances, including the addition of energy storage to an energy generation facility, risks from hazardous materials contained in the BESS, undisclosed greenhouse gas ("GHG") emissions from facility operations, and Project's size and location, are likely to result in potentially significant impacts. Additionally, cumulatively significant impacts to air quality and biological resources are reasonably foreseeable.

We reviewed the Staff Report and accompanying technical reports with GHG emissions experts Matt Hagemann, P.G., C.Hg. and Paul Rosenfeld, Ph.D., of Soil Water Air Protection Enterprise ("SWAPE"),[8] as well as biological expert Scott Cashen, M.S.[9] For the reasons discussed herein, we urge the Planning Commission to find that the Project does not qualify for the Class 2 exemption proposed by the County, and remand the Project to Staff to prepare a legally adequate EIR to fully describe the Project, and to disclose and mitigate the Project's potentially significant environmental impacts.

---

[6] PRC § 21168.5.
[7] 14 CCR § 15300.2 (b), (c).
[8] Letter to Kendra Hartmann, Adams Broadwell Joseph & Cardozo from Sarah Swinnerton, SWAPE, re Comments on the Resurgence Solar Project (September 9, 2021) (hereinafter "SWAPE Comments"), attached as **Exhibit A**.
[9] Letter to Kendra Hartmann, Adams Broadwell Joseph & Cardozo from Scott Cashen, M.S. re: Comments on the Resurgence Solar Project (September 9, 2021) (*hereinafter* "Cashen Comments"), attached as **Exhibit B**.
5142-006acp

We reserve the right to supplement these comments at later hearings on this Project.[10]

I. STATEMENT OF INTEREST

These comments are submitted on behalf of Citizens for Responsible Solar. Citizens is an unincorporated association of individuals and labor organizations with members who may be adversely affected by the potential public and worker health and safety hazards and environmental and public service impacts of the Project. The association includes San Bernardino County residents, California Unions for Reliable Energy ("CURE") and its local affiliates, and the affiliates' members and their families, as well as other individuals who live, work and recreate in San Bernardino County. Accordingly, they would be directly affected by the Project's environmental and health and safety impacts. Individual members of Citizens may also work on the Project itself. They will, therefore, be first in line to be exposed to any hazardous materials, air contaminants or other health and safety hazards that exist onsite.

Citizens' members also have an interest in enforcing environmental laws that encourage sustainable development and ensure a safe working environment for the members that they represent. Environmentally detrimental projects can jeopardize future jobs by making it more difficult and more expensive for industry to expand in San Bernardino County, and by making it less desirable for businesses to locate and people to live and recreate in the County. Continued degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn, reduces future employment opportunities.

Finally, the members of Citizens are concerned with projects that can result in serious environmental harm without providing countervailing economic benefits. CEQA provides a balancing process whereby economic benefits are weighted against significant impacts to the environment. It is in this spirit that we offer these comments.

---

[10] Gov. Code § 65009(b); Cal. Pub. Res. Code ("PRC") § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield ("Bakersfield")* (2004) 124 Cal. App. 4th 1184, 1199-1203; *see Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109, 1121.

II. THE PROPOSED EXEMPTION DETERMINATION FAILS TO COMPLY WITH CEQA'S PURPOSE AND GOALS

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an EIR except in certain limited circumstances.[11] The EIR is the very heart of CEQA.[12] "The foremost principle in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language."[13]

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.[14] "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'"[15] The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[16]

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures.[17] The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced."[18] If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[19]

---

[11] *See, e.g.,* PRC § 21100.
[12] *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.
[13] *Communities. for a Better Env. v. Cal. Res. Agency* (2002) 103 Cal. App.4th 98, 109 ("*CBE v. CRA*").
[14] 14 Cal. Code Regs. § 15002(a)(1).
[15] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564.
[16] *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs.* (2001) 91 Cal. App. 4th 1344, 1354 ("*Berkeley Jets*"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[17] 14 CCR § 15002(a)(2) and (3); *see also Berkeley Jets*, 91 Cal.App.4th at 1354; *Citizens of Goleta Valley*, 52 Cal.3d at p. 564.
[18] 14 Cal. Code Regs. §15002(a)(2).
[19] PRC § 21081; 14 CCR § 15092(b)(2)(A) & (B).

Under CEQA, mitigation measures must be fully enforceable through permit conditions, agreements or other legally binding instruments.[20] A CEQA lead agency is precluded from making the required CEQA findings to approve a project unless the record shows that all uncertainties regarding the mitigation of impacts have been resolved. For this reason, an agency may not rely on mitigation measures of uncertain efficacy or feasibility.[21] This approach helps "ensure the integrity of the process of decision by precluding stubborn problems or serious criticism from being swept under the rug."[22]

CEQA identifies certain classes of projects which are exempt from the provisions of CEQA, called categorical exemptions.[23] Categorical exemptions apply to certain narrow classes of activities that generally do not have a significant effect on the environment.[24] Public agencies utilizing such exemptions must support their determination with substantial evidence.[25] CEQA exemptions are narrowly construed and "[e]xemption categories are not to be expanded beyond the reasonable scope of their statutory language."[26] Erroneous reliance by a lead agency on a categorical exemption constitutes a prejudicial abuse of discretion and a violation of CEQA.[27] "[I]f the court perceives there was substantial evidence that the project might have an adverse impact, but the agency failed to secure preparation of an EIR, the agency's action must be set aside because the agency abused its discretion by failing to follow the law."[28]

CEQA also contains several exceptions to categorical exemptions. In particular, a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to "unusual circumstances,"[29] or where there is a reasonable possibility that the activity will have a significant effect on the environment,

---

[20] CEQA Guidelines, § 15126.4, subd. (a)(2).
[21] *Kings County Farm Bureau v. County of Hanford* (1990) 221 Cal.App.3d 692, 727-28 (a groundwater purchase agreement found to be inadequate mitigation because there was no record evidence that replacement water was available).
[22] *Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Agricultural Assn.* (1986) 42 Cal.3d 929, 935.
[23] PRC § 21084(a); 14 CCR §§ 15300, 15354.
[24] *Id.*
[25] PRC § 21168.5.
[26] *Mountain Lion Found. v. Fish & Game Com.* (1997) 16 Cal.4th 105, 125; *McQueen*, 2 Cal.App.3d at 1148.
[27] *Azusa*, 52 Cal.App.4th at 1192.
[28] *Dunn-Edwards Corp. v. Bay Area Air Quality Mgmt. Dist.* (1992) 9 Cal.App.4th 644, 656).
[29] 14 CCR § 15300.2(c).

including (1) when "the cumulative impact of successive projects of the same type in the same place, over time is significant."[30] An agency may not rely on a categorical exemption if to do so would require the imposition of mitigation measures to reduce potentially significant effects.[31]

The Staff Report and supporting Project documents fail to comply with CEQA's basic informational requirements, fail to disclose the Project's key differences from the existing solar facility, lack details in key areas which the public and decision-makers rely upon to assess the Project's significant environmental impacts, and fail to disclose the Project's potentially significant individual and cumulative impacts. The Staff Report also impermissibly piecemeals the Project from the SEGS III-VII's decommissioning and fails to incorporate all feasible mitigation measures to mitigate significant decommissioning impacts. Ultimately, the County lacks substantial evidence to support its finding that a categorical exemption from CEQA review applies, and must instead prepare an EIR to fully describe the scope of the Project, and to fully disclose and mitigate the Project's potentially significant environmental impacts.

III. THE STAFF REPORT IMPERMISSIBLY PIECEMEALS THE PROJECT FROM THE SEGS III-IV DECOMISSIONING

CEQA prohibits a project proponent from seeking approval of a large project in smaller pieces in order to take advantage of environmental exemptions or lesser CEQA review for smaller projects.[32] This "segmenting" violates CEQA, as it inhibits the full disclosure, analysis and mitigation of impacts, and discussion of alternatives.[33]

CEQA prohibits such a piecemeal approach and requires review of a Project's impacts as a whole.[34] "Project" is defined as "the whole of an action," which has the

---

[30] 14 CCR § 15300.2(b).
[31] *Salmon Pro. & Watershed Network v. County of Marin* ("*SPAWN*") (2004) 125 Cal.App.4th 1098, 1198-1201.
[32] *Arviv Enterprises, Inc. v. South Valley Area Planning Com*., 101 Cal. App. 4th 1337, 1340 (2002).
[33] E.g., Pub. Resources Code, §21002, 210021.1(a); CEQA Guidelines, §§ 151363, 15121, 15140, 15151 (An EIR is informational document whose purpose is to disclose and mitigate impacts, analyze a reasonable range of alternatives, and select as the project any alternative which can achieve project objectives, but is more protective of the environment, consistent with CEQA's substantive mandate); CEQA Guidelines, § 15378 (project description must include all project components).
[34] 14 Cal. Code Reg. § 15378, subd. (a); *Burbank- Glendale-Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592.

potential to result in a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.[35] CEQA mandates "that environmental considerations do not become submerged by chopping a large project into many little ones—each with a minimal potential impact on the environment—which cumulatively may have disastrous consequences."[36] Before undertaking a project, the lead agency must assess the environmental impacts of all reasonably foreseeable phases of a project.[37]

Courts have found improper piecemealing where a lead agency conducts separate CEQA reviews for related activities proposed by the same applicant in the same vicinity. In *Plan for Arcadia v. City Council of Arcadia*, a developer submitted two applications for developments on a 400-acre property, first a 72-acre shopping center and then a parking lot to serve a racetrack on the property.[38] A site plan showed that the owner had plans to redevelop the entire property.[39] Although both projects were exempt from CEQA because they predated CEQA's effective date, it was "clear" to the court that they were "related to each other and that in assessing their environmental impact they should be regarded as a single project under [CEQA]."[40]

In *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora,* the court articulated "general principles" for determining whether two actions are one CEQA project, including "how closely related the acts are to the overall objective of the project," and how closely related they are in *time*, *physical location*, and *the entity undertaking the action*.[41] The court rejected arguments that a shopping center and nearby road alignment were "separate and independent" projects, and held that (1) separate approvals do not sever the connections between two activities; (2) the broad definition of a CEQA "project" extends beyond situations where a future activity is "necessitated by" an earlier one (noting that when actions "actually will

---

[35] 14 Cal. Code Reg., § 15378.
[36] *Los Angeles Department of Water and Power v. County of Inyo* ("*LADWP v Inyo*") (Cal. Ct. App., Aug. 17, 2021, No. F081389) 2021 WL 3629227, at *9; *Bozung v. LAFCO* (1975) 13 Cal.3d 263, 283-84; *City of Santee v. County of San Diego*, (1989) 214 Cal.App.3d 1438, 1452.
[37] *Laurel Heights Improvement Assoc. v. Regents of the Univ. of Calif.* (1988) 47 Cal.3d 376, 396-97, 253 Cal.Rptr. 426) (EIR held inadequate for failure to assess impacts of second phase of pharmacy school's occupancy of a new medical research facility).
[38] *Plan for Arcadia v. City Council of Arcadia* (1974) 42 Cal.App.3d 712, 718, 721
[39] *Id.* at 719.
[40] *Id.* at 723, 726.
[41] *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1226-1227 ("*Tuolumne*").
5142-006acp

be taken," the appropriate inquiry is whether they are related to one another, i.e. they comprise the "whole of an action" or "coordinated endeavor"); and (3) the applicable standard is not always whether two actions "could be implemented independently of each other."[42]

More persuasive, the court found, is whether the "relationship between the particular act and the remainder of the project is sufficiently close when the proposed physical act is among the various steps which taken together obtain an objective.'"[43] The question of whether two actions are part of the same project can be answered by determining whether one act is a "step taken toward the achievement of an objective—that is, whether the act is part of a coordinated endeavor."[44]

Here, the Project Application and Staff Report explain that, after decommissioning and demolition of the 150-MW SEGS III-VII solar thermal facility, the Project would redevelop, at the same location, a new PV solar facility and associated infrastructure necessary to generate a combined 150 MW of electrical energy with up to 150 MW of battery energy storage intended to replace the previous solar energy generation from SEGS III-VII which ceased operation in 2018. The SEGS III-VII solar thermal facility Decommission Plan provides substantial evidence demonstrating that decommissioning the SEGS facility has potentially significant impacts and includes mitigation measures to reduce project impacts to less than significant levels.[45]

Despite the clear relationship between decommissioning the SEGS facility and constructing the Project, the Staff Report fails to discuss or analyze the impacts of decommissioning as part of the Project. Had the Project's environmental review not been fragmented from the SEGS III-VII decommissioning, these impacts and mitigation measures, as one component part of the larger Project, would have necessitated environmental review and precluded reliance on a CEQA categorical exemption.[46] This amounts to an impermissible chopping up of a larger project with

---

[42] *Id.* at 1228-1230 (citing 14 Cal. Code Reg. § 15378(c) and analyzing *Sierra Club v. W. Side Irr. Dist.* (2005) 128 Cal.App.4th 690, 698-700).
[43] *Id.*, p. 1226.
[44] *Id.*, p. 1228.
[45] Decommissioning Plan Solar Energy Generating System (SEGS) III-VII (87-AFC-01C) San Bernardino County, California (February 12, 2021) https://efiling.energy.ca.gov/GetDocument.aspx?tn=236752&DocumentContentId=69784.
[46] Categorical exemptions, such as the Class 2 exemption which County Staff asserts should apply to the Project, are only available to projects that would not result in significant impacts and are

potentially more significant impacts that would require mitigation into smaller projects in an attempt to circumvent the requirements of CEQA.

The whole of this action includes decommissioning the SEGS and reconstructing a solar PV facility on the Project site. These actions have the potential to result in a direct physical change in the environment, and a reasonably foreseeable indirect physical change in the environment. The SEGS III-VII decommissioning and the Project's construction of a new solar PV facility are not separate and independent actions; they are directly related actions. Their piecemealing violates CEQA. The piecemealing of this Project results in the misleading information contained Staff Report, which misinforms the public and decisionmakers as to the true impacts of the whole action before them.

The County must withdraw the Staff Report and prepare an EIR that properly considers the whole of the action, as required by CEQA.

IV. THE STAFF REPORT FAILS TO ACCURATELY DESCRIBE THE PROJECT

California courts have repeatedly held that "an accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient [CEQA document]."[47] CEQA requires that a project be described with enough particularity that its impacts can be assessed.[48] As articulated by the court in *County of Inyo v. City of Los Angeles*, "a curtailed, enigmatic or unstable project description draws a red herring across the path of public input."[49] Without a complete project description, the environmental analysis under CEQA is impermissibly limited, thus minimizing the project's impacts and undermining meaningful public review.[50] Though the County, in its determination that the Project is exempt from environmental review, did not prepare a formal initial study, an accurate and complete project description is still necessary to adequately

---

therefore inapplicable to projects that require mitigation measures. See, e.g., *Muzzy Ranch Co. v. Solano County Airport Land Use Com.* (2007) 41 Cal.4th 372.

[47] *County of Inyo v. City of Los Angeles* (3d Dist. 1977) 71 CalApp.3d 185, 193.

[48] *Id.* at 192.

[49] *Id.* at 197-198.

[50] *See, e.g., Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376.

evaluate the Project's potential adverse effects.[51] Without a complete project description, the environmental analysis will be impermissibly narrow, thus minimizing the project's impacts and undercutting public review.[52] "Only through an accurate view of the project may affected outsiders and public decision makers balance the proposal's benefit against its environmental costs."[53] The question of which acts make up the whole of the action constituting the CEQA project is "a question of law (i.e., is not a discretionary determination) resolved without deference to the agency's determination."[54]

The Staff Report's vague and imprecise descriptions of Project activities, objectives, and operations fail to meet CEQA's requirement that a project description be complete and accurate, rendering the County's reliance on a Class 2 categorical exemption unsupported. The Project description is inadequate for several reasons, including its failure to sufficiently explain (1) how or where—or if—the BESS will be connected to the solar array or directly to the energy grid, (2) the processes by which the BESS will collect and store energy, (3) the efficiency of the Project's batteries, (4) the amount of energy generation required to charge the batteries and the amount lost prior to discharging the batteries, and (5) the methods used to conduct biological surveys to detect the presence of special-status species at the Project site. As a result of these deficiencies, the Project is not clearly defined and the County lacks substantial evidence to support the proposed finding that a Class 2 exemption should be considered for the Project. As explained below, when properly described, the actual scope of the Project demonstrates that the Project has potentially significant impacts and does not qualify for a CEQA exemption. An EIR must be prepared to adequately analyze and mitigate significant Project impacts.

A. The Staff Report's Description of BESS Operations is Vague and Inadequate

The Staff Report's description of the purpose and operations of the BESS is at best vague, and at worst misleading and disingenuous. The only section dedicated to a description of the BESS offers only three short sentences, including an ambiguous statement that the BESS "would be used to either control electric

[51] *See, e.g., Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376.
[52] *See id.*
[53] *Id.*, pp. 192–193.
[54] LADWP v. Inyo, 2021 WL 3629227, at *9.

frequency or store energy from the solar project."[55] It does not provide any explanation of the proposed manner in which the BESS could be connected directly to the solar array or how energy would flow between the two.

Indeed, the discussion of the BESS in the Staff Report appears to assume that that the solar PV facility would be connected to the BESS, rather than directly connected to the energy grid. This assumption contradicts evidence elsewhere in the Staff Report which explains that the Project would continue to utilize the existing 115 kV interconnection to the Kramer Junction Substation.[56] The assumption also contradicts readily available energy agency guidance, which defines large-scale (or utility-scale) BESS systems as "being connected directly to the electricity grid" and having a nameplate power capacity greater than 1 MW.[57]

The mere statement in the Staff Report that the BESS will store energy from the solar facility does not constitute substantial evidence supporting a conclusion that the BESS would draw its charging energy from the solar facility. The Staff Report lacks any details about the BESS specifications, energy flow within the Project facilities, or any binding conditions guaranteeing that the BESS *will not* absorb energy from the energy grid. The County therefore lacks substantial evidence to support a conclusion that the BESS will store energy directly from the solar PV facility. The lack of meaningful detail describing the Project also leaves the public with no way to meaningfully evaluate the Project's impacts, or assess whether the Project would meet its stated operational objectives.

B. The Staff Report Fails to Describe the Batteries, Battery Layout, and Battery Efficiency and Generation Requirements

The Staff Report contains no information regarding the kind of lithium-ion batteries to be used in the Project, nor does it include information regarding the number of batteries, the chemical components of each individual battery, or the proposed layout of battery units, other than to say that they will be "distributed throughout the project boundary adjacent to each power block, pending final design."[58] The Report also fails to describe the efficiency of the batteries (the percentage of charging energy which can be recovered as generation during

[55] Staff Report, p. 10,
[56] Staff Report, p. 11.
[57] See U.S. Energy Information Administrations. Battery Storage Market Trends, p. 8, available at https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf.
[58] Staff Report, p. 46.

discharge) and the generation required to charge the batteries, or how many megawatt hours ("MWh") of generation are required to charge the batteries. SWAPE's comment letter points out that, "[l]ike any electrical device, BESS's consume energy to operate. Thus, in order to store energy, the Project's BESS would use some of the energy it absorbs for its own operation. As a result, the BESS will discharge less energy back to the grid than it initially absorbs, resulting in imperfect round-trip efficiency."[59] Absent this information, it is impossible to accurately analyze the Project's environmental effects and establish a finding of no significant impact, the crucial first step in determining if a categorical exemption applies.

C. The Staff Report Fails to Describe Project Decommissioning

The Staff Report states that "the Project includes the decommissioning and demolition of the existing thermal power facility and the redevelopment of the proposed PV solar facility within the existing solar site."[60] The Air Quality Technical Report further acknowledges that construction emissions estimates are based in part on decommissioning activities.[61] Nowhere in the Staff Report, however, does a clear description of decommissioning activities appear, leaving the public and decisionmakers to guess what parameters were used in emissions modeling, and to hope that they were performed accurately. The Staff Report fails to provide any evidence in support of its conclusion that emissions associated with decommissioning would not exceed applicable MDAQMD thresholds.[62]

Any mention of future decommissioning of the proposed Project, meanwhile, is omitted entirely. SWAPE points out that "the industry standard life span for solar panels is approximately 25 to 30 years. Therefore, some years after operation of the Project commences, the solar panels and associated structures will need to be removed, impacted soils will need to be restored, and debris will need to be hauled off-site."[63] The Air Quality Technical Report fails to include any quantification or analysis of emissions associated with decommissioning activities, thus failing to provide any evidence in support of its conclusions.[64]

---

[59] SWAPE Comments, p. 9.
[60] Staff Report, p. 10.
[61] Air Quality Technical Report, p. 18.
[62] SWAPE Comments, p. 7.
[63] SWAPE Comments, p. 7.
[64] *Id*.

Without this critical information, the Staff Report has not provided enough information to satisfy CEQA's requirement to provide a complete project description and the County fails to meet its burden to provide substantial evidence supporting its conclusion that the Project qualifies for an exemption. These deficiencies render the remainder of Project determinations unsubstantiated.

V. THE PROJECT DOES NOT QUALIFY FOR A CLASS 2 CATEGORICAL EXEMPTION FOR REPLACEMENT OR RECONSTRUCTION OF EXISTING FACILITIES

CEQA is "an integral part of any public agency's decision making process."[65] It was enacted to require public agencies and decisionmakers to document and consider the environmental implications of their actions before formal decisions are made.[66] CEQA requires an agency to conduct adequate environmental review prior to taking any discretionary action that may significantly affect the environment, unless an exemption applies.[67] Categorical exemptions apply to classes of projects that are determined to be exempt because they do not have a significant effect on the environment.[68] "Thus an agency's finding that a particular proposed project comes within one of the exempt classes necessarily includes an implied finding that the project has no significant effect on the environment."[69] "It follows that where there is any reasonable possibility that a project or activity may have a significant effect on the environment, an exemption would be improper."[70]

CEQA exemptions must be narrowly construed and are not to be expanded beyond the scope of their plain language.[71] They should not be construed so broadly as to include classes of projects that do not normally satisfy the requirements for a categorical exemption.[72]

---

[65] Pub. Resources Code § 21006.
[66] *Id*., §§ 21000, 21001.
[67] *Id.,* § 21100(a); *see also* CEQA Guidelines § 15004(a).
[68] *Muzzy Ranch Co. v. Solano County Airport Land Use Com.* (2007) 41 Cal.4th 372, 380.
[69] *Davidon Homes v. City of San Jose* (1997) 54 Cal.App.4th 106, 115.
[70] *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal.App.4th 1165, 1191 ("*Azusa Land Reclamation*"), *quoting Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 205–206.
[71] *Castaic Lake Water Agency v. City of Santa Clarita* (1995) 41 Cal.App.4th 1257.
[72] *Azusa Land Reclamation* (1997) 52 Cal.App.4th 1165, 1192.

To qualify for a categorical exemption, a lead agency must provide "substantial evidence to support [its] finding that the Project will not have a significant effect."[73] "Substantial evidence" means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency.[74] If a court locates substantial evidence in the record to support the agency's conclusion, the agency's decision will be upheld.[75] If, however, the record lacks substantial evidence, as here, a reviewing court will not uphold an exemption determination.

A. Class 2 Exemption

Section 15302 of the CEQA Guidelines provides an exemption from CEQA for the "replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced," including the "[r]eplacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity."[76]

Insisting that the Project will have the "same solar utility purpose and capacity" as the existing facility, the County claims that the Project is exempt pursuant to Class 2, asserting that the BESS "will not constitute an expansion of capacity since the use of BESS technology will be used in making the same end product as the existing utility system, viz., energy. Nor will the use of the BESS technology increase the daily total MW production into the grid."[77] The Staff Report further claims, without supporting evidence, that no exceptions exist that would render the exemption inapplicable, and that the Project will have no significant environmental impacts.[78] In fact, it also asserts, "the proposed facility would reduce the environmental effects associated with the existing use, including but not limited

[73] *Banker's Hill, Hillcrest, Park West Community Preservation Group v. City of San Diego* (2006) 139 Cal.App.4th 249, 269.
[74] CEQA Guidelines § 15384.
[75] *Bankers Hill Hillcrest*, 139 Cal.App.4th at 269.
[76] 14 CCR § 15302(c).
[77] Staff Report, p. 23.
[78] *Id*.

to a reduction in water usage and GHG emissions by shutting down the existing gas fired heaters and reducing visual impacts with the use reduced panel heights."[79]

The record demonstrates that neither the County nor the Applicant have provided substantial evidence showing that the Project qualifies for the Class 2 exemption. To the contrary, as discussed below, there is substantial evidence demonstrating that unusual circumstances and cumulative impacts are present which preclude reliance on the Class 2 exemption. There is also substantial evidence supporting a fair argument that the Project will result in significant, unmitigated environmental impacts to air quality, biological resources, and risks to human health from hazards that require preparation of an initial study and an EIR, and preclude the application of categorical exemptions.

i. The Purpose and Capacity of the Proposed Project are Significantly Different from the Existing Facility

The court in *Dehne v. County of Santa Clara* determined that the "same purpose and capacity" requirement applies to productive purpose and capacity.[80] Here, the Project's purpose is significantly different from the existing solar thermal facility because battery **storage** does not provide "substantially the same purpose" as solar energy **generation**. Furthermore, the addition of 150 MW of energy storage capacity from the BESS to the 150 MW energy generation capacity of the solar PV facility will effectively double the total capacity of the Project to discharge energy onto the grid.

First, the addition of the energy storage facility fundamentally changes the Project's utility purpose, as it would allow for storage, rather than only generation, to take place at the Project site. While solar plants generate renewable electricity and transmit that electricity to the grid, an energy storage facility does not generate electricity. Rather, it receives energy from the grid, stores it, and then transmits that energy back to the grid at a later time. Energy storage facilities are thus *not* renewable energy sources, but neutral energy sources, reflecting the energy composition of the grid they are connected to.

Absent regulatory requirements or mitigation measures to the contrary, battery storage facilities designed to provide storage capacity for the electric grid

[79] *Id.*
[80] *Dehne v. County of Santa Clara* (1981) 115 Cal.App.3d 827, 839.

store whatever energy is the cheapest and displace whatever is the most expensive, with no concern for the emissions that would result.[81] As explained in SWAPE's comment letter, BESS's are not stand-alone generation sources and must buy electricity supplied by other generators to recharge and cover the round-trip efficiency losses experienced during cycles of charging and discharging.[82]

> This is a key difference in the operation of a BESS as compared to the solar PV facility, which generates its own electricity without the roundtrip inefficiency created by a BESS. The BESS, on the other hand, stores, uses, and redistributes energy that has been generated by another source. As a result of this inefficiency, the Project's BESS has direct energy and air quality impacts that must be analyzed pursuant to CEQA.[83]

The Project documents and Air Quality Technical Report fail to address these impacts.

Though the Project Description states that the BESS will store energy from the solar project, nowhere in any of the Project's planning documents or the Staff Report does the Applicant or the County provide any assurance that the BESS will not absorb energy from any other source. Thus, in addition to changing the facility's purpose from solely generation to a combination of generation and storage, the Project would likely facilitate additional generation from non-renewable sources like natural gas, which currently comprises over 50% of the energy composition on the CAISO grid.[84] This represents an unequivocally different purpose than simple solar energy generation, which the SEGS facility produced.

Moreover, the County offers no substantial evidence to support its proposed finding that the BESS will not increase the facility's capacity. The Staff Report states that the Project "will not constitute an expansion of capacity since the use of BESS technology will be used in making the same end product as the existing

---

[81] Eric S. Hittinger and Ines M.L. Azevedo, *Bulk Energy Storage Increase United States Electricity System Emissions*, J. OF ENV. SCI. TECH. (2015) available at https://doi.org/10.1021/es505027p.
[82] SWAPE Comments, p. 9; *Id.* at p. 19.
[83] SWAPE Comments, p. 9.
[84] Total System Electric Generation, California Energy Commission, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation (last visited Sept. 9, 2021); See CAISO Current Supply and Renewables, accessed 9/8/21, available at http://www.caiso.com/todaysoutlook/pages/supply.aspx.

utility system, viz., energy. Nor will the use of the BESS technology increase the daily total MW production into the grid."[85] Evidence, however, supports the finding that energy storage has actually increased energy use in the United States due to "energy arbitrage," the practice of storing energy when cheapest and discharging energy when most expensive.[86] When a BESS draws energy from the grid and stores it, it creates space for another source—be it renewable or nonrenewable—to increase its production. The general design of utility-scale BESS's like the Project's is to charge directly from the energy grid. Thus, the BESS's charging energy would come from whatever energy generation facilities are charging the grid at the time the BESS charges. The solar PV facility also interconnects directly with the grid. If the BESS discharges stored energy onto the grid at the same time that the solar PV facility is sending energy to the grid, the BESS, in providing an additional 150 MW storage capability, increases the potential energy output capacity of the facility twofold.

The County's assertion that the Project is replacing the previous solar facility with substantially the same purpose and capacity is baseless. Furthermore, energy absorbed by the BESS would reflect the energy composition of the grid. Because energy on the CAISO grid includes energy from non-renewable sources (until at least 2045), operation of the BESS is therefore likely to result in indirect criteria air pollutant and GHG emissions that would not occur from operation of just the solar PV facility. These impacts require analysis and mitigation pursuant to CEQA. In particular, mitigation measures requiring no net increase in GHG emissions beyond those generated by the Project's solar array would be necessary to satisfy the standards of the County's General Plan, Renewable Energy and Conservation Element, and other applicable Community or Specific Plans indicated by County Staff.[87] An EIR is required to fully disclose and mitigate the potentially significant impacts from these new Project components.

---

[85] Staff Report, p. 12.
[86] Eric S. Hittinger and Ines M.L. Azevedo, *Bulk Energy Storage Increase United states Electricity System Emissions*, J. OF ENV. SCI. TECH. (2015) available at https://doi.org/10.1021/es505027p (last visited September 8, 2021); Robert L. Fares, Michael E. Webber. What are the tradeoffs between battery energy storage cycle life and calendar life in the energy arbitrage application?. *Journal of Energy Storage* 2018, *16*, 37-45, https://doi.org/10.1016/j.est.2018.01.002 (last visited September 8, 2021).
[87] Staff Report, pp. 11–12.

ii. The Project is Likely to Result in Significant Adverse Environmental Impacts, Precluding the Application of a Categorical Exemption

Before an agency makes a determination that a project qualifies for a categorical exemption, it must determine, based on substantial evidence, that the project will have no significant adverse environmental impacts. As explained in more detail below, the County, lacking substantial evidence that is not flawed or erroneous, cannot support its findings that the Project will not result in significant adverse impacts. SWAPE and Mr. Cashen have established through extensive substantial evidence that the Project will result in significant impacts to biological resources and air quality. Furthermore, as a result of these impacts, the Project would be unable to satisfy all the required findings for approval of a commercial solar energy facility pursuant to San Bernardino Development Code Section 84.29.035.

a) Air Quality

SWAPE explains that the Air Quality Technical Report's calculations of air quality impacts from Project construction and operation contain numerous errors and inaccuracies. "CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type."[88] Construction mitigation measures, for example, some of which are vague and unenforceable, are inappropriately applied to the analysis of emissions. Additionally, variables for land use size were significantly underestimated, rendering the estimated calculations unreliable and erroneous.[89] SWAPE's estimates, using the correct figures and variables, demonstrate that the actual emissions numbers are significantly higher.[90]

b) Biological Resources

There is evidence supporting a conclusion that the significant risk to avian mortality posed by solar PV facilities, combined with the Project's location, size, and technology, is substantial.[91]

[88] SWAPE Comments, p. 1.
[89] SWAPE Comments, p. 2.
[90] SWAPE Comments, pp. 2–8.
[91] Cashen Comments, p. 3.

Mr. Cashen describes the increased risks to biological resources as a result of the Project's location near the intersection of two major avian migration routes, its relatively large size, and the use of PV technology, which appears to be especially hazardous to birds.[92] The Biological Report prepared for the Project states that the Project site has been "mostly disturbed by the existing thermal solar use and activities" and indicated that a biological survey had been conducted to document "all biological resources identified within" the Project site area.[93] These statements, however, are misleading. As explained by Mr. Cashen:[94]

> A Tetra Tech biologist surveyed the Project site on December 10, 2020.[95] Although no special-status species were detected during the survey, the timing of the survey was not conducive to detection of many of the special-status species that, according to the Biological Report, have the potential to occur at or adjacent to the Project site.[96] The survey was not conducted when desert tortoises are active aboveground,[97] and most of the special-status plants that have the potential occur at or adjacent to the Project site are annual plants that are not detectable in December.[98]

The Biological Report acknowledged that "larger mammals have been accessing the interior of the site on occasion and could potentially be present within the site, which may include the desert kit fox."[99] As Mr. Cashen pointed out, no additional efforts were made to determine the presence of desert kit foxes, suggesting that any conclusions drawn by the Report regarding the absence of special-status species at the site were unsubstantiated and questionable.[100]

---

[92] Cashen Comments, p. 3; Walston LJ Jr, KE Rollins, KE LaGory, KP Smith, SA Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy 92:404-414.
[93] Staff Report, p. 19.
[94] Cashen Comments, p. 5.
[95] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 1.
[96] *Ibid*, Table 1.
[97] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 12.
[98] California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0). Website https://www.rareplants.cnps.org [accessed September 7, 2021].
[99] Biological Report, p. 13.
[100] Cashen Comments, p. 5.

Even more egregiously, the Biological Report states that no Joshua trees were observed in the Project site during the survey.[101] Mr. Cashen indicated that Google Earth imagery from March 2021 "depicts one, possibly two, Joshua trees within the Project site."[102] This glaring inaccuracy "draws into question the accuracy of the information provided in the Biological Report, and the County's subsequent conclusion that the Project would not impact any special special-status species because none are present within the Project site."[103]

c) Land Use

In order to receive approval as a commercial solar energy facility, a project must meet the Required Findings for Approval of a Commercial Solar Energy Facility pursuant to San Bernardino Development Code Section 84.29.035, in addition to meeting the general requirements for all use permits found in Section 85.06.040.

Section 84.29.035(c) includes 31 findings that must be met before approval may be granted. As discussed herein and in Mr. Cashen's comments, findings (9) and (10), regarding a proposed solar energy facility's impacts to biological resources, cannot be met.

Section 84.29.035(c)(9) states that a proposed facility "will be sited so as to avoid or minimize impacts to the habitat of special status species, including threatened, endangered, or rare species, Critical Habitat Areas as designated by the U.S. Fish and Wildlife Service, important habitat/wildlife linkages or areas of connectivity designated by County, State or Federal agencies, and areas of Habitat Conservation Plans or Natural Community Conservation Plans that discourage or preclude development."[104] Section (10) requires that "[a]dequate provision has been made to maintain and promote native vegetation and avoid the proliferation of invasive weeds during and following construction."[105]

[101] Biological Report, Table 1, p. 6.
[102] Cashen Comments, p. 5.
[103] *Id.*
[104] San Bernardino Development Code § 84.29.035(c)(9).
[105] *Id.*, § (c)(10).

Mr. Cashen's comments provide substantial evidence demonstrating that the Project will not meet these two criteria.[106] The Project, therefore, does not meet the County's own criteria required for approval of a commercial solar energy facility.

VI. THE PROJECT FALLS WITHIN THE EXCEPTIONS TO CATEGORICAL EXEMPTIONS

In addition to satisfying the criteria required for a categorical exemption, a project must not fall under one of the exceptions that, if established, preclude application of an exemption. For the purposes of this letter, two of these exceptions are noteworthy:[107]

> (b) Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.
>
> (c) Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

The standard of review for exceptions to the exemption generally requires that a challenger provide a fair argument that the project *may* have a significant effect on the environment.[108] An reviewing court will simply inquire whether, as a matter of law, the record contains credible evidence to support an argument that there may be a significant effect, but neither the agency nor the court may weigh the evidence or resolve any conflict.[109] In those instances, an EIR must be prepared. Here, there is substantial evidence supporting a fair argument that the Project will have significant environmental effects due to cumulative impacts and unusual circumstances that have not been adequately disclosed or mitigated, and which preclude reliance on the County's claimed categorical exemption.

---

[106] See Cashen Comments.
[107] CEQA Guidelines § 15300.2
[108] *Friends of the College of San Mateo Gardens v. San Mateo County Community College* (2016) 1 Cal.5th 926.
[109] *Bankers Hill Hillcrest*, 139 Cal.App.4th at 263.

A. The Project May Have Significant Cumulative Impacts When Considered with Other Planned Solar/Battery Storage Projects in San Bernardino County

The Class 2 exemption is inapplicable when a project has significant cumulative impacts:

> All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.[110]

Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.[111] San Bernardino County currently has a significant number of solar projects planned and under construction, many of which are also planning to add battery storage capacity along with the solar array.[112] The County also adopted an initiative in 2019 to prioritize existing sites for solar projects,[113] which means that many of these projects may apply for a similar Class 2 exemption. Thus, many of these projects are "of the same type in the same place." The County failed to consider the impacts of these cumulative projects in reaching its determination that the Project is categorically exempt and that no exceptions apply.

i. Cumulative Air Quality Impacts

The Air Quality Report states that "[a]lthough the Project site is located in a region that is in non-attainment for O3, PM10 and PM2.5, the cumulative emissions associated with the Project would not be considerable as the emissions would fall below MDAQMD thresholds."[114] This rationale relies on the reasoning that "where a project has 'zero impact … then the cumulative effect of adding [projects] together

---

[110] CEQA Guidelines § 15300.2(b).
[111] CEQA Guidelines § 15355.
[112] County of San Bernardino, Land Use Services/Planning Division, Renewable Energy Projects as of August 31, 20201, http://www.sbcounty.gov/uploads/LUS/Renewable/SolarProjectList2020_Maps.pdf.
[113] Resolution No. 2019-17, Amendment of the Renewable Energy and Conservation Element of the County General Plan, http://www.sbcounty.gov/uploads/LUS/Renewable/2019_WEBSITE/RES-LUS-2-28-19-RECE_SIGNED.pdf.
[114] Air Quality Technical Report, p. 21.

would remain zero.'"[115] Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.[116] The courts have held that analysis of cumulative impacts is "necessary because the full environmental impact of a proposed project cannot be gauged in a vacuum."[117]

SWAPE's recalculated emissions estimates for the Project establish that Project impacts will in fact be much more significant than proposed by the Staff Report and Air Quality Technical Report. Additional GHG and criteria pollutant emissions as a result of battery storage projects associated with solar energy projects in the area are likely to result in cumulatively significant impacts, and an even worse record of regional air quality.

An EIR must be prepared to determine the extent of the Project's cumulative impacts in conjunction with other reasonably foreseeable solar/battery projects in the County, and to require mitigation to reduce any potentially significant cumulative impacts to less than significant levels.

ii. Cumulative Impacts to Biological Resources

As explained by Mr. Cashen, the Project may have significant and unmitigated cumulative impacts to biological resources, regardless of whether the Project's individual impacts on bird populations are less than significant.[118] According to the County, there are 11 active, 7 conditionally approved, and 41 completed solar project in the County of San Bernardino as of August 31, 2021.[119] The Project would contribute to the significant cumulative impacts caused by all of the solar energy and battery energy storage facilities in the region. Mr. Cashen points out that for species that have low population numbers, even a small number of fatalities caused by solar energy facilities can have a population-level effect.[120]

Several other special-status species, both plant and animal, known to occur in the area are at risk of adverse Project impacts. The Mojave spineflower, western Joshua tree, and several nesting bird species protected under the Migratory Bird

---

[115] *North Coast Rivers Alliance v. Westlands Water Dist*. (2014) 227 Cal.App.4th 832, 874.
[116] CEQA Guidelines § 15355.
[117] *North Coast Rivers Alliance v. Westlands Water Dist.* (2014) 227 Cal.App.4th at 874.
[118] Cashen Comments, p. 3.
[119] Cashen Comments, p. 3; *See* https://www.sbcounty.gov/uploads/LUS/Renewable/SolarProjectList2020_Maps.pdf.
[120] Cashen Comments, p. 3.

Treaty Act and California Fish and Game Code, have the potential to occur at the Project site.[121] All of these species could potentially be adversely affected by cumulative impacts from the Project and other similar projects taking place in the region through destruction of habitat during construction activities and other activity that causes habitat abandonment or loss of reproductive effort.[122]

B. The Project may have Significant Effects on the Environment due to Unusual Circumstances

The determination of whether a project presents "unusual circumstances" pursuant to CEQA Guidelines, § 15300.2, subd. (c) is reviewed under a 2-prong standard. First, the determination of whether a particular project presents circumstances that are unusual for projects in the exempt class is reviewed under the substantial evidence standard. Second, the agency's finding as to whether unusual circumstances give rise to "a reasonable possibility that the activity will have a significant effect on the environment" is reviewed under the fair argument standard.[123]

Unusual circumstances can be established without evidence of an environmental effect "by showing that the project has some feature that distinguishes it from others in the exempt class, such as its size or location."[124] In such instances, only "a reasonable possibility of a significant effect due to that unusual circumstance" must be shown.[125] Alternatively, an unusual circumstance may be demonstrated "with evidence that the project will have a significant environmental effect. That evidence, if convincing, necessarily also establishes 'a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.'"[126]

Based on the information in the Staff Report and accompanying documents, as well as in the comments provided by Citizens' experts, there is substantial evidence supporting a fair argument that the exception applies due to the unusual circumstance of a "replacement" energy generation facility proposing energy storage

---

[121] Cashen Comments, pp. 5–6.
[122] Id., pp. 3–6.
[123] *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1114, as modified (May 27, 2015).
[124] *Id.*, p. 1106.
[125] *Id.*
[126] *Id.*

rather than simply energy generation. The addition of the BESS to a solar energy generating facility is likely to result in significant environmental effects caused by GHG emissions from BESS energy storage and operation, as well as impacts resulting from the Project's unique size and location.

i. GHG Impacts

The Air Quality Technical Report concludes that the Project's construction and operational emissions would not exceed the Mojave Desert Air Quality Management District's ("MDAQMD's") threshold of 100,000 tons of carbon dioxide equivalent per year (CO_2e/year). However, these conclusions can only be reached by including in the calculations blatant errors and omissions. Substantial evidence clearly demonstrates that the Project will almost certainly result in potentially significant GHG impacts in excess of the threshold from indirect emissions and increased facility capacity that the County failed to disclose and mitigate.

As explained by SWAPE and discussed above, the Project's analysis of GHG emissions is inaccurate and omits an analysis of GHG emissions caused by BESS charging and roundtrip inefficiency. As a result, the County significantly underestimates the GHG emissions, which substantial evidence shows are nearly certain to exceed air district thresholds when the errors contained in the Air Quality analysis are corrected.[127] Additionally, analysis of Project emissions failed to account for the direct energy usage associated with operation of the BESS. As discussed in detail in SWAPE's comment letter, the omission of direct and indirect Project emissions results in underestimated and inaccurate impacts.[128]

First, energy from the grid would be used to charge the BESS when the solar facility is not generating power. The grid, however, does not contain a 100% renewable energy mix. "Specifically, renewable energy constituted 33.09% of California's total energy mix in 2020."[129]

Second, SWAPE's comments explain, energy storage is not neutral in terms of energy use or emissions. Studies demonstrate that energy storage increases energy use due to "energy arbitrage," the practice of storing energy during off-peak

[127] SWAPE Comments, pp. 8–10.
[128] SWAPE Comments, pp. 9–10.
[129] SWAPE Comments, p. 9; 2020 Total System Electric Generation, California Energy Commission, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation.

periods, when energy is cheapest, and discharging energy during peak-periods, when energy is most expensive.[130]

> This poses a problem, as storing energy increases the value of the energy sources it draws from and, when discharged, decreases the value of the energy sources it competes against. Thus, if the BESS is charged at night with energy from the grid, rather than during the day from the solar facility, the BESS promotes the use of non-renewable energy. As such, unless the developer commits to only charge the BESS with generation from the adjoining solar power plant, the proposed Project would increase GHG emissions.[131]

Third, like any electrical device, the BESS consumes energy in order to operate. This results in potentially significant direct energy and GHG impacts that the County failed to disclose and analyze in the Staff Report.

Evidence showing that a project will have a significant environmental impact, as here, can serve to establish the presence of an unusual circumstance for the purposes of determining if an exception applies.[132]

ii. Biological Resources

As Mr. Cashen points out, the location, size, and technology of the Project, all of which represent unusual project circumstances, increase the impacts to bird populations and communities.[133] As discussed above, the Project is located near the intersection of two major migration routes: one used by landbirds, and one used by waterbirds.[134] Furthermore, the Project is relatively large (1,172 acres),[135] and would employ PV technology, which, according to Mr. Cashen, appears to be

---

[130] Eric S. Hittinger and Ines M.L. Azevedo, *Bulk Energy Storage Increase United states Electricity System Emissions*, J. OF ENV. SCI. TECH. (2015) available at https://doi.org/10.1021/es505027p.
[131] SWAPE Comments, p. 10.
[132] *Berkeley Hillside*, 60 Cal.4th at 1105.
[133] Cashen Comments, p. 3.
[134] Cooper DS. 2016. Industrial-scale solar projects and birds in the California desert: Assessing impacts & developing mitigation. Technical report prepared for Sonoran Joint Venture, Tucson, AZ. Figure 3.
[135] NextEra Energy. 2021 Jan 27. Project Description: Resurgence Solar Project. p. 1.

especially hazardous to birds.[136] The combination of these three factors, he explains, heightens the risk that the Project will cause a significant amount of avian mortality: "The number of avian fatalities being caused by solar energy facilities is not trivial, especially for species that have low population numbers. For these species, the loss of even small numbers of individuals can have a population-level effect."[137]

Additionally, the Project is uniquely situated so that it has the potential to facilitate the spread of existing invasive weed species and introduce new non-native species.[138] According to Mr. Cashen, "[t]hree things are required for an invasive plant to become established in an area:[139]

1. A vector for transporting the plant or its propagules from one place to another. Some vectors are natural (e.g., wind, water, and wildlife); however, most are related to human activities. Tools, equipment, vehicles, livestock, clothing, and boots are potential vectors for the spread of invasive plants.

2. Suitable conditions for invasive plant colonization. Soil and vegetation disturbance create suitable conditions for the establishment of invasive plants.

3. A suitable environment for the invasive plant to survive, reproduce, and spread. Many invasive species possess a competitive advantage over native species in an area. As a result, invasive species can reproduce and spread exponentially, especially if the ecosystem lacks a mechanism for keeping them in check."[140]

The Project, Mr. Cashen explains, has the potential to facilitate the colonization and spread of invasive plants because construction and operation activities "(a) provide vectors for transporting invasive plant propagules, (b) involve

---

[136] Walston LJ Jr, KE Rollins, KE LaGory, KP Smith, SA Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy 92:404-414.
[137] Cashen Comments, p. 3.
[138] Cashen Comments, p. 8.
[139] *Id*.
[140] California Department of Food and Agriculture, California Invasive Weed Awareness Coalition. 2005. California Noxious & Invasive Weed Action Plan. California Dept. of Food and Agriculture, Sacramento, CA.

soil disturbance, and (c) would be conducted in an environment susceptible to invasion."[141]

The County's measures designed to minimize these adverse effects, Mr. Cashen adds, are ineffective, unenforceable, and vague. They will not mitigate impacts from invasive non-native species to less-than-significant levels.[142]

iii. Hazards

The risk of fire caused by lithium-ion batteries is undoubtedly a circumstance unusual to the class of facilities covered by a Class 2 exemption. Unique to a facility of this nature, in which batteries used to store energy present a significant risk of harm, fires and accidents at these facilities have been the subject of recent events, including a fire at a Tesla battery storage facility in Australia in August 2021.[143] The Staff Report omits from any discussion of potential Project impacts the issue of a lithium-ion battery fire.

Even more alarming, as pointed out in SWAPE's comments, the Staff Report fails to consider the need for battery replacement and disposal throughout the lifespan and during the decommissioning of the Project. "Estimates for the life of lithium-ion batteries in a utility-scale application are as little as 4.9 years until the battery degrades to 70% of original capacity, and up to 10 years with an effective thermal management system."[144] The unique challenges presented by the use of lithium-ion batteries calls for adequate environmental review so that the potential risks and impacts can be analyzed and mitigated.

VII. CONCLUSION

The Project does not qualify for a CEQA exemption for several reasons. First, the Project Description is inaccurate, incomplete, and misleading. Additionally, the Project does not share the "purpose and capacity" of the existing solar array on the Project site, and therefore fails to meet the facial requirements for a Class 2 exemption. Finally, the Project has the potential to result in significant environmental and public health impacts due to unusual circumstances and the

[141] Cashen Comments, p. 8.
[142] *Id.*
[143] See https://www.technowize.com/fire-at-tesla-battery-site-in-australia-raises-concern-over-lithium-risk/.
[144] SWAPE Comments, p. 2; https://www.nrel.gov/docs/fy17osti/67102.pdf

cumulative effects of successive projects that the County has failed to disclose and mitigate in violation of CEQA.

For the foregoing reasons, we respectfully request that the County of San Bernardino Planning Commission deny the Class 2 exemption and requested Conditional Use Permits for the Project and remand the Project to Staff to conduct and adequate and thorough environmental review. Such review must analyze the entire Project, including the type of interconnection the Project will use to connect the energy storage facility to the grid, the Project's potentially significant cumulative impacts, and the potential for risk to public health from hazards associated with the lithium-ion batteries. The County must also ensure that the Project is consistent with all other applicable laws, regulations and policies.

Thank you for your consideration of these comments.

Sincerely,

Kendra Hartmann

KDH:acp

Attachments

EXHIBIT A

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

Paul E. Rosenfeld, PhD
(310) 795-2335
prosenfeld@swape.com

September 7, 2021

Kendra Hartmann
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd #1000
South San Francisco, CA 94080

Subject: Comments on the Resurgence Solar Project

Dear Ms. Hartmann,

We have reviewed the August 2021 Land Use Services Department Planning Commission Staff Report ("Staff Report") and the January 2021 Project Description for the Resurgence Solar Project ("Project") located in the County of San Bernardino ("City"). The Project proposes to construct a new 150-megawatt ("MW") solar facility consisting of approximately 312,000 solar photovoltaic panels and associated infrastructure on the 1,172-acre site, to replace the existing 150 MW SEGS III-VII solar thermal power facility at the Project site. The Project also proposes to install a 150-MW battery energy storage system ("BESS") to store energy.

Our review concludes that the Staff Report fails to adequately evaluate the Project's air quality, health risk, energy, and greenhouse gas impacts. As a result, emissions, health risk, and energy consumption impacts associated with construction and operation of the proposed Project are underestimated and inadequately addressed. An EIR should be prepared to adequately assess and mitigate the potential air quality, health risk, energy, and greenhouse gas impacts that the project may have on the surrounding environment.

Hazards and Hazardous Materials

Fire Protection was not Adequately Evaluated

Plans for preventing fires and firefighting at utility-scale battery storage facilities are critical to include in the Project's design. Lithium-ion battery fires are the subject of frequent news reports, including an

August 2021 fire at a Tesla battery storage facility in Australia.[1] The fire, which occurred at a newly opened 300 MW facility, took more than three days to extinguish.[2]

Fires at utility-scale lithium-ion battery storage facilities have proven difficult to fight and have required new techniques. In commenting on the August 2021 Tesla battery fire, Paul Christensen, an expert on lithium-ion battery fires and safety, stated he would like to see fire and rescue teams involved early on in the design and installation of energy storage systems. He states: "If the design is approved, and then the fire and rescue service are brought in -- that's the wrong way around."[3] Christensen also argues systems should be designed to allow space for first responders to maneuver and aim a hose with an abundant supply of water available on site, where enough hydrants are installed. Additionally, he states that developers of utility-scale batteries need to offer a means of monitoring the system that would allow owners, operators, and fire crews to assess what's happening inside the system at any time. Forty fires have occurred at large-scale, lithium-ion battery energy storage systems, according to Christensen's research, most of which have occurred in the past three years and include four fires at three facilities in the U.S. in Arizona, Wisconsin, and Illinois.[4]

The Staff Report fails to specifically address the issue of a lithium-ion fire or consider the possibility of such a fire and the measures that would be required to effectively respond. To address concerns for fire impacts at the Project site, and to identify appropriate mitigation, an EIR should be prepared to include:

1. An estimate of the amount of water, the source of the water, and the network (including hydrants) that would be necessary to fight a reasonable worst-case fire scenario;

2. A list of all chemical components in the lithium-ion batteries including chemicals in the electrolyte;

3. Plans for a fire monitoring system;

4. Plans to show that secondary containment would be adequate to handle the volume of chemicals and any water required to fight a worst-case scenario fire; and

5. An Emergency Action Plan to include ability of local resources to fight a lithium-ion battery fires and an evaluation of response times.

Furthermore, the Staff Report fails to consider the need for battery replacement and disposal throughout the lifespan and during the decommissioning of the Project. Estimates for the life of lithium-ion batteries in a utility-scale application are as little as 4.9 years until the battery degrades to 70% of original capacity, and up to 10 years with an effective thermal management system.[5] In California, all

[1] https://www.technowize.com/fire-at-tesla-battery-site-in-australia-raises-concern-over-lithium-risk/

[2] https://www.theguardian.com/australia-news/2021/aug/02/tesla-big-battery-fire-in-victoria-burns-into-day-three

[3] https://www.cnbc.com/2021/08/05/tesla-megapack-fire-highlights-early-stage-issues-with-big-batteries.html

[4] Ibid.

[5] https://www.nrel.gov/docs/fy17osti/67102.pdf

discarded batteries are considered to be hazardous waste.[6] An EIR should identify the quantity of batteries that are anticipated over the life of the Project and how and where such batteries would be discarded.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The Project's air quality analysis relies on emissions calculated with CalEEMod.2016.3.2 (AQ & GHG Technical Report, p. 1).[7] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence. Once all of the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files disclose to the reader what parameters are utilized in calculating the Project's air pollutant emissions and make known which default values are changed as well as provide justification for the values selected.

When reviewing the Project's CalEEMod output files, provided in the Detailed CalEEMod Output as Appendix A to the May 2021 Air Quality and Greenhouse Gas Technical Report ("AQ and GHG Technical Report"), we found that several model inputs were not consistent with information disclosed in the Staff Report. As a result, the Project's construction and operational emissions may be underestimated.

Underestimated Land Use Size

According to the Staff Report:

> "The Project site is 1,172 acres including a total of nine (9) parcels located along Highway 395 in an unincorporated area of San Bernardino County in the community of Kramer Junction" (p. 15).

However, review of the CalEEMod output files demonstrates that the Resurgence Solar model includes only 1,019 acres of "User Defined Industrial" (see excerpt below) (Appendix A, pp. 34, 72, 105).

Land Uses	Size	Metric	Lot Acreage
User Defined Industrial	1,019.00	User Defined Unit	1,019.00

As you can see in the excerpt above, the Project site is underestimated by 153 acres. These underestimations present an issue, as the land use size features are used throughout CalEEMod to determine default variable and emission factors that go into the model's calculations.[8] For example, the

[6] http://www.calrecycle.ca.gov/reducewaste/Batteries/

[7] CAPCOA (November 2017) CalEEMod User's Guide, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

[8] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/01_user-39-s-guide2016-3-1.pdf?sfvrsn=2, p. 17.

lot acreage of a land use is used for calculations associated with site preparation and grading.[9] Thus, by underestimating the proposed Project site, the model underestimates the Project's emissions and should not be relied upon to determine Project significance.

Incorrect Application of Tier 4 Final Mitigation

Review of the CalEEMod output files demonstrates that the Resurgence Solar model assumes that the Project's off-road construction equipment fleet would meet Tier 4 Final emissions standards (see excerpt below) (Appendix A, pp. 35, 36, 73, 74, 106, 107).

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	36.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	61.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	32.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	22.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[10] According to the "User Entered Comments and Non-Default Data" table, the justification provided for the inclusion of the construction-related measure is: "Provided by applicant" (Appendix A, pp. 35, 73, 106). Furthermore, regarding the use of Tier 4 equipment, the AQ & GHG Report states:

---

[9] "CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 29.

[10] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9.

"To reduce exhaust emissions from construction equipment, the Project Owner is proposing the following:

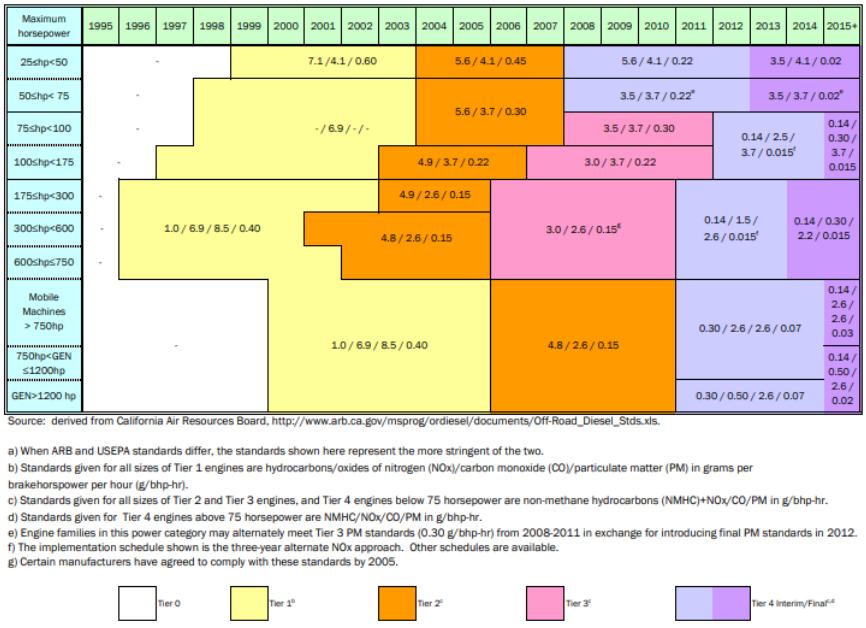
- The Project Owner will work with the construction contractor to utilize EPA/CARB Tier IV engine compliant equipment for engines greater than 50 horsepower" (p. 23).

However, these justifications remain insufficient for two reasons.

First, as demonstrated above, the Project does not include any binding mitigation measures, and neither the Conditions of Approval or the AQ & GHG Report include any mandatory requirement for the Project to utilize the more efficient Tier 4 Final emission standards, which are not yet mandated under existing law. The United States Environmental Protection Agency ("U.S. EPA") has slowly adopted more stringent standards to lower the emissions from off-road construction equipment. Since 1994, Tier 1, Tier 2, Tier 3, Tier 4 Interim, and Tier 4 Final construction equipment have been phased in over time. CARB regulations are currently phasing in Tier 4 engines in over several years. Under the CARB regulations, lower tiered (more polluting) equipment may remain in construction fleets for almost ten more years. For example, Tier 0 and Tier 1 (highest polluting equipment) may constitute up to half of small construction fleets in 2022, and will not be phase out until 2029. Large construction fleets are not required to phase out older equipment until 2023.[11] Without a binding condition requiring the Applicant to use exclusively Tier 4 construction equipment, there is no requirement that the Project use Tier 4 equipment. Measures that are not formally included in a mitigation plan or the Project's conditions of approval may be eliminated from the Project's design altogether. The Project includes neither. The modeling assumption in the AQ & GHG Report which calculates construction emissions based on the use of Tier 4 equipment is therefore unsupported.

Additionally, Tier 4 "Final" represents the cleanest burning equipment and therefore has the lowest emissions compared to other tiers, including Tier 4 Interim equipment (see excerpt below):[12]

[11] See https://www.arb.ca.gov/msprog/offroadzone/pdfs/offroad_booklet.pdf at pp. 7-10).
[12] "San Francisco Clean Construction Ordinance Implementation Guide for San Francisco Public Projects." August 2015, *available at:* https://www.sfdph.org/dph/files/EHSdocs/AirQuality/San_Francisco_Clean_Construction_Ordinance_2015.pdf, p. 6.



Source: derived from California Air Resources Board, http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Stds.xls.

a) When ARB and USEPA standards differ, the standards shown here represent the more stringent of the two.
b) Standards given for all sizes of Tier 1 engines are hydrocarbons/oxides of nitrogen (NOx)/carbon monoxide (CO)/particulate matter (PM) in grams per brakehorspower per hour (g/bhp-hr).
c) Standards given for all sizes of Tier 2 and Tier 3 engines, and Tier 4 engines below 75 horsepower are non-methane hydrocarbons (NMHC)+NOx/CO/PM in g/bhp-hr.
d) Standards given for Tier 4 engines above 75 horsepower are NMHC/NOx/CO/PM in g/bhp-hr.
e) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
f) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
g) Certain manufacturers have agreed to comply with these standards by 2005.

As demonstrated in the figure above, Tier 4 Interim equipment has higher emission levels than Tier 4 Final equipment. Therefore, by modeling construction emissions assuming nearly a full Tier 4 Final equipment fleet, the AQ & GHG Report fails to account for higher emissions that may occur as a result of the use of Tier 4 Interim equipment. Since the AQ & GHG Report fails to specify whether the Project will use Tier 4 Interim or Tier 4 Final equipment, it is incorrect to model emissions assuming that the more efficient Tier 4 Final equipment would be implemented

Second, the same assertion regarding project design features, discussed above, applies. As the use of Tier 4 Final construction equipment is not formally included as a mitigation measure, the County cannot guarantee that Tier 4 Final emission standards would be implemented, monitored, and enforced on the Project site. Thus, the model's assumption that the entire off-road construction equipment fleet would meet Tier 4 Final emissions standards is incorrect and unsuppoted.

Failure to Evaluate Emissions from Decommissioning

According to the Staff Report:

> "[T]he Project includes the decommissioning and demolition of the existing thermal power facility and the redevelopment of the proposed PV solar facility within the existing solar site" (p. 10).

Furthermore, the AQ & GHG Technical Report states:

> "Construction-related emissions are based on the following: […]
>
> 2. Mobilization of the construction equipment may occur in the open spaces of the shared facilities area. Equipment and vehicle travels may also occur within the 1,019-acre project site and the shared facilities area during the decommissioning period" (p. 18).

However, while the AQ & GHG Technical Report states that construction emissions would result from decommissioning activities, the AQ & GHG Technical Report fails to explicitly mention or specify what demolition practices are required to decommission the existing solar facility. As such, we cannot verify that emissions associated with decommissioning were accurately modeled. Thus, the AQ & GHG Technical Report lacks evidence to support its conclusion that emissions associated with decommissioning would not exceed applicable MDAQMD thresholds.

Furthermore, the industry standard life span for solar panels is approximately 25 to 30 years. Therefore, some years after operation of the Project commences, the solar panels and associated structures will need to be removed, impacted soils will need to be restored, and debris will need to be hauled off-site. However, the AQ & GHG Technical Report fails to quantify emissions associated with future decommissioning, and the Project's proposed Conditions of Approval improperly defers analysis of the Project's future decommissioning impacts to creation of a post-approval Closure Plan.[13] As a result, the Project's air quality impacts have been inadequately evaluated. Until an adequate analysis is conducted that evaluates and quantifies these impacts, the emissions generated by future decommissioning activities remain unknown. As such, the Project should not be approved until an EIR is prepared to evaluate the emissions associated with decommissioning activities.

Updated Analysis Indicates a Potentially Significant Air Quality Impact

In an effort to more accurately estimate the Project's construction-related and operational emissions, we prepared updated CalEEMod models, using the Project-specific information provided by the Staff Report. In our updated model, we included the correct land use size and excluded the unsubstantiated Tier 4 Final and construction-related mitigation measures.

Our updated analysis estimates that the Project's construction-related NO_X emissions exceed the applicable MDAQMD threshold of 137 pounds per day ("lbs/day"), as referenced by the AQ & GHG Technical Report (see table below) (p. 20, Table 8).

Model	**NO_X**
Staff Report Construction	136.80
SWAPE Construction	204.03
% Increase	49%
MDAQMD Regional Threshold (lbs/day)	**137**
Threshold Exceeded?	***Yes***

As you can see in the excerpt above, the Project's construction-related NO_X emissions, as estimated by SWAPE, increase by approximately 49% and exceed the applicable MDAQMD significance threshold. Thus, our model demonstrates that the Project would result in potentially significant air quality impacts that were not previously identified or addressed in the AQ & GHG Report. As a result, an EIR should be prepared to adequately assess and mitigate the potential air quality impacts that the Project may have on the surrounding environment.

[13] See Staff Report, Exhibit C, Condition 54.

Greenhouse Gas & Energy

Failure to Adequately Evaluate Greenhouse Gas and Energy Impacts

The AQ & GHG Technical Report estimates that the Project would generate net annual construction-related and operational greenhouse gas ("GHG") emissions of 6,426- and 101-short tons of carbon dioxide equivalents per year ("tons CO_2e/year"), respectively, which would not exceed the MDAQMD threshold of 100,000 tons CO_2e/year (see excerpts below) (p. 26, Table 11-12).

Table 11. Estimated Short-Term Annual and Daily Construction Greenhouse Gas Emissions

Total Construction Period	CO_2e (short tons / year)	CO_2e (lbs / day)
Construction Emissions	6,426	85,879
MDAQMD Threshold	*100,000*	*548,000*
Threshold Exceeded?	**No**	**No**

Table 12. Estimated Annual and Daily Operational Greenhouse Gas Emissions

Maximum Annual / Daily	CO_2e (short tons / year)	CO_2e (lbs / day)
Area, Mobile, Waste, and Water	101	835
MDAQMD Threshold	*100,000*	*548,000*
Threshold Exceeded?	**No**	**No**

As a result, the AQ & GHG Technical Report concludes:

> Under the MDAQMD's CEQA thresholds for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA compliant analysis was completed for the GHG reduction plan. By meeting MDAQMD's significance thresholds and by providing renewable energy, the Project will assist San Bernardino County in achieving the requirements of the San Bernardino County GHG Reduction Plan (p. 26).

However, the AQ & GHG Technical Report's GHG analysis, as well as the subsequent less-than-significant impact conclusion, is incorrect for three reasons:

1) The Project documents and AQ & GHG Technical Report fail to evaluate the direct energy and GHG impacts from energy consumed by operating the BESS.
2) The AQ & GHG Technical Report fails to evaluate the indirect GHG emissions associated with the BESS; and
3) The AQ & GHG Technical Report fails to evaluate the Project's increase in energy capacity.

1) Failure to Describe BESS Operation and Direct Energy and Air Quality/GHG Impacts

Neither the Project Application nor the Staff Report clearly describe the BESS, its components, or its operational efficiency. The Project documents that have been provided to the public therefore contain no information or supporting evidence on the amount of electricity needed to operate the BESS, the storage efficiency of the BESS, or the expected energy output of the batteries (e.g. the percentage of the

original charging energy that will be available for discharge by the BESS after consuming energy to operate). This information is essential to estimate the direct energy and air quality/GHG impacts from operating the BESS as part of the Project.

The Project documents assert that the storage capacity of the BESS will total 150 MW, but do not explain how that capacity is calculated, and do not describe the BESS's storage efficiency. The overall storage efficiency (also called "round-trip efficiency")[14] addresses the amount of energy generation that is required to operate the BESS. Like any electrical device, BESS's consume energy to operate. Thus, in order to store energy, the Project's BESS would use some of the energy it absorbs for its own operation. As a result, the BESS will discharge less energy back to the grid than it initially absorbs, resulting in imperfect round-trip efficiency.

BESS's are not stand-alone generation sources and must buy electricity supplied by other generators to recharge and cover the round-trip efficiency losses experienced during cycles of charging and discharging.[15] This is a key difference in the operation of a BESS as compared to the solar PV facility, which generates its own electricity without the roundtrip inefficiency created by a BESS. The BESS, on the other hand, stores, uses, and redistributes energy that has been generated by another source. As a result of this inefficiency, the Project's BESS has direct energy and air quality impacts that must be analyzed pursuant to CEQA. The Project documents and AQ & GHG Technical Report fail to address these impacts.

2) Failure to Evaluate Indirect GHG Emissions Associated with the BESS

The AQ & GHG Technical Report fails to mention or evaluate the indirect GHG emissions associated with the proposed BESS. Specifically, according to the AQ & GHG Report:

> "Operation of the Project would generate GHG emissions through motor vehicle trips to and from the Project site, on-site maintenance, water usage, and waste generation" (p. 26).

However, as demonstrated above, the proposed Project fails to account for the energy usage associated with operation of the BESS. This, as well as the less-than-significant GHG impact conclusion, is incorrect for two reasons.

First, the batteries in the BESS would need to be charged with energy from the grid, which does not contain an 100% renewable energy mix, when the solar facility is not generating power.[16] Specifically,

---

[14] Round-trip efficiency is the battery system efficiency over one cycle, measured as the amount of energy discharged to a specified depth over the amount of energy consumed to bring the system back up to its specified initial state of charge. See U.S. Energy Information Administration|US. Battery Storage Market Trends, p. 14, available at https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf.

[15] *Id.* at p. 19.

[16] The Project Application and Staff Report loosely assert that the BESS will charge directly from the solar facility. However, there is no evidence in the record which supports this statement. Rather, the Staff Report states that the Project would "continue to utilize the existing 115Kv interconnection to the Kramer Junction Substation," indicating that the solar PV generation and BESS facilities will connect directly to the grid. See Staff Report, p. 11.

renewable energy constituted 33.09% of California's total energy mix in 2020.[17] As such, unless the developer commits to only charge the BESS with generation from the adjoining solar power plant, the proposed Project would increase GHG emissions.

Second, energy storage is not neutral in terms of energy use or emissions. Studies demonstrate that energy storage increases energy use due to "energy arbitrage," the practice of storing energy during Off-peak periods, when energy is cheapest, and discharging energy during Peak-periods, when energy is most expensive.[18] However, this occurs without regard to the electricity source that charges the battery. This poses a problem, as storing energy increases the value of the energy sources it draws from and, when discharged, decreases the value of the energy sources it competes against. Thus, if the BESS is charged at night with energy from the grid, rather than during the day from the solar facility, the BESS promotes the use of non-renewable energy.[19] As such, unless the developer commits to only charge the BESS with generation from the adjoining solar power plant, and demonstrates with substantial evidence that such a condition is feasible, the proposed Project would increase GHG emissions. As a result, the Project's GHG analysis should not be relied upon to determine Project

3) Failure to Acknowledge or Evaluate the Project's Increase in Energy Capacity

According to the Staff Report:

> "Together, Resurgence Solar I & II, the site previously occupied by SEGS III-VII, would provide up to a combined 150 MW of renewable electrical energy with up to 150 MW of battery energy storage, which is the same amount of electricity generated by the facility being replaced" (p. 9).

As demonstrated above, the Staff Report claims that the amount of generated electricity proposed for Resurgence Solar I & II is remaining the same as the previous facility, SEGS III-VII. Furthermore, the Staff Report states:

> Further, the use and incorporation of battery energy storage into the Project will not constitute an expansion of capacity since the use of BESS technology will be used in making the same end product as the existing utility system, viz., energy. Nor will the use of the BESS technology increase the daily total MW production into the grid (p. 12).

As demonstrated above, the Staff Report claims the Project would not constitute an expansion of capacity since the BESS would make the same end product and would not increase the daily total MW production into the grid. However, these claims are insufficient for two reasons.

---

[17] "2020 Total System Electric Generation." California Energy Commission, *available at:* https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation.

[18] Eric S. Hittinger and Ines M.L. Azevedo, *Bulk Energy Storage Increase United states Electricity System Emissions*, J. OF ENV. SCI. TECH. (2015) available at https://doi.org/10.1021/es505027p.

[19] Over 50% of the energy currently supplied to the CAISO grid is produced by fossil fuels, including predominantly natural gas. See CAISO Current Supply and Renewables, accessed 9/8/21, available at http://www.caiso.com/todaysoutlook/pages/supply.aspx.

First, the Staff Report's claim that "the use of BESS technology will be used in making the same end product" fails to address capacity whatsoever. Rather, the Staff Report reiterates that the BESS would be used to store energy, similar to the existing utility system. As such, this claim fails to clarify whether more energy will enter the grid as a result of the 150 MW produced by the solar facility, as well as the 150 MW stored in the BESS.

Second, the Staff Report's claim that the BESS would not "increase the daily total MW production into the grid" is misleading. While we acknowledge that the BESS would not itself produce energy which would be offloaded onto the grid (BESS's do not generate energy, they store and discharge existing energy), the incorporation of the BESS allows the proposed facility, or any facility that is able to send and store its electricity in the BESS, to potentially offload another 150 MW of stored energy on to the grid (minus energy lost due to the BESS's round-trip inefficiency).

Specifically, the old facility could produce 150 MW of energy, which could then be distributed. However, the proposed facility not only would produce 150 MW via solar panels, but also would be able to store 150 MW via the BESS, both of which could be distributed to the grid. As such, the total amount of potential energy that could enter that grid from the Project is 300 MW – double the SEGS's existing solar generation capacity. Thus, while energy production by the solar PV facility remains the same, the dispersion of potential energy (both produced by the solar PV facility and stored by the BESS) entering the grid increases. In other words, the storage capabilities of the BESS would allow the facility to potentially offload double – or nearly double, minus the energy used in operation of the BESS – the 150 MW of the former facility on to the grid. The Staff Report fails to distinguish between the Project's potential production and dispersion of energy, and therefore fails to acknowledge the increase in energy output capacity that will result from the Project's installation of both a solar PV facility and a BESS.

Until an EIR is prepared and includes an adequate analysis of the impacts of the proposed Project's increased energy capacity, the Project should not be approved.

Design Features Should Be Included as Mitigation Measures

Our analysis demonstrates that the Project would result in potentially significant construction-related air quality impacts that should be mitigated further. We recommend that the Staff Report implement all product design features ("PDFs"), such as the previously discussed fugitive dust control measures and Tier 4 Final emission standards, as formal mitigation measures. As a result, we could guarantee that these measures would be implemented, monitored, and enforced on the Project site. Including formal mitigation measures by properly committing to their implementation would result in verifiable emissions reductions that may help reduce emissions to less-than-significant levels.

Disclaimer

SWAPE has received limited discovery regarding this project. Additional information may become available in the future; thus, we retain the right to revise or amend this report when additional information becomes available. Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at the time of service. No other warranty, expressed or implied, is

made as to the scope of work, work methodologies and protocols, site conditions, analytical testing results, and findings presented. This report reflects efforts which were limited to information that was reasonably accessible at the time of the work, and may contain informational gaps, inconsistencies, or otherwise be incomplete due to the unavailability or uncertainty of information obtained or provided by third parties.

Sincerely,

Matt Hagemann, P.G., C.Hg.

Paul E. Rosenfeld, Ph.D.

Attachment A: CalEEMod Output Files
Attachment B: Matt Hagemann CV
Attachment C: Paul E. Rosenfeld CV

ATTACHMENT A

Resurgance Solar

Kern-Mojave Desert County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1,019.00	User Defined Unit	1,172.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the Project's model.

Land Use - See SWAPE comment regarding land use size.

Construction Phase - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Grading - Consistent with the Project's model.

Trips and VMT - Consistent with the Project's model.

Vehicle Trips - Consistent with the Project's model.

Energy Use -

Water And Wastewater - Consistent with the Project's model.

Solid Waste - Consistent with the Project's model.

Construction Off-road Equipment Mitigation - See SWAPE comment regarding Tier 4 and construction-related mitigation.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	43.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	65.00
tblConstructionPhase	NumDays	15,500.00	86.00
tblConstructionPhase	PhaseEndDate	4/26/2821	11/15/2022

tblConstructionPhase	PhaseEndDate	12/28/2736	9/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2060	3/16/2022
tblConstructionPhase	PhaseEndDate	11/12/2142	8/15/2022
tblConstructionPhase	PhaseEndDate	2/26/2779	10/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2083	6/15/2022
tblConstructionPhase	PhaseStartDate	2/27/2779	10/15/2022
tblConstructionPhase	PhaseStartDate	11/13/2142	8/16/2022
tblConstructionPhase	PhaseStartDate	6/15/2083	6/16/2022
tblConstructionPhase	PhaseStartDate	12/29/2736	9/15/2022
tblConstructionPhase	PhaseStartDate	6/15/2060	3/17/2022
tblGrading	AcresOfGrading	195.00	250.00
tblGrading	AcresOfGrading	44.00	90.00
tblLandUse	LotAcreage	0.00	1,172.00
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders

tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	12.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00

tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	90.00	200.00
tblTripsAndVMT	WorkerTripNumber	148.00	500.00
tblTripsAndVMT	WorkerTripNumber	133.00	500.00

tblTripsAndVMT	WorkerTripNumber	133.00	400.00
tblTripsAndVMT	WorkerTripNumber	58.00	350.00
tblTripsAndVMT	WorkerTripNumber	33.00	150.00
tblTripsAndVMT	WorkerTripNumber	28.00	100.00
tblVehicleTrips	CW_TL	14.70	60.00
tblVehicleTrips	CW_TTP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.01
tblWater	OutdoorWaterUseRate	0.00	325,851.00

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					
2022	1.9520	15.9982	15.0282	0.0600	3.6470	0.5474	4.1945	1.1732	0.5049	1.6781	0.0000	5,431.3908	5,431.3908	0.8106	0.0000	5,451.6554
2023	0.1560	1.2323	1.2178	4.0300e-003	0.4155	0.0471	0.4626	0.1377	0.0433	0.1810	0.0000	361.2398	361.2398	0.0702	0.0000	362.9937
Maximum	**1.9520**	**15.9982**	**15.0282**	**0.0600**	**3.6470**	**0.5474**	**4.1945**	**1.1732**	**0.5049**	**1.6781**	**0.0000**	**5,431.3908**	**5,431.3908**	**0.8106**	**0.0000**	**5,451.6554**

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					
2022	1.9520	15.9982	15.0282	0.0600	3.6470	0.5474	4.1945	1.1732	0.5049	1.6781	0.0000	5,431.3880	5,431.3880	0.8106	0.0000	5,451.6526
2023	0.1560	1.2323	1.2178	4.0300e-003	0.4155	0.0471	0.4626	0.1377	0.0433	0.1810	0.0000	361.2395	361.2395	0.0702	0.0000	362.9934
Maximum	**1.9520**	**15.9982**	**15.0282**	**0.0600**	**3.6470**	**0.5474**	**4.1945**	**1.1732**	**0.5049**	**1.6781**	**0.0000**	**5,431.3880**	**5,431.3880**	**0.8106**	**0.0000**	**5,451.6526**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	2-15-2022	5-14-2022	6.6176	6.6176
2	5-15-2022	8-14-2022	6.2636	6.2636
3	8-15-2022	11-14-2022	4.5528	4.5528
4	11-15-2022	2-14-2023	1.8743	1.8743
5	2-15-2023	5-14-2023	0.5453	0.5453
		Highest	6.6176	6.6176

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	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194
Energy	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
Mobile	8.4300e-003	0.0842	0.1369	9.1000e-004	0.0614	5.3000e-004	0.0619	0.0165	5.0000e-004	0.0170	0.0000	84.7384	84.7384	2.1600e-003	0.0000	84.7925
Waste						0.0000	0.0000		0.0000	0.0000	2.4359	0.0000	2.4359	0.1440	0.0000	6.0348
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.1535	1.1535	5.0000e-005	1.0000e-005	1.1576
Total	**9.3000e-003**	**0.0843**	**0.1463**	**9.1000e-004**	**0.0614**	**5.6000e-004**	**0.0619**	**0.0165**	**5.3000e-004**	**0.0170**	**2.4359**	**85.9101**	**88.3460**	**0.1462**	**1.0000e-005**	**92.0043**

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	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194
Energy	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
Mobile	8.4300e-003	0.0842	0.1369	9.1000e-004	0.0614	5.3000e-004	0.0619	0.0165	5.0000e-004	0.0170	0.0000	84.7384	84.7384	2.1600e-003	0.0000	84.7925
Waste						0.0000	0.0000		0.0000	0.0000	2.4359	0.0000	2.4359	0.1440	0.0000	6.0348
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.1535	1.1535	5.0000e-005	1.0000e-005	1.1576
Total	**9.3000e-003**	**0.0843**	**0.1463**	**9.1000e-004**	**0.0614**	**5.6000e-004**	**0.0619**	**0.0165**	**5.3000e-004**	**0.0170**	**2.4359**	**85.9101**	**88.3460**	**0.1462**	**1.0000e-005**	**92.0043**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Month 1	Grading	2/15/2022	3/16/2022	5	22	
2	Month 2-4	Grading	3/17/2022	6/15/2022	5	65	
3	Month 5-6	Grading	6/16/2022	8/15/2022	5	43	
4	Month 7	Grading	8/16/2022	9/14/2022	5	22	
5	Month 8	Grading	9/15/2022	10/14/2022	5	22	
6	Month 9	Grading	10/15/2022	11/15/2022	5	22	
7	Month 10-13	Grading	11/16/2022	3/15/2023	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Month 5-6	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 5-6	Welders	2	8.00	46	0.45
Month 7	Aerial Lifts	1	8.00	63	0.31
Month 7	Bore/Drill Rigs	12	8.00	221	0.50
Month 7	Forklifts	16	8.00	89	0.20
Month 7	Off-Highway Trucks	6	8.00	402	0.38
Month 7	Skid Steer Loaders	5	8.00	65	0.37
Month 7	Welders	2	8.00	46	0.45
Month 8	Forklifts	7	8.00	89	0.20

Month 8	Off-Highway Trucks	6	8.00	402	0.38
Month 8	Skid Steer Loaders	2	8.00	65	0.37
Month 9	Forklifts	1	8.00	89	0.20
Month 9	Off-Highway Trucks	4	8.00	402	0.38
Month 10-13	Forklifts	1	8.00	89	0.20
Month 10-13	Off-Highway Trucks	2	8.00	402	0.38
Month 1	Excavators	2	8.00	158	0.38
Month 1	Scrapers	1	8.00	367	0.48
Month 2-4	Excavators	2	8.00	158	0.38
Month 2-4	Scrapers	2	8.00	367	0.48
Month 5-6	Excavators	2	8.00	158	0.38
Month 5-6	Graders	1	8.00	187	0.41
Month 5-6	Rubber Tired Dozers	1	8.00	247	0.40
Month 5-6	Scrapers	2	8.00	367	0.48
Month 7	Excavators	2	8.00	158	0.38
Month 7	Graders	1	8.00	187	0.41
Month 7	Rubber Tired Dozers	1	8.00	247	0.40
Month 7	Scrapers	2	8.00	367	0.48
Month 8	Excavators	2	8.00	158	0.38
Month 8	Graders	1	8.00	187	0.41
Month 8	Rubber Tired Dozers	1	8.00	247	0.40
Month 8	Scrapers	2	8.00	367	0.48
Month 2-4	Bore/Drill Rigs	12	8.00	221	0.50
Month 2-4	Cranes	1	8.00	231	0.29
Month 1	Rubber Tired Dozers	2	8.00	247	0.40
Month 7	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 2-4	Tractors/Loaders/Backhoes	5	8.00	97	0.37

Month 2-4	Rubber Tired Dozers	2	8.00	247	0.40
Month 2-4	Rollers	1	8.00	80	0.38
Month 9	Excavators	2	8.00	158	0.38
Month 10-13	Excavators	2	8.00	158	0.38
Month 1	Graders	2	8.00	187	0.41
Month 2-4	Graders	2	8.00	187	0.41
Month 9	Graders	1	8.00	187	0.41
Month 10-13	Graders	1	8.00	187	0.41
Month 9	Rubber Tired Dozers	1	8.00	247	0.40
Month 10-13	Rubber Tired Dozers	1	8.00	247	0.40
Month 2-4	Forklifts	16	8.00	89	0.20
Month 5-6	Aerial Lifts	1	8.00	63	0.31
Month 9	Scrapers	2	8.00	367	0.48
Month 10-13	Scrapers	2	8.00	367	0.48
Month 1	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 8	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 9	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 10-13	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 1	Aerial Lifts	1	8.00	63	0.31
Month 1	Cranes	2	8.00	231	0.29
Month 1	Forklifts	4	8.00	89	0.20
Month 1	Off-Highway Trucks	4	8.00	402	0.38
Month 1	Rollers	1	8.00	80	0.38
Month 1	Rubber Tired Loaders	2	8.00	203	0.36
Month 1	Skid Steer Loaders	7	8.00	65	0.37
Month 1	Trenchers	3	8.00	78	0.50
Month 2-4	Off-Highway Trucks	4	8.00	402	0.38

Month 2-4	Rubber Tired Loaders	2	8.00	203	0.36
Month 2-4	Skid Steer Loaders	5	8.00	65	0.37
Month 2-4	Trenchers	3	8.00	78	0.50
Month 2-4	Welders	2	8.00	46	0.45
Month 5-6	Bore/Drill Rigs	12	8.00	221	0.50
Month 5-6	Forklifts	16	8.00	89	0.20
Month 5-6	Off-Highway Trucks	6	8.00	402	0.38
Month 5-6	Skid Steer Loaders	5	8.00	65	0.37

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
Month 1	36	200.00	0.00	800.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 2-4	59	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 5-6	53	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 7	53	400.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 8	23	350.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 9	13	150.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 10-13	11	100.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Month 1 - 2022

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					0.1802	0.0000	0.1802	0.0780	0.0000	0.0780	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1125	1.1286	0.8805	2.0200e-003		0.0509	0.0509		0.0468	0.0468	0.0000	177.1329	177.1329	0.0573	0.0000	178.5651
Total	**0.1125**	**1.1286**	**0.8805**	**2.0200e-003**	**0.1802**	**0.0509**	**0.2311**	**0.0780**	**0.0468**	**0.1248**	**0.0000**	**177.1329**	**177.1329**	**0.0573**	**0.0000**	**178.5651**

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	0.0157	0.4337	0.0851	1.9900e-003	0.0517	1.8700e-003	0.0536	0.0142	1.7900e-003	0.0160	0.0000	189.5253	189.5253	2.5300e-003	0.0000	189.5884
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	0.0312	0.0226	0.2236	9.1000e-004	0.0984	5.9000e-004	0.0990	0.0261	5.5000e-004	0.0267	0.0000	82.0690	82.0690	1.6700e-003	0.0000	82.1108
Total	**0.0469**	**0.4563**	**0.3086**	**2.9000e-003**	**0.1501**	**2.4600e-003**	**0.1525**	**0.0403**	**2.3400e-003**	**0.0427**	**0.0000**	**271.5943**	**271.5943**	**4.2000e-003**	**0.0000**	**271.6992**

3.2 Month 1 - 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					
Fugitive Dust					0.1802	0.0000	0.1802	0.0780	0.0000	0.0780	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1125	1.1286	0.8805	2.0200e-003		0.0509	0.0509		0.0468	0.0468	0.0000	177.1327	177.1327	0.0573	0.0000	178.5649
Total	**0.1125**	**1.1286**	**0.8805**	**2.0200e-003**	**0.1802**	**0.0509**	**0.2311**	**0.0780**	**0.0468**	**0.1248**	**0.0000**	**177.1327**	**177.1327**	**0.0573**	**0.0000**	**178.5649**

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	0.0157	0.4337	0.0851	1.9900e-003	0.0517	1.8700e-003	0.0536	0.0142	1.7900e-003	0.0160	0.0000	189.5253	189.5253	2.5300e-003	0.0000	189.5884
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	0.0312	0.0226	0.2236	9.1000e-004	0.0984	5.9000e-004	0.0990	0.0261	5.5000e-004	0.0267	0.0000	82.0690	82.0690	1.6700e-003	0.0000	82.1108
Total	**0.0469**	**0.4563**	**0.3086**	**2.9000e-003**	**0.1501**	**2.4600e-003**	**0.1525**	**0.0403**	**2.3400e-003**	**0.0427**	**0.0000**	**271.5943**	**271.5943**	**4.2000e-003**	**0.0000**	**271.6992**

3.3 Month 2-4 - 2022

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					0.5240	0.0000	0.5240	0.2295	0.0000	0.2295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4910	4.8009	3.9776	0.0105		0.2132	0.2132		0.1965	0.1965	0.0000	921.4370	921.4370	0.2955	0.0000	928.8250
Total	**0.4910**	**4.8009**	**3.9776**	**0.0105**	**0.5240**	**0.2132**	**0.7372**	**0.2295**	**0.1965**	**0.4259**	**0.0000**	**921.4370**	**921.4370**	**0.2955**	**0.0000**	**928.8250**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.2305	0.1672	1.6514	6.7000e-003	0.7268	4.3900e-003	0.7311	0.1930	4.0400e-003	0.1970	0.0000	606.1916	606.1916	0.0123	0.0000	606.4999
Total	**0.2618**	**1.0318**	**1.8210**	**0.0107**	**0.8298**	**8.1200e-003**	**0.8379**	**0.2213**	**7.6100e-003**	**0.2289**	**0.0000**	**984.0576**	**984.0576**	**0.0174**	**0.0000**	**984.4919**

3.3 Month 2-4 - 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					
Fugitive Dust					0.5240	0.0000	0.5240	0.2295	0.0000	0.2295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4910	4.8009	3.9776	0.0105		0.2132	0.2132		0.1965	0.1965	0.0000	921.4359	921.4359	0.2955	0.0000	928.8239
Total	**0.4910**	**4.8009**	**3.9776**	**0.0105**	**0.5240**	**0.2132**	**0.7372**	**0.2295**	**0.1965**	**0.4259**	**0.0000**	**921.4359**	**921.4359**	**0.2955**	**0.0000**	**928.8239**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.2305	0.1672	1.6514	6.7000e-003	0.7268	4.3900e-003	0.7311	0.1930	4.0400e-003	0.1970	0.0000	606.1916	606.1916	0.0123	0.0000	606.4999
Total	**0.2618**	**1.0318**	**1.8210**	**0.0107**	**0.8298**	**8.1200e-003**	**0.8379**	**0.2213**	**7.6100e-003**	**0.2289**	**0.0000**	**984.0576**	**984.0576**	**0.0174**	**0.0000**	**984.4919**

3.4 Month 5-6 - 2022

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					0.1865	0.0000	0.1865	0.0773	0.0000	0.0773	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2738	2.5834	2.3711	6.5700e-003		0.1093	0.1093		0.1008	0.1008	0.0000	575.3779	575.3779	0.1844	0.0000	579.9889
Total	**0.2738**	**2.5834**	**2.3711**	**6.5700e-003**	**0.1865**	**0.1093**	**0.2958**	**0.0773**	**0.1008**	**0.1781**	**0.0000**	**575.3779**	**575.3779**	**0.1844**	**0.0000**	**579.9889**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.1525	0.1106	1.0925	4.4300e-003	0.4808	2.9000e-003	0.4837	0.1277	2.6700e-003	0.1303	0.0000	401.0191	401.0191	8.1600e-003	0.0000	401.2230
Total	**0.1837**	**0.9752**	**1.2621**	**8.4000e-003**	**0.5838**	**6.6300e-003**	**0.5904**	**0.1560**	**6.2400e-003**	**0.1622**	**0.0000**	**778.8851**	**778.8851**	**0.0132**	**0.0000**	**779.2150**

3.4 Month 5-6 - 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					
Fugitive Dust					0.1865	0.0000	0.1865	0.0773	0.0000	0.0773	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2738	2.5834	2.3711	6.5700e-003		0.1093	0.1093		0.1008	0.1008	0.0000	575.3772	575.3772	0.1844	0.0000	579.9882
Total	**0.2738**	**2.5834**	**2.3711**	**6.5700e-003**	**0.1865**	**0.1093**	**0.2958**	**0.0773**	**0.1008**	**0.1781**	**0.0000**	**575.3772**	**575.3772**	**0.1844**	**0.0000**	**579.9882**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.1525	0.1106	1.0925	4.4300e-003	0.4808	2.9000e-003	0.4837	0.1277	2.6700e-003	0.1303	0.0000	401.0191	401.0191	8.1600e-003	0.0000	401.2230
Total	**0.1837**	**0.9752**	**1.2621**	**8.4000e-003**	**0.5838**	**6.6300e-003**	**0.5904**	**0.1560**	**6.2400e-003**	**0.1622**	**0.0000**	**778.8851**	**778.8851**	**0.0132**	**0.0000**	**779.2150**

3.5 Month 7 - 2022

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					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1401	1.3217	1.2131	3.3600e-003		0.0559	0.0559		0.0516	0.0516	0.0000	294.3794	294.3794	0.0944	0.0000	296.7385
Total	**0.1401**	**1.3217**	**1.2131**	**3.3600e-003**	**0.0954**	**0.0559**	**0.1513**	**0.0396**	**0.0516**	**0.0911**	**0.0000**	**294.3794**	**294.3794**	**0.0944**	**0.0000**	**296.7385**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.0624	0.0453	0.4472	1.8100e-003	0.1968	1.1900e-003	0.1980	0.0523	1.0900e-003	0.0533	0.0000	164.1380	164.1380	3.3400e-003	0.0000	164.2215
Total	**0.0937**	**0.9099**	**0.6168**	**5.7800e-003**	**0.2998**	**4.9200e-003**	**0.3047**	**0.0806**	**4.6600e-003**	**0.0852**	**0.0000**	**542.0041**	**542.0041**	**8.3800e-003**	**0.0000**	**542.2135**

3.5 Month 7 - 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					
Fugitive Dust					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1401	1.3217	1.2131	3.3600e-003		0.0559	0.0559		0.0516	0.0516	0.0000	294.3790	294.3790	0.0944	0.0000	296.7382
Total	**0.1401**	**1.3217**	**1.2131**	**3.3600e-003**	**0.0954**	**0.0559**	**0.1513**	**0.0396**	**0.0516**	**0.0911**	**0.0000**	**294.3790**	**294.3790**	**0.0944**	**0.0000**	**296.7382**

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	0.0313	0.8646	0.1696	3.9700e-003	0.1030	3.7300e-003	0.1068	0.0283	3.5700e-003	0.0319	0.0000	377.8660	377.8660	5.0400e-003	0.0000	377.9920
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	0.0624	0.0453	0.4472	1.8100e-003	0.1968	1.1900e-003	0.1980	0.0523	1.0900e-003	0.0533	0.0000	164.1380	164.1380	3.3400e-003	0.0000	164.2215
Total	**0.0937**	**0.9099**	**0.6168**	**5.7800e-003**	**0.2998**	**4.9200e-003**	**0.3047**	**0.0806**	**4.6600e-003**	**0.0852**	**0.0000**	**542.0041**	**542.0041**	**8.3800e-003**	**0.0000**	**542.2135**

3.6 Month 8 - 2022

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					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0850	0.7938	0.6605	1.7200e-003		0.0338	0.0338		0.0311	0.0311	0.0000	150.9061	150.9061	0.0488	0.0000	152.1263
Total	**0.0850**	**0.7938**	**0.6605**	**1.7200e-003**	**0.0954**	**0.0338**	**0.1292**	**0.0396**	**0.0311**	**0.0706**	**0.0000**	**150.9061**	**150.9061**	**0.0488**	**0.0000**	**152.1263**

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	7.8400e-003	0.2168	0.0425	1.0000e-003	0.0258	9.4000e-004	0.0268	7.1000e-003	8.9000e-004	7.9900e-003	0.0000	94.7626	94.7626	1.2600e-003	0.0000	94.7942
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	0.0546	0.0396	0.3913	1.5900e-003	0.1722	1.0400e-003	0.1732	0.0457	9.6000e-004	0.0467	0.0000	143.6208	143.6208	2.9200e-003	0.0000	143.6938
Total	**0.0625**	**0.2564**	**0.4338**	**2.5900e-003**	**0.1980**	**1.9800e-003**	**0.2000**	**0.0528**	**1.8500e-003**	**0.0547**	**0.0000**	**238.3834**	**238.3834**	**4.1800e-003**	**0.0000**	**238.4881**

3.6 Month 8 - 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					
Fugitive Dust					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0850	0.7938	0.6605	1.7200e-003		0.0338	0.0338		0.0311	0.0311	0.0000	150.9059	150.9059	0.0488	0.0000	152.1261
Total	**0.0850**	**0.7938**	**0.6605**	**1.7200e-003**	**0.0954**	**0.0338**	**0.1292**	**0.0396**	**0.0311**	**0.0706**	**0.0000**	**150.9059**	**150.9059**	**0.0488**	**0.0000**	**152.1261**

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	7.8400e-003	0.2168	0.0425	1.0000e-003	0.0258	9.4000e-004	0.0268	7.1000e-003	8.9000e-004	7.9900e-003	0.0000	94.7626	94.7626	1.2600e-003	0.0000	94.7942
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	0.0546	0.0396	0.3913	1.5900e-003	0.1722	1.0400e-003	0.1732	0.0457	9.6000e-004	0.0467	0.0000	143.6208	143.6208	2.9200e-003	0.0000	143.6938
Total	**0.0625**	**0.2564**	**0.4338**	**2.5900e-003**	**0.1980**	**1.9800e-003**	**0.2000**	**0.0528**	**1.8500e-003**	**0.0547**	**0.0000**	**238.3834**	**238.3834**	**4.1800e-003**	**0.0000**	**238.4881**

3.7 Month 9 - 2022

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					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0644	0.6155	0.4799	1.2800e-003		0.0252	0.0252		0.0232	0.0232	0.0000	112.5174	112.5174	0.0364	0.0000	113.4272
Total	**0.0644**	**0.6155**	**0.4799**	**1.2800e-003**	**0.0954**	**0.0252**	**0.1206**	**0.0396**	**0.0232**	**0.0627**	**0.0000**	**112.5174**	**112.5174**	**0.0364**	**0.0000**	**113.4272**

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	7.8400e-003	0.2168	0.0425	1.0000e-003	0.0258	9.4000e-004	0.0268	7.1000e-003	8.9000e-004	7.9900e-003	0.0000	94.7626	94.7626	1.2600e-003	0.0000	94.7942
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	0.0234	0.0170	0.1677	6.8000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.1000e-004	0.0200	0.0000	61.5518	61.5518	1.2500e-003	0.0000	61.5831
Total	**0.0312**	**0.2338**	**0.2102**	**1.6800e-003**	**0.0996**	**1.3900e-003**	**0.1010**	**0.0267**	**1.3000e-003**	**0.0280**	**0.0000**	**156.3144**	**156.3144**	**2.5100e-003**	**0.0000**	**156.3773**

3.7 Month 9 - 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					
Fugitive Dust					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0644	0.6155	0.4799	1.2800e-003		0.0252	0.0252		0.0232	0.0232	0.0000	112.5173	112.5173	0.0364	0.0000	113.4270
Total	**0.0644**	**0.6155**	**0.4799**	**1.2800e-003**	**0.0954**	**0.0252**	**0.1206**	**0.0396**	**0.0232**	**0.0627**	**0.0000**	**112.5173**	**112.5173**	**0.0364**	**0.0000**	**113.4270**

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	7.8400e-003	0.2168	0.0425	1.0000e-003	0.0258	9.4000e-004	0.0268	7.1000e-003	8.9000e-004	7.9900e-003	0.0000	94.7626	94.7626	1.2600e-003	0.0000	94.7942
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	0.0234	0.0170	0.1677	6.8000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.1000e-004	0.0200	0.0000	61.5518	61.5518	1.2500e-003	0.0000	61.5831
Total	**0.0312**	**0.2338**	**0.2102**	**1.6800e-003**	**0.0996**	**1.3900e-003**	**0.1010**	**0.0267**	**1.3000e-003**	**0.0280**	**0.0000**	**156.3144**	**156.3144**	**2.5100e-003**	**0.0000**	**156.3773**

3.8 Month 10-13 - 2022

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					0.2134	0.0000	0.2134	0.0669	0.0000	0.0669	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0791	0.7908	0.6091	1.4900e-003		0.0330	0.0330		0.0303	0.0303	0.0000	130.4870	130.4870	0.0422	0.0000	131.5421
Total	**0.0791**	**0.7908**	**0.6091**	**1.4900e-003**	**0.2134**	**0.0330**	**0.2463**	**0.0669**	**0.0303**	**0.0972**	**0.0000**	**130.4870**	**130.4870**	**0.0422**	**0.0000**	**131.5421**

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	3.0100e-003	0.0832	0.0163	3.8000e-004	0.0219	3.6000e-004	0.0222	5.6600e-003	3.4000e-004	6.0000e-003	0.0000	36.3624	36.3624	4.8000e-004	0.0000	36.3745
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	0.0234	0.0170	0.1677	6.8000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.1000e-004	0.0200	0.0000	61.5518	61.5518	1.2500e-003	0.0000	61.5831
Total	**0.0264**	**0.1002**	**0.1840**	**1.0600e-003**	**0.0957**	**8.1000e-004**	**0.0965**	**0.0253**	**7.5000e-004**	**0.0260**	**0.0000**	**97.9142**	**97.9142**	**1.7300e-003**	**0.0000**	**97.9576**

3.8 Month 10-13 - 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					
Fugitive Dust					0.2134	0.0000	0.2134	0.0669	0.0000	0.0669	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0791	0.7908	0.6091	1.4900e-003		0.0330	0.0330		0.0303	0.0303	0.0000	130.4869	130.4869	0.0422	0.0000	131.5419
Total	**0.0791**	**0.7908**	**0.6091**	**1.4900e-003**	**0.2134**	**0.0330**	**0.2463**	**0.0669**	**0.0303**	**0.0972**	**0.0000**	**130.4869**	**130.4869**	**0.0422**	**0.0000**	**131.5419**

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	3.0100e-003	0.0832	0.0163	3.8000e-004	0.0219	3.6000e-004	0.0222	5.6600e-003	3.4000e-004	6.0000e-003	0.0000	36.3624	36.3624	4.8000e-004	0.0000	36.3745
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	0.0234	0.0170	0.1677	6.8000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.1000e-004	0.0200	0.0000	61.5518	61.5518	1.2500e-003	0.0000	61.5831
Total	**0.0264**	**0.1002**	**0.1840**	**1.0600e-003**	**0.0957**	**8.1000e-004**	**0.0965**	**0.0253**	**7.5000e-004**	**0.0260**	**0.0000**	**97.9142**	**97.9142**	**1.7300e-003**	**0.0000**	**97.9576**

3.8 Month 10-13 - 2023

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					0.2736	0.0000	0.2736	0.1000	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1175	1.1292	0.9480	2.3900e-003		0.0462	0.0462		0.0425	0.0425	0.0000	209.6151	209.6151	0.0678	0.0000	211.3099
Total	**0.1175**	**1.1292**	**0.9480**	**2.3900e-003**	**0.2736**	**0.0462**	**0.3198**	**0.1000**	**0.0425**	**0.1425**	**0.0000**	**209.6151**	**209.6151**	**0.0678**	**0.0000**	**211.3099**

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	3.3800e-003	0.0786	0.0227	5.9000e-004	0.0234	2.4000e-004	0.0236	6.2000e-003	2.3000e-004	6.4300e-003	0.0000	56.4930	56.4930	5.7000e-004	0.0000	56.5072
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	0.0352	0.0245	0.2471	1.0500e-003	0.1185	7.0000e-004	0.1192	0.0315	6.4000e-004	0.0321	0.0000	95.1316	95.1316	1.8000e-003	0.0000	95.1766
Total	**0.0386**	**0.1031**	**0.2698**	**1.6400e-003**	**0.1419**	**9.4000e-004**	**0.1428**	**0.0377**	**8.7000e-004**	**0.0385**	**0.0000**	**151.6247**	**151.6247**	**2.3700e-003**	**0.0000**	**151.6838**

3.8 Month 10-13 - 2023

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					0.2736	0.0000	0.2736	0.1000	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1175	1.1292	0.9480	2.3900e-003		0.0462	0.0462		0.0425	0.0425	0.0000	209.6148	209.6148	0.0678	0.0000	211.3097
Total	**0.1175**	**1.1292**	**0.9480**	**2.3900e-003**	**0.2736**	**0.0462**	**0.3198**	**0.1000**	**0.0425**	**0.1425**	**0.0000**	**209.6148**	**209.6148**	**0.0678**	**0.0000**	**211.3097**

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	3.3800e-003	0.0786	0.0227	5.9000e-004	0.0234	2.4000e-004	0.0236	6.2000e-003	2.3000e-004	6.4300e-003	0.0000	56.4930	56.4930	5.7000e-004	0.0000	56.5072
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	0.0352	0.0245	0.2471	1.0500e-003	0.1185	7.0000e-004	0.1192	0.0315	6.4000e-004	0.0321	0.0000	95.1316	95.1316	1.8000e-003	0.0000	95.1766
Total	**0.0386**	**0.1031**	**0.2698**	**1.6400e-003**	**0.1419**	**9.4000e-004**	**0.1428**	**0.0377**	**8.7000e-004**	**0.0385**	**0.0000**	**151.6247**	**151.6247**	**2.3700e-003**	**0.0000**	**151.6838**

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	8.4300e-003	0.0842	0.1369	9.1000e-004	0.0614	5.3000e-004	0.0619	0.0165	5.0000e-004	0.0170	0.0000	84.7384	84.7384	2.1600e-003	0.0000	84.7925
Unmitigated	8.4300e-003	0.0842	0.1369	9.1000e-004	0.0614	5.3000e-004	0.0619	0.0165	5.0000e-004	0.0170	0.0000	84.7384	84.7384	2.1600e-003	0.0000	84.7925

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	10.19	0.00	0.00	158,964	158,964
Total	10.19	0.00	0.00	158,964	158,964

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
User Defined Industrial	60.00	6.60	6.60	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.487920	0.030073	0.170877	0.112061	0.016651	0.005572	0.019337	0.146855	0.001612	0.001610	0.005760	0.000912	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures 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	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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					
User Defined Industrial	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
Total		**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**

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					
User Defined Industrial	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
Total		**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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	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

	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	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194
Unmitigated	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194

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	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194
Total	**8.7000e-004**	**9.0000e-005**	**9.3600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0182**	**0.0182**	**5.0000e-005**	**0.0000**	**0.0194**

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	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.7000e-004	9.0000e-005	9.3600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0182	0.0182	5.0000e-005	0.0000	0.0194
Total	**8.7000e-004**	**9.0000e-005**	**9.3600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0182**	**0.0182**	**5.0000e-005**	**0.0000**	**0.0194**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.1535	5.0000e-005	1.0000e-005	1.1576
Unmitigated	1.1535	5.0000e-005	1.0000e-005	1.1576

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0.325851	1.1535	5.0000e-005	1.0000e-005	1.1576
Total		**1.1535**	**5.0000e-005**	**1.0000e-005**	**1.1576**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0.325851	1.1535	5.0000e-005	1.0000e-005	1.1576
Total		**1.1535**	**5.0000e-005**	**1.0000e-005**	**1.1576**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.4359	0.1440	0.0000	6.0348
Unmitigated	2.4359	0.1440	0.0000	6.0348

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	12	2.4359	0.1440	0.0000	6.0348
Total		**2.4359**	**0.1440**	**0.0000**	**6.0348**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	12	2.4359	0.1440	0.0000	6.0348
Total		**2.4359**	**0.1440**	**0.0000**	**6.0348**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Resurgance Solar

Kern-Mojave Desert County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1,019.00	User Defined Unit	1,172.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the Project's model.

Land Use - See SWAPE comment regarding land use size.

Construction Phase - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Grading - Consistent with the Project's model.

Trips and VMT - Consistent with the Project's model.

Vehicle Trips - Consistent with the Project's model.

Energy Use -

Water And Wastewater - Consistent with the Project's model.

Solid Waste - Consistent with the Project's model.

Construction Off-road Equipment Mitigation - See SWAPE comment regarding Tier 4 and construction-related mitigation.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	43.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	65.00
tblConstructionPhase	NumDays	15,500.00	86.00
tblConstructionPhase	PhaseEndDate	4/26/2821	11/15/2022

tblConstructionPhase	PhaseEndDate	12/28/2736	9/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2060	3/16/2022
tblConstructionPhase	PhaseEndDate	11/12/2142	8/15/2022
tblConstructionPhase	PhaseEndDate	2/26/2779	10/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2083	6/15/2022
tblConstructionPhase	PhaseStartDate	2/27/2779	10/15/2022
tblConstructionPhase	PhaseStartDate	11/13/2142	8/16/2022
tblConstructionPhase	PhaseStartDate	6/15/2083	6/16/2022
tblConstructionPhase	PhaseStartDate	12/29/2736	9/15/2022
tblConstructionPhase	PhaseStartDate	6/15/2060	3/17/2022
tblGrading	AcresOfGrading	195.00	250.00
tblGrading	AcresOfGrading	44.00	90.00
tblLandUse	LotAcreage	0.00	1,172.00
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders

tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	12.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00

tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	90.00	200.00
tblTripsAndVMT	WorkerTripNumber	148.00	500.00
tblTripsAndVMT	WorkerTripNumber	133.00	500.00

tblTripsAndVMT	WorkerTripNumber	133.00	400.00
tblTripsAndVMT	WorkerTripNumber	58.00	350.00
tblTripsAndVMT	WorkerTripNumber	33.00	150.00
tblTripsAndVMT	WorkerTripNumber	28.00	100.00
tblVehicleTrips	CW_TL	14.70	60.00
tblVehicleTrips	CW_TTP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.01
tblWater	OutdoorWaterUseRate	0.00	325,851.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	23.4641	198.9947	190.6846	0.8496	42.1427	6.8093	48.9520	13.9885	6.2791	20.2676	0.0000	85,620.5861	85,620.5861	10.6714	0.0000	85,878.8616
2023	5.9413	46.3093	48.2273	0.1564	14.1308	1.7770	15.9078	5.0433	1.6352	6.6785	0.0000	15,449.6096	15,449.6096	2.9291	0.0000	15,522.8372
Maximum	**23.4641**	**198.9947**	**190.6846**	**0.8496**	**42.1427**	**6.8093**	**48.9520**	**13.9885**	**6.2791**	**20.2676**	**0.0000**	**85,620.5861**	**85,620.5861**	**10.6714**	**0.0000**	**85,878.8616**

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	lb/day										lb/day					
2022	23.4641	198.9947	190.6846	0.8496	42.1427	6.8093	48.9520	13.9885	6.2791	20.2676	0.0000	85,620.5861	85,620.5861	10.6714	0.0000	85,878.8615
2023	5.9413	46.3093	48.2273	0.1564	14.1308	1.7770	15.9078	5.0433	1.6352	6.6785	0.0000	15,449.6096	15,449.6096	2.9291	0.0000	15,522.8372
Maximum	**23.4641**	**198.9947**	**190.6846**	**0.8496**	**42.1427**	**6.8093**	**48.9520**	**13.9885**	**6.2791**	**20.2676**	**0.0000**	**85,620.5861**	**85,620.5861**	**10.6714**	**0.0000**	**85,878.8615**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**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	lb/day										lb/day					
Area	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Energy	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
Mobile	0.0697	0.6213	1.2328	7.4000e-003	0.4809	4.0900e-003	0.4850	0.1291	3.8400e-003	0.1330		756.7834	756.7834	0.0190		757.2580
Total	**0.0793**	**0.6222**	**1.3368**	**7.4100e-003**	**0.4809**	**4.4600e-003**	**0.4853**	**0.1291**	**4.2100e-003**	**0.1334**		**757.0065**	**757.0065**	**0.0196**	**0.0000**	**757.4956**

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	lb/day										lb/day					
Area	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Energy	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
Mobile	0.0697	0.6213	1.2328	7.4000e-003	0.4809	4.0900e-003	0.4850	0.1291	3.8400e-003	0.1330		756.7834	756.7834	0.0190		757.2580
Total	**0.0793**	**0.6222**	**1.3368**	**7.4100e-003**	**0.4809**	**4.4600e-003**	**0.4853**	**0.1291**	**4.2100e-003**	**0.1334**		**757.0065**	**757.0065**	**0.0196**	**0.0000**	**757.4956**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Month 1	Grading	2/15/2022	3/16/2022	5	22	
2	Month 2-4	Grading	3/17/2022	6/15/2022	5	65	
3	Month 5-6	Grading	6/16/2022	8/15/2022	5	43	
4	Month 7	Grading	8/16/2022	9/14/2022	5	22	
5	Month 8	Grading	9/15/2022	10/14/2022	5	22	
6	Month 9	Grading	10/15/2022	11/15/2022	5	22	
7	Month 10-13	Grading	11/16/2022	3/15/2023	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Month 5-6	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 5-6	Welders	2	8.00	46	0.45
Month 7	Aerial Lifts	1	8.00	63	0.31

Month 7	Bore/Drill Rigs	12	8.00	221	0.50
Month 7	Forklifts	16	8.00	89	0.20
Month 7	Off-Highway Trucks	6	8.00	402	0.38
Month 7	Skid Steer Loaders	5	8.00	65	0.37
Month 7	Welders	2	8.00	46	0.45
Month 8	Forklifts	7	8.00	89	0.20
Month 8	Off-Highway Trucks	6	8.00	402	0.38
Month 8	Skid Steer Loaders	2	8.00	65	0.37
Month 9	Forklifts	1	8.00	89	0.20
Month 9	Off-Highway Trucks	4	8.00	402	0.38
Month 10-13	Forklifts	1	8.00	89	0.20
Month 10-13	Off-Highway Trucks	2	8.00	402	0.38
Month 1	Excavators	2	8.00	158	0.38
Month 1	Scrapers	1	8.00	367	0.48
Month 2-4	Excavators	2	8.00	158	0.38
Month 2-4	Scrapers	2	8.00	367	0.48
Month 5-6	Excavators	2	8.00	158	0.38
Month 5-6	Graders	1	8.00	187	0.41
Month 5-6	Rubber Tired Dozers	1	8.00	247	0.40
Month 5-6	Scrapers	2	8.00	367	0.48
Month 7	Excavators	2	8.00	158	0.38
Month 7	Graders	1	8.00	187	0.41
Month 7	Rubber Tired Dozers	1	8.00	247	0.40
Month 7	Scrapers	2	8.00	367	0.48
Month 8	Excavators	2	8.00	158	0.38
Month 8	Graders	1	8.00	187	0.41
Month 8	Rubber Tired Dozers	1	8.00	247	0.40

Month 8	Scrapers	2	8.00	367	0.48
Month 2-4	Bore/Drill Rigs	12	8.00	221	0.50
Month 2-4	Cranes	1	8.00	231	0.29
Month 1	Rubber Tired Dozers	2	8.00	247	0.40
Month 7	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 2-4	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 2-4	Rubber Tired Dozers	2	8.00	247	0.40
Month 2-4	Rollers	1	8.00	80	0.38
Month 9	Excavators	2	8.00	158	0.38
Month 10-13	Excavators	2	8.00	158	0.38
Month 1	Graders	2	8.00	187	0.41
Month 2-4	Graders	2	8.00	187	0.41
Month 9	Graders	1	8.00	187	0.41
Month 10-13	Graders	1	8.00	187	0.41
Month 9	Rubber Tired Dozers	1	8.00	247	0.40
Month 10-13	Rubber Tired Dozers	1	8.00	247	0.40
Month 2-4	Forklifts	16	8.00	89	0.20
Month 5-6	Aerial Lifts	1	8.00	63	0.31
Month 9	Scrapers	2	8.00	367	0.48
Month 10-13	Scrapers	2	8.00	367	0.48
Month 1	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 8	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 9	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 10-13	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 1	Aerial Lifts	1	8.00	63	0.31
Month 1	Cranes	2	8.00	231	0.29
Month 1	Forklifts	4	8.00	89	0.20

Month 1	Off-Highway Trucks	4	8.00	402	0.38
Month 1	Rollers	1	8.00	80	0.38
Month 1	Rubber Tired Loaders	2	8.00	203	0.36
Month 1	Skid Steer Loaders	7	8.00	65	0.37
Month 1	Trenchers	3	8.00	78	0.50
Month 2-4	Off-Highway Trucks	4	8.00	402	0.38
Month 2-4	Rubber Tired Loaders	2	8.00	203	0.36
Month 2-4	Skid Steer Loaders	5	8.00	65	0.37
Month 2-4	Trenchers	3	8.00	78	0.50
Month 2-4	Welders	2	8.00	46	0.45
Month 5-6	Bore/Drill Rigs	12	8.00	221	0.50
Month 5-6	Forklifts	16	8.00	89	0.20
Month 5-6	Off-Highway Trucks	6	8.00	402	0.38
Month 5-6	Skid Steer Loaders	5	8.00	65	0.37

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
Month 1	36	200.00	0.00	800.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 2-4	59	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 5-6	53	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 7	53	400.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 8	23	350.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 9	13	150.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 10-13	11	100.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Month 1 - 2022

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	lb/day										lb/day					
Fugitive Dust					16.3826	0.0000	16.3826	7.0889	0.0000	7.0889			0.0000			0.0000
Off-Road	10.2298	102.5965	80.0419	0.1833		4.6243	4.6243		4.2543	4.2543		17,750.5123	17,750.5123	5.7409		17,894.0342
Total	**10.2298**	**102.5965**	**80.0419**	**0.1833**	**16.3826**	**4.6243**	**21.0068**	**7.0889**	**4.2543**	**11.3432**		**17,750.5123**	**17,750.5123**	**5.7409**		**17,894.0342**

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	lb/day										lb/day					
Hauling	1.4219	37.6190	7.6852	0.1814	4.7767	0.1698	4.9466	1.3099	0.1625	1.4724		19,023.3893	19,023.3893	0.2450		19,029.5137
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
Worker	2.9592	1.9173	25.2445	0.0912	9.1185	0.0540	9.1726	2.4175	0.0498	2.4672		9,096.4549	9,096.4549	0.1932		9,101.2839
Total	**4.3810**	**39.5363**	**32.9297**	**0.2726**	**13.8953**	**0.2239**	**14.1191**	**3.7274**	**0.2122**	**3.9396**		**28,119.8442**	**28,119.8442**	**0.4381**		**28,130.7976**

3.2 Month 1 - 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	lb/day										lb/day					
Fugitive Dust					16.3826	0.0000	16.3826	7.0889	0.0000	7.0889			0.0000			0.0000
Off-Road	10.2298	102.5965	80.0419	0.1833		4.6243	4.6243		4.2543	4.2543	0.0000	17,750.5123	17,750.5123	5.7409		17,894.0342
Total	**10.2298**	**102.5965**	**80.0419**	**0.1833**	**16.3826**	**4.6243**	**21.0068**	**7.0889**	**4.2543**	**11.3432**	**0.0000**	**17,750.5123**	**17,750.5123**	**5.7409**		**17,894.0342**

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	lb/day										lb/day					
Hauling	1.4219	37.6190	7.6852	0.1814	4.7767	0.1698	4.9466	1.3099	0.1625	1.4724		19,023.3893	19,023.3893	0.2450		19,029.5137
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
Worker	2.9592	1.9173	25.2445	0.0912	9.1185	0.0540	9.1726	2.4175	0.0498	2.4672		9,096.4549	9,096.4549	0.1932		9,101.2839
Total	**4.3810**	**39.5363**	**32.9297**	**0.2726**	**13.8953**	**0.2239**	**14.1191**	**3.7274**	**0.2122**	**3.9396**		**28,119.8442**	**28,119.8442**	**0.4381**		**28,130.7976**

3.3 Month 2-4 - 2022

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	lb/day										lb/day					
Fugitive Dust					16.1230	0.0000	16.1230	7.0609	0.0000	7.0609			0.0000			0.0000
Off-Road	15.1066	147.7199	122.3873	0.3237		6.5596	6.5596		6.0450	6.0450		31,252.6289	31,252.6289	10.0232		31,503.2084
Total	**15.1066**	**147.7199**	**122.3873**	**0.3237**	**16.1230**	**6.5596**	**22.6826**	**7.0609**	**6.0450**	**13.1059**		**31,252.6289**	**31,252.6289**	**10.0232**		**31,503.2084**

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	lb/day										lb/day					
Hauling	0.9595	25.3856	5.1861	0.1224	3.2234	0.1146	3.3380	0.8840	0.1096	0.9936		12,837.1295	12,837.1295	0.1653		12,841.2622
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
Worker	7.3980	4.7932	63.1112	0.2280	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		22,741.1372	22,741.1372	0.4829		22,753.2098
Total	**8.3575**	**30.1788**	**68.2973**	**0.3504**	**26.0197**	**0.2497**	**26.2694**	**6.9276**	**0.2340**	**7.1617**		**35,578.2666**	**35,578.2666**	**0.6482**		**35,594.4720**

3.3 Month 2-4 - 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	lb/day										lb/day					
Fugitive Dust					16.1230	0.0000	16.1230	7.0609	0.0000	7.0609			0.0000			0.0000
Off-Road	15.1066	147.7199	122.3873	0.3237		6.5596	6.5596		6.0450	6.0450	0.0000	31,252.6288	31,252.6288	10.0232		31,503.2083
Total	**15.1066**	**147.7199**	**122.3873**	**0.3237**	**16.1230**	**6.5596**	**22.6826**	**7.0609**	**6.0450**	**13.1059**	**0.0000**	**31,252.6288**	**31,252.6288**	**10.0232**		**31,503.2083**

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	lb/day										lb/day					
Hauling	0.9595	25.3856	5.1861	0.1224	3.2234	0.1146	3.3380	0.8840	0.1096	0.9936		12,837.1295	12,837.1295	0.1653		12,841.2622
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
Worker	7.3980	4.7932	63.1112	0.2280	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		22,741.1372	22,741.1372	0.4829		22,753.2098
Total	**8.3575**	**30.1788**	**68.2973**	**0.3504**	**26.0197**	**0.2497**	**26.2694**	**6.9276**	**0.2340**	**7.1617**		**35,578.2666**	**35,578.2666**	**0.6482**		**35,594.4720**

3.4 Month 5-6 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864		29,499.7939	29,499.7939	9.4563		29,736.2009
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**		**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2009**

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	lb/day										lb/day					
Hauling	1.4504	38.3736	7.8394	0.1850	4.8726	0.1732	5.0458	1.3362	0.1657	1.5019		19,404.9631	19,404.9631	0.2499		19,411.2103
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
Worker	7.3980	4.7932	63.1112	0.2280	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		22,741.1372	22,741.1372	0.4829		22,753.2098
Total	**8.8484**	**43.1668**	**70.9506**	**0.4130**	**27.6689**	**0.3083**	**27.9772**	**7.3799**	**0.2901**	**7.6700**		**42,146.1003**	**42,146.1003**	**0.7328**		**42,164.4201**

3.4 Month 5-6 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864	0.0000	29,499.7939	29,499.7939	9.4563		29,736.2008
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**	**0.0000**	**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2008**

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	lb/day										lb/day					
Hauling	1.4504	38.3736	7.8394	0.1850	4.8726	0.1732	5.0458	1.3362	0.1657	1.5019		19,404.9631	19,404.9631	0.2499		19,411.2103
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
Worker	7.3980	4.7932	63.1112	0.2280	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		22,741.1372	22,741.1372	0.4829		22,753.2098
Total	**8.8484**	**43.1668**	**70.9506**	**0.4130**	**27.6689**	**0.3083**	**27.9772**	**7.3799**	**0.2901**	**7.6700**		**42,146.1003**	**42,146.1003**	**0.7328**		**42,164.4201**

3.5 Month 7 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864		29,499.7939	29,499.7939	9.4563		29,736.2009
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**		**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2009**

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	lb/day										lb/day					
Hauling	2.8348	75.0029	15.3224	0.3616	9.5236	0.3386	9.8622	2.6117	0.3239	2.9356		37,927.8825	37,927.8825	0.4884		37,940.0929
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
Worker	5.9184	3.8346	50.4890	0.1824	18.2371	0.1081	18.3451	4.8350	0.0995	4.9345		18,192.9097	18,192.9097	0.3863		18,202.5679
Total	**8.7532**	**78.8375**	**65.8114**	**0.5440**	**27.7607**	**0.4467**	**28.2073**	**7.4466**	**0.4234**	**7.8701**		**56,120.7922**	**56,120.7922**	**0.8747**		**56,142.6607**

3.5 Month 7 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864	0.0000	29,499.7939	29,499.7939	9.4563		29,736.2008
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**	**0.0000**	**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2008**

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	lb/day										lb/day					
Hauling	2.8348	75.0029	15.3224	0.3616	9.5236	0.3386	9.8622	2.6117	0.3239	2.9356		37,927.8825	37,927.8825	0.4884		37,940.0929
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
Worker	5.9184	3.8346	50.4890	0.1824	18.2371	0.1081	18.3451	4.8350	0.0995	4.9345		18,192.9097	18,192.9097	0.3863		18,202.5679
Total	**8.7532**	**78.8375**	**65.8114**	**0.5440**	**27.7607**	**0.4467**	**28.2073**	**7.4466**	**0.4234**	**7.8701**		**56,120.7922**	**56,120.7922**	**0.8747**		**56,142.6607**

3.6 Month 8 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	7.7297	72.1672	60.0445	0.1562		3.0688	3.0688		2.8233	2.8233		15,122.3206	15,122.3206	4.8909		15,244.5923
Total	**7.7297**	**72.1672**	**60.0445**	**0.1562**	**8.6733**	**3.0688**	**11.7421**	**3.5965**	**2.8233**	**6.4198**		**15,122.3206**	**15,122.3206**	**4.8909**		**15,244.5923**

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	lb/day										lb/day					
Hauling	0.7109	18.8095	3.8426	0.0907	2.3884	0.0849	2.4733	0.6550	0.0812	0.7362		9,511.6947	9,511.6947	0.1225		9,514.7568
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
Worker	5.1786	3.3553	44.1779	0.1596	15.9574	0.0946	16.0520	4.2306	0.0871	4.3177		15,918.7960	15,918.7960	0.3380		15,927.2469
Total	**5.8895**	**22.1648**	**48.0205**	**0.2503**	**18.3458**	**0.1795**	**18.5253**	**4.8856**	**0.1683**	**5.0539**		**25,430.4907**	**25,430.4907**	**0.4605**		**25,442.0037**

3.6 Month 8 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	7.7297	72.1672	60.0445	0.1562		3.0688	3.0688		2.8233	2.8233	0.0000	15,122.3206	15,122.3206	4.8909		15,244.5922
Total	**7.7297**	**72.1672**	**60.0445**	**0.1562**	**8.6733**	**3.0688**	**11.7421**	**3.5965**	**2.8233**	**6.4198**	**0.0000**	**15,122.3206**	**15,122.3206**	**4.8909**		**15,244.5922**

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	lb/day										lb/day					
Hauling	0.7109	18.8095	3.8426	0.0907	2.3884	0.0849	2.4733	0.6550	0.0812	0.7362		9,511.6947	9,511.6947	0.1225		9,514.7568
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
Worker	5.1786	3.3553	44.1779	0.1596	15.9574	0.0946	16.0520	4.2306	0.0871	4.3177		15,918.7960	15,918.7960	0.3380		15,927.2469
Total	**5.8895**	**22.1648**	**48.0205**	**0.2503**	**18.3458**	**0.1795**	**18.5253**	**4.8856**	**0.1683**	**5.0539**		**25,430.4907**	**25,430.4907**	**0.4605**		**25,442.0037**

3.7 Month 9 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.8521	55.9532	43.6302	0.1165		2.2886	2.2886		2.1055	2.1055		11,275.3826	11,275.3826	3.6467		11,366.5497
Total	**5.8521**	**55.9532**	**43.6302**	**0.1165**	**8.6733**	**2.2886**	**10.9619**	**3.5965**	**2.1055**	**5.7020**		**11,275.3826**	**11,275.3826**	**3.6467**		**11,366.5497**

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	lb/day										lb/day					
Hauling	0.7109	18.8095	3.8426	0.0907	2.3884	0.0849	2.4733	0.6550	0.0812	0.7362		9,511.6947	9,511.6947	0.1225		9,514.7568
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
Worker	2.2194	1.4380	18.9334	0.0684	6.8389	0.0405	6.8794	1.8131	0.0373	1.8504		6,822.3412	6,822.3412	0.1449		6,825.9629
Total	**2.9303**	**20.2475**	**22.7760**	**0.1591**	**9.2273**	**0.1254**	**9.3527**	**2.4681**	**0.1186**	**2.5866**		**16,334.0358**	**16,334.0358**	**0.2674**		**16,340.7198**

3.7 Month 9 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.8521	55.9532	43.6302	0.1165		2.2886	2.2886		2.1055	2.1055	0.0000	11,275.3825	11,275.3825	3.6467		11,366.5497
Total	**5.8521**	**55.9532**	**43.6302**	**0.1165**	**8.6733**	**2.2886**	**10.9619**	**3.5965**	**2.1055**	**5.7020**	**0.0000**	**11,275.3825**	**11,275.3825**	**3.6467**		**11,366.5497**

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	lb/day										lb/day					
Hauling	0.7109	18.8095	3.8426	0.0907	2.3884	0.0849	2.4733	0.6550	0.0812	0.7362		9,511.6947	9,511.6947	0.1225		9,514.7568
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
Worker	2.2194	1.4380	18.9334	0.0684	6.8389	0.0405	6.8794	1.8131	0.0373	1.8504		6,822.3412	6,822.3412	0.1449		6,825.9629
Total	**2.9303**	**20.2475**	**22.7760**	**0.1591**	**9.2273**	**0.1254**	**9.3527**	**2.4681**	**0.1186**	**2.5866**		**16,334.0358**	**16,334.0358**	**0.2674**		**16,340.7198**

3.8 Month 10-13 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7953	47.9258	36.9127	0.0900		1.9967	1.9967		1.8369	1.8369		8,717.4120	8,717.4120	2.8194		8,787.8967
Total	**4.7953**	**47.9258**	**36.9127**	**0.0900**	**8.6733**	**1.9967**	**10.6700**	**3.5965**	**1.8369**	**5.4334**		**8,717.4120**	**8,717.4120**	**2.8194**		**8,787.8967**

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	lb/day										lb/day					
Hauling	0.1819	4.8117	0.9830	0.0232	1.3517	0.0217	1.3734	0.3494	0.0208	0.3701		2,433.2242	2,433.2242	0.0313		2,434.0076
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
Worker	1.4796	0.9587	12.6223	0.0456	4.5593	0.0270	4.5863	1.2087	0.0249	1.2336		4,548.2274	4,548.2274	0.0966		4,550.6420
Total	**1.6615**	**5.7704**	**13.6052**	**0.0688**	**5.9110**	**0.0487**	**5.9597**	**1.5581**	**0.0457**	**1.6038**		**6,981.4517**	**6,981.4517**	**0.1279**		**6,984.6495**

3.8 Month 10-13 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7953	47.9258	36.9127	0.0900		1.9967	1.9967		1.8369	1.8369	0.0000	8,717.4120	8,717.4120	2.8194		8,787.8966
Total	**4.7953**	**47.9258**	**36.9127**	**0.0900**	**8.6733**	**1.9967**	**10.6700**	**3.5965**	**1.8369**	**5.4334**	**0.0000**	**8,717.4120**	**8,717.4120**	**2.8194**		**8,787.8966**

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	lb/day										lb/day					
Hauling	0.1819	4.8117	0.9830	0.0232	1.3517	0.0217	1.3734	0.3494	0.0208	0.3701		2,433.2242	2,433.2242	0.0313		2,434.0076
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
Worker	1.4796	0.9587	12.6223	0.0456	4.5593	0.0270	4.5863	1.2087	0.0249	1.2336		4,548.2274	4,548.2274	0.0966		4,550.6420
Total	**1.6615**	**5.7704**	**13.6052**	**0.0688**	**5.9110**	**0.0487**	**5.9597**	**1.5581**	**0.0457**	**1.6038**		**6,981.4517**	**6,981.4517**	**0.1279**		**6,984.6495**

3.8 Month 10-13 - 2023

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4320	42.6111	35.7729	0.0901		1.7418	1.7418		1.6025	1.6025		8,719.2856	8,719.2856	2.8200		8,789.7854
Total	**4.4320**	**42.6111**	**35.7729**	**0.0901**	**8.6733**	**1.7418**	**10.4152**	**3.5965**	**1.6025**	**5.1990**		**8,719.2856**	**8,719.2856**	**2.8200**		**8,789.7854**

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	lb/day										lb/day					
Hauling	0.1272	2.8375	0.8528	0.0224	0.8982	8.8900e-003	0.9071	0.2381	8.5100e-003	0.2466		2,353.7731	2,353.7731	0.0228		2,354.3437
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
Worker	1.3822	0.8607	11.6016	0.0439	4.5593	0.0263	4.5856	1.2087	0.0242	1.2330		4,376.5509	4,376.5509	0.0863		4,378.7081
Total	**1.5093**	**3.6982**	**12.4544**	**0.0663**	**5.4574**	**0.0352**	**5.4927**	**1.4468**	**0.0327**	**1.4795**		**6,730.3240**	**6,730.3240**	**0.1091**		**6,733.0518**

3.8 Month 10-13 - 2023

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4320	42.6111	35.7729	0.0901		1.7418	1.7418		1.6025	1.6025	0.0000	8,719.2856	8,719.2856	2.8200		8,789.7854
Total	**4.4320**	**42.6111**	**35.7729**	**0.0901**	**8.6733**	**1.7418**	**10.4152**	**3.5965**	**1.6025**	**5.1990**	**0.0000**	**8,719.2856**	**8,719.2856**	**2.8200**		**8,789.7854**

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	lb/day										lb/day					
Hauling	0.1272	2.8375	0.8528	0.0224	0.8982	8.8900e-003	0.9071	0.2381	8.5100e-003	0.2466		2,353.7731	2,353.7731	0.0228		2,354.3437
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
Worker	1.3822	0.8607	11.6016	0.0439	4.5593	0.0263	4.5856	1.2087	0.0242	1.2330		4,376.5509	4,376.5509	0.0863		4,378.7081
Total	**1.5093**	**3.6982**	**12.4544**	**0.0663**	**5.4574**	**0.0352**	**5.4927**	**1.4468**	**0.0327**	**1.4795**		**6,730.3240**	**6,730.3240**	**0.1091**		**6,733.0518**

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	lb/day										lb/day					
Mitigated	0.0697	0.6213	1.2328	7.4000e-003	0.4809	4.0900e-003	0.4850	0.1291	3.8400e-003	0.1330		756.7834	756.7834	0.0190		757.2580
Unmitigated	0.0697	0.6213	1.2328	7.4000e-003	0.4809	4.0900e-003	0.4850	0.1291	3.8400e-003	0.1330		756.7834	756.7834	0.0190		757.2580

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	10.19	0.00	0.00	158,964	158,964
Total	10.19	0.00	0.00	158,964	158,964

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
User Defined Industrial	60.00	6.60	6.60	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.487920	0.030073	0.170877	0.112061	0.016651	0.005572	0.019337	0.146855	0.001612	0.001610	0.005760	0.000912	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures 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	lb/day										lb/day					
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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	lb/day										lb/day					
User Defined Industrial	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
Total		**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**

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	lb/day										lb/day					
User Defined Industrial	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
Total		**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**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	lb/day										lb/day					
Mitigated	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Unmitigated	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376

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	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Total	**9.6300e-003**	**9.5000e-004**	**0.1040**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**		**0.2230**	**0.2230**	**5.8000e-004**		**0.2376**

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	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Total	**9.6300e-003**	**9.5000e-004**	**0.1040**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**		**0.2230**	**0.2230**	**5.8000e-004**		**0.2376**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Resurgance Solar

Kern-Mojave Desert County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1,019.00	User Defined Unit	1,172.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the Project's model.

Land Use - See SWAPE comment regarding land use size.

Construction Phase - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Off-road Equipment - Consistent with the Project's model.

Grading - Consistent with the Project's model.

Trips and VMT - Consistent with the Project's model.

Vehicle Trips - Consistent with the Project's model.

Energy Use -

Water And Wastewater - Consistent with the Project's model.

Solid Waste - Consistent with the Project's model.

Construction Off-road Equipment Mitigation - See SWAPE comment regarding Tier 4 and construction-related mitigation.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	43.00
tblConstructionPhase	NumDays	15,500.00	22.00
tblConstructionPhase	NumDays	15,500.00	65.00
tblConstructionPhase	NumDays	15,500.00	86.00
tblConstructionPhase	PhaseEndDate	4/26/2821	11/15/2022

tblConstructionPhase	PhaseEndDate	12/28/2736	9/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2060	3/16/2022
tblConstructionPhase	PhaseEndDate	11/12/2142	8/15/2022
tblConstructionPhase	PhaseEndDate	2/26/2779	10/14/2022
tblConstructionPhase	PhaseEndDate	6/14/2083	6/15/2022
tblConstructionPhase	PhaseStartDate	2/27/2779	10/15/2022
tblConstructionPhase	PhaseStartDate	11/13/2142	8/16/2022
tblConstructionPhase	PhaseStartDate	6/15/2083	6/16/2022
tblConstructionPhase	PhaseStartDate	12/29/2736	9/15/2022
tblConstructionPhase	PhaseStartDate	6/15/2060	3/17/2022
tblGrading	AcresOfGrading	195.00	250.00
tblGrading	AcresOfGrading	44.00	90.00
tblLandUse	LotAcreage	0.00	1,172.00
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders

tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	12.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00

tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripLength	20.00	150.00
tblTripsAndVMT	HaulingTripNumber	0.00	800.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,595.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	HaulingTripNumber	0.00	400.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	90.00	200.00
tblTripsAndVMT	WorkerTripNumber	148.00	500.00
tblTripsAndVMT	WorkerTripNumber	133.00	500.00

tblTripsAndVMT	WorkerTripNumber	133.00	400.00
tblTripsAndVMT	WorkerTripNumber	58.00	350.00
tblTripsAndVMT	WorkerTripNumber	33.00	150.00
tblTripsAndVMT	WorkerTripNumber	28.00	100.00
tblVehicleTrips	CW_TL	14.70	60.00
tblVehicleTrips	CW_TTP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.01
tblWater	OutdoorWaterUseRate	0.00	325,851.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	24.0761	204.0321	174.9569	0.8240	42.1427	6.8096	48.9524	13.9885	6.2794	20.2679	0.0000	83,072.2693	83,072.2693	10.5977	0.0000	83,329.7766
2023	6.0615	46.5913	45.3023	0.1505	14.1308	1.7770	15.9078	5.0433	1.6352	6.6785	0.0000	14,863.2498	14,863.2498	2.9152	0.0000	14,936.1305
Maximum	**24.0761**	**204.0321**	**174.9569**	**0.8240**	**42.1427**	**6.8096**	**48.9524**	**13.9885**	**6.2794**	**20.2679**	**0.0000**	**83,072.2693**	**83,072.2693**	**10.5977**	**0.0000**	**83,329.7766**

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	lb/day										lb/day					
2022	24.0761	204.0321	174.9569	0.8240	42.1427	6.8096	48.9524	13.9885	6.2794	20.2679	0.0000	83,072.2693	83,072.2693	10.5977	0.0000	83,329.7765
2023	6.0615	46.5913	45.3023	0.1505	14.1308	1.7770	15.9078	5.0433	1.6352	6.6785	0.0000	14,863.2498	14,863.2498	2.9152	0.0000	14,936.1305
Maximum	**24.0761**	**204.0321**	**174.9569**	**0.8240**	**42.1427**	**6.8096**	**48.9524**	**13.9885**	**6.2794**	**20.2679**	**0.0000**	**83,072.2693**	**83,072.2693**	**10.5977**	**0.0000**	**83,329.7765**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**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	lb/day										lb/day					
Area	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Energy	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
Mobile	0.0639	0.6578	1.0130	6.8700e-003	0.4809	4.1000e-003	0.4850	0.1291	3.8500e-003	0.1330		704.0418	704.0418	0.0185		704.5031
Total	**0.0736**	**0.6587**	**1.1170**	**6.8800e-003**	**0.4809**	**4.4700e-003**	**0.4853**	**0.1291**	**4.2200e-003**	**0.1334**		**704.2648**	**704.2648**	**0.0190**	**0.0000**	**704.7407**

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	lb/day										lb/day					
Area	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Energy	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
Mobile	0.0639	0.6578	1.0130	6.8700e-003	0.4809	4.1000e-003	0.4850	0.1291	3.8500e-003	0.1330		704.0418	704.0418	0.0185		704.5031
Total	**0.0736**	**0.6587**	**1.1170**	**6.8800e-003**	**0.4809**	**4.4700e-003**	**0.4853**	**0.1291**	**4.2200e-003**	**0.1334**		**704.2648**	**704.2648**	**0.0190**	**0.0000**	**704.7407**

	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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Month 1	Grading	2/15/2022	3/16/2022	5	22	
2	Month 2-4	Grading	3/17/2022	6/15/2022	5	65	
3	Month 5-6	Grading	6/16/2022	8/15/2022	5	43	
4	Month 7	Grading	8/16/2022	9/14/2022	5	22	
5	Month 8	Grading	9/15/2022	10/14/2022	5	22	
6	Month 9	Grading	10/15/2022	11/15/2022	5	22	
7	Month 10-13	Grading	11/16/2022	3/15/2023	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Month 5-6	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 5-6	Welders	2	8.00	46	0.45
Month 7	Aerial Lifts	1	8.00	63	0.31

Resurgance Solar - Kern-Mojave Desert County, Winter

Month 7	Bore/Drill Rigs	12	8.00	221	0.50
Month 7	Forklifts	16	8.00	89	0.20
Month 7	Off-Highway Trucks	6	8.00	402	0.38
Month 7	Skid Steer Loaders	5	8.00	65	0.37
Month 7	Welders	2	8.00	46	0.45
Month 8	Forklifts	7	8.00	89	0.20
Month 8	Off-Highway Trucks	6	8.00	402	0.38
Month 8	Skid Steer Loaders	2	8.00	65	0.37
Month 9	Forklifts	1	8.00	89	0.20
Month 9	Off-Highway Trucks	4	8.00	402	0.38
Month 10-13	Forklifts	1	8.00	89	0.20
Month 10-13	Off-Highway Trucks	2	8.00	402	0.38
Month 1	Excavators	2	8.00	158	0.38
Month 1	Scrapers	1	8.00	367	0.48
Month 2-4	Excavators	2	8.00	158	0.38
Month 2-4	Scrapers	2	8.00	367	0.48
Month 5-6	Excavators	2	8.00	158	0.38
Month 5-6	Graders	1	8.00	187	0.41
Month 5-6	Rubber Tired Dozers	1	8.00	247	0.40
Month 5-6	Scrapers	2	8.00	367	0.48
Month 7	Excavators	2	8.00	158	0.38
Month 7	Graders	1	8.00	187	0.41
Month 7	Rubber Tired Dozers	1	8.00	247	0.40
Month 7	Scrapers	2	8.00	367	0.48
Month 8	Excavators	2	8.00	158	0.38
Month 8	Graders	1	8.00	187	0.41
Month 8	Rubber Tired Dozers	1	8.00	247	0.40

Month 8	Scrapers	2	8.00	367	0.48
Month 2-4	Bore/Drill Rigs	12	8.00	221	0.50
Month 2-4	Cranes	1	8.00	231	0.29
Month 1	Rubber Tired Dozers	2	8.00	247	0.40
Month 7	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 2-4	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 2-4	Rubber Tired Dozers	2	8.00	247	0.40
Month 2-4	Rollers	1	8.00	80	0.38
Month 9	Excavators	2	8.00	158	0.38
Month 10-13	Excavators	2	8.00	158	0.38
Month 1	Graders	2	8.00	187	0.41
Month 2-4	Graders	2	8.00	187	0.41
Month 9	Graders	1	8.00	187	0.41
Month 10-13	Graders	1	8.00	187	0.41
Month 9	Rubber Tired Dozers	1	8.00	247	0.40
Month 10-13	Rubber Tired Dozers	1	8.00	247	0.40
Month 2-4	Forklifts	16	8.00	89	0.20
Month 5-6	Aerial Lifts	1	8.00	63	0.31
Month 9	Scrapers	2	8.00	367	0.48
Month 10-13	Scrapers	2	8.00	367	0.48
Month 1	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Month 8	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 9	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 10-13	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Month 1	Aerial Lifts	1	8.00	63	0.31
Month 1	Cranes	2	8.00	231	0.29
Month 1	Forklifts	4	8.00	89	0.20

Month 1	Off-Highway Trucks	4	8.00	402	0.38
Month 1	Rollers	1	8.00	80	0.38
Month 1	Rubber Tired Loaders	2	8.00	203	0.36
Month 1	Skid Steer Loaders	7	8.00	65	0.37
Month 1	Trenchers	3	8.00	78	0.50
Month 2-4	Off-Highway Trucks	4	8.00	402	0.38
Month 2-4	Rubber Tired Loaders	2	8.00	203	0.36
Month 2-4	Skid Steer Loaders	5	8.00	65	0.37
Month 2-4	Trenchers	3	8.00	78	0.50
Month 2-4	Welders	2	8.00	46	0.45
Month 5-6	Bore/Drill Rigs	12	8.00	221	0.50
Month 5-6	Forklifts	16	8.00	89	0.20
Month 5-6	Off-Highway Trucks	6	8.00	402	0.38
Month 5-6	Skid Steer Loaders	5	8.00	65	0.37

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
Month 1	36	200.00	0.00	800.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 2-4	59	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 5-6	53	500.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 7	53	400.00	0.00	1,595.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 8	23	350.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 9	13	150.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT
Month 10-13	11	100.00	0.00	400.00	60.00	7.30	150.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Month 1 - 2022

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	lb/day										lb/day					
Fugitive Dust					16.3826	0.0000	16.3826	7.0889	0.0000	7.0889			0.0000			0.0000
Off-Road	10.2298	102.5965	80.0419	0.1833		4.6243	4.6243		4.2543	4.2543		17,750.5123	17,750.5123	5.7409		17,894.0342
Total	**10.2298**	**102.5965**	**80.0419**	**0.1833**	**16.3826**	**4.6243**	**21.0068**	**7.0889**	**4.2543**	**11.3432**		**17,750.5123**	**17,750.5123**	**5.7409**		**17,894.0342**

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	lb/day										lb/day					
Hauling	1.4308	39.8713	7.8109	0.1807	4.7767	0.1704	4.9471	1.3099	0.1630	1.4729		18,949.4885	18,949.4885	0.2644		18,956.0981
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
Worker	3.2016	2.1908	18.9195	0.0791	9.1185	0.0540	9.1726	2.4175	0.0498	2.4672		7,895.9664	7,895.9664	0.1585		7,899.9276
Total	**4.6324**	**42.0621**	**26.7304**	**0.2598**	**13.8953**	**0.2244**	**14.1197**	**3.7274**	**0.2127**	**3.9402**		**26,845.4548**	**26,845.4548**	**0.4228**		**26,856.0257**

3.2 Month 1 - 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	lb/day										lb/day					
Fugitive Dust					16.3826	0.0000	16.3826	7.0889	0.0000	7.0889			0.0000			0.0000
Off-Road	10.2298	102.5965	80.0419	0.1833		4.6243	4.6243		4.2543	4.2543	0.0000	17,750.5123	17,750.5123	5.7409		17,894.0342
Total	**10.2298**	**102.5965**	**80.0419**	**0.1833**	**16.3826**	**4.6243**	**21.0068**	**7.0889**	**4.2543**	**11.3432**	**0.0000**	**17,750.5123**	**17,750.5123**	**5.7409**		**17,894.0342**

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	lb/day										lb/day					
Hauling	1.4308	39.8713	7.8109	0.1807	4.7767	0.1704	4.9471	1.3099	0.1630	1.4729		18,949.4885	18,949.4885	0.2644		18,956.0981
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
Worker	3.2016	2.1908	18.9195	0.0791	9.1185	0.0540	9.1726	2.4175	0.0498	2.4672		7,895.9664	7,895.9664	0.1585		7,899.9276
Total	**4.6324**	**42.0621**	**26.7304**	**0.2598**	**13.8953**	**0.2244**	**14.1197**	**3.7274**	**0.2127**	**3.9402**		**26,845.4548**	**26,845.4548**	**0.4228**		**26,856.0257**

3.3 Month 2-4 - 2022

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	lb/day										lb/day					
Fugitive Dust					16.1230	0.0000	16.1230	7.0609	0.0000	7.0609			0.0000			0.0000
Off-Road	15.1066	147.7199	122.3873	0.3237		6.5596	6.5596		6.0450	6.0450		31,252.6289	31,252.6289	10.0232		31,503.2084
Total	**15.1066**	**147.7199**	**122.3873**	**0.3237**	**16.1230**	**6.5596**	**22.6826**	**7.0609**	**6.0450**	**13.1059**		**31,252.6289**	**31,252.6289**	**10.0232**		**31,503.2084**

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	lb/day										lb/day					
Hauling	0.9655	26.9055	5.2709	0.1219	3.2234	0.1150	3.3383	0.8840	0.1100	0.9939		12,787.2606	12,787.2606	0.1784		12,791.7208
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
Worker	8.0040	5.4769	47.2988	0.1978	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		19,739.9160	19,739.9160	0.3961		19,749.8190
Total	**8.9695**	**32.3824**	**52.5697**	**0.3197**	**26.0197**	**0.2501**	**26.2698**	**6.9276**	**0.2344**	**7.1620**		**32,527.1766**	**32,527.1766**	**0.5745**		**32,541.5398**

3.3 Month 2-4 - 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	lb/day										lb/day					
Fugitive Dust					16.1230	0.0000	16.1230	7.0609	0.0000	7.0609			0.0000			0.0000
Off-Road	15.1066	147.7199	122.3873	0.3237		6.5596	6.5596		6.0450	6.0450	0.0000	31,252.6288	31,252.6288	10.0232		31,503.2083
Total	**15.1066**	**147.7199**	**122.3873**	**0.3237**	**16.1230**	**6.5596**	**22.6826**	**7.0609**	**6.0450**	**13.1059**	**0.0000**	**31,252.6288**	**31,252.6288**	**10.0232**		**31,503.2083**

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	lb/day										lb/day					
Hauling	0.9655	26.9055	5.2709	0.1219	3.2234	0.1150	3.3383	0.8840	0.1100	0.9939		12,787.2606	12,787.2606	0.1784		12,791.7208
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
Worker	8.0040	5.4769	47.2988	0.1978	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		19,739.9160	19,739.9160	0.3961		19,749.8190
Total	**8.9695**	**32.3824**	**52.5697**	**0.3197**	**26.0197**	**0.2501**	**26.2698**	**6.9276**	**0.2344**	**7.1620**		**32,527.1766**	**32,527.1766**	**0.5745**		**32,541.5398**

3.4 Month 5-6 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864		29,499.7939	29,499.7939	9.4563		29,736.2009
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**		**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2009**

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	lb/day										lb/day					
Hauling	1.4595	40.6710	7.9676	0.1843	4.8726	0.1738	5.0463	1.3362	0.1663	1.5025		19,329.5799	19,329.5799	0.2697		19,336.3221
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
Worker	8.0040	5.4769	47.2988	0.1978	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		19,739.9160	19,739.9160	0.3961		19,749.8190
Total	**9.4635**	**46.1480**	**55.2664**	**0.3821**	**27.6689**	**0.3089**	**27.9777**	**7.3799**	**0.2907**	**7.6705**		**39,069.4959**	**39,069.4959**	**0.6658**		**39,086.1411**

3.4 Month 5-6 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864	0.0000	29,499.7939	29,499.7939	9.4563		29,736.2008
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**	**0.0000**	**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2008**

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	lb/day										lb/day					
Hauling	1.4595	40.6710	7.9676	0.1843	4.8726	0.1738	5.0463	1.3362	0.1663	1.5025		19,329.5799	19,329.5799	0.2697		19,336.3221
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
Worker	8.0040	5.4769	47.2988	0.1978	22.7963	0.1351	22.9314	6.0437	0.1244	6.1681		19,739.9160	19,739.9160	0.3961		19,749.8190
Total	**9.4635**	**46.1480**	**55.2664**	**0.3821**	**27.6689**	**0.3089**	**27.9777**	**7.3799**	**0.2907**	**7.6705**		**39,069.4959**	**39,069.4959**	**0.6658**		**39,086.1411**

3.5 Month 7 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864		29,499.7939	29,499.7939	9.4563		29,736.2009
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**		**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2009**

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	lb/day										lb/day					
Hauling	2.8526	79.4934	15.5730	0.3602	9.5236	0.3396	9.8633	2.6117	0.3249	2.9366		37,780.5426	37,780.5426	0.5271		37,793.7205
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
Worker	6.4032	4.3816	37.8390	0.1582	18.2371	0.1081	18.3451	4.8350	0.0995	4.9345		15,791.9328	15,791.9328	0.3169		15,799.8552
Total	**9.2558**	**83.8750**	**53.4121**	**0.5184**	**27.7607**	**0.4477**	**28.2084**	**7.4466**	**0.4245**	**7.8711**		**53,572.4754**	**53,572.4754**	**0.8440**		**53,593.5757**

3.5 Month 7 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	12.7338	120.1572	110.2830	0.3056		5.0828	5.0828		4.6864	4.6864	0.0000	29,499.7939	29,499.7939	9.4563		29,736.2008
Total	**12.7338**	**120.1572**	**110.2830**	**0.3056**	**8.6733**	**5.0828**	**13.7561**	**3.5965**	**4.6864**	**8.2829**	**0.0000**	**29,499.7939**	**29,499.7939**	**9.4563**		**29,736.2008**

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	lb/day										lb/day					
Hauling	2.8526	79.4934	15.5730	0.3602	9.5236	0.3396	9.8633	2.6117	0.3249	2.9366		37,780.5426	37,780.5426	0.5271		37,793.7205
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
Worker	6.4032	4.3816	37.8390	0.1582	18.2371	0.1081	18.3451	4.8350	0.0995	4.9345		15,791.9328	15,791.9328	0.3169		15,799.8552
Total	**9.2558**	**83.8750**	**53.4121**	**0.5184**	**27.7607**	**0.4477**	**28.2084**	**7.4466**	**0.4245**	**7.8711**		**53,572.4754**	**53,572.4754**	**0.8440**		**53,593.5757**

3.6 Month 8 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	7.7297	72.1672	60.0445	0.1562		3.0688	3.0688		2.8233	2.8233		15,122.3206	15,122.3206	4.8909		15,244.5923
Total	**7.7297**	**72.1672**	**60.0445**	**0.1562**	**8.6733**	**3.0688**	**11.7421**	**3.5965**	**2.8233**	**6.4198**		**15,122.3206**	**15,122.3206**	**4.8909**		**15,244.5923**

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	lb/day										lb/day					
Hauling	0.7154	19.9357	3.9055	0.0903	2.3884	0.0852	2.4735	0.6550	0.0815	0.7365		9,474.7442	9,474.7442	0.1322		9,478.0490
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
Worker	5.6028	3.8339	33.1092	0.1384	15.9574	0.0946	16.0520	4.2306	0.0871	4.3177		13,817.9412	13,817.9412	0.2773		13,824.8733
Total	**6.3182**	**23.7695**	**37.0146**	**0.2288**	**18.3458**	**0.1797**	**18.5255**	**4.8856**	**0.1686**	**5.0541**		**23,292.6854**	**23,292.6854**	**0.4095**		**23,302.9223**

3.6 Month 8 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	7.7297	72.1672	60.0445	0.1562		3.0688	3.0688		2.8233	2.8233	0.0000	15,122.3206	15,122.3206	4.8909		15,244.5922
Total	**7.7297**	**72.1672**	**60.0445**	**0.1562**	**8.6733**	**3.0688**	**11.7421**	**3.5965**	**2.8233**	**6.4198**	**0.0000**	**15,122.3206**	**15,122.3206**	**4.8909**		**15,244.5922**

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	lb/day										lb/day					
Hauling	0.7154	19.9357	3.9055	0.0903	2.3884	0.0852	2.4735	0.6550	0.0815	0.7365		9,474.7442	9,474.7442	0.1322		9,478.0490
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
Worker	5.6028	3.8339	33.1092	0.1384	15.9574	0.0946	16.0520	4.2306	0.0871	4.3177		13,817.9412	13,817.9412	0.2773		13,824.8733
Total	**6.3182**	**23.7695**	**37.0146**	**0.2288**	**18.3458**	**0.1797**	**18.5255**	**4.8856**	**0.1686**	**5.0541**		**23,292.6854**	**23,292.6854**	**0.4095**		**23,302.9223**

3.7 Month 9 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.8521	55.9532	43.6302	0.1165		2.2886	2.2886		2.1055	2.1055		11,275.3826	11,275.3826	3.6467		11,366.5497
Total	**5.8521**	**55.9532**	**43.6302**	**0.1165**	**8.6733**	**2.2886**	**10.9619**	**3.5965**	**2.1055**	**5.7020**		**11,275.3826**	**11,275.3826**	**3.6467**		**11,366.5497**

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	lb/day										lb/day					
Hauling	0.7154	19.9357	3.9055	0.0903	2.3884	0.0852	2.4735	0.6550	0.0815	0.7365		9,474.7442	9,474.7442	0.1322		9,478.0490
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
Worker	2.4012	1.6431	14.1896	0.0593	6.8389	0.0405	6.8794	1.8131	0.0373	1.8504		5,921.9748	5,921.9748	0.1188		5,924.9457
Total	**3.1166**	**21.5787**	**18.0951**	**0.1497**	**9.2273**	**0.1257**	**9.3530**	**2.4681**	**0.1188**	**2.5869**		**15,396.7190**	**15,396.7190**	**0.2510**		**15,402.9947**

3.7 Month 9 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.8521	55.9532	43.6302	0.1165		2.2886	2.2886		2.1055	2.1055	0.0000	11,275.3825	11,275.3825	3.6467		11,366.5497
Total	**5.8521**	**55.9532**	**43.6302**	**0.1165**	**8.6733**	**2.2886**	**10.9619**	**3.5965**	**2.1055**	**5.7020**	**0.0000**	**11,275.3825**	**11,275.3825**	**3.6467**		**11,366.5497**

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	lb/day										lb/day					
Hauling	0.7154	19.9357	3.9055	0.0903	2.3884	0.0852	2.4735	0.6550	0.0815	0.7365		9,474.7442	9,474.7442	0.1322		9,478.0490
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
Worker	2.4012	1.6431	14.1896	0.0593	6.8389	0.0405	6.8794	1.8131	0.0373	1.8504		5,921.9748	5,921.9748	0.1188		5,924.9457
Total	**3.1166**	**21.5787**	**18.0951**	**0.1497**	**9.2273**	**0.1257**	**9.3530**	**2.4681**	**0.1188**	**2.5869**		**15,396.7190**	**15,396.7190**	**0.2510**		**15,402.9947**

3.8 Month 10-13 - 2022

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7953	47.9258	36.9127	0.0900		1.9967	1.9967		1.8369	1.8369		8,717.4120	8,717.4120	2.8194		8,787.8967
Total	**4.7953**	**47.9258**	**36.9127**	**0.0900**	**8.6733**	**1.9967**	**10.6700**	**3.5965**	**1.8369**	**5.4334**		**8,717.4120**	**8,717.4120**	**2.8194**		**8,787.8967**

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	lb/day										lb/day					
Hauling	0.1830	5.0998	0.9991	0.0231	1.3517	0.0218	1.3735	0.3494	0.0209	0.3702		2,423.7718	2,423.7718	0.0338		2,424.6172
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
Worker	1.6008	1.0954	9.4598	0.0396	4.5593	0.0270	4.5863	1.2087	0.0249	1.2336		3,947.9832	3,947.9832	0.0792		3,949.9638
Total	**1.7838**	**6.1952**	**10.4588**	**0.0627**	**5.9110**	**0.0488**	**5.9598**	**1.5581**	**0.0457**	**1.6038**		**6,371.7550**	**6,371.7550**	**0.1130**		**6,374.5810**

3.8 Month 10-13 - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7953	47.9258	36.9127	0.0900		1.9967	1.9967		1.8369	1.8369	0.0000	8,717.4120	8,717.4120	2.8194		8,787.8966
Total	**4.7953**	**47.9258**	**36.9127**	**0.0900**	**8.6733**	**1.9967**	**10.6700**	**3.5965**	**1.8369**	**5.4334**	**0.0000**	**8,717.4120**	**8,717.4120**	**2.8194**		**8,787.8966**

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	lb/day										lb/day					
Hauling	0.1830	5.0998	0.9991	0.0231	1.3517	0.0218	1.3735	0.3494	0.0209	0.3702		2,423.7718	2,423.7718	0.0338		2,424.6172
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
Worker	1.6008	1.0954	9.4598	0.0396	4.5593	0.0270	4.5863	1.2087	0.0249	1.2336		3,947.9832	3,947.9832	0.0792		3,949.9638
Total	**1.7838**	**6.1952**	**10.4588**	**0.0627**	**5.9110**	**0.0488**	**5.9598**	**1.5581**	**0.0457**	**1.6038**		**6,371.7550**	**6,371.7550**	**0.1130**		**6,374.5810**

3.8 Month 10-13 - 2023

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4320	42.6111	35.7729	0.0901		1.7418	1.7418		1.6025	1.6025		8,719.2856	8,719.2856	2.8200		8,789.7854
Total	**4.4320**	**42.6111**	**35.7729**	**0.0901**	**8.6733**	**1.7418**	**10.4152**	**3.5965**	**1.6025**	**5.1990**		**8,719.2856**	**8,719.2856**	**2.8200**		**8,789.7854**

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	lb/day										lb/day					
Hauling	0.1279	2.9975	0.8618	0.0224	0.8982	8.9100e-003	0.9071	0.2381	8.5200e-003	0.2466		2,344.6025	2,344.6025	0.0245		2,345.2147
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
Worker	1.5016	0.9827	8.6676	0.0381	4.5593	0.0263	4.5856	1.2087	0.0242	1.2330		3,799.3617	3,799.3617	0.0707		3,801.1304
Total	**1.6295**	**3.9802**	**9.5293**	**0.0604**	**5.4574**	**0.0352**	**5.4927**	**1.4468**	**0.0328**	**1.4795**		**6,143.9643**	**6,143.9643**	**0.0952**		**6,146.3451**

3.8 Month 10-13 - 2023

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4320	42.6111	35.7729	0.0901		1.7418	1.7418		1.6025	1.6025	0.0000	8,719.2856	8,719.2856	2.8200		8,789.7854
Total	**4.4320**	**42.6111**	**35.7729**	**0.0901**	**8.6733**	**1.7418**	**10.4152**	**3.5965**	**1.6025**	**5.1990**	**0.0000**	**8,719.2856**	**8,719.2856**	**2.8200**		**8,789.7854**

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	lb/day										lb/day					
Hauling	0.1279	2.9975	0.8618	0.0224	0.8982	8.9100e-003	0.9071	0.2381	8.5200e-003	0.2466		2,344.6025	2,344.6025	0.0245		2,345.2147
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
Worker	1.5016	0.9827	8.6676	0.0381	4.5593	0.0263	4.5856	1.2087	0.0242	1.2330		3,799.3617	3,799.3617	0.0707		3,801.1304
Total	**1.6295**	**3.9802**	**9.5293**	**0.0604**	**5.4574**	**0.0352**	**5.4927**	**1.4468**	**0.0328**	**1.4795**		**6,143.9643**	**6,143.9643**	**0.0952**		**6,146.3451**

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	lb/day										lb/day					
Mitigated	0.0639	0.6578	1.0130	6.8700e-003	0.4809	4.1000e-003	0.4850	0.1291	3.8500e-003	0.1330		704.0418	704.0418	0.0185		704.5031
Unmitigated	0.0639	0.6578	1.0130	6.8700e-003	0.4809	4.1000e-003	0.4850	0.1291	3.8500e-003	0.1330		704.0418	704.0418	0.0185		704.5031

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	10.19	0.00	0.00	158,964	158,964
Total	10.19	0.00	0.00	158,964	158,964

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
User Defined Industrial	60.00	6.60	6.60	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.487920	0.030073	0.170877	0.112061	0.016651	0.005572	0.019337	0.146855	0.001612	0.001610	0.005760	0.000912	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures 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	lb/day										lb/day					
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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	lb/day										lb/day					
User Defined Industrial	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
Total		**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**

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	lb/day										lb/day					
User Defined Industrial	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
Total		**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**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	lb/day										lb/day					
Mitigated	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Unmitigated	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376

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	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Total	**9.6300e-003**	**9.5000e-004**	**0.1040**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**		**0.2230**	**0.2230**	**5.8000e-004**		**0.2376**

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	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.6300e-003	9.5000e-004	0.1040	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2230	0.2230	5.8000e-004		0.2376
Total	**9.6300e-003**	**9.5000e-004**	**0.1040**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**		**0.2230**	**0.2230**	**5.8000e-004**		**0.2376**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ATTACHMENT B

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street,
Suite 201
Santa Monica, CA
90405

(949) 887-9013
mhagemann@swape.com

Matthew F. Hagemann, P.G.,* C.Hg**

Geologic and Hydrogeologic Characterization, Investigation and Remediation Strategies

Expert Testimony

Industrial Stormwater Compliance

CEQA Review

Professional Certifications:

*Professional Geologist
**Certified Hydrogeologist

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist

Professional Experience:

30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. Spent nine years with the U.S. EPA in the Resource Conservation Recovery Act (RCRA) and

Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater. While with EPA, served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. Led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) and directed efforts to improve hydrogeologic characterization and water quality monitoring. For the past 15 years, as a founding partner with SWAPE, developed extensive client relationships and has managed complex projects that include consultations as an expert witness and a regulatory specialist, and managing projects ranging from industrial stormwater compliance to CEQA review of impacts from hazardous waste, air quality and greenhouse gas emissions.

Positions held include:

Government:

- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Geologist, U.S. Forest Service (1986 – 1998)

Educational:

- Geology Instructor, Golden West College, 2010 – 2104, 2017;
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);

Private Sector:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);
- Executive Director, Orange Coast Watch (2001 – 2004);
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, responsibilities have included:

- Lead analyst and testifying expert, for both plaintiffs and defendants, in the review of over 300 environmental impact reports and negative declarations since 2003 under CEQA that identify significant issues with regard to

hazardous waste, water resources, water quality, air quality, greenhouse gas emissions, and geologic hazards.

- Recommending additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce exposure to hazards from toxins.
- Stormwater analysis, sampling and best management practice evaluation, for both government agencies and corporate clients, at more than 150 industrial facilities.
- Serving as expert witness for both plaintiffs and defendants in cases including contamination of groundwater, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns, for both government agencies and corporate clients.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.

With Komex H2O Science Inc., duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Lead author for a multi-volume remedial investigation report for an

operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, an Orange County-based not-for-profit water-quality organization, led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities included:

- Leading efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiating a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identifying emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. Used

analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. Prepared geologic reports, conducted hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Served as a hydrogeologist with the RCRA Hazardous Waste program. Duties included:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
  - Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.

- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation- wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served as senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advising the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaping EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improving the technical training of EPA's scientific and engineering staff.
- Earning an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Establishing national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities included:

- Mapping geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinating research with community stakeholders who were concerned with natural resource protection.
- Characterizing the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large

hazardous waste site in eastern Oregon. Duties included the following:

- Supervising year-long effort for soil and groundwater sampling.
- Conducting aquifer tests.
    - Investigating active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.
- Part time geology instructor at Golden West College in Huntington Beach, California from 2010 to 2014 and in 2017.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the PublicEnvironmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S.EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making andPublic Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins atschools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBEReleases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells.
Presentation to the Ground Water and Environmental Law Conference, National

GroundwaterAssociation.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Waterin Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Waterin the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to atribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to ameeting of tribal representatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking WaterSupplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant.Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invitedpresentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting ofthe National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to ameeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to AddressImpacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in

Groundwater(and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA andState Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublishedreport.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water.Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground StorageTanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal WatercraftUsage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George WrightSociety Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA SuperfundGroundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval AirStation, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui,October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu,
Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Airand Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Ch ar ac te r i z a t i o n and Cl ean up a t Closing Military Basesin California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce ofPrevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examinations,2009-2011.

ATTACHMENT C

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Attn: Paul Rosenfeld, Ph.D.
Mobil: (310) 795-2335
Office: (310) 452-5555
Fax: (310) 452-5550
Email: prosenfeld@swape.com

Paul Rosenfeld, Ph.D.

Chemical Fate and Transport & Air Dispersion Modeling

Principal Environmental Chemist

Risk Assessment & Remediation Specialist

Education

Ph.D. Soil Chemistry, University of Washington, 1999. Dissertation on volatile organic compound filtration.

M.S. Environmental Science, U.C. Berkeley, 1995. Thesis on organic waste economics.

B.A. Environmental Studies, U.C. Santa Barbara, 1991. Thesis on wastewater treatment.

Professional Experience

Dr. Rosenfeld has over 25 years' experience conducting environmental investigations and risk assessments for evaluating impacts to human health, property, and ecological receptors. His expertise focuses on the fate and transport of environmental contaminants, human health risk, exposure assessment, and ecological restoration. Dr. Rosenfeld has evaluated and modeled emissions from oil spills, landfills, boilers and incinerators, process stacks, storage tanks, confined animal feeding operations, industrial, military and agricultural sources, unconventional oil drilling operations, and locomotive and construction engines. His project experience ranges from monitoring and modeling of pollution sources to evaluating impacts of pollution on workers at industrial facilities and residents in surrounding communities. Dr. Rosenfeld has also successfully modeled exposure to contaminants distributed by water systems and via vapor intrusion.

Dr. Rosenfeld has investigated and designed remediation programs and risk assessments for contaminated sites containing lead, heavy metals, mold, bacteria, particulate matter, petroleum hydrocarbons, chlorinated solvents, pesticides, radioactive waste, dioxins and furans, semi- and volatile organic compounds, PCBs, PAHs, creosote, perchlorate, asbestos, per- and poly-fluoroalkyl substances (PFOA/PFOS), unusual polymers, fuel oxygenates (MTBE), among other pollutants. Dr. Rosenfeld also has experience evaluating greenhouse gas emissions from various projects and is an expert on the assessment of odors from industrial and agricultural sites, as well as the evaluation of odor nuisance impacts and technologies for abatement of odorous emissions. As a principal scientist at SWAPE, Dr. Rosenfeld directs air dispersion modeling and exposure assessments. He has served as an expert witness and testified about pollution sources causing nuisance and/or personal injury at sites and has testified as an expert witness on numerous cases involving exposure to soil, water and air contaminants from industrial, railroad, agricultural, and military sources.

[1]

Professional History:

Soil Water Air Protection Enterprise (SWAPE); 2003 to present; Principal and Founding Partner
UCLA School of Public Health; 2007 to 2011; Lecturer (Assistant Researcher)
UCLA School of Public Health; 2003 to 2006; Adjunct Professor
UCLA Environmental Science and Engineering Program; 2002-2004; Doctoral Intern Coordinator
UCLA Institute of the Environment, 2001-2002; Research Associate
Komex H_2O Science, 2001 to 2003; Senior Remediation Scientist
National Groundwater Association, 2002-2004; Lecturer
San Diego State University, 1999-2001; Adjunct Professor
Anteon Corp., San Diego, 2000-2001; Remediation Project Manager
Ogden (now Amec), San Diego, 2000-2000; Remediation Project Manager
Bechtel, San Diego, California, 1999 – 2000; Risk Assessor
King County, Seattle, 1996 – 1999; Scientist
James River Corp., Washington, 1995-96; Scientist
Big Creek Lumber, Davenport, California, 1995; Scientist
Plumas Corp., California and USFS, Tahoe 1993-1995; Scientist
Peace Corps and World Wildlife Fund, St. Kitts, West Indies, 1991-1993; Scientist

Publications:

Remy, L.L., Clay T., Byers, V., **Rosenfeld P. E.** (2019) Hospital, Health, and Community Burden After Oil Refinery Fires, Richmond, California 2007 and 2012. *Environmental Health.* 18:48

Simons, R.A., Seo, Y. **Rosenfeld, P**., (2015) Modeling the Effect of Refinery Emission On Residential Property Value. Journal of Real Estate Research. 27(3):321-342

Chen, J. A, Zapata A. R., Sutherland A. J., Molmen, D.R., Chow, B. S., Wu, L. E., **Rosenfeld, P. E.,** Hesse, R. C., (2012) Sulfur Dioxide and Volatile Organic Compound Exposure To A Community In Texas City Texas Evaluated Using Aermod and Empirical Data. *American Journal of Environmental Science*, 8(6), 622-632.

Rosenfeld, P.E. & Feng, L. (2011). *The Risks of Hazardous Waste.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2011). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Agrochemical Industry*, Amsterdam: Elsevier Publishing.

Gonzalez, J., Feng, L., Sutherland, A., Waller, C., Sok, H., Hesse, R., **Rosenfeld, P.** (2010). PCBs and Dioxins/Furans in Attic Dust Collected Near Former PCB Production and Secondary Copper Facilities in Sauget, IL. *Procedia Environmental Sciences*. 113–125.

Feng, L., Wu, C., Tam, L., Sutherland, A.J., Clark, J.J., **Rosenfeld, P.E.** (2010). Dioxin and Furan Blood Lipid and Attic Dust Concentrations in Populations Living Near Four Wood Treatment Facilities in the United States. *Journal of Environmental Health*. 73(6), 34-46.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2010). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Wood and Paper Industries.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2009). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Petroleum Industry*. Amsterdam: Elsevier Publishing.

[1]

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. *WIT Transactions on Ecology and the Environment, Air Pollution,* 123 (17), 319-327.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equivalency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. *Organohalogen Compounds*, 70, 002252-002255.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. *Organohalogen Compounds*, 70, 000527-000530.

Hensley, A.R. A. Scott, J. J. J. Clark, **Rosenfeld, P.E.** (2007). Attic Dust and Human Blood Samples Collected near a Former Wood Treatment Facility. *Environmental Research*. 105, 194-197.

Rosenfeld, P.E., J. J. J. Clark, A. R. Hensley, M. Suffet. (2007). The Use of an Odor Wheel Classification for Evaluation of Human Health Risk Criteria for Compost Facilities. *Water Science & Technology* 55(5), 345-357.

Rosenfeld, P. E., M. Suffet. (2007). The Anatomy Of Odour Wheels For Odours Of Drinking Water, Wastewater, Compost And The Urban Environment. *Water Science & Technology* 55(5), 335-344.

Sullivan, P. J. Clark, J.J.J., Agardy, F. J., **Rosenfeld, P.E.** (2007). *Toxic Legacy, Synthetic Toxins in the Food, Water, and Air in American Cities.* Boston Massachusetts: Elsevier Publishing

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash. *Water Science and Technology*. 49(9),171-178.

Rosenfeld P. E., J.J. Clark, I.H. (Mel) Suffet (2004). The Value of An Odor-Quality-Wheel Classification Scheme For The Urban Environment. *Water Environment Federation's Technical Exhibition and Conference (WEFTEC) 2004.* New Orleans, October 2-6, 2004.

Rosenfeld, P.E., and Suffet, I.H. (2004). Understanding Odorants Associated With Compost, Biomass Facilities, and the Land Application of Biosolids. *Water Science and Technology*. 49(9), 193-199.

Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash, *Water Science and Technology*, 49(9), 171-178.

Rosenfeld, P. E., Grey, M. A., Sellew, P. (2004). Measurement of Biosolids Odor and Odorant Emissions from Windrows, Static Pile and Biofilter. *Water Environment Research*. 76(4), 310-315.

Rosenfeld, P.E., Grey, M and Suffet, M. (2002). Compost Demonstration Project, Sacramento California Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Integrated Waste Management Board Public Affairs Office*, Publications Clearinghouse (MS–6), Sacramento, CA Publication #442-02-008.

Rosenfeld, P.E., and C.L. Henry. (2001). Characterization of odor emissions from three different biosolids. *Water Soil and Air Pollution*. 127(1-4), 173-191.

Rosenfeld, P.E., and Henry C. L., (2000). Wood ash control of odor emissions from biosolids application. *Journal of Environmental Quality.* 29, 1662-1668.

Rosenfeld, P.E., C.L. Henry and D. Bennett. (2001). Wastewater dewatering polymer affect on biosolids odor emissions and microbial activity. *Water Environment Research*. 73(4), 363-367.

Rosenfeld, P.E., and C.L. Henry. (2001). Activated Carbon and Wood Ash Sorption of Wastewater, Compost, and Biosolids Odorants. *Water Environment Research*, 73, 388-393.

Rosenfeld, P.E., and Henry C. L., (2001). High carbon wood ash effect on biosolids microbial activity and odor. *Water Environment Research*. 131(1-4), 247-262.

Chollack, T. and **P. Rosenfeld. (**1998). Compost Amendment Handbook For Landscaping. Prepared for and distributed by the City of Redmond, Washington State.

Rosenfeld, P. E. (1992). The Mount Liamuiga Crater Trail. *Heritage Magazine of St. Kitts*, 3(2).

Rosenfeld, P. E. (1993). High School Biogas Project to Prevent Deforestation On St. Kitts. *Biomass Users Network*, 7(1).

Rosenfeld, P. E. (1998). Characterization, Quantification, and Control of Odor Emissions From Biosolids Application To Forest Soil. Doctoral Thesis. University of Washington College of Forest Resources.

Rosenfeld, P. E. (1994). Potential Utilization of Small Diameter Trees on Sierra County Public Land. Masters thesis reprinted by the Sierra County Economic Council. Sierra County, California.

Rosenfeld, P. E. (1991). How to Build a Small Rural Anaerobic Digester & Uses Of Biogas In The First And Third World. Bachelors Thesis. University of California.

Presentations:

Rosenfeld, P.E., "The science for Perfluorinated Chemicals (PFAS): What makes remediation so hard?" Law Seminars International, (May 9-10, 2018) 800 Fifth Avenue, Suite 101 Seattle, WA.

Rosenfeld, P.E., Sutherland, A; Hesse, R.; Zapata, A. (October 3-6, 2013). Air dispersion modeling of volatile organic emissions from multiple natural gas wells in Decatur, TX. *44th Western Regional Meeting, American Chemical Society.* Lecture conducted from Santa Clara, CA.

Sok, H.L.; Waller, C.C.; Feng, L.; Gonzalez, J.; Sutherland, A.J.; Wisdom-Stack, T.; Sahai, R.K.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Atrazine: A Persistent Pesticide in Urban Drinking Water. *Urban Environmental Pollution*. Lecture conducted from Boston, MA.

Feng, L.; Gonzalez, J.; Sok, H.L.; Sutherland, A.J.; Waller, C.C.; Wisdom-Stack, T.; Sahai, R.K.; La, M.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Bringing Environmental Justice to East St. Louis, Illinois. *Urban Environmental Pollution.* Lecture conducted from Boston, MA.

Rosenfeld, P.E. (April 19-23, 2009). Perfluoroctanoic Acid (PFOA) and Perfluoroactane Sulfonate (PFOS) Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*, Lecture conducted from Tuscon, AZ.

Rosenfeld, P.E. (April 19-23, 2009). Cost to Filter Atrazine Contamination from Drinking Water in the United States" Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*. Lecture conducted from Tuscon, AZ.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (20-22 July, 2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. Brebbia, C.A. and Popov, V., eds., *Air Pollution XVII: Proceedings of the Seventeenth International Conference on Modeling, Monitoring and Management of Air Pollution*. Lecture conducted from Tallinn, Estonia.

Rosenfeld, P. E. (October 15-18, 2007). Moss Point Community Exposure To Contaminants From A Releasing Facility. *The 23rd Annual International Conferences on Soils Sediment and Water.* Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). The Repeated Trespass of Tritium-Contaminated Water Into A Surrounding Community Form Repeated Waste Spills From A Nuclear Power Plant. *The 23rd Annual International Conferences on Soils Sediment and Water*. Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). Somerville Community Exposure To Contaminants From Wood Treatment Facility Emissions. The *23rd Annual International Conferences on Soils Sediment and Water*. Lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld P. E. (March 2007). Production, Chemical Properties, Toxicology, & Treatment Case Studies of 1,2,3-Trichloropropane (TCP). *The Association for Environmental Health and Sciences (AEHS) Annual Meeting*. Lecture conducted from San Diego, CA.

Rosenfeld P. E. (March 2007). Blood and Attic Sampling for Dioxin/Furan, PAH, and Metal Exposure in Florala, Alabama. *The AEHS Annual Meeting.* Lecture conducted from San Diego, CA.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (August 21 – 25, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006*. Lecture conducted from Radisson SAS Scandinavia Hotel in Oslo Norway.

Hensley A.R., Scott, A., **Rosenfeld P.E.,** Clark, J.J.J. (November 4-8, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *APHA 134 Annual Meeting & Exposition.* Lecture conducted from Boston Massachusetts.

Paul Rosenfeld Ph.D. (October 24-25, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. Mealey's C8/PFOA. *Science, Risk & Litigation Conference.* Lecture conducted from The Rittenhouse Hotel, Philadelphia, PA.

Paul Rosenfeld Ph.D. (September 19, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, *Toxicology and Remediation PEMA Emerging Contaminant Conference*. Lecture conducted from Hilton Hotel, Irvine California.

Paul Rosenfeld Ph.D. (September 19, 2005). Fate, Transport, Toxicity, And Persistence of 1,2,3-TCP. *PEMA Emerging Contaminant Conference.* Lecture conducted from Hilton Hotel in Irvine, California.

Paul Rosenfeld Ph.D. (September 26-27, 2005). Fate, Transport and Persistence of PDBEs. *Mealey's Groundwater Conference.* Lecture conducted from Ritz Carlton Hotel, Marina Del Ray, California.

Paul Rosenfeld Ph.D. (June 7-8, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. *International Society of Environmental Forensics: Focus On Emerging Contaminants*. Lecture conducted from Sheraton Oceanfront Hotel, Virginia Beach, Virginia.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Fate Transport, Persistence and Toxicology of PFOA and Related Perfluorochemicals. *2005 National Groundwater Association Ground Water And Environmental Law Conference*. Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, Toxicology and Remediation. *2005 National Groundwater Association Ground Water and Environmental Law Conference.* Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. and Rob Hesse R.G. (May 5-6, 2004). Tert-butyl Alcohol Liability and Toxicology, A National Problem and Unquantified Liability. *National Groundwater Association. Environmental Law Conference*. Lecture conducted from Congress Plaza Hotel, Chicago Illinois.

Paul Rosenfeld, Ph.D. (March 2004). Perchlorate Toxicology. *Meeting of the American Groundwater Trust*. Lecture conducted from Phoenix Arizona.

Hagemann, M.F., **Paul Rosenfeld, Ph.D.** and Rob Hesse (2004). Perchlorate Contamination of the Colorado River. *Meeting of tribal representatives*. Lecture conducted from Parker, AZ.

Paul Rosenfeld, Ph.D. (April 7, 2004). A National Damage Assessment Model For PCE and Dry Cleaners. *Drycleaner Symposium. California Ground Water Association*. Lecture conducted from Radison Hotel, Sacramento, California.

Rosenfeld, P. E., Grey, M., (June 2003) Two stage biofilter for biosolids composting odor control. *Seventh International In Situ And On Site Bioremediation Symposium Battelle Conference* Orlando, FL.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. (February 20-21, 2003) Understanding Historical Use, Chemical Properties, Toxicity and Regulatory Guidance of 1,4 Dioxane. *National Groundwater Association. Southwest Focus Conference. Water Supply and Emerging Contaminants*.. Lecture conducted from Hyatt Regency Phoenix Arizona.

Paul Rosenfeld, Ph.D. (February 6-7, 2003). Underground Storage Tank Litigation and Remediation. *California CUPA Forum*. Lecture conducted from Marriott Hotel, Anaheim California.

Paul Rosenfeld, Ph.D. (October 23, 2002) Underground Storage Tank Litigation and Remediation. *EPA Underground Storage Tank Roundtable*. Lecture conducted from Sacramento California.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Understanding Odor from Compost, *Wastewater and Industrial Processes. Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Using High Carbon Wood Ash to Control Compost Odor. *Sixth Annual Symposium On Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Grey, M. A. (September 22-24, 2002). Biocycle Composting For Coastal Sage Restoration. *Northwest Biosolids Management Association*. Lecture conducted from Vancouver Washington..

Rosenfeld, P.E. and Grey, M. A. (November 11-14, 2002). Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Soil Science Society Annual Conferenc*e. Lecture conducted from Indianapolis, Maryland.

Rosenfeld. P.E. (September 16, 2000). Two stage biofilter for biosolids composting odor control. *Water Environment Federation.* Lecture conducted from Anaheim California.

Rosenfeld. P.E. (October 16, 2000). Wood ash and biofilter control of compost odor. *Biofest.* Lecture conducted from Ocean Shores, California.

Rosenfeld, P.E. (2000). Bioremediation Using Organic Soil Amendments. *California Resource Recovery Association*. Lecture conducted from Sacramento California.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. *Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings*. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., and C.L. Henry. (1999). An evaluation of ash incorporation with biosolids for odor reduction. *Soil Science Society of America*. Lecture conducted from Salt Lake City Utah.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Comparison of Microbial Activity and Odor Emissions from Three Different Biosolids Applied to Forest Soil. *Brown and Caldwell.* Lecture conducted from Seattle Washington.

Rosenfeld, P.E., C.L. Henry. (1998). Characterization, Quantification, and Control of Odor Emissions from Biosolids Application To Forest Soil. *Biofest.* Lecture conducted from Lake Chelan, Washington.

Rosenfeld, P.E, C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation With High-Carbon Wood-Ash. Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., C.L. Henry, R. B. Harrison, and R. Dills. (1997). Comparison of Odor Emissions From Three Different Biosolids Applied to Forest Soil. *Soil Science Society of America*. Lecture conducted from Anaheim California.

Teaching Experience:

UCLA Department of Environmental Health (Summer 2003 through 20010) Taught Environmental Health Science 100 to students, including undergrad, medical doctors, public health professionals and nurses. Course focused on the health effects of environmental contaminants.

National Ground Water Association, Successful Remediation Technologies. Custom Course in Sante Fe, New Mexico. May 21, 2002. Focused on fate and transport of fuel contaminants associated with underground storage tanks.

National Ground Water Association; Successful Remediation Technologies Course in Chicago Illinois. April 1, 2002. Focused on fate and transport of contaminants associated with Superfund and RCRA sites.

California Integrated Waste Management Board, April and May, 2001. Alternative Landfill Caps Seminar in San Diego, Ventura, and San Francisco. Focused on both prescriptive and innovative landfill cover design.

UCLA Department of Environmental Engineering, February 5, 2002. Seminar on Successful Remediation Technologies focusing on Groundwater Remediation.

University Of Washington, Soil Science Program, Teaching Assistant for several courses including: Soil Chemistry, Organic Soil Amendments, and Soil Stability.

U.C. Berkeley, Environmental Science Program Teaching Assistant for Environmental Science 10.

Academic Grants Awarded:

California Integrated Waste Management Board. $41,000 grant awarded to UCLA Institute of the Environment. Goal: To investigate effect of high carbon wood ash on volatile organic emissions from compost. 2001.

Synagro Technologies, Corona California: $10,000 grant awarded to San Diego State University.
Goal: investigate effect of biosolids for restoration and remediation of degraded coastal sage soils. 2000.

King County, Department of Research and Technology, Washington State. $100,000 grant awarded to University of Washington: Goal: To investigate odor emissions from biosolids application and the effect of polymers and ash on VOC emissions. 1998.

Northwest Biosolids Management Association, Washington State. $20,000 grant awarded to investigate effect of polymers and ash on VOC emissions from biosolids. 1997.

James River Corporation, Oregon: $10,000 grant was awarded to investigate the success of genetically engineered Poplar trees with resistance to round-up. 1996.

United State Forest Service, Tahoe National Forest: $15,000 grant was awarded to investigating fire ecology of the Tahoe National Forest. 1995.

Kellogg Foundation, Washington D.C. $500 grant was awarded to construct a large anaerobic digester on St. Kitts in West Indies. 1993

Deposition and/or Trial Testimony:

In the Circuit Court of Cook County Illinois
Joseph Rafferty, Plaintiff vs. Consolidated Rail Corporation and National Railroad Passenger Corporation d/b/a AMTRAK,
Case No.: No. 18-L-6845
Rosenfeld Deposition, 6-28-2021

In the United States District Court For the Northern District of Illinois
Theresa Romcoe, Plaintiff vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail, Defendants
Case No.: No. 17-cv-8517
Rosenfeld Deposition, 5-25-2021

In the Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 5-14-2021

In the Superior Court of the State of Arizona In and For the Cunty of Maricopa
Mary Tryon et al., Plaintiff vs. The City of Pheonix,; Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.
Case Number CV20127-094749
Rosenfeld Deposition: 5-7-2021

In the United States District Court for the Eastern District of Texas Beaumont Division
Robinson, Jeremy et al *Plaintiffs*, vs. CNA Insurance Company et al.
Case Number 1:17-cv-000508
Rosenfeld Deposition: 3-25-2021

In the Superior Court of the State of California, County of San Bernardino
Gary Garner, Personal Representative for the Estate of Melvin Garner vs. BNSF Railway Company.
Case No. 1720288
Rosenfeld Deposition 2-23-2021

In the Superior Court of the State of California, County of Los Angeles, Spring Street Courthouse
Benny M Rodriguez vs. Union Pacific Railroad, A Corporation, et al.
Case No. 18STCV01162
Rosenfeld Deposition 12-23-2020

In the Circuit Court of Jackson County, Missouri
Karen Cornwell, *Plaintiff,* vs. Marathon Petroleum, LP, *Defendant.*
Case No.: 1716-CV10006
Rosenfeld Deposition. 8-30-2019

In the United States District Court For The District of New Jersey
Duarte et al, *Plaintiffs,* vs. United States Metals Refining Company et. al. *Defendant.*
Case No.: 2:17-cv-01624-ES-SCM
Rosenfeld Deposition. 6-7-2019

In the United States District Court of Southern District of Texas Galveston Division
M/T Carla Maersk, *Plaintiffs,* vs. Conti 168., Schiffahrts-GMBH & Co. Bulker KG MS "Conti Perdido" *Defendant.*
Case No.: 3:15-CV-00106 consolidated with 3:15-CV-00237
Rosenfeld Deposition. 5-9-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
Carole-Taddeo-Bates et al., vs. Ifran Khan et al., Defendants
Case No.: No. BC615636
Rosenfeld Deposition, 1-26-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
The San Gabriel Valley Council of Governments et al. vs El Adobe Apts. Inc. et al., Defendants
Case No.: No. BC646857
Rosenfeld Deposition, 10-6-2018; Trial 3-7-19

In United States District Court For The District of Colorado
Bells et al. Plaintiff vs. The 3M Company et al., Defendants
Case No.: 1:16-cv-02531-RBJ
Rosenfeld Deposition, 3-15-2018 and 4-3-2018

In The District Court Of Regan County, Texas, 112th Judicial District
Phillip Bales et al., Plaintiff vs. Dow Agrosciences, LLC, et al., Defendants
Cause No.: 1923
Rosenfeld Deposition, 11-17-2017

In The Superior Court of the State of California In And For The County Of Contra Costa
Simons et al., Plaintiffs vs. Chevron Corporation, et al., Defendants
Cause No C12-01481
Rosenfeld Deposition, 11-20-2017

In The Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition, 8-23-2017

In United States District Court For The Southern District of Mississippi
Guy Manuel vs. The BP Exploration et al., Defendants
Case: No 1:19-cv-00315-RHW
Rosenfeld Deposition, 4-22-2020

In The Superior Court of the State of California, For The County of Los Angeles
Warrn Gilbert and Penny Gilber, Plaintiff vs. BMW of North America LLC
Case No.: LC102019 (c/w BC582154)
Rosenfeld Deposition, 8-16-2017, Trail 8-28-2018

In the Northern District Court of Mississippi, Greenville Division
Brenda J. Cooper, et al., *Plaintiffs,* vs. Meritor Inc., et al., *Defendants*
Case Number: 4:16-cv-52-DMB-JVM
Rosenfeld Deposition: July 2017

In The Superior Court of the State of Washington, County of Snohomish
Michael Davis and Julie Davis et al., Plaintiff vs. Cedar Grove Composting Inc., Defendants
Case No.: No. 13-2-03987-5
Rosenfeld Deposition, February 2017
Trial, March 2017

In The Superior Court of the State of California, County of Alameda
Charles Spain., Plaintiff vs. Thermo Fisher Scientific, et al., Defendants
Case No.: RG14711115
Rosenfeld Deposition, September 2015

In The Iowa District Court In And For Poweshiek County
Russell D. Winburn, et al., Plaintiffs vs. Doug Hoksbergen, et al., Defendants
Case No.: LALA002187
Rosenfeld Deposition, August 2015

In The Circuit Court of Ohio County, West Virginia
Robert Andrews, et al. v. Antero, et al.
Civil Action N0. 14-C-30000
Rosenfeld Deposition, June 2015

In The Iowa District Court For Muscatine County
Laurie Freeman et. al. Plaintiffs vs. Grain Processing Corporation, Defendant
Case No 4980
Rosenfeld Deposition: May 2015

In the Circuit Court of the 17th Judicial Circuit, in and For Broward County, Florida
Walter Hinton, et. al. Plaintiff, vs. City of Fort Lauderdale, Florida, a Municipality, Defendant.
Case Number CACE07030358 (26)
Rosenfeld Deposition: December 2014

In the County Court of Dallas County Texas
Lisa Parr et al, *Plaintiff*, vs. Aruba et al, *Defendant.*
Case Number cc-11-01650-E
Rosenfeld Deposition: March and September 2013
Rosenfeld Trial: April 2014

In the Court of Common Pleas of Tuscarawas County Ohio
John Michael Abicht, et al., *Plaintiffs,* vs. Republic Services, Inc., et al., *Defendants*
Case Number: 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition: October 2012

In the United States District Court for the Middle District of Alabama, Northern Division
James K. Benefield, et al., *Plaintiffs*, vs. International Paper Company, *Defendant*.
Civil Action Number 2:09-cv-232-WHA-TFM
Rosenfeld Deposition: July 2010, June 2011

In the Circuit Court of Jefferson County Alabama
Jaeanette Moss Anthony, et al., *Plaintiffs*, vs. Drummond Company Inc., et al., *Defendants*
Civil Action No. CV 2008-2076
Rosenfeld Deposition: September 2010

In the United States District Court, Western District Lafayette Division
Ackle et al., *Plaintiffs*, vs. Citgo Petroleum Corporation, et al., *Defendants*.
Case Number 2:07CV1052
Rosenfeld Deposition: July 2009

EXHIBIT B

September 7, 2021

Ms. Kendra Hartmann
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

Subject: Comments on Biological Resource Impacts Associated with the Resurgence Solar Project

Dear Ms. Hartmann:

This letter contains my comments on biological resource impacts associated with the Resurgence Solar Project ("Project"). Resurgence Solar I & II, LLC ("Applicant") is proposing to decommission an existing 150-megawatt concentrated solar thermal facility and redevelop the site with a new 150-megawatt photovoltaic ("PV") solar facility and battery energy storage system in the Community of Kramer Junction.

I am an environmental biologist with 28 years of professional experience in wildlife biology and natural resources management. I have served as a biological resources expert for over 150 projects, the majority of which have been renewable energy facilities in California. My experience and scope of work in this regard has included assisting various clients with evaluations of biological resource issues, reviewing environmental compliance documents prepared pursuant to the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), and submitting written comments in response to CEQA and NEPA documents. My work has included the preparation of written and oral testimony for the California Energy Commission, California Public Utilities Commission, and Federal courts. My educational background includes a B.S. in Resource Management from the University of California at Berkeley, and a M.S. in Wildlife and Fisheries Science from the Pennsylvania State University. A copy of my current curriculum vitae is attached hereto.

The comments herein are based on my review of the environmental documents prepared for the Project, a review of scientific literature pertaining to biological resources known to occur in the Project area, consultations with other biological resource experts, and the knowledge and experience I have acquired during my 28-year career in the field of natural resources management.

Avian Collisions

The presence of dead and injured birds at solar facilities operating in California demonstrates that solar facilities present a collision hazard to birds.[1] At photovoltaic PV facilities, birds appear to mistake the broad reflective surfaces of the solar arrays for water, trees, and other attractive habitat.[2] When this occurs, the birds become susceptible to mortality by: (a) colliding with the solar panels; or (b) becoming stranded (often injured) on a substrate from which they cannot take flight, thereby becoming susceptible to predation and starvation.[3]

There is also evidence that PV solar panels produce polarized light pollution that attracts insects, which in turn attract insectivores (insect-eating birds).[4] Those birds then become susceptible to injury or death when they attempt to prey upon the insects that have been attracted to the PV solar panels. Dead and injured insectivores then attract avian predators and scavengers, which too become susceptible to collision with the PV panels and other project features. This creates an entire food chain vulnerable to injury and death, which can have profound but unquantified effects on the ecological community surrounding the solar facility.[5]

A study completed by the National Fish and Wildlife Forensics Laboratory reported: "solar facilities appear to represent 'equal-opportunity' hazards for the bird species that encounter them."[6] Although solar facilities kill all types of birds, monitoring reports have documented an unexpectedly high proportion of waterbird deaths at recently constructed solar energy facilities, including those that use PV solar panels. This phenomenon appears to be due to waterbirds mistaking the PV arrays for a lake (or other water body).[7] A letter from the USFWS confirms that this "lake effect" is a growing concern for all types of solar projects:

> "Incidental fatalities are increasingly being documented and reported at a range of solar projects. . . All [solar] technology types appear to present a hazard to water-associated bird species from the lake effect, based on the species composition of avian mortalities documented at ISEGS, Genesis (solar trough), and Desert Sunlight (photovoltaic) projects. The magnitude of this lake effect remains unclear, but may be location specific and may be correlated with migratory flyways or the availability of other habitat for

---

[1] Kagan RA, TC Viner, PW Trail, EO Espinoza. 2014. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. National Fish and Wildlife Forensics Laboratory. 28 pp.
[2] *Ibid.*
[3] *Ibid.*
[4] *Ibid. See also* Horváth G, Kriska G, Malik P, Robertson B. 2009. Polarized light pollution: A new kind of ecological photopollution. Frontiers in Ecology and the Environment 7:317–325. *See also* Horváth G, M Blaho, A Egri, G Krista, I Seres, B Robertson. 2010. Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. Conservation Biology 24(6):1644-1653. *See also* Lovich JE, JR Ennen. 2011. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. Bioscience 61(12):982-992.
[5] Lovich JE, Ennen JR. 2011. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. Bioscience 61(12):982-992.
[6] Kagan RA, TC Viner, PW Trail, EO Espinoza. 2014. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. National Fish and Wildlife Forensics Laboratory. 28 pp.
[7] U.S. Fish and Wildlife Service. 2018 May 2. Energy Development: Energy Technologies and Impacts – Solar Energy [web page]. Available at: <https://www.fws.gov/ecological-services/energy-development/solar.html>. (Accessed June 15, 2020).

migratory stopovers."[8]

The nature and magnitude of impacts to bird populations and communities is generally related to the following three project-specific factors: location, size, and technology.[9] As reported by Walston et al. (2016):

> Bird abundance and activity at local and regional scales varies by the distribution of habitat and other landscape features (e.g., elevation) in the environment. Therefore, the location of a solar energy project relative to bird habitats, such as migration flyways, wetlands, and riparian vegetation, could influence avian mortality risk. The footprint size of the solar project is a direct measure of the amount of surface disturbance and human activity. Projects with larger footprints, therefore, may result in more avian fatalities than projects with smaller footprints. Lastly, different solar technologies and project designs may influence avian mortality risk. For example, project designs that utilize constructed cooling ponds, or solar collectors that reflect polarized sunlight in such a way so as to be perceived as waterbodies, may attract birds and their prey (e.g., insects), thereby increasing the risk of bird collisions with project structures.[10]

The location, size, and technology of the Project increase the risk that it would have significant impacts on bird populations and communities. First, the Project is located near the intersection of two major migration routes: one used by landbirds, and one used by waterbirds (Figure 1, below).[11] Second, the Project is relatively large (1,172 acres).[12] Finally, the Project would employ PV technology, which appears to be especially hazardous to birds.[13] The combination of these three factors heighten the risk that the Project will cause a significant amount of avian mortality.

The number of avian fatalities being caused by solar energy facilities is not trivial, especially for species that have low population numbers. For these species, the loss of even small numbers of individuals can have a population-level effect. Furthermore, even if the Project's impacts on bird populations are less than significant, the Project would contribute to the significant cumulative impact caused by all of the solar energy facilities in the region.[14]

The USFWS concluded in its analysis of another solar facility that, given the large sizes of existing and proposed PV facilities, and the lack of opportunity for effective adaptive

---

[8] Letter from Kennon Corey, U.S. Fish and Wildlife Service, to Christine Stora, California Energy Commission dated August 7, 2014. [emphasis added].
[9] Walston LJ Jr, KE Rollins, KE LaGory, KP Smith, SA Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy 92:404-414.
[10] *Ibid*.
[11] Cooper DS. 2016. Industrial-scale solar projects and birds in the California desert: Assessing impacts & developing mitigation. Technical report prepared for Sonoran Joint Venture, Tucson, AZ. Figure 3.
[12] NextEra Energy. 2021 Jan 27. Project Description: Resurgence Solar Project. p. 1.
[13] Walston LJ Jr, KE Rollins, KE LaGory, KP Smith, SA Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy 92:404-414.
[14] According to County, there are 11 active, 7 conditionally approved, and 41 completed solar project in the County of San Bernardino as of August 31, 2021. *See* <https://www.sbcounty.gov/uploads/LUS/Renewable/SolarProjectList2020_Maps.pdf>.

management measures and other design modifications sufficient to avoid take of birds, PV facilities could have significant effects on migratory birds.[15] I concur with that conclusion.

Mitigating a solar energy project's impacts on bird populations requires measures that offset the loss of individual birds by augmenting bird populations, ideally on breeding grounds. The County has not incorporated any mitigation for avian fatalities that will be caused by the Project. As a result, avian collisions with the Project's PV panels (and other components) represent a potentially significant, unmitigated impact.

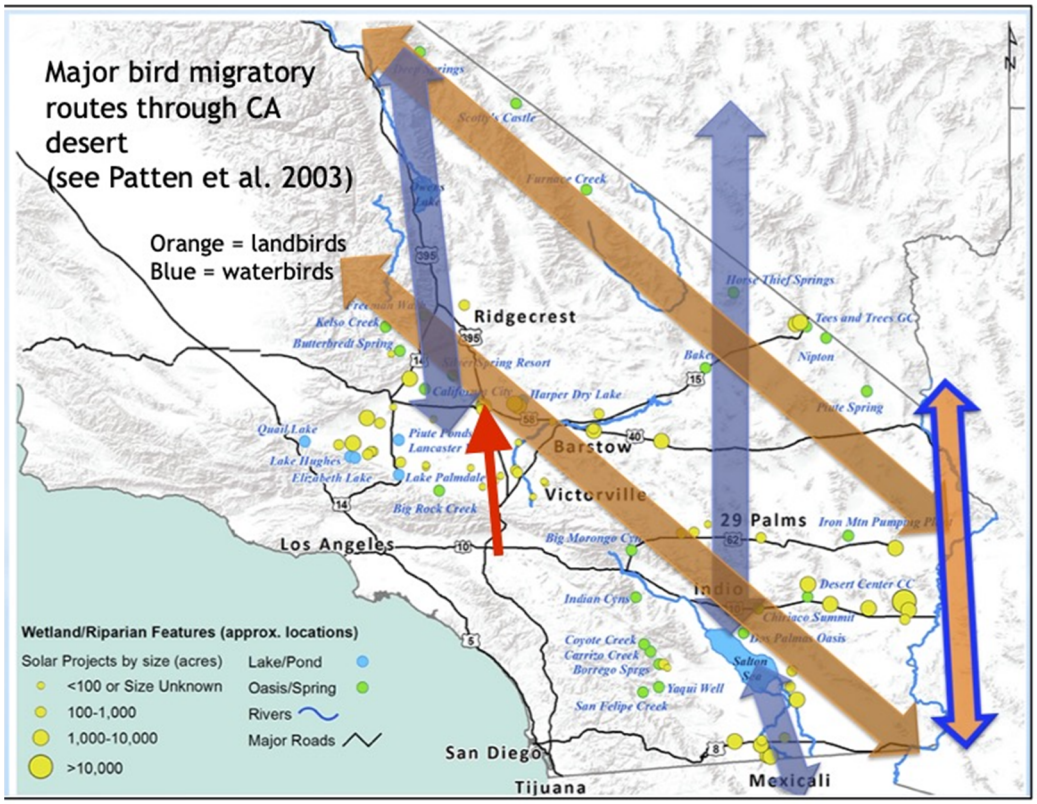


Figure 1. Project site (red arrow) in relation to major migratory routes for landbirds (orange arrows) and waterbirds (blue arrows).

Special-Status Species

According to the Planning Commission Staff Report that was prepared for the Project:

> The Project site has been mostly disturbed by the existing thermal solar use and activities. A general biological survey was conducted to document all biological resources identified within the survey area and included a floral/fauna inventory, vegetation/land use mapping, and habitat suitability assessments to determine the potential for special-status plant and wildlife species and vegetation communities to occur within the survey

[15] U.S. Fish and Wildlife Service. 2014 Aug 4. Comments on the Draft Environmental Impact Report (EIR 529) for the Blythe Mesa Solar Project (CUP 2685), Riverside County, California.

> area. No special-status plant or wildlife species or vegetation communities were observed within the Project site.[16]

These statements are misleading. A Tetra Tech biologist surveyed the Project site on December 10, 2020.[17] Although no special-status species were detected during the survey, the timing of the survey was not conducive to detection of many of the special-status species that, according to the Biological Report, have the potential to occur at or adjacent to the Project site.[18] The survey was not conducted when desert tortoises are active aboveground,[19] and most of the special-status plants that have the potential occur at or adjacent to the Project site are annual plants that are not detectable in December.[20] Furthermore, the Biological Report states: "it was evident that larger mammals have been accessing the interior of the site on occasion and could potentially be present within the site (Attachment 2, Photograph 6), which may include the desert kit fox (*Vulpes macrotis arsipus*)."[21] Because no additional efforts were made to determine whether desert kit foxes were indeed present within the site, there is no basis for the County's determination that the species is absent.

The Biological Report states that Mojave spineflower (*Chorizanthe spinosa*) has a low potential to occur in the vicinity of the Project site because: "[t]his species has not been documented within 10 miles from the site."[22] The Biological Report further states that crowned muilla (*Muilla coronata*) has a low potential to occur because: "[t]his species has not been documented within 10 miles from the site (CDFW 2020). Woodland habitats this rare plant would occur within do not exist in the project vicinity."[23] The rationale for these determinations is flawed. More than 1,000 Mojave spineflower plants were scattered across the Project site and adjacent areas in 1987.[24] This included plants occurring in a "disturbed area of old trash dump site." Crowned muilla was documented approximately 0.5 mile southeast of the Project site, and contrary to what is stated in the Biological Report, it is not limited to "woodland habitats" (it also occurs in scrub communities).[25]

The western Joshua tree (*Yucca brevifolia*) is a candidate for listing under the California Endangered Species Act. Google Earth imagery (dated March 2021) depicts one, possibly two, Joshua trees within the Project site (Figure 2, below). However, according to Tetra Tech's Biological Report: "[t]his species was not observed in the Project site during the Project-specific

---

[16] County of San Bernardino. Planning Commission Staff Report for September 9, 2021, hearing. p. 19.
[17] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 1.
[18] *Ibid*, Table 1.
[19] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 12.
[20] California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0). Website https://www.rareplants.cnps.org [accessed September 7, 2021].
[21] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 13.
[22] *Ibid*, Table 1.
[23] *Ibid.*
[24] Data provided by the participants of the Consortium of California Herbaria (ucjeps.berkeley.edu/cch_archive/; Tue Sep 7 20:53:39 2021).
[25] California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0). Website https://www.rareplants.cnps.org [accessed September 7, 2021].

survey."[26] This draws into question the accuracy of the information provided in the Biological Report, and the County's subsequent conclusion that the Project would not impact any special special-status species because none are present within the Project site.[27]

Birds protected under the Migratory Bird Treaty Act, California Fish and Game Code, or both have the potential to nest within and adjacent to the Project site.[28] The Project has the potential to impact nesting bird through: (a) destruction of active bird nests, and (b) construction activities that cause nest abandonment or loss of reproductive effort. These outcomes are considered "take" by the California Department of Fish and Wildlife, and therefore would be significant impacts. The County has not incorporated mitigation to avoid significant direct and indirect impacts to nesting birds.

[26] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. Table 1.
[27] County of San Bernardino. Planning Commission Staff Report for September 9, 2021, hearing. p. 23.
[28] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 12, Table 1, and photograph 7.

Figure 2. Joshua tree(s) adjacent to Pipeline Road and within the boundary of the Project site.[29]

[29] *Ibid*, Figure 4 (depicting Project site and absence of Joshua trees at this location).

Invasive Plants

Invasive plants (or "weeds") threaten native diversity, alter ecosystem processes,[30] and can cause extinction of native species.[31] Indeed, next to habitat loss, invasive species pose the greatest threat to the nation's biodiversity and natural resources.[32] Although some invasive plant species are already present in the Project area, the Project has the potential to: (1) introduce new weed species, and (2) facilitate the spread of existing weed species. Three things are required for an invasive plant to become established in an area:

1. A vector for transporting the plant or its propagules from one place to another. Some vectors are natural (e.g., wind, water, and wildlife); however, most are related to human activities. Tools, equipment, vehicles, livestock, clothing, and boots are potential vectors for the spread of invasive plants.
2. Suitable conditions for invasive plant colonization. Soil and vegetation disturbance create suitable conditions for the establishment of invasive plants.
3. A suitable environment for the invasive plant to survive, reproduce, and spread. Many invasive species possess a competitive advantage over native species in an area. As a result, invasive species can reproduce and spread exponentially, especially if the ecosystem lacks a mechanism for keeping them in check.[33]

The Project has the potential to facilitate the colonization and spread of invasive plants because construction and operation activities: (a) provide vectors for transporting invasive plant propagules, (b) involve soil disturbance, and (c) would be conducted in an environment susceptible to invasion.

According to the County's Staff Report: "[t]he Project includes measures to minimize the growth of invasive weeds during and following construction."[34] However, these measures appear to be limited to the requirement that: "[t]he applicant shall comply with San Bernardino County weed abatement regulations and periodically clear the site of all non-complying vegetation. This includes removal of all Russian thistle (tumbleweeds)."[35] This requirement does not mitigate potentially significant impacts associated with the colonization and spread of weeds for the following reasons:

---

[30] Vitousek P. 1990. Biological invasions and ecosystem processes: towards an integration of population biology and ecosystem studies. Oikos 57:7–13. *See also* Theoharides KA, Dukes JS. 2007. Plant invasion across space and time: factors affecting nonindigenous species success during four stages of invasion. New Phytologist 176:256-273.
[31] Gurevitch J, Padilla DK. 2004. Are invasive species a major cause of extinctions? Trends in Ecology and Evolution 19(9):470-474.
[32] U.S. Department of the Interior, Office of Congressional and Legislative Affairs. 2013. Invasive Species Management. Statement for the Record: U.S. Department of the Interior Before the House Natural Resources Subcommittee on Public Lands and Environmental Regulation's oversight hearing on "Invasive Species Management on Federal Lands."
[33] California Department of Food and Agriculture, California Invasive Weed Awareness Coalition. 2005. California Noxious & Invasive Weed Action Plan. California Dept. of Food and Agriculture, Sacramento, CA.
[34] County of San Bernardino. Planning Commission Staff Report for September 9, 2021, hearing. p. 19.
[35] *Ibid*, p. 36.

1. The weed abatement regulations require removal of Russian thistle, but no other invasive weed species.[36]
2. The weed abatement regulations are designed to reduce fire hazards—not the ecological impacts of invasive weeds. There is no evidence or analysis supporting the conclusion that the County's fire hazard abatement regulations would reduce the potentially significant ecological impacts of weeds to less than significant levels.
3. There are no ecological performance standards associated with the weed abatement regulations. In addition, the presence of Russian thistle (and several other invasive weeds) on the Project site suggests there is limited monitoring and enforcement of the weed abatement regulations.[37]

Sincerely,

Scott Cashen, M.S.
Senior Biologist

[36] San Bernardino County Code Section 23.0301–23.0319.
[37] Tetra Tech. 2021 Jan 29. Biological Report, Resurgence Solar Project Site, San Bernardino County, California. p. 12 and Table 3.

Scott Cashen, M.S.
Senior Wildlife Biologist

Scott Cashen has 28 years of professional experience in natural resources management. During that time he has worked as a field biologist, forester, environmental consultant, and instructor of Wildlife Management. Mr. Cashen focuses on CEQA/NEPA compliance issues, endangered species, scientific field studies, and other topics that require a high level of scientific expertise.

Mr. Cashen has knowledge and experience with numerous taxa, ecoregions, biological resource issues, and environmental regulations. As a biological resources expert, Mr. Cashen is knowledgeable of the various agency-promulgated guidelines for field surveys, impact assessments, and mitigation. Mr. Cashen has led field investigations on several special-status species, including ones focusing on the yellow-legged frog, red-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and various forest carnivores.

Mr. Cashen is a recognized expert on the environmental impacts of renewable energy development. He has been involved in the environmental review process of over 100 solar, wind, biomass, and geothermal energy projects. Mr. Cashen's role in this capacity has encompassed all stages of the environmental review process, from initial document review through litigation support. Mr. Cashen provided expert witness testimony on several of the Department of the Interior's "fast-tracked" renewable energy projects. His testimony on those projects helped lead agencies develop project alternatives and mitigation measures to reduce environmental impacts associated with the projects.

Mr. Cashen was a member of the independent scientific review panel for the Quincy Library Group project, the largest community forestry project in the United States. As a member of the panel, Mr. Cashen was responsible for advising the U.S. Forest Service on its scientific monitoring program, and for preparing a final report to Congress describing the effectiveness of the Herger-Feinstein Forest Recovery Act of 1998.

AREAS OF EXPERTISE

- CEQA, NEPA, and Endangered Species Act compliance issues
- Comprehensive biological resource assessments
- Endangered species management
- Renewable energy development
- Scientific field studies, grant writing and technical editing

EDUCATION

M.S. Wildlife and Fisheries Science - The Pennsylvania State University (1998)
Thesis: *Avian Use of Restored Wetlands in Pennsylvania*
B.S. Resource Management - The University of California, Berkeley (1992)

PROFESSIONAL EXPERIENCE

Litigation Support / Expert Witness

Mr. Cashen has served as a biological resources expert for over 125 projects subject to environmental review under the California Environmental Quality Act (CEQA) and/or the National Environmental Policy Act (NEPA). As a biological resources expert, Mr. Cashen reviews CEQA/NEPA documents and provides his clients with an assessment of biological resource issues. He then submits formal comments on the scientific and legal adequacy of the project's environmental documents (e.g., Environmental Impact Report). If needed, Mr. Cashen conducts field studies to generate evidence for legal testimony, or he can obtain supplemental testimony from his deep network of species-specific experts. Mr. Cashen has provided written and oral testimony to the California Energy Commission, California Public Utilities Commission, and U.S. district courts. His clients have included law firms, non-profit organizations, and citizen groups.

REPRESENTATIVE EXPERIENCE

Solar Energy

- Abengoa Mojave Solar Project
- Avenal Energy Power Plant
- Beacon Solar Energy Project
- Blythe Solar Power Project
- Calico Solar Project
- California Flats Solar Project
- Calipatria Solar Farm II
- Carrizo Energy Solar Farm
- Catalina Renewable Energy
- Fink Road Solar Farm
- Genesis Solar Energy Project
- Heber Solar Energy Facility
- Imperial Valley Solar Project
- Ivanpah Solar Electric Generating
- Maricopa Sun Solar Complex
- McCoy Solar Project
- Mt. Signal and Calexico Solar
- Panoche Valley Solar
- San Joaquin Solar I & II
- San Luis Solar Project
- Stateline Solar Project
- Solar Gen II Projects
- SR Solis Oro Loma
- Vestal Solar Facilities
- Victorville 2 Power Project
- Willow Springs Solar

Geothermal Energy

- Casa Diablo IV Geothermal
- East Brawley Geothermal
- Mammoth Pacific 1 Replacement
- Orni 21 Geothermal Project
- Western GeoPower Plant

Wind Energy

- Catalina Renewable Energy
- Ocotillo Wind Energy Project
- SD County Wind Energy
- Searchlight Wind Project
- Shu'luuk Wind Project
- Tres Vaqueros Repowering Project
- Tule Wind Project
- Vasco Winds Relicensing Project

Biomass Facilities

- CA Ethanol Project
- Colusa Biomass Project
- Tracy Green Energy Project

Other Development Projects

- Cal-Am Desalination Project
- Carnegie SVRA Expansion Project
- Lakeview Substation Project
- Monterey Bay Shores Ecoresort
- Phillips 66 Rail Spur
- Valero Benecia Crude By Rail
- World Logistics Center

Project Management

Mr. Cashen has managed several large-scale wildlife, forestry, and natural resource management projects. Many of the projects have required hiring and training field crews, coordinating with other professionals, and communicating with project stakeholders. Mr. Cashen's experience in study design, data collection, and scientific writing make him an effective project manager, and his background in several different natural resource disciplines enable him to address the many facets of contemporary land management in a cost-effective manner.

REPRESENTATIVE EXPERIENCE

Wildlife Studies

- Peninsular Bighorn Sheep Resource Use and Behavior Study: (*CA State Parks*)
- "KV" Spotted Owl and Northern Goshawk Inventory: (*USFS, Plumas NF*)
- Amphibian Inventory Project: (*USFS, Plumas NF*)
- San Mateo Creek Steelhead Restoration Project: (*Trout Unlimited and CA Coastal Conservancy, Orange County*)
- Delta Meadows State Park Special-Status Species Inventory: (*CA State Parks, Locke*)

Natural Resources Management

- Mather Lake Resource Management Study and Plan – (*Sacramento County*)
- Placer County Vernal Pool Study – (*Placer County*)
- Weidemann Ranch Mitigation Project – (*Toll Brothers, Inc., San Ramon*)
- Ion Communities Biological Resource Assessments – (*Ion Communities, Riverside and San Bernardino Counties*)
- Del Rio Hills Biological Resource Assessment – (*The Wyro Company, Rio Vista*)

Forestry

- Forest Health Improvement Projects – (*CalFire, SD and Riverside Counties*)
- San Diego Bark Beetle Tree Removal Project – (*SDG&E, San Diego Co.*)
- San Diego Bark Beetle Tree Removal Project – (*San Diego County/NRCS*)
- Hillslope Monitoring Project – (*CalFire, throughout California*)

Biological Resources

Mr. Cashen has a diverse background with biological resources. He has conducted comprehensive biological resource assessments, habitat evaluations, species inventories, and scientific peer review. Mr. Cashen has led investigations on several special-status species, including ones focusing on the foothill yellow-legged frog, mountain yellow-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and forest carnivores.

REPRESENTATIVE EXPERIENCE

Biological Assessments/Biological Evaluations ("BA/BE")

- Aquatic Species BA/BE – Reliable Power Project (*SFPUC*)
- Terrestrial Species BA/BE – Reliable Power Project (*SFPUC*)
- Management Indicator Species Report – Reliable Power Project (*SFPUC*)
- Migratory Bird Report – Reliable Power Project (*SFPUC*)
- Terrestrial and Aquatic Species BA – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BE – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BA/BE – Public Lands Lease Application (*Society for the Conservation of Bighorn Sheep*)
- Terrestrial and Aquatic Species BA/BE – Simon Newman Ranch (*The Nature Conservancy*)
- Draft EIR (Vegetation and Special-Status Plants) - Wildland Fire Resiliency Program (*Midpeninsula Regional Open Space District*)

Avian

- Study design and Lead Investigator - Delta Meadows State Park Special-Status Species Inventory *(CA State Parks: Locke)*
- Study design and lead bird surveyor - Placer County Vernal Pool Study *(Placer County: throughout Placer County)*
- Surveyor - Willow flycatcher habitat mapping *(USFS: Plumas NF)*
- Surveyor - Tolay Creek, Cullinan Ranch, and Guadacanal Village restoration projects *(Ducks Unlimited/USGS: San Pablo Bay)*
- Study design and Lead Investigator - Bird use of restored wetlands research *(Pennsylvania Game Commission: throughout Pennsylvania)*
- Study design and surveyor - Baseline inventory of bird species at a 400-acre site in Napa County *(HCV Associates: Napa)*
- Surveyor - Baseline inventory of bird abundance following diesel spill *(LFR Levine-Fricke: Suisun Bay)*

- Study design and lead bird surveyor - Green Valley Creek Riparian Restoration Site *(City of Fairfield: Fairfield, CA)*
- Surveyor - Burrowing owl relocation and monitoring *(US Navy: Dixon, CA)*
- Surveyor - Pre-construction burrowing owl surveys *(various clients: Livermore, San Ramon, Rio Vista, Napa, Victorville, Imperial County, San Diego County)*
- Surveyor - Backcountry bird inventory *(National Park Service: Eagle, Alaska)*
- Lead surveyor - Tidal salt marsh bird surveys (*Point Reyes Bird Observatory: throughout Bay Area*)
- Surveyor – Pre-construction surveys for nesting birds (*various clients and locations)*

Amphibian

- Crew Leader - Red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog surveys *(USFS: Plumas NF)*
- Surveyor - Foothill yellow-legged frog surveys *(PG&E: North Fork Feather River)*
- Surveyor - Mountain yellow-legged frog surveys *(El Dorado Irrigation District: Desolation Wilderness)*
- Crew Leader - Bullfrog eradication *(Trout Unlimited: Cleveland NF)*

Fish and Aquatic Resources

- Surveyor - Hardhead minnow and other fish surveys *(USFS: Plumas NF)*
- Surveyor - Weber Creek aquatic habitat mapping (*El Dorado Irrigation District: Placerville, CA*)
- Surveyor - Green Valley Creek aquatic habitat mapping *(City of Fairfield: Fairfield, CA)*
- GPS Specialist - Salmonid spawning habitat mapping *(CDFG: Sacramento River)*
- Surveyor - Fish composition and abundance study (*PG&E: Upper North Fork Feather River and Lake Almanor*)
- Crew Leader - Surveys of steelhead abundance and habitat use *(CA Coastal Conservancy: Gualala River estuary)*
- Crew Leader - Exotic species identification and eradication *(Trout Unlimited: Cleveland NF)*

Mammals

- Principal Investigator – Peninsular bighorn sheep resource use and behavior study (*California State Parks: Freeman Properties*)

- Scientific Advisor –Study on red panda occupancy and abundance in eastern Nepal *(The Red Panda Network: CA and Nepal)*
- Surveyor - Forest carnivore surveys *(University of CA: Tahoe NF)*
- Surveyor - Relocation and monitoring of salt marsh harvest mice and other small mammals *(US Navy: Skagg's Island, CA)*
- Surveyor – Surveys for Monterey dusky-footed woodrat. Relocation of woodrat houses (*Touré Associates: Prunedale*)

Natural Resource Investigations / Multiple Species Studies

- Scientific Review Team Member – Member of the scientific review team assessing the effectiveness of the US Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.
- Lead Consultant - Baseline biological resource assessments and habitat mapping for CDF management units *(CDF: San Diego, San Bernardino, and Riverside Counties)*
- Biological Resources Expert – Peer review of CEQA/NEPA documents (*various law firms, non-profit organizations, and citizen groups)*
- Lead Consultant - Pre- and post-harvest biological resource assessments of tree removal sites *(SDG&E: San Diego County)*
- Crew Leader - T&E species habitat evaluations for Biological Assessment in support of a steelhead restoration plan *(Trout Unlimited: Cleveland NF)*
- Lead Investigator - Resource Management Study and Plan for Mather Lake Regional Park *(County of Sacramento: Sacramento, CA)*
- Lead Investigator - Biological Resources Assessment for 1,070-acre Alfaro Ranch property *(Yuba County, CA)*
- Lead Investigator - Wildlife Strike Hazard Management Plan *(HCV Associates: Napa)*
- Lead Investigator - Del Rio Hills Biological Resource Assessment *(The Wyro Company: Rio Vista, CA)*
- Lead Investigator – Ion Communities project sites (*Ion Communities: Riverside and San Bernardino Counties*)
- Surveyor – Tahoe Pilot Project: Validation of California's Wildlife Habitat Relationships (CWHR) Model *(University of California: Tahoe NF)*

Forestry

Mr. Cashen has five years of experience working as a consulting forester on projects throughout California. Mr. Cashen has consulted with landowners and timber operators on forest management practices; and he has worked on a variety of forestry tasks including selective tree marking, forest inventory, harvest layout, erosion control, and supervision of logging operations. Mr. Cashen's experience with many different natural resources enable him to provide a holistic approach to forest management, rather than just management of timber resources.

REPRESENTATIVE EXPERIENCE

- Lead Consultant - CalFire fuels treatment projects *(SD and Riverside Counties)*
- Lead Consultant and supervisor of harvest activities – San Diego Gas and Electric Bark Beetle Tree Removal Project *(San Diego)*
- Crew Leader - Hillslope Monitoring Program *(CalFire: throughout California)*
- Consulting Forester – Forest inventories and timber harvest projects *(various clients throughout California)*

Grant Writing and Technical Editing

Mr. Cashen has prepared and submitted over 50 proposals and grant applications. Many of the projects listed herein were acquired through proposals he wrote. Mr. Cashen's clients and colleagues have recognized his strong scientific writing skills and ability to generate technically superior proposal packages. Consequently, he routinely prepares funding applications and conducts technical editing for various clients.

PERMITS

U.S. Fish and Wildlife Service Section 10(a)(1)(A) Recovery Permit for the Peninsular bighorn sheep

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

The Wildlife Society

Cal Alumni Foresters

Mt. Diablo Audubon Society

OTHER AFFILIATIONS

Scientific Advisor and Grant Writer – *The Red Panda Network*

Scientific Advisor – *Mt. Diablo Audubon Society*

Grant Writer – *American Conservation Experience*

TEACHING EXPERIENCE

Instructor: Wildlife Management - The Pennsylvania State University, 1998

Teaching Assistant: Ornithology - The Pennsylvania State University, 1996-1997

PUBLICATIONS

Gutiérrez RJ, AS Cheng, DR Becker, S Cashen, et al. 2015. Legislated collaboration in a conservation conflict: a case study of the Quincy Library group in California, USA. Chapter 19 *in*: Redpath SR, et al. (eds). Conflicts in Conservation: Navigating Towards Solutions. Cambridge Univ. Press, Cambridge, UK.

Cheng AS, RJ Gutiérrez RJ, S Cashen, et al. 2016. Is There a Place for Legislating Place-Based Collaborative Forestry Proposals?: Examining the Herger-Feinstein Quincy Library Group Forest Recovery Act Pilot Project. Journal of Forestry.