Attachment B

May 2, 2016 Appeal by Oakland Residents for Responsible Development

CITY OF OAKLAND
APPEAL FORM
FOR DECISION TO PLANNING COMMISSION, CITY COUNCIL OR HEARING OFFICER

PROJECT INFORMATION

Case No. of Appealed Project: PLN15-336

Project Address of Appealed Project: 2400 Valdez Street

Assigned Case Planner/City Staff: Peterson Z. Vollmann

APPELLANT INFORMATION:

Printed Name: Laura Horton

Mailing Address: 601 Gateway Blvd, Suite 1000

City/Zip Code S. San Francisco, 94080

Email: lhorton@adamsbroadwell.com

Phone Number: 650-589-1660

Alternate Contact Number:

Representing: Oakland Residents for Responsible Development

An appeal is hereby submitted on:

☐ **AN ADMINISTRATIVE DECISION (APPEALABLE TO THE CITY PLANNING COMMISSION OR HEARING OFFICER)**

YOU MUST INDICATE ALL THAT APPLY:

- ☐ Approving an application on an Administrative Decision
- ☐ Denying an application for an Administrative Decision
- ☐ Administrative Determination or Interpretation by the Zoning Administrator
- ☐ Other (please specify) _____

Please identify the specific Administrative Decision/Determination Upon Which Your Appeal is Based Pursuant to the Oakland Municipal and Planning Codes listed below:

- ☐ Administrative Determination or Interpretation (OPC Sec. 17.132.020)
- ☐ Determination of General Plan Conformity (OPC Sec. 17.01.080)
- ☐ Design Review (OPC Sec. 17.136.080)
- ☐ Small Project Design Review (OPC Sec. 17.136.130)
- ☐ Minor Conditional Use Permit (OPC Sec. 17.134.060)
- ☐ Minor Variance (OPC Sec. 17.148.060)
- ☐ Tentative Parcel Map (OMC Section 16.304.100)
- ☐ Certain Environmental Determinations (OPC Sec. 17.158.220)
- ☐ Creek Protection Permit (OMC Sec. 13.16.450)
- ☐ Creek Determination (OMC Sec. 13.16.460)
- ☐ City Planner's determination regarding a revocation hearing (OPC Sec. 17.152.080)
- ☐ Hearing Officer's revocation/impose or amend conditions (OPC Sec. 17.152.150 &/or 17.156.160)
- ☐ Other (please specify) _____

(Continued on reverse)

(Continued)

☑ **A DECISION OF THE CITY PLANNING COMMISSION (APPEALABLE TO THE CITY COUNCIL)** ☐ Granting an application to: **OR** ☐ Denying an application to:

YOU MUST INDICATE ALL THAT APPLY:

Pursuant to the Oakland Municipal and Planning Codes listed below:

- ☑ Major Conditional Use Permit (OPC Sec. 17.134.070)
- ☐ Major Variance (OPC Sec. 17.148.070)
- ☑ Design Review (OPC Sec. 17.136.090)
- ☑ Tentative Map (OMC Sec. 16.32.090)
- ☐ Planned Unit Development (OPC Sec. 17.140.070)
- ☐ Environmental Impact Report Certification (OPC Sec. 17.158.220F)
- ☐ Rezoning, Landmark Designation, Development Control Map, Law Change (OPC Sec. 17.144.070)
- ☐ Revocation/impose or amend conditions (OPC Sec. 17.152.160)
- ☐ Revocation of Deemed Approved Status (OPC Sec. 17.156.170)
- ☑ Other (please specify) CEQA Findings

FOR ANY APPEAL: An appeal in accordance with the sections of the Oakland Municipal and Planning Codes listed above shall state specifically wherein it is claimed there was an error or abuse of discretion by the Zoning Administrator, other administrative decisionmaker or Commission (Advisory Agency) or wherein their/its decision is not supported by substantial evidence in the record, or in the case of Rezoning, Landmark Designation, Development Control Map, or Law Change by the Commission, shall state specifically wherein it is claimed the Commission erred in its decision. The appeal must be accompanied by the required fee pursuant to the City's Master Fee Schedule.

You must raise each and every issue you wish to appeal on this Appeal Form (or attached additional sheets). Failure to raise each and every issue you wish to challenge/appeal on this Appeal Form (or attached additional sheets), and provide supporting documentation along with this Appeal Form, may preclude you from raising such issues during your appeal and/or in court. However, the appeal will be limited to issues and/or evidence presented to the decision-maker prior to the close of the public hearing/comment period on the matter.

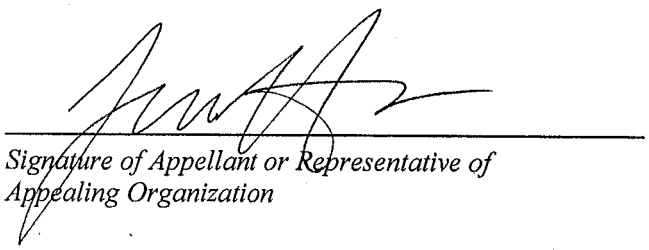
The appeal is based on the following: *(Attach additional sheets as needed.)*

Please see attached.

Supporting Evidence or Documents Attached. *(The appellant must submit all supporting evidence along with this Appeal Form;* however, the appeal will be limited evidence presented to the decision-maker prior to the close of the public hearing/comment period on the matter.

(Continued on reverse)

(Continued)



Signature of Appellant or Representative of Appealing Organization

4/29/16

Date

TO BE COMPLETED BY STAFF BASED ON APPEAL TYPE AND APPLICABLE FEE

APPEAL FEE: $_____

Fees are subject to change without prior notice. The fees charged will be those that are in effect at the time of application submittal. All fees are due at submittal of application.

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April 29, 2016

VIA EMAIL AND OVERNIGHT MAIL

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Planning and Zoning Division
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City Clerk
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Email: cityclerk@oaklandnet.com

Re: 2400 Valdez Street Project (PLN15-336) Appeal to Oakland City Council

Dear Mr. Vollmann and City Clerk:

We write on behalf of Oakland Residents for Responsible Development to appeal the Oakland Planning Commission's April 20, 2016 decision to approve and adopt the CEQA findings for the 2400 Valdez Project ("Project"). The Project is proposed on a 1.1-acre site in the western portion of the city of Oakland, generally bounded by 26th Street immediately to the north, Valdez Street to the west, 24th Street to the south, and an automotive business as well as parking lots to the east.

This appeal letter demonstrates that the Commission's decision was not supported by the evidence in the record. Furthermore this appeal letter raises each and every issue that is contested, and includes all arguments and evidence in the record previously presented to the Planning Commission as required by Section

17.134.070 of the Oakland Planning Code. We previously filed comments on the Project on April 19, 2016.[1]

We reviewed the April 20, 2016 letter from the City's consultant, ICF International,[2] as well as the April 20 letter from the Applicant,[3] with the help of experts Matt Hagemann and Jessie Jaeger. Their attached technical comments are submitted as support for this appeal letter.[4]

I. THE CITY MAY NOT RELY ON CEQA EXEMPTIONS OR AN ADDENDUM FOR PROJECT APPROVAL

The Commission relied on three CEQA provisions to approve the Project without an Environmental Impact Report ("EIR"). Those provisions include the Community Plan Exemption,[5] Qualified Infill Exemption,[6] and Addendum to the Broadway Valdez District Specific Plan ("BVDSP").[7] Each of the exemptions apply only when a Project does not have impacts peculiar to the proposed project that are new or more significant than previously analyzed or can be substantially mitigated by uniformly applicable development policies or standards. The Project fails to meet these requirements because, as explained in our April 19 comments, the Project's greenhouse gas ("GHG") impacts are highly significant and the City has failed to incorporate the Standard Conditions of Approval ("SCAs") that would apply to those impacts under the BVDSP. Thus, the impact is not mitigated at all, and is more significant than previously analyzed under the BVDSP, which assumed that significant GHG impacts would be mitigated.

In addition, the City failed to quantify the health risk impacts during construction. Because the BVDSP did not quantify project-level health risks, as

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[1] *See* Letter and Attachments from Laura Horton to the Oakland Planning Commission and Peterson Vollman re: Comments on the Addendum for the 2400 Valdez Street Project (PLN15-336), April 19, 2016, **Attachment A.**
[2] *See* Letter from ICF International to Peterson Z. Vollmann re: 2400 Valdez Project – Response to Comment Letter from Adams Broadwell Joseph & Cardozo, April; 20, 2016 (hereinafter, "Consultant Letter"), **Attachment B.**
[3] *See* Letter from Jennifer Renk to Chairman Jim Moore and Members of the Planning Commission re: 2400 Valdez—PLN15-336, April; 20, 2016, **Attachment C.**
[4] *See* Letter from Matt Hagemann and Jessie Jaeger, SWAPE, to Laura Horton re: Response to Comments on the 2400 Valdez Street Project, April 27, 2016 (hereinafter, "SWAPE Letter"), **Attachment D.**
[5] CEQA Guidelines Section 15183.
[6] CEQA Guidelines Section 15183.3.
[7] CEQA Guidelines Section 15164.

explained in our previous letter, the absence of any previous project-specific analysis undermines the City's determination that SCAs would mitigate the impact.

Finally, as explained in our previous comments, the City failed to adequately analyze and substantially mitigate the hazardous conditions on the Project site that may impact to worker and public health.

Moreover, as we explained in detail in our comments, the City may not rely on an addendum for Project approval. CEQA allows addendums to a previously certified EIR "if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."[8] In any case, however, the decision must be supported by substantial evidence. Here, the City's decision to prepare an addendum, rather than a subsequent or supplemental EIR for the Project is not supported by substantial evidence. We previously noted that the City's CEQA Analysis did not simply provide "*some* changes or additions" to the EIR; rather, it included over 2,000 pages of analysis for a large development project that was not specifically analyzed in the BVDSP. Furthermore, the Project will have new or more severe significant impacts than previously analyzed in the BVDSP EIR.

Therefore, our previous comments and this appeal letter demonstrate that the City may not rely on exemptions or an addendum for Project approval.

II. THE CITY'S RESPONSE STILL FAILS TO ADEQUATELY ANALYZE PROJECT-SPECIFIC GREENHOUSE GAS EMISSIONS AND INCORPORATE CONDITIONS AND MEASURES IDENTIFIED IN THE BROADWAY VALDEZ DISTRICT SPECIFIC PLAN

We previously commented that the City fails to provide support for its conclusion that the Project would have a less than significant GHG impact, and therefore no SCAs are necessary. We demonstrated that the City's GHG analysis was flawed because it failed to include certain demolition material in its model, and it ignored Applicant-provided data on energy use, substantially underestimating the Project's GHG impact.

[8] *Id.*

The City's consultant responded by clarifying that the Project "would require excavation of only up to 42,000 cubic yards (cy) of material."[9] However, the consultant fails to address the discrepancy noted by SWAPE between the energy and natural gas usage values used within the two air models provided with the Project's CEQA Analysis. As a result, SWAPE concludes that "the air pollution model prepared in the GHG analysis is still inaccurate and cannot be relied upon to determine Project significance."[10]

SWAPE conducted an updated analysis, taking into account the consultant's clarification regarding the excavation of material. After correcting the excavation inputs and providing a more detailed explanation of the City's flawed energy use inputs, SWAPE still finds that the GHG emissions will exceed both of the applicable numerical thresholds for GHG significance (see tables below).[11] As such, a GHG Reduction Plan must be prepared under the SCAs identified in the BVDSP EIR.

Total Project Emissions

	Greenhouse Gas Emissions (MT CO2e/Yr)	
Activity	**CEQA Analysis**	**SWAPE Analysis**
Construction	65	65
Operation	1,962	20,942
Total	**2,027**	**21,007**
Significance Threshold	1,100	1,100
Exceeds Threshold?	*Yes*	*Yes*

[9] Consultant Letter, p. 4.
[10] SWAPE Letter, p. 1.
[11] *Id.*, at 3 – 5.

Total Project Emissions		
	Greenhouse Gas Emissions Per Service Population (MT CO2e/SP/Yr)	
Activity	**CEQA Analysis**	**SWAPE Analysis**
Construction	65	65
Operation	1,962	20,942
Total	**2,027**	**21,007**
Service Population	466	466
Emissions Per Service Population	**4.3**	**45.1**
Significance Threshold	4.6	4.6
Exceeds Threshold?	*No*	***Yes***

The City's consultant states that the "emissions per service population estimate of 45.1 MT CO_2e/sp/year presented in the Adams Broadwell submittal are highly unusual for any kind of urban infill project."[12] However, SWAPE explains that "the reason the Project's GHG emissions are so high is not due to an error within our updated model. . . Rather, it is due to the Project-specific Energy Use and Natural Gas values provided within the CEQA Analysis."[13] Therefore, SWAPE finds that unless the Applicant can provide new, Project-specific Energy Use and Natural Gas values that are different to the ones provided in the CEQA Analysis, "the emission estimates generated within [the] updated model are most representative of the Project's operational emissions."[14]

Contrary to the City's conclusions, substantial evidence shows that the Project will have a significant GHG impact. Therefore, the City should prepare a revised air pollution model for public review in an EIR in order to accurately assess the Project's GHG impact, and incorporate all feasible mitigation measures, including the City's SCAs, available to reduce those impacts to less than significant levels.

[12] Consultant Letter, p. 5.
[13] SWAPE Letter, p. 5.
[14] *Id.*, at 5.

III. THE CITY'S RESPONSE STILL FAILS TO QUANTIFY THE PROJECT-SPECIFIC HEALTH RISK

We previously commented that the City's CEQA Analysis completely fails to evaluate the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction. We explained that SWAPE's analysis of the Project's construction health risk demonstrated that the Project would exceed local air district thresholds of significance, which was not identified or analyzed in the CEQA Analysis.

The City's consultant attempts to address our concerns on this matter, stating that a health risk screening was conducted for the Project and that the BVDSP EIR specifies that the construction health risks would be minimized through SCAs. However, as SWAPE explains, this justification is unsupported for several reasons.

First, the City's consultant still confuses the operational health risk assessment, which is included as Attachment E to the CEQA Analysis, with a construction health risk assessment, which was not conducted within the CEQA Analysis at all. SWAPE finds that the CEQA Analysis completely fails to assess the health risk impacts from construction-related DPM emissions. As we previously noted, the City's failure to quantify the risk associated with Project construction is inconsistent with guidance set forth by the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing recommendations for health risk assessments in California.[15] OEHHA recommends that all short-term projects lasting longer than two months be evaluated for cancer risks to nearby sensitive receptors.[16] SWAPE explains that "[t]his recommendation reflects the most recent health risk assessment policy, and as such, the health risk for Project construction should be quantified and evaluated against the numerical significance threshold established by the Bay Area Air Quality Management District ("BAAQMD").[17]

Second, the consultant's statement that "the construction health risks would be minimized" through SCAs fails to justify the omission of an actual health risk

[15] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html
[16] *Id.* at 8-18.
[17] SWAPE Letter, p. 6.

assessment. Without it, the City not only fails to disclose all potential impacts associated with the Project, but also fails to provide substantial evidence to support its determination that SCAs would be effective in reducing emissions to below a level of significance. As a result, the Project's health risk assessment is incomplete, and should not be relied upon to determine Project significance.

Third, as we explained in our previous comments, the BVDSP did not address construction related exposures because "the specificity of detail necessary to conduct a health risk assessment [was] not available at the Specific Plan stage."[18] The BVDSP EIR thus deferred the assessment of health risks from construction activities to the project level stage where project-specific impacts and mitigation measures could be determined. The City's consultant fails to provide support for its contention that "the BVDSP EIR does not require a stand-alone health risk assessment for construction-related impacts."[19] Given the BVDSP's clear omission of project-specific health risk assessments, the City is required to conduct analysis of health risks on a project by project basis. Otherwise, the analysis would never be done, in violation of CEQA.

Therefore, the screening-level health risk assessment provided by SWAPE and discussed in our previous letter remains valid and its calculations undisputed by the City's consultant. The results of SWAPE's assessment demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact.[20] As a result, a revised health risk assessment must be prepared and included in an EIR to examine the air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules.

IV. THE CITY'S RESPONSE STILL FAILS TO ADEQUATELY ANALYZE AND MITIGATE PROJECT-SPECIFIC HAZARDS

We previously commented that the City failed to adequate mitigate and analyze the hazardous conditions on the Project site. Specifically, we cited concerns that no regulatory agencies were engaged to provide oversight of the Phase I and Phase II ESAs, and therefore the conclusions reached in the CEQA Analysis are unreliable for decision-making. The City responded by stating that SCAs would be

[18] BVDSP EIR, p. 4.2-27.
[19] Consultant Letter, p. 3.
[20] SWAPE Letter, p. 7.

applied to the Project, per the requirements of the BVDSP, and that the impacts would be less than significant.

As explained by SWAPE, the City's SCAs fail to include provisions for the preparation of a soil management plan to govern safe handling of contaminated soils that have been documented at the Project site.[21] SWAPE notes that the preparation of soil management plans "is routine to protect health of workers and the public and an EIR should be prepared to include requirements for such a plan, as mitigation."[22]

The City's consultant states that soils will be excavated across the entire site to a depth of approximately 25 feet.[23] Furthermore, all soil to a depth of 25 feet will be excavated and properly disposed of offsite. The consultant then states that "the excavation and disposal of soil at the Site will comply with the protocols set forth in the Broadway Valdez Specific Plan EIR."[24]

However, the BVDSP contains no specific provisions for the preparation of a soil management plan to ensure the safe excavation of soils at the project site under regulatory supervision.[25] SWAPE explains that the preparation of such plans is routine where there are concerns that the public or workers may come into contact with conditions that may pose a health hazard.[26] For example, at a 2014 Port of Oakland project, the following SCAs were incorporated.[27]

> 4.D-1a: Prior to issuance of building permit, the project applicant shall notify the San Francisco Regional Water Quality Control Board (RWQCB) of planned construction activities. The applicant shall retain a qualified environmental consultant to prepare a Soil Management Plan to protect site workers and the environment. The Soil Management Plan should include pre-construction and pre-development controls, construction controls, and post construction controls along with any modifications or requests made by the

[21] *Id.*
[22] *Id.*
[23] Consultant Letter, Attachment A, p. 2.
[24] *Id.*
[25] SWAPE Letter, p. 7.
[26] *Id.*
[27] 195 Hegenberger Road Hotel EIR, http://www.portofoakland.com/pdf/environment/195_Hegenberger_DEIR-web.pdf, p. 2-5.

RWQCB or DTSC (overseeing agency) into project specifications. Construction controls shall include the preparation of a health and safety plan along with the requirement that all workers including subcontractors have OSHA 40-hour health and training. The health and safety plan shall include at a minimum, a summary of the known contaminants at the site, a copy of the Material Data Safety Sheets for each contaminant, a description of required personal protective equipment to be worn by site workers, protocol for the discovery of any suspected contaminated materials during excavation, a map of the nearest emergency medical facility, and emergency contact information.

SWAPE concludes that, consistent with other Oakland-area projects, an EIR should be prepared to include a requirement for the preparation of a soil management plan.[28] The plan must be prepared by qualified professionals for submittal to the RWQCB to ensure protection of public health.

V. CONCLUSION

The City's environmental analysis for the Project fails to satisfy the requirements of CEQA. As explained above and in our previous comments, the City has failed to adequately analyze and mitigate the Project's GHG emissions as required under the BVDSP; failed to analyze and mitigate the Project's health risks posed to the surrounding community, which are new or more severe than previously analyzed; and failed to adequately analyze hazards on the Project site. For these reasons, we urge the City Council to reject the Commission's Project approval and CEQA findings and order the preparation of an EIR for the Project.

Sincerely,

Laura E. Horton

LEH:ric
Attachments

[28] SWAPE Letter, p. 8.

ATTACHMENT A

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April 19, 2016

VIA EMAIL AND
HAND DELIVERY on April 20, 2016

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Peterson Vollman
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Re: Comments on the Addendum for the 2400 Valdez Street Project (PLN15-336)

Dear Honorable Members of the Oakland Planning Commission and Mr. Vollman:

We write on behalf of Oakland Residents for Responsible Development to comment on the City of Oakland's Addendum ("Addendum") to the Environmental Impact Report ("EIR") for the Broadway Valdez District Specific Plan ("BVDSP") prepared pursuant to the California Environmental Quality Act ("CEQA").[1] The Project is proposed on a 1.1-acre site in the western portion of the city of Oakland, generally bounded by 26th Street immediately to the north, Valdez Street to the west, 24th Street to the south, and an automotive business as well as parking lots to the east.

The Addendum evaluates the Project's potential impacts and consistency with the BVDSP. We reviewed the Addendum and BVDSP EIR, and we identified

[1] Pub. Resources Code §§ 21000 et seq.

several flaws in the Project analysis as well as new information regarding new or more severe impacts than previously analyzed in the BVDSP EIR. Specifically, the Addendum fails to adequately address the Project's inconsistency with the BVDSP; fails to adequately describe the Project; fails to analyze and mitigate the Project's health risks posed to the surrounding community, which are new or more severe than previously analyzed; fails to adequately analyze and mitigate the Project's greenhouse gas ("GHG") emissions as required under the BVDSP; and fails to adequately analyze hazards on the Project site. Therefore, the City lacks substantial evidence to support its decision that an Addendum is appropriate, rather than a new EIR.

We reviewed the Addendum and BVDSP EIR with the help of experts Matt Hagemann and Jessie Jaeger. Their attached technical comments are submitted in addition to the comments in this letter.[2] Accordingly, they must be addressed and responded to separately. The curricula vitae of these experts are also attached as exhibits to this letter.

I. STATEMENT OF INTEREST

Oakland Residents for Responsible Development ("Oakland Residents") is an unincorporated association of individuals and labor organizations that may be adversely affected by the potential impacts associated with Project development. The association includes Alan Guan, Risi Agbabiaka, Peter Lew, Bridgette Hall, Tanya Pitts, the International Brotherhood of Electrical Workers Local 595, Plumbers and Steamfitters Local 342, Sheet Metal Workers Local 104, and their members and their families who live and/or work in the City of Oakland and Contra Costa County.

The individual members of Oakland Residents live, work, and raise their families in the City of Oakland. They would be directly affected by the Project's impacts. Individual members may also work on the Project itself. They will therefore be first in line to be exposed to any health and safety hazards that may exist on the Project site.

The organizational members of Oakland Residents also have an interest in enforcing the City's planning and zoning laws and the State's environmental laws

[2] *See* Letter from Matt Hagemann and Jessie Jaeger, SWAPE, to Laura Horton re: Comments on the 2400 Valdez Street Project, April 13, 2016 (hereinafter, "SWAPE Comments"), **Attachment A.**

that encourage sustainable development and ensure a safe working environment for its members. Environmentally detrimental projects can jeopardize future jobs by making it more difficult and more expensive for business and industry to expand in the region, and by making it less desirable for businesses to locate and people to live there. Indeed, continued degradation can, and has, caused restrictions on growth that reduce future employment opportunities. Finally, Oakland Residents' members are concerned about projects that present environmental and land use impacts without providing countervailing economic and community benefits.

II. THE CITY CANNOT RELY ON THE ADDENDUM FOR PROJECT APPROVAL

CEQA has two basic purposes, neither of which is satisfied by the Addendum. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental impacts of a project before harm is done to the environment.[3] The EIR is the "heart" of this requirement.[4] 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."[5]

To fulfill this function, the discussion of impacts in an EIR must be detailed, complete, and "reflect a good faith effort at full disclosure."[6] An adequate EIR must contain facts and analysis, not just an agency's conclusions.[7] CEQA requires an EIR to disclose all potential direct and indirect, significant environmental impacts of a project.[8]

Second, CEQA directs public agencies to avoid or reduce environmental damage when possible by requiring imposition of mitigation measures and by

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[3] 14 Cal. Code Regs. § 15002(a)(1) ("CEQA Guidelines"); *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.
[4] *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 84.
[5] *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[6] CEQA Guidelines § 15151; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 721-722.
[7] *See Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 568.
[8] Pub. Resources Code § 21100(b)(1); CEQA Guidelines § 15126.2(a).

requiring the consideration of environmentally superior alternatives.[9] If an EIR identifies potentially significant impacts, it must then propose and evaluate mitigation measures to minimize these impacts.[10] CEQA imposes an affirmative obligation on agencies to avoid or reduce environmental harm by adopting feasible project alternatives or mitigation measures.[11] Without an adequate analysis and description of feasible mitigation measures, it would be impossible for agencies relying upon the EIR to meet this obligation.

Under CEQA, an EIR must not only discuss measures to avoid or minimize adverse impacts, but must ensure that mitigation conditions are fully enforceable through permit conditions, agreements or other legally binding instruments.[12] A CEQA lead agency is precluded from making the required CEQA findings unless the record shows that all uncertainties regarding the mitigation of impacts have been resolved; an agency may not rely on mitigation measures of uncertain efficacy or feasibility.[13] This approach helps "insure the integrity of the process of decision by precluding stubborn problems or serious criticism from being swept under the rug."[14]

Following preliminary review of a project to determine whether an activity is subject to CEQA, a lead agency is required to prepare an initial study to determine whether to prepare an EIR or negative declaration, identify whether a program EIR, tiering, or other appropriate process can be used for analysis of the project's environmental effects, or determine whether a previously prepared EIR could be used with the project, among other purposes.[15] CEQA requires an agency to analyze the potential environmental impacts of its proposed actions in an EIR except in certain limited circumstances.[16] A negative declaration may be prepared

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[9] CEQA Guidelines § 15002(a)(2) and (3); *Berkeley Jets*, 91 Cal.App.4th at 1354; *Laurel Heights Improvement Ass'n v. Regents of the University of Cal.* (1998) 47 Cal.3d 376, 400.
[10] Pub. Resources Code §§ 21002.1(a), 21100(b)(3).
[11] *Id.*, §§ 21002-21002.1.
[12] CEQA Guidelines § 15126.4(a)(2).
[13] *Kings County Farm Bur. 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).
[14] *Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Agricultural Assn.* (1986) 42 Cal.3d 929, 935.
[15] CEQA Guidelines §§ 15060, 15063(c).
[16] *See, e.g.*, Pub. Resources Code § 21100.

instead of an EIR when, after preparing an initial study, a lead agency determines that a project "would not have a significant effect on the environment."[17]

When an EIR has been prepared for a project, CEQA requires the lead agency to conduct subsequent or supplemental environmental review when one or more of the following events occur:

(a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report;

(b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report; or

(c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.[18]

The CEQA Guidelines explain that the lead agency must determine, on the basis of substantial evidence in light of the whole record, if one or more of the following events occur:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant effects or a substantial increase in the severity of previously identified effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at

[17] *Quail Botanical Gardens v. City of Encinitas* (1994) 29 Cal.App.4th 1597; Pub. Resources Code § 21080(c).
[18] Pub. Resources Code § 21166.

the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.[19]

Only where ***none*** of the conditions described above calling for preparation of a subsequent or supplemental EIR have occurred may the lead agency consider preparing a subsequent negative declaration, an addendum or no further documentation.[20] For addendums specifically, CEQA allows addendums to a previously certified EIR "if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."[21] In any case, however, the decision must be supported by substantial evidence.[22]

Here, the City's decision to prepare an addendum, rather than a subsequent or supplemental EIR for the Project is not supported by substantial evidence. The addendum does not simply provide "some changes or additions" to the EIR; rather, it includes over 2,000 pages of analysis for a large development project that was not

[19] CEQA Guidelines § 15162(a)(1)-(3).
[20] CEQA Guidelines § 15162(b).
[21] CEQA Guidelines § 15164.
[22] *Id.* §§ 15162 (a), 15164(e), and 15168(c)(4).

specifically analyzed in the BVDSP. Moreover, the Project will have new or more severe significant impacts than previously analyzed in the BVDSP EIR. In addition, as described below, the site-specific analysis conducted for the Project is flawed in several ways and the Addendum fails to incorporate all applicable mitigation and Standard Conditions of Approval ("SCAs") identified in the BVDSP. Therefore, the City may not rely on the Addendum for Project approval, and must provide detailed analysis of the Project's impacts in an EIR.

A. The Addendum Is Inconsistent With The Broadway Valdez District Specific Plan

The BVDSP EIR provides program level analysis, and site-specific analysis in some instances, for impacts resulting from development in the Broadway Valdez District. The BVDSP envisioned the area surrounding the Project site as retail-focused. For example, GOAL LU-8 for the Valdez Triangle, the area in which the Project is sited,[23] establishes the Valdez Triangle as a "dynamic new retail destination that caters to the comparison shopping needs for Oakland and the broader East Bay."[24] The BVDSP differentiated the retail-oriented Valdez Triangle with the more residential North End, stating:

> Due to its proximity to Downtown, its accessibility to transit and freeways, and its fine-grained network of cross-streets, the focus in the Valdez Triangle will be on creating a new destination retail district. In response to its linear configuration, proximity to the two medical centers, and inventory of historic buildings, the focus in the North End will be on creating a high-density mixed use boulevard that caters to. . . residential neighborhoods with a mix of retail, dining, office, residential and professional services.[25]

The BVDSP then addressed this specific Project site and assumed the development of zero residential units and 127,733 square feet of commercial use.[26] The Addendum acknowledges the Project's clear inconsistency with the BVDSP, but states that because the traffic impacts are within the range of traffic impacts

[23] Addendum, p. 4.
[24] BVDSP, p. 71.
[25] BVDSP, p. 102.
[26] BVDSP, Appendix D.

contemplated in the BVDSP EIR, the Project's inconsistency with the BVDSP is not relevant and an EIR would not be required.[27] This conclusion is flawed.

Although the BVDSP may allow some flexibility in specific build out of the area, the fact that the Project adds the development of 225 units that result in significant air quality and GHG emission impacts as explained below, combined with the fact that those units were not anticipated under the BVDSP, demonstrates an inconsistency that cannot be ignored under CEQA. The City cannot rely on CEQA analysis that not only fails to adequately analyze and mitigate Project impacts, as required under the overlaying specific plan, but is also directly in conflict with the intent of the plan. The infill exemptions, streamlining provisions, and use of addendums under CEQA anticipate projects that are *consistent* with the overlaying plan and that do not result in new or more significant impacts than previously analyzed. That is not the case here.

As explained below, the Addendum not only fails to adequately describe the Project, which is a basic requirement of any CEQA document, but it also fails to address new or more severe health risks resulting from the Project, and fails to incorporate SCAs required for GHG emissions under the BVDSP. Furthermore, the Addendum fails to adequately analyze hazards on the Project site. For these reasons, the Project is not consistent with the BVDSP and therefore cannot rely on the plan's EIR. A new EIR must be prepared for the Project.

B. The Addendum Fails To Adequately Describe The Project

The Addendum fails to meet CEQA's requirements because it fails to include a complete Project description regarding on-site hazards, rendering the entire hazards analysis inadequate. CEQA places the burden of environmental investigation on the government rather than the public. Accordingly, a lead agency may not hide behind its failure to obtain a complete and accurate project description.[28] An accurate and complete project description is necessary to perform an adequate evaluation of the potential environmental effects of a proposed project. In contrast, an inaccurate or incomplete project description renders the analysis of environmental impacts inherently unreliable. Without a complete project

[27] Addendum, p. 3.
[28] *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 311.

description, the environmental analysis under CEQA will be impermissibly narrow, thus minimizing the project's impacts and undercutting public review.[29]

Because the BVDSP did not analyze specific development projects, the City is required to provide a complete and detailed description of projects proposed under the plan in all project-level CEQA documents. In this case, the Addendum fails to sufficiently describe the Project by failing to describe dewatering requirements for the Project that may be associated with excavation and trenching at the Project site, which could lead to potentially significant impacts. An EIR must be prepared to address these deficiencies.

The CEQA analysis in the Addendum is inconsistent because it states that "*if* construction dewatering activities occur, the groundwater analytical results included in the Phase II Environmental Site Assessment ("ESA") would be provided to EBMUD prior to the completion of construction activities."[30] However, as explained by SWAPE, this statement is misleading because "[d]ewatering activities will assuredly occur because the water table is found at a depth as shallow as seven feet . . . and the Project would involve excavation to a depth of between 25 and 27 feet."[31] In addition, the Phase II ESA conducted for the Project appears to conclude that dewatering would be required for the Project. No detailed description of the Project's dewatering requirements was included in the Addendum.

Construction dewatering has the potential to introduce pollutants into the storm drain systems. For example, groundwater from dewatering could contain sediment that, if not properly managed, could be discharged to the storm drain system. In addition, shallow soil contamination could introduce further contamination to storm drains and other water bodies. As SWAPE points out, the Phase I & II ESAs found petroleum hydrocarbons (motor oil), cobalt, and lead in soil at depths less than 12 feet at levels above San Francisco Regional Water Quality Control Board regulatory screening levels for a residential setting.[32] Without additional information and analysis, the Project's impacts to workers, the public, and hydrological resources cannot adequately be determined. The City must

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[29] *See, e.g., Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376.
[30] Addendum, p. 34.
[31] SWAPE Comments, p. 3.
[32] *Id.*, at 2.

describe potential dewatering activities so the public and decision makers can fully assess the Project's impacts on the environment.

Therefore, SWAPE concludes that an EIR "is necessary to properly document the need for dewatering, the impacts of dewatering, and a determination by EBMUD that the water quality is suitable for disposal."[33]

C. The Addendum Fails To Adequately Analyze The Project-Specific Health Risk And Fails To Incorporate Conditions And Measures Identified in the Broadway Valdez District Specific Plan

The BVDSP EIR determined that development under the plan could generate substantial levels of Toxic Air Contaminants ("TACs"), resulting in significant health risks to sensitive receptors during construction activities and project operations. The BVDSP further determined that new operational sources, such as backup diesel generators, could result in significant impacts on new and existing receptors.[34] SCAs and mitigation measures were identified to reduce the impacts.[35]

Despite the SCAs and mitigation measures, the BVDSP EIR determined that the TAC exposure resulting generally from Project would remain significant and unavoidable. This conclusion, however, was based primarily on operational exposures, and the BVDSP did not evaluate in detail the potential health risk to sensitive receptors during *construction*. The BVDSP did not address construction related exposures because "the specificity of detail necessary to conduct a health risk assessment is not available at the Specific Plan stage."[36] The BVDSP EIR thus deferred the assessment of health risks from construction activities to the project level stage where project-specific impacts and mitigation measures could be determined.

As explained by SWAPE, however, the Addendum completely fails to evaluate the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction.[37] The

[33] *Id.*, at 3.
[34] BVDSP EIR, p. 4.2-28.
[35] *Id.*, at 4.2-28 – 29.
[36] *Id.*, at 4.2-27.
[37] SWAPE Comments, p. 9.

Addendum concludes that, "[b]ased on an examination of the analysis, findings, and conclusions of the BVDSP EIR, implementation of the proposed project would not substantially increase the severity of significant impacts identified in the BVDSP EIR, nor would it result in new significant impacts related to air quality that were not identified in the BVDSP EIR."[38] This conclusion is incorrect.

While an operational health risk assessment ("HRA") was prepared, the risk from exposure to DPM emissions during construction were not quantified, nor were they compared to applicable numerical thresholds. Although the Addendum states that the Project would require implementation of SCAs and Transportation Demand Management ("TDM") to control construction emissions,[39] SWAPE notes that the risk should still be quantified to determine whether all necessary SCAs and mitigation measures have been applied if the measures will adequately reduce DPM emissions.[40]

Furthermore, SWAPE explains that by failing to quantify the risk associated with Project construction, the Addendum "is inconsistent with guidance set forth by the Office of Environmental Health Hazard Assessment ("OEHHA")," the organization responsible for providing recommendations for HRAs in California.[41] The February 2015 OEHHA guidance document describes the types of projects that warrant the preparation of an HRA.[42] According to SWAPE, construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 24 months, from June 2016 to June 2018, as stated in the Addendum.[43] OEHHA recommends that all short-term projects lasting longer than two months be evaluated for cancer risks to nearby sensitive receptors.[44] SWAPE explains that "[t]his recommendation reflects the most recent HRA policy, and as such, the health risk for Project construction should be quantified and evaluated against the numerical significance

[38] Addendum, p. 22
[39] *Id.*
[40] SWAPE Comments, p. 9 – 10.
[41] *Id.*, at 10.
[42] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.
[43] SWAPE Comments, p. 10.
[44] OEHHA, Risk Assessment Guidelines, at 8-18.

threshold established by the Bay Area Air Quality Management District ("BAAQMD")."[45]

SWAPE prepared a simple screening-level HRA, which demonstrates that construction-related DPM emissions would exceed BAAQMD health risk thresholds.[46] SWAPE's model indicates that construction activities will generate approximately 1,531 pounds of DPM over a 729-day construction period.[47] SWAPE then calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant receptors using applicable HRA methodologies prescribed by OEHHA. As SWAPE explains, OEHHA recommends the use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[48] SWAPE's findings are included below.

Parameter	Description	Units	Adult	Child	Infant
C_{air}	Concentration	$\mu g/m^3$	4.44	4.44	4.44
DBR	Daily breathing rate	L/kg-day	302	581	581
EF	Exposure Frequency	days/year	350	350	350
ED	Exposure Duration	years	2	2	2
AT	Averaging Time	days	25550	25550	25550
	Inhaled Dose	(mg/kg-day)	3.7E-05	7.1E-05	7.1E-05
CPF	Cancer Potency Factor	1/(mg/kg-day)	1.1	1.1	1.1
ASF	Age Sensitivity Factor	-	1	3	10
	Cancer Risk		**4.04E-05**	**2.33E-04**	**7.77E-04**

As demonstrated in the table, SWAPE found that excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors located 25 meters away are 40.4, 233, and 777 in one million, respectively, which far exceed applicable thresholds. Thus, SWAPE concludes that "a refined health risk assessment must be prepared and included in [an EIR] to examine air quality impacts generated by Project construction using site-specific meteorology and

[45] SWAPE Comments, p. 10.
[46] *Id.*
[47] *Id.*
[48] OEHHA, Risk Assessment Guidelines.

specific equipment usage schedules."[49] The Addendum fails to adequately address this impact.

Furthermore, the Addendum has not indentified or incorporated all SCAs and mitigation required under the BVDSP. The Addendum not only fails to quantify the construction health risk to determine whether all necessary SCAs and mitigation have been incorporated (which were not even clearly identified in the BVDSP), but also fails to incorporate Mitigation Measure AIR-4: Risk Reduction Plan to address the Project's use of an emergency generator, which can introduce new TACs as stated in the Addendum.[50]

AIR-4 states that "[a]pplicants for projects that would include backup generators shall prepare and submit to the City, a Risk Reduction Plan for City review and approval. . . The applicant shall implement the approved plan."[51] The BVDSP appears to require this measure for all projects with backup generators, such as this Project, to address cumulatively considerable health risks from multiple new sources.[52] However, even though the BVDSP clearly anticipated cumulatively considerable health risks from new sources of TACs such as emergency generators, the Addendum ignores this analysis and concludes that AIR-4 is not required. This is counter to the BVDSP.

The Addendum is inconsistent with the BVDSP because it fails to incorporate all mitigation required under the BVDSP for health risks to the surrounding community. In addition, given that the Addendum acknowledges that the proposed Project "differs from what was presented in the BVDSP EIR," the health risk impact from DPM during construction does in fact present new information showing a significant impact, which the BVDSP stated could not be known at the Project level, and which was not discussed in the BVDSP EIR. Therefore, an EIR is required for the Project and the City may not rely on the Addendum for Project approval.

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[49] SWAPE Comments, p. 12.
[50] Addendum, p. 21 ("[The Project] would have an emergency generator, thereby introducing new sources of TACs.").
[51] BVDSP EIR, p. 4.2-28.
[52] *Id.*

D. The Addendum Fails To Adequately Analyze Project-Specific Greenhouse Gas Emissions And Fails To Incorporate Conditions And Measures Identified In The Broadway Valdez District Specific Plan

The BVDSP EIR analyzed GHG emission impacts resulting from build-out of the entire plan, which were determined to be significant and unavoidable. Several mitigating SCAs were identified and incorporated into the BVDSP. Those SCAs, such as a GHG Reduction Plan, apply to Projects that meet certain thresholds for GHG emissions. According to the Addendum, a GHG screening analysis ("GHG Analysis") was conducted to determine if the proposed Project would meet the thresholds requiring the development of a GHG Reduction Plan under SCA F in the BVDSP (or SCA 38 as the Addendum's GHG Analysis refers to it).[53]

Under SCA F, if the Project emits more than 1,100 metric tons of CO_2e per year ($MTCO_2e/yr$) and generates more than 4.6 metric tons of CO_2e per year per service population ($MTCO2_2/yr/sp$), the Project would have a significant GHG impact, and the Project Applicant would be required to develop a GHG Reduction Plan.[54] The Addendum concluded that the Project does not exceed the applicable thresholds, and thus would have a less than significant GHG impact. No SCAs or mitigation measures were applied to the Project.

However, SWAPE finds that the City's conclusion regarding GHG impacts is "inaccurate" and "based on emissions generated by an incorrect model."[55] As explained by SWAPE, the GHG Analysis relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[56] 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 CEQA requires that such changes be justified by substantial evidence.[57] Once all the values are inputted into the model, the Project's construction and operational emissions are calculated and "output files" are generated. These output files

[53] BVDSP EIR, Section 4.6; Addendum, Attachment F.
[54] *Id.*
[55] SWAPE Comments, p.4.
[56] CalEEMod website, *available at*: http://www.caleemod.com/
[57] CalEEMod User Guide, pp. 2, 9.

disclose to the reader what parameters were utilized in calculating the Project's air pollution emissions, and make known which default values were changed as well as provide a justification for the values selected.[58]

When reviewing the construction and operational CalEEMod output files for the GHG analysis, SWAPE found that several of the values inputted into the model are "not consistent with each other and with information disclosed in the [Addendum]."[59] As a result, the GHG emissions associated with the construction and operation of the Project are "greatly underestimated."[60] When SWAPE corrected those values, the model shows that the Project will have a significant GHG impact.[61] The model values are incorrect for two reasons.

First, the Project's GHG Analysis failed to include the anticipated amount of material that will be exported off site during the "Excavation" construction phase within the CalEEMod model, and as a result, the Project's construction emissions are underestimated.[62] The Addendum states that "[c]onstruction would include excavation and off-haul of up to 42,000 cubic yards of excavated material and approximately 42,000 cubic yards of demolition material would be disposed of off-site."[63] The material generated during the "Demolition" phase would come from the demolition of the existing paved features on the Project site and the material generated during the "Excavation" phase will come from the excavation of the top soil on the Project site to a depth of between 25 and 27 feet below grade.[64] SWAPE explains that these proposed material export activities would "produce substantial pollutant and GHG emissions, and as a result, these activities should have been included in the Project's CalEEMod model."[65]

Second, the Energy Use values inputted into the construction CalEEMod model are inconsistent with the Energy Use values inputted into the operational CalEEMod model.[66] SWAPE explains that CalEEMod is an inclusive model that allows the user to model both construction and operational emissions for a proposed

[58] *Id.*, at 7, 13.
[59] SWAPE Comments, p. 5.
[60] *Id.*
[61] *Id.*, at 7 – 9.
[62] *Id.*, at 5.
[63] Addendum, p. 21.
[64] *Id.*, at 10.
[65] SWAPE Comments, p. 5.
[66] *Id.*, at 6.

Project within the same model. As such, most CEQA evaluations estimate the Project's construction and operational emissions in one model. However, SWAPE notes that contrary to this common practice, the analyses prepared for the Project uses two separate CalEEMod models – one for construction and one for Project operation. According to SWAPE, the construction model indicates that the Applicant provided Project-specific values for operational energy use, but those same values were not included in the operational emissions model.

SWAPE corrected the operational model, as seen below, using the Project-specific Energy Use and Natural Gas values referenced in the construction model. SWAPE's corrected model demonstrates that GHG emissions will greatly exceed both of the numerical thresholds referenced in SCA F;[67] thus, the BVDSP requires that a GHG Reduction Plan must be prepared.[68]

Total Project Emissions

Activity	Greenhouse Gas Emissions (MT CO2e/Yr)	
	CEQA Analysis	SWAPE Analysis
Construction	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Significance Threshold	1,100	1,100
Exceeds Threshold?	***Yes***	***Yes***

Total Project Emissions

Activity	Greenhouse Gas Emissions Per Service Population (MT CO2e/SP/Yr)	
	CEQA Analysis	SWAPE Analysis
Construction	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Service Population	466	466

[67] *Id.*, at 8 – 9.
[68] BVDSP EIR, p. 4.6-27 – 28.

Emissions Per Service Population	**4.3**	**45.1**
Significance Threshold	4.6	4.6
Exceeds Threshold?	*No*	***Yes***

Therefore, SWAPE concludes that the City's determination that the Project's GHG emissions are less than significant and none of the SCAs identified in the BVDSP are required is "not substantiated."[69] An updated analysis in an EIR should be prepared to adequately evaluate and mitigate the Project's significant GHG impact.

E. The Addendum Fails To Adequately Analyze Project-Specific Hazards

1. Hazardous Materials on the Project Site

A July 2015 Phase I ESA prepared for the Project site and an August 2015 Phase II ESA were used as the basis for the Addendum to conclude that hazards impacts were less than significant and that no mitigation was necessary. However, SWAPE explains that "[n]o regulatory agencies were engaged to provide oversight of the Phase I and Phase II ESAs and therefore the conclusions reached in the CEQA Analysis are unreliable for decision-making."[70]

As explained above, the sampling that was reported in the Phase II ESA documented detections of petroleum hydrocarbons (motor oil), cobalt, and lead in soil at depths less than 12 feet. SWAPE explains that "[t]he detections were above San Francisco Regional Water Quality Control Board regulatory screening levels for a residential setting" and that "[t]he lead detection was so elevated, the soil may need to be classified as hazardous waste."[71] However, the Addendum merely states that contaminated soil would be excavated for Project construction and that general Standard Conditions of Approval would be required without further analysis. The Addendum then concludes that "implementation of the proposed project would not substantially increase the severity of significant impacts identified in the BVDSP

[69] SWAPE Comments, p. 5.
[70] *Id.*, at 2.
[71] *Id.*

EIR, nor would it result in new significant impacts related to hazards and hazardous materials that were not identified in the BVDSP EIR."[72]

However, SWAPE explains that the contaminants that were detected in soil have health effects that include:

- Total petroleum hydrocarbons: headaches and dizziness, a nerve disorder called "peripheral neuropathy," and effects on the blood, immune system, lungs, skin, and eyes.
- Cobalt: lung, heart, liver and kidney effects.
- Lead: neurological and kidney effects, probable human carcinogen.[73]

Although the BVDSP analyzed potential release of hazardous materials into the environment such as PCBs and lead-based paint, it is not clear that the BVDSP specifically analyzed the potential for impacts from high levels of petroleum hydrocarbons and cobalt in the soil. Given the limited analysis of hazardous materials in the BVDSP, SWAPE concludes that "[t]o assure the adequacy of the investigations, the Alameda County Department of Environmental Health should be engaged to review the findings of the Phase I and the Phase II . . . Regulatory oversight is necessary to validate the environmental sampling was adequate and that all contaminated soil will be excavated."[74] Without this oversight, SWAPE finds that the Addendum is "inadequate" and that an EIR is "necessary to document regulatory engagement and a regulatory finding that the conditions at the Project site are appropriate for residential development."[75]

2. Phase I Recommendations

The July 2015 Phase I ESA prepared for the Project site made several recommendations, including the "[a]bandonment of the existing groundwater monitoring wells on the project site in accordance with local and state regulations."[76]

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[72] Addendum, p. 34.
[73] SWAPE Comments, p. 2.
[74] *Id.*
[75] *Id.*
[76] Addendum, p. 33.

Three monitoring wells were identified in the Phase I and in the subsequent August 2015 Phase II ESA.[77] However, no details on the well construction (depth, date of completion) were included in the Phase I or Phase II. SWAPE finds that the Addendum fails to include any documentation that the wells were abandoned, as recommended in the Phase I.[78] Given the elevated concentrations of various materials such as motor oil and lead in soil samples, and the potential for those materials to have a significant environmental impact, the City should follow all Phase I ESA recommendations. Therefore, SWAPE concludes that an EIR "should be prepared to show that the wells were abandoned in accordance with Alameda County Municipal Code 6.88.060 to meet standards in Chapter II of the Department of Water Resources Bulletin No. 74-81, "Water Well Standards: State of California," Department of Water Resources Bulletin No. 74-90."[79]

III. CONCLUSION

The City has failed to satisfy CEQA's procedural and evidentiary standards for the preparation of an addendum. As explained above, the Addendum fails to adequately address the Project's inconsistency with the BVDSP; fails to adequately describe the Project; fails to analyze and mitigate the Project's health risks posed to the surrounding community, which are new or more severe than previously analyzed; fails to adequately analyze and mitigate the Project's GHG emissions as required under the BVDSP; and fails to adequately analyze hazards on the Project site. For these reasons, we urge the City to prepare an EIR for the Project before the City considers approval of the Project.

Sincerely,

Laura E. Horton

LEH:ric
Attachments

[77] *See* Addendum, Attachments G & H.
[78] SWAPE Comments, p. 3.
[79] *Id.*

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April 13, 2016

Laura E. Horton
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd., Suite 1000
South San Francisco, CA 94080

Subject: Comments on the 2400 Valdez Street Project

Dear Ms. Horton:

We have reviewed the March 28, 2016 CEQA Analysis ("CEQA Analysis") and associated attachments for the proposed 2400 Valdez Street Project ("Project") located in Oakland, California. The Project proposes to redevelop 12 parcels within the Broadway Valdez District Specific Plan (BVDSP), and construct a building consisting of 225 residential units and 23,465 square feet of retail space on 1.1 acres. The BVDSP Environmental Impact Report (EIR) analyzed impacts associated with adoption and implementation of the BVDSP. Project-level analysis allows the use of CEQA streamlining and/or tiering provisions for projects that are developed under the BVDSP.

Our review concludes that the project-level CEQA Analysis fails to adequately evaluate the Project's Hazard and Hazardous Waste, Greenhouse Gas, and Air Quality Impacts. The environmental assessments conducted for the Project site have not been subjected to regulatory scrutiny, not all recommendations have been heeded and the CEQA Analysis fails to adequately describe the Project's dewatering requirements. Furthermore, the CEQA Analysis models the Project's construction and operational greenhouse gas (GHG) emissions using incorrect input parameters, and as a result, the Project's significant GHG emissions are greatly underestimated. Finally, the CEQA Analysis concludes that construction of the Project would not expose sensitive receptors to substantial pollutant concentrations without providing any basis for this claim. Our health risk assessment shows, in fact, that construction of the Project will expose sensitive receptors to substantial pollutant concentrations; as a result, the significance determination made within the CEQA Analysis is incorrect. A project-specific Draft Environmental Impact Report (DEIR) should be prepared to adequately address these issues and incorporate additional mitigation.

Hazards and Hazardous Waste

Sampling not Conducted under Regulatory Oversight

A July 2015 Phase I Environmental Site Assessment (ESA) prepared for the Project site (Appendix G) and an August 2015 Phase II ESA (Appendix H) were used as the basis for the CEQA Analysis to conclude that Hazards and Hazardous Waste issues were not significant and that no mitigation was necessary. No regulatory agencies were engaged to provide oversight of the Phase I and Phase II ESAs and therefore the conclusions reached in the CEQA Analysis are unreliable for decision-making.

The sampling that was reported in the Phase II ESA documented detections of petroleum hydrocarbons (motor oil), cobalt, and lead in soil at depths less than 12 feet (Appendix G, Table A). The detections were above San Francisco Regional Water Quality Control Board regulatory screening levels for a residential setting, as proposed for the Project site. The lead detection was so elevated, the soil may need to be classified as hazardous waste (p. 34). The CEQA analysis provides for no mitigation to address these detections, stating generally that soil will be excavated for Project construction (p. 34).

The contaminants that were detected in soil have health effects that include:

- Total petroleum hydrocarbons: headaches and dizziness, a nerve disorder called "peripheral neuropathy," and effects on the blood, immune system, lungs, skin, and eyes.[1]
- Cobalt: lung, heart, liver and kidney effects.[2]
- Lead: neurological and kidney effects, probable human carcinogen.[3]

The CEQA analysis is inadequate because no regulatory approval for the investigations has been granted. To assure the adequacy of the investigations, the Alameda County Department of Environmental Health should be engaged to review the findings of the Phase I and the Phase II. Regulatory oversight is necessary to validate the environmental sampling was adequate and that all contaminated soil will be excavated. A DEIR is necessary to document regulatory engagement and a regulatory finding that the conditions at the Project site are appropriate for residential development.

Phase I ESA Recommendations not Incorporated

The July 2015 Phase I ESA prepared for the Project site (Appendix G) made a recommendation that was not incorporated into the CEQA Analysis. A DEIR must be prepared to show that the recommendation has been incorporated into the Project consistent with Alameda County and California standards.

A recommendation was made in the Phase I ESA as follows (p. 29):

> Abandonment of the existing groundwater monitoring wells on the project site in accordance with local and state regulations.

[1] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=423&tid=75
[2] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=372&tid=64
[3] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=93&tid=22

Three monitoring wells were identified in the Phase I and in the subsequent August 2015 Phase II ESA (Appendix H). No details on the well construction (depth, date of completion) were included in the Phase I or Phase II.

The CEQA Analysis fails to include any documentation that the wells were abandoned, as recommended in the Phase I. A DEIR should be prepared to show that the wells were abandoned in accordance with Alameda County Municipal Code 6.88.060 to meet standards in Chapter II of the Department of Water Resources Bulletin No. 74-81, "Water Well Standards: State of California," Department of Water Resources Bulletin No. 74-90.

Dewatering not Incorporated into Analysis

The CEQA Analysis states (p. 34):

> In accordance with the Phase II ESA, if construction dewatering activities occur, the groundwater analytical results included in the Phase II ESA would be provided to EBMUD prior to the completion of construction activities.

This statement is misleading when it states "*if* construction dewatering activities occur." Dewatering activities will assuredly occur because the water table is found at a depth as shallow as seven feet (p. 29) and the Project would involve excavation to a depth of between 25 and 27 feet (p. 10). However, a detailed description of the Project's dewatering requirements was not included in the CEQA Analysis. A DEIR is necessary to properly document the need for dewatering, the impacts of dewatering, and a determination by EBMUD that the water quality is suitable for disposal.

Greenhouse Gas

Unsubstantiated Input Parameters Used to Estimate Project Emissions

According to the CEQA Analysis, a GHG Screening Analysis ("GHG Analysis") was conducted to determine if the proposed Project would fall under any of the three scenarios that would require the development of a GHG reduction plan under the Standard Conditions of Approval 38 (SCA 38), as it is referred to in the GHG analysis (Attachment F), or SCA F as identified in the BVDSP EIR. Table F-1 of the GHG Analysis, which is included as Attachment F of the CEQA Analysis, compares the proposed Project to the criteria identified under the SCA 38 (see excerpt below) (GHG Analysis, p. 4).

Table F-1. Comparison of Proposed Project with Scenarios of SCA 38

Scenario	Criterion (a)	Criterion (b)	Criterion (c)	Criterion (d)
Scenario A	Involve a land use development	Exceed the GHG emissions screening criteria contained in the BAAQMD's CEQA Guidelines	Exceed *both* applicable numeric City of Oakland CEQA thresholds[1]	—
Project	Yes – the proposed project entails development of land uses	Yes – the proposed project's land use components exceed the BAAQMD screening size levels[2]	No – see Section 2.0, below	—
Scenario B	Involve a land use development	Exceed the GHG emissions screening criteria contained in the BAAQMD's CEQA Guidelines	Exceed one of the applicable numeric City of Oakland CEQA thresholds[1]	Very large project
Project	Yes – the proposed project entails development of land uses	Yes – the proposed project's land use components exceed the BAAQMD screening size levels[2]	Yes – see Section 2.0, below	No – see Section 3.0, below
Scenario C	Involve a stationary source of GHG	Exceed 10,000 metric tons CO_2e per year	—	—
Project	No – the proposed project does not include an emergency generator	—	—	—

Notes:

[1] The City of Oakland's CEQA thresholds are 1,100 metric tons CO_2e per year and or 4.6 metric tons CO_2e per service population per year.

[2] The GHG screening-level sizes for mid-rise apartments are 87 dwelling units or less and 19,000 square feet or less for strip malls/regional shopping centers, per Table 3-1 from the BAAQMD's CEQA Guidelines.

Under Scenario A, Criterion C, if the Project emits more than 1,100 metric tons of CO_2e per year ($MTCO_2e/yr$) and generates more than 4.6 metric tons of CO_2e per year per service population ($MTCO2_2/yr/sp$), the Project would have a significant GHG impact, and the Project Applicant would be required to develop a GHG reduction plan. Since the City determined that the Project does not exceed both of the applicable numeric City of Oakland CEQA thresholds (Scenario A), is not classified as a "very large project" (Scenario B), and does not involve any stationary sources of GHG (Scenario C), the Project was found to have a less than significant GHG impact in the CEQA Analysis. While the significance determinations made under Scenarios B and C are adequate, the conclusion that the Project complies with the criteria set forth under Scenario A is inaccurate, as this conclusion is based on emissions generated by an incorrect model.

The GHG Analysis relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[4] CalEEMod provides recommended default values based on site specific information, such as land use type, meteorological data, total lot acreage, project type and

[4] CalEEMod website, *available at*: http://www.caleemod.com/

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 CEQA requires that such changes be justified by substantial evidence.[5] Once all 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 were utilized in calculating the Project's air pollution emissions, and make known which default values were changed as well as provide a justification for the values selected.[6]

When reviewing the GHG Analysis' construction and operational CalEEMod output files, we found that several of the values inputted into the model are not consistent with each other and with information disclosed in the CEQA Analysis. As a result, GHG emissions associated with the construction and operation of the Project are greatly underestimated. Indeed, when the model values are corrected, the model shows that the Project will have a significant GHG impact. Therefore, the determination that the Project's GHG emissions comply with the criteria under Scenario A of SCA 38 and will not require a GHG reduction plan are not substantiated. An updated analysis should be prepared to adequately evaluate the Project's GHG impact, and additional mitigation measures should be implemented, if necessary.

Omission of Material Export During Excavation

The Project's GHG Analysis failed to include the anticipated amount of material that will be exported off site during the "Excavation" construction phase within the CalEEMod model, and as a result, the Project's construction emissions are underestimated.

The CEQA Analysis states that "Construction would include excavation and off-haul of up to 42,000 cubic yards of excavated material and approximately 42,000 cubic yards of demolition material would be disposed of off-site" (p. 21). The material generated during the "Demolition" phase will come from the demolition of the existing paved features on the Project site and the material generated during the "Excavation" phase will come from the excavation of the top soil on the Project site to a depth of between 25 and 27 feet below grade (CEQA Analysis, p. 10). These proposed material export activities will produce substantial pollutant and GHG emissions, and as a result, these activities should have been included in the Project's CalEEMod model.

Upon review of the CalEEMod output files, however, it is clear that the approximately 42,000 cubic yards of material export during the "Excavation" construction phase was completely omitted from the model. This presents a significant issue, as the inclusion of the amount of material export within the model is necessary to calculate emissions produced from material movement, including truck loading and unloading, and additional hauling truck trips.[7] As a result, GHG emissions generated during Project construction are underestimated.

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[5] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/

[6] CalEEMod User Guide, pp. 7, 13, *available at:* http://www.caleemod.com/ (A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.)

[7] CalEEMod User's Guide, *available at:* http://www.caleemod.com/, p. 3, 26.

Inconsistent Energy Use Input Values

The Energy Use values inputted into the construction CalEEMod model are inconsistent with the Energy Use values inputted into the operational CalEEMod model. As a result, the Project's pollution models are inaccurate and should not be relied upon to determine Project significance.

As previously stated, CalEEMod is an inclusive model that allows the user to model both construction and operational emissions for a proposed Project within the same model. As such, most CEQA evaluations estimate the Project's construction and operational emissions in one model. Contrary to this common practice, the CEQA Analysis prepares two separate CalEEMod models – one for construction and one for Project operation. Usually, when a user models construction and operational emissions separately, the input values for the scenario not being modeled during that run are set to zero to avoid any confusion. For example, if a user is estimating just the construction emissions of a proposed project, they would set each of the operational input values to zero, such as Energy and Natural Gas use. Review of the Project's CalEEMod output files, however, demonstrates that the CEQA Analysis failed to set the operational input values to zero for the construction run, and failed to set the construction input values to zero for the operational run. Not only did they fail to zero-out the appropriate inputs, they actually applied site specific operational information to the construction model, but then failed to apply this same site specific operational information to the operational model. This discrepancy between the operational input values present a significant issue, as site-specific operational information for the operational model should have been utilized. By relying on the CalEEMod default values, rather than the site specific information, the Project's operational model is inaccurate and should not be used to determine Project significance.

Specifically, the CEQA Analysis inputs site specific Energy Use and Natural Gas values into the construction model, but then relies on CalEEMod default Energy Use and Natural Gas values for the operational model. As you can see in the excerpt below, every default Energy Use Value and default Natural Gas value within the construction model was adjusted to reflect Project-specific usage (default values in left column, site-specific values in right-most column) (CEQA Analysis, pp. 154).

tblEnergyUse	LightingElect	741.44	1,230.49
tblEnergyUse	LightingElect	5.51	1,186.48
tblEnergyUse	NT24E	2,561.86	4,251.64
tblEnergyUse	NT24E	3.36	723.51
tblEnergyUse	NT24NG	1,662.00	619.47
tblEnergyUse	NT24NG	0.70	218.75
tblEnergyUse	T24E	312.05	517.88
tblEnergyUse	T24E	2.74	590.01
tblEnergyUse	T24NG	7,191.67	2,680.53
tblEnergyUse	T24NG	4.10	1,281.25

The User Entered Comments provides insight on how these Project-specific values were derived, stating that they "Used an Excel spreadsheet to break down the applicant provided Energy and NG info" (CEQA Analysis, pp. 154). These Energy Use values, while adjusted in the construction model, reflect the Energy Use that will occur during Project operation. Therefore, the Project-specific Energy Use and Natural Gas

values inputted into the construction model should have also been used within the Project's operational model. When we reviewed the operational model, however, we found that default Energy Use and Natural Gas values provided by CalEEMod were used, rather than the Project-specific values disclosed in the construction model (see excerpt below) (CEQA Analysis, pp. 179).

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	224,000.00	179,545.00
tblLandUse	LotAcreage	2.08	0.00
tblLandUse	LotAcreage	5.89	1.10
tblProjectCharacteristics	Population	641.00	419.00
tblTripsAndVMT	OperationalYear	2014	2019
tblVehicleTrips	HaulingTripNumber	213.00	5,250.00
tblVehicleTrips	ST_TR	7.16	3.77
tblVehicleTrips	ST_TR	49.97	24.26
tblVehicleTrips	SU_TR	6.07	3.77
tblVehicleTrips	SU_TR	25.24	24.26
tblVehicleTrips	WD_TR	6.59	3.77
tblVehicleTrips	WD_TR	42.94	24.26

CalEEMod provides recommended default values based on site specific information; however, if more specific project information is known, the user should change the default values and input project-specific values in an effort to accurately estimate emissions.[8] The User Entered Comments provided in the construction model clearly indicate that the non-default Energy Use values are specific to the Project's operational energy and natural gas consumption. Furthermore, the Project-specific Energy Use and Natural Gas values used within the construction model are much higher than the CalEEMod default values used within the operational model. By failing to include these Project-specific Energy Use and Natural Gas values within the operational model, the Project's operational emissions are greatly underestimated.

Updated Analysis Indicates Significant Greenhouse Gas Emissions

In an effort to more accurately estimate the Project's emissions, we prepared an updated air model using CalEEMod. The results of our analysis demonstrate that when correct input parameters are used, GHG emissions will exceed both of the numerical thresholds provided under Scenario A, Criterion C.[9] As such, a GHG reduction plan must be prepared under SCA 38.

We inputted 229 parking spaces and 225 dwelling units into our updated model, which is consistent with information provided in the CEQA Analysis. Furthermore, since the CEQA Analysis provides the cubic yards of demolition, and the demolition input in CalEEMod can only be inputted as building square footage or tons of debris, we converted the 42,000 cubic yards of demolition material to tons of debris. CalRecycle provides default volume-to-weight conversion factors based on material type. According to CalRecycle's table, "Construction Debris, Asphalt or Concrete: Loose" has a weight of approximately

[8] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/
[9] Refer to page 2 of this report for additional details on these numerical thresholds.

2,400 pounds per cubic yard.[10] Using this conversion factor, removal of the existing parking lot would produce approximately 50,400 tons of waste.[11]

Finally, we utilized the Project specific Energy Use and Natural Gas values provided in the construction model to estimate the Project's operational emissions (see table below).

Energy Use		
	Parameter	**Input Value**
Apartments Mid-Rise	Lighting Energy Intensity (KWhr/size/yr)	1,230.49
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	4,251.64
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	619.47
	Title-24 Electricity Energy Intensity (KWhr/size/yr	517.88
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	2,680.53
Strip Mall	Lighting Energy Intensity (KWhr/size/yr)	1,186.48
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	723.51
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	218.75
	Title-24 Electricity Energy Intensity (KWhr/size/yr	590.01
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	1,281.25

When correct input parameters are used within the model, we find that the Project's construction and operational emissions increase significantly when compared to the emissions estimated in the Project's GHG Screening Analysis. Furthermore, we find that the Project's operational GHG emissions exceed both of the numerical thresholds disclosed under Scenario A, Criterion C (1,100 $MTCO_2e$/yr and the efficiency threshold of 4.6 $MTCO2_2$/yr/sp) (see tables below).

Total Project Emissions		
	Greenhouse Gas Emissions (MT CO2e/Yr)	
Activity	**CEQA Analysis**	**SWAPE Analysis**
Construction[12]	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Significance Threshold	1,100	1,100
Exceeds Threshold?	***Yes***	***Yes***

[10] http://www.calrecycle.ca.gov/swfacilities/cdi/tools/Calculations.htm
[11] [42,000 cubic yards x (2,400 lbs/cubic yard)] / [2000 lbs/ton] = 50,400 tons
[12] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

Total Project Emissions		
	Greenhouse Gas Emissions Per Service Population (MT CO2e/SP/Yr)	
Activity	CEQA Analysis	SWAPE Analysis
Construction[13]	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Service Population[14]	466	466
Emissions Per Service Population	**4.3**	**45.1**
Significance Threshold	4.6	4.6
Exceeds Threshold?	*No*	***Yes***

As you can see in the tables above, our analysis demonstrates that the Project will produce approximately 21,010 MT CO_2e/year and approximately 45.1 MT CO_2e/sp/year when modeled correctly. Because both of the applicable thresholds are exceeded, the proposed Project does not comply with Scenario A, Criterion C (p. 4). As such, under Scenario A, the Project will require the development of a GHG reduction plan as set forth by SCA 38.

By failing to correctly model the Project's GHG emissions, the CEQA Analysis artificially reduced the emissions that will be generated during construction and operation. As such, the significance determination made within the CEQA Analysis is incorrect, as the Project will have a significant GHG impact. A DEIR should be prepared to adequately evaluate the Project's GHG emissions, and a GHG reduction plan should be prepared prior to Project approval.

Air Quality

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The CEQA Analysis fails to evaluate the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter (DPM) emissions released during Project construction. The CEQA Analysis concludes that, "Based on an examination of the analysis, findings, and conclusions of the BVDSP EIR, implementation of the proposed project would not substantially increase the severity of significant impacts identified in the BVDSP EIR, nor would it result in new significant impacts related to air quality that were not identified in the BVDSP EIR" (p. 22). While an operational health risk assessment (HRA) was prepared, the risk from exposure to DPM emissions during construction were not quantified, nor were they compared to applicable numerical thresholds.

Although the CEQA Analysis states that the Project would require implementation of Standard Conditions of Approval (SCAs) and Transportation Demand Management (TDM) to control construction emissions (p. 22), the risk should still be quantified to determine which measures must be applied to

[13] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

[14] Service Population refers to the total number of residents and employees the Project will generate.

reduce DPM emissions and if the measures will reduce emissions to levels that will not cause a significant impact.

Furthermore, failing to quantify the risk associated with Project construction, the CEQA Analysis is inconsistent with guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, which was formally adopted in March of 2015.[15] This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 24 months, from June 2016 to June 2018. OEHHA recommends that all short-term projects lasting longer than two months be evaluated for cancer risks to nearby sensitive receptors.[16] This recommendation reflects the most recent health risk assessment policy, and as such, the health risk for Project construction should be quantified and evaluated against the numerical significance threshold established by the Bay Area Air Quality Management District (BAAQMD). In an effort to demonstrate this, we prepared a simple screening-level health risk assessment. The results of our assessment, as described below, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact.

As of 2011, the EPA recommends AERSCREEN as the leading air dispersion model, due to improvements in simulating local meteorological conditions based on simple input parameters.[17] The model replaced SCREEN3, and AERSCREEN is included in OEHHA[18] and CAPCOA[19] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

We prepared a preliminary health risk screening assessment of the Project's construction emissions using the sum of on-site annual exhaust PM_{10} emissions from our updated CalEEMod model, as it incorporates more accurate, site-specific information.

Our updated model indicates that construction activities will generate approximately 1,531 pounds of DPM over a 729-day construction period. The AERSCREEN model relies on a continuous average

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[15] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[16] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18

[17] "AERSCREEN Released as the EPA Recommended Screening Model," USEPA, April 11, 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf

[18] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[19] "Health Risk Assessments for Proposed Land Use Projects," CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf

emissions rate to simulate maximum downwind concentrations from point, area, and volume emissions sources. To account for the variability in construction equipment usage over the six phases of Project construction, we calculated an average DPM emission rate by the following equation.

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{1{,}530.6\ lbs}{729\ days} \times \frac{453.6\ grams}{lb} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} \approx \mathbf{0.011023}\ {}^{g}/_{s}$$

Construction activity was simulated as a 1.1 acre rectangular area source in AERSCREEN, with dimensions of 150 meters by 30 meters. A release height of three meters was selected to represent the height of exhaust stacks on construction equipment, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generated maximum reasonable estimates of single hour downwind DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant may be estimated by multiplying the single-hour concentration by 10%.[20] The maximum single-hour downwind concentration in the AERSCREEN output was approximately 44.46 $\mu g/m^3$ DPM 25 meters downwind, a distance that is most representative of sensitive receptor locations adjacent to the Project site. The annualized average concentration for the sensitive receptors was estimated to be 4.446 $\mu g/m^3$.

We calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant receptors using applicable HRA methodologies prescribed by OEHHA. OEHHA recommends the use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[21] According to the revised guidance, quantified cancer risk should be multiplied by a factor of ten during the first two years of life (infant), and by a factor of three for the subsequent fourteen years of life (child aged two until sixteen). Furthermore, in accordance with guidance set forth by the BAAQMD, we used 95th percentile breathing rates for infants and children and 80th percentile breathing rates for adults.[22] We used a cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

[20] http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf
[21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf
[22] "Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," BAAQMD, January 2010, *available at:* http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx, p. 2-3

Parameter	Description	Units	Adult	Child	Infant
C_{air}	Concentration	µg/m³	4.44	4.44	4.44
DBR	Daily breathing rate	L/kg-day	302	581	581
EF	Exposure Frequency	days/year	350	350	350
ED	Exposure Duration	years	2	2	2
AT	Averaging Time	days	25550	25550	25550
	Inhaled Dose	(mg/kg-day)	3.7E-05	7.1E-05	7.1E-05
CPF	Cancer Potency Factor	1/(mg/kg-day)	1.1	1.1	1.1
ASF	Age Sensitivity Factor	-	1	3	10
	Cancer Risk		**4.04E-05**	**2.33E-04**	**7.77E-04**

The excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors located 25 meters away are 40.4, 233, and 777 in one million, respectively. Consistent with OEHHA guidance, exposure was assumed to begin in the infantile stage of life to provide the most conservative estimates of air quality hazards. The adult, child, and infantile exposure for the sensitive receptors all exceed the BAAQMD threshold of 10 in one million. As a result, a refined health risk assessment must be prepared and included in a DEIR to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules.

Sincerely,

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

Jessie Jaeger

ATTACHMENT A

ATTACHMENT A

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

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April 13, 2016

Laura E. Horton
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd., Suite 1000
South San Francisco, CA 94080

Subject: **Comments on the 2400 Valdez Street Project**

Dear Ms. Horton:

We have reviewed the March 28, 2016 CEQA Analysis ("CEQA Analysis") and associated attachments for the proposed 2400 Valdez Street Project ("Project") located in Oakland, California. The Project proposes to redevelop 12 parcels within the Broadway Valdez District Specific Plan (BVDSP), and construct a building consisting of 225 residential units and 23,465 square feet of retail space on 1.1 acres. The BVDSP Environmental Impact Report (EIR) analyzed impacts associated with adoption and implementation of the BVDSP. Project-level analysis allows the use of CEQA streamlining and/or tiering provisions for projects that are developed under the BVDSP.

Our review concludes that the project-level CEQA Analysis fails to adequately evaluate the Project's Hazard and Hazardous Waste, Greenhouse Gas, and Air Quality Impacts. The environmental assessments conducted for the Project site have not been subjected to regulatory scrutiny, not all recommendations have been heeded and the CEQA Analysis fails to adequately describe the Project's dewatering requirements. Furthermore, the CEQA Analysis models the Project's construction and operational greenhouse gas (GHG) emissions using incorrect input parameters, and as a result, the Project's significant GHG emissions are greatly underestimated. Finally, the CEQA Analysis concludes that construction of the Project would not expose sensitive receptors to substantial pollutant concentrations without providing any basis for this claim. Our health risk assessment shows, in fact, that construction of the Project will expose sensitive receptors to substantial pollutant concentrations; as a result, the significance determination made within the CEQA Analysis is incorrect. A project-specific Draft Environmental Impact Report (DEIR) should be prepared to adequately address these issues and incorporate additional mitigation.

Hazards and Hazardous Waste

Sampling not Conducted under Regulatory Oversight

A July 2015 Phase I Environmental Site Assessment (ESA) prepared for the Project site (Appendix G) and an August 2015 Phase II ESA (Appendix H) were used as the basis for the CEQA Analysis to conclude that Hazards and Hazardous Waste issues were not significant and that no mitigation was necessary. No regulatory agencies were engaged to provide oversight of the Phase I and Phase II ESAs and therefore the conclusions reached in the CEQA Analysis are unreliable for decision-making.

The sampling that was reported in the Phase II ESA documented detections of petroleum hydrocarbons (motor oil), cobalt, and lead in soil at depths less than 12 feet (Appendix G, Table A). The detections were above San Francisco Regional Water Quality Control Board regulatory screening levels for a residential setting, as proposed for the Project site. The lead detection was so elevated, the soil may need to be classified as hazardous waste (p. 34). The CEQA analysis provides for no mitigation to address these detections, stating generally that soil will be excavated for Project construction (p. 34).

The contaminants that were detected in soil have health effects that include:

- Total petroleum hydrocarbons: headaches and dizziness, a nerve disorder called "peripheral neuropathy," and effects on the blood, immune system, lungs, skin, and eyes.[1]
- Cobalt: lung, heart, liver and kidney effects.[2]
- Lead: neurological and kidney effects, probable human carcinogen.[3]

The CEQA analysis is inadequate because no regulatory approval for the investigations has been granted. To assure the adequacy of the investigations, the Alameda County Department of Environmental Health should be engaged to review the findings of the Phase I and the Phase II. Regulatory oversight is necessary to validate the environmental sampling was adequate and that all contaminated soil will be excavated. A DEIR is necessary to document regulatory engagement and a regulatory finding that the conditions at the Project site are appropriate for residential development.

Phase I ESA Recommendations not Incorporated

The July 2015 Phase I ESA prepared for the Project site (Appendix G) made a recommendation that was not incorporated into the CEQA Analysis. A DEIR must be prepared to show that the recommendation has been incorporated into the Project consistent with Alameda County and California standards.

A recommendation was made in the Phase I ESA as follows (p. 29):

> Abandonment of the existing groundwater monitoring wells on the project site in accordance with local and state regulations.

[1] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=423&tid=75
[2] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=372&tid=64
[3] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=93&tid=22

Three monitoring wells were identified in the Phase I and in the subsequent August 2015 Phase II ESA (Appendix H). No details on the well construction (depth, date of completion) were included in the Phase I or Phase II.

The CEQA Analysis fails to include any documentation that the wells were abandoned, as recommended in the Phase I. A DEIR should be prepared to show that the wells were abandoned in accordance with Alameda County Municipal Code 6.88.060 to meet standards in Chapter II of the Department of Water Resources Bulletin No. 74-81, "Water Well Standards: State of California," Department of Water Resources Bulletin No. 74-90.

Dewatering not Incorporated into Analysis

The CEQA Analysis states (p. 34):

> In accordance with the Phase II ESA, if construction dewatering activities occur, the groundwater analytical results included in the Phase II ESA would be provided to EBMUD prior to the completion of construction activities.

This statement is misleading when it states "*if* construction dewatering activities occur." Dewatering activities will assuredly occur because the water table is found at a depth as shallow as seven feet (p. 29) and the Project would involve excavation to a depth of between 25 and 27 feet (p. 10). However, a detailed description of the Project's dewatering requirements was not included in the CEQA Analysis. A DEIR is necessary to properly document the need for dewatering, the impacts of dewatering, and a determination by EBMUD that the water quality is suitable for disposal.

Greenhouse Gas

Unsubstantiated Input Parameters Used to Estimate Project Emissions

According to the CEQA Analysis, a GHG Screening Analysis ("GHG Analysis") was conducted to determine if the proposed Project would fall under any of the three scenarios that would require the development of a GHG reduction plan under the Standard Conditions of Approval 38 (SCA 38), as it is referred to in the GHG analysis (Attachment F), or SCA F as identified in the BVDSP EIR. Table F-1 of the GHG Analysis, which is included as Attachment F of the CEQA Analysis, compares the proposed Project to the criteria identified under the SCA 38 (see excerpt below) (GHG Analysis, p. 4).

Table F-1. Comparison of Proposed Project with Scenarios of SCA 38

Scenario	Criterion (a)	Criterion (b)	Criterion (c)	Criterion (d)
Scenario A	Involve a land use development	Exceed the GHG emissions screening criteria contained in the BAAQMD's CEQA Guidelines	Exceed *both* applicable numeric City of Oakland CEQA thresholds[1]	—
Project	Yes – the proposed project entails development of land uses	Yes – the proposed project's land use components exceed the BAAQMD screening size levels[2]	No – see Section 2.0, below	—
Scenario B	Involve a land use development	Exceed the GHG emissions screening criteria contained in the BAAQMD's CEQA Guidelines	Exceed one of the applicable numeric City of Oakland CEQA thresholds[1]	Very large project
Project	Yes – the proposed project entails development of land uses	Yes – the proposed project's land use components exceed the BAAQMD screening size levels[2]	Yes – see Section 2.0, below	No – see Section 3.0, below
Scenario C	Involve a stationary source of GHG	Exceed 10,000 metric tons CO_2e per year	—	—
Project	No – the proposed project does not include an emergency generator	—	—	—

Notes:

[1] The City of Oakland's CEQA thresholds are 1,100 metric tons CO_2e per year and or 4.6 metric tons CO_2e per service population per year.

[2] The GHG screening-level sizes for mid-rise apartments are 87 dwelling units or less and 19,000 square feet or less for strip malls/regional shopping centers, per Table 3-1 from the BAAQMD's CEQA Guidelines.

Under Scenario A, Criterion C, if the Project emits more than 1,100 metric tons of CO_2e per year ($MTCO_2e/yr$) and generates more than 4.6 metric tons of CO_2e per year per service population ($MTCO2_2/yr/sp$), the Project would have a significant GHG impact, and the Project Applicant would be required to develop a GHG reduction plan. Since the City determined that the Project does not exceed both of the applicable numeric City of Oakland CEQA thresholds (Scenario A), is not classified as a "very large project" (Scenario B), and does not involve any stationary sources of GHG (Scenario C), the Project was found to have a less than significant GHG impact in the CEQA Analysis. While the significance determinations made under Scenarios B and C are adequate, the conclusion that the Project complies with the criteria set forth under Scenario A is inaccurate, as this conclusion is based on emissions generated by an incorrect model.

The GHG Analysis relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[4] CalEEMod provides recommended default values based on site specific information, such as land use type, meteorological data, total lot acreage, project type and

[4] CalEEMod website, *available at*: http://www.caleemod.com/

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 CEQA requires that such changes be justified by substantial evidence.[5] Once all 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 were utilized in calculating the Project's air pollution emissions, and make known which default values were changed as well as provide a justification for the values selected.[6]

When reviewing the GHG Analysis' construction and operational CalEEMod output files, we found that several of the values inputted into the model are not consistent with each other and with information disclosed in the CEQA Analysis. As a result, GHG emissions associated with the construction and operation of the Project are greatly underestimated. Indeed, when the model values are corrected, the model shows that the Project will have a significant GHG impact. Therefore, the determination that the Project's GHG emissions comply with the criteria under Scenario A of SCA 38 and will not require a GHG reduction plan are not substantiated. An updated analysis should be prepared to adequately evaluate the Project's GHG impact, and additional mitigation measures should be implemented, if necessary.

Omission of Material Export During Excavation

The Project's GHG Analysis failed to include the anticipated amount of material that will be exported off site during the "Excavation" construction phase within the CalEEMod model, and as a result, the Project's construction emissions are underestimated.

The CEQA Analysis states that "Construction would include excavation and off-haul of up to 42,000 cubic yards of excavated material and approximately 42,000 cubic yards of demolition material would be disposed of off-site" (p. 21). The material generated during the "Demolition" phase will come from the demolition of the existing paved features on the Project site and the material generated during the "Excavation" phase will come from the excavation of the top soil on the Project site to a depth of between 25 and 27 feet below grade (CEQA Analysis, p. 10). These proposed material export activities will produce substantial pollutant and GHG emissions, and as a result, these activities should have been included in the Project's CalEEMod model.

Upon review of the CalEEMod output files, however, it is clear that the approximately 42,000 cubic yards of material export during the "Excavation" construction phase was completely omitted from the model. This presents a significant issue, as the inclusion of the amount of material export within the model is necessary to calculate emissions produced from material movement, including truck loading and unloading, and additional hauling truck trips.[7] As a result, GHG emissions generated during Project construction are underestimated.

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[5] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/

[6] CalEEMod User Guide, pp. 7, 13, *available at:* http://www.caleemod.com/ (A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.)

[7] CalEEMod User's Guide, *available at:* http://www.caleemod.com/, p. 3, 26.

Inconsistent Energy Use Input Values

The Energy Use values inputted into the construction CalEEMod model are inconsistent with the Energy Use values inputted into the operational CalEEMod model. As a result, the Project's pollution models are inaccurate and should not be relied upon to determine Project significance.

As previously stated, CalEEMod is an inclusive model that allows the user to model both construction and operational emissions for a proposed Project within the same model. As such, most CEQA evaluations estimate the Project's construction and operational emissions in one model. Contrary to this common practice, the CEQA Analysis prepares two separate CalEEMod models – one for construction and one for Project operation. Usually, when a user models construction and operational emissions separately, the input values for the scenario not being modeled during that run are set to zero to avoid any confusion. For example, if a user is estimating just the construction emissions of a proposed project, they would set each of the operational input values to zero, such as Energy and Natural Gas use. Review of the Project's CalEEMod output files, however, demonstrates that the CEQA Analysis failed to set the operational input values to zero for the construction run, and failed to set the construction input values to zero for the operational run. Not only did they fail to zero-out the appropriate inputs, they actually applied site specific operational information to the construction model, but then failed to apply this same site specific operational information to the operational model. This discrepancy between the operational input values present a significant issue, as site-specific operational information for the operational model should have been utilized. By relying on the CalEEMod default values, rather than the site specific information, the Project's operational model is inaccurate and should not be used to determine Project significance.

Specifically, the CEQA Analysis inputs site specific Energy Use and Natural Gas values into the construction model, but then relies on CalEEMod default Energy Use and Natural Gas values for the operational model. As you can see in the excerpt below, every default Energy Use Value and default Natural Gas value within the construction model was adjusted to reflect Project-specific usage (default values in left column, site-specific values in right-most column) (CEQA Analysis, pp. 154).

tblEnergyUse	LightingElect	741.44	1,230.49
tblEnergyUse	LightingElect	5.51	1,186.48
tblEnergyUse	NT24E	2,561.86	4,251.64
tblEnergyUse	NT24E	3.36	723.51
tblEnergyUse	NT24NG	1,662.00	619.47
tblEnergyUse	NT24NG	0.70	218.75
tblEnergyUse	T24E	312.05	517.88
tblEnergyUse	T24E	2.74	590.01
tblEnergyUse	T24NG	7,191.67	2,680.53
tblEnergyUse	T24NG	4.10	1,281.25

The User Entered Comments provides insight on how these Project-specific values were derived, stating that they "Used an Excel spreadsheet to break down the applicant provided Energy and NG info" (CEQA Analysis, pp. 154). These Energy Use values, while adjusted in the construction model, reflect the Energy Use that will occur during Project operation. Therefore, the Project-specific Energy Use and Natural Gas

values inputted into the construction model should have also been used within the Project's operational model. When we reviewed the operational model, however, we found that default Energy Use and Natural Gas values provided by CalEEMod were used, rather than the Project-specific values disclosed in the construction model (see excerpt below) (CEQA Analysis, pp. 179).

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	224,000.00	179,545.00
tblLandUse	LotAcreage	2.08	0.00
tblLandUse	LotAcreage	5.89	1.10
tblLandUse	Population	641.00	419.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblTripsAndVMT	HaulingTripNumber	213.00	5,250.00
tblVehicleTrips	ST_TR	7.16	3.77
tblVehicleTrips	ST_TR	49.97	24.26
tblVehicleTrips	SU_TR	6.07	3.77
tblVehicleTrips	SU_TR	25.24	24.26
tblVehicleTrips	WD_TR	6.59	3.77
tblVehicleTrips	WD_TR	42.94	24.26

CalEEMod provides recommended default values based on site specific information; however, if more specific project information is known, the user should change the default values and input project-specific values in an effort to accurately estimate emissions.[8] The User Entered Comments provided in the construction model clearly indicate that the non-default Energy Use values are specific to the Project's operational energy and natural gas consumption. Furthermore, the Project-specific Energy Use and Natural Gas values used within the construction model are much higher than the CalEEMod default values used within the operational model. By failing to include these Project-specific Energy Use and Natural Gas values within the operational model, the Project's operational emissions are greatly underestimated.

Updated Analysis Indicates Significant Greenhouse Gas Emissions

In an effort to more accurately estimate the Project's emissions, we prepared an updated air model using CalEEMod. The results of our analysis demonstrate that when correct input parameters are used, GHG emissions will exceed both of the numerical thresholds provided under Scenario A, Criterion C.[9] As such, a GHG reduction plan must be prepared under SCA 38.

We inputted 229 parking spaces and 225 dwelling units into our updated model, which is consistent with information provided in the CEQA Analysis. Furthermore, since the CEQA Analysis provides the cubic yards of demolition, and the demolition input in CalEEMod can only be inputted as building square footage or tons of debris, we converted the 42,000 cubic yards of demolition material to tons of debris. CalRecycle provides default volume-to-weight conversion factors based on material type. According to CalRecycle's table, "Construction Debris, Asphalt or Concrete: Loose" has a weight of approximately

[8] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/
[9] Refer to page 2 of this report for additional details on these numerical thresholds.

2,400 pounds per cubic yard.[10] Using this conversion factor, removal of the existing parking lot would produce approximately 50,400 tons of waste.[11]

Finally, we utilized the Project specific Energy Use and Natural Gas values provided in the construction model to estimate the Project's operational emissions (see table below).

Energy Use		
	Parameter	**Input Value**
Apartments Mid-Rise	Lighting Energy Intensity (KWhr/size/yr)	1,230.49
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	4,251.64
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	619.47
	Title-24 Electricity Energy Intensity (KWhr/size/yr	517.88
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	2,680.53
Strip Mall	Lighting Energy Intensity (KWhr/size/yr)	1,186.48
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	723.51
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	218.75
	Title-24 Electricity Energy Intensity (KWhr/size/yr	590.01
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	1,281.25

When correct input parameters are used within the model, we find that the Project's construction and operational emissions increase significantly when compared to the emissions estimated in the Project's GHG Screening Analysis. Furthermore, we find that the Project's operational GHG emissions exceed both of the numerical thresholds disclosed under Scenario A, Criterion C (1,100 $MTCO_2e/yr$ and the efficiency threshold of 4.6 $MTCO2_2/yr/sp$) (see tables below).

Total Project Emissions		
	Greenhouse Gas Emissions (MT CO2e/Yr)	
Activity	**CEQA Analysis**	**SWAPE Analysis**
Construction[12]	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Significance Threshold	1,100	1,100
Exceeds Threshold?	***Yes***	***Yes***

[10] http://www.calrecycle.ca.gov/swfacilities/cdi/tools/Calculations.htm
[11] [42,000 cubic yards x (2,400 lbs/cubic yard)] / [2000 lbs/ton] = 50,400 tons
[12] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

Total Project Emissions		
	Greenhouse Gas Emissions Per Service Population (MT CO2e/SP/Yr)	
Activity	CEQA Analysis	SWAPE Analysis
Construction[13]	65	68
Operation	1,962	20,942
Total	**2,027**	**21,010**
Service Population[14]	466	466
Emissions Per Service Population	**4.3**	**45.1**
Significance Threshold	4.6	4.6
Exceeds Threshold?	*No*	***Yes***

As you can see in the tables above, our analysis demonstrates that the Project will produce approximately 21,010 MT CO_2e/year and approximately 45.1 MT CO_2e/sp/year when modeled correctly. Because both of the applicable thresholds are exceeded, the proposed Project does not comply with Scenario A, Criterion C (p. 4). As such, under Scenario A, the Project will require the development of a GHG reduction plan as set forth by SCA 38.

By failing to correctly model the Project's GHG emissions, the CEQA Analysis artificially reduced the emissions that will be generated during construction and operation. As such, the significance determination made within the CEQA Analysis is incorrect, as the Project will have a significant GHG impact. A DEIR should be prepared to adequately evaluate the Project's GHG emissions, and a GHG reduction plan should be prepared prior to Project approval.

Air Quality

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The CEQA Analysis fails to evaluate the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter (DPM) emissions released during Project construction. The CEQA Analysis concludes that, "Based on an examination of the analysis, findings, and conclusions of the BVDSP EIR, implementation of the proposed project would not substantially increase the severity of significant impacts identified in the BVDSP EIR, nor would it result in new significant impacts related to air quality that were not identified in the BVDSP EIR" (p. 22). While an operational health risk assessment (HRA) was prepared, the risk from exposure to DPM emissions during construction were not quantified, nor were they compared to applicable numerical thresholds.

Although the CEQA Analysis states that the Project would require implementation of Standard Conditions of Approval (SCAs) and Transportation Demand Management (TDM) to control construction emissions (p. 22), the risk should still be quantified to determine which measures must be applied to

[13] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

[14] Service Population refers to the total number of residents and employees the Project will generate.

reduce DPM emissions and if the measures will reduce emissions to levels that will not cause a significant impact.

Furthermore, failing to quantify the risk associated with Project construction, the CEQA Analysis is inconsistent with guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, which was formally adopted in March of 2015.[15] This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 24 months, from June 2016 to June 2018. OEHHA recommends that all short-term projects lasting longer than two months be evaluated for cancer risks to nearby sensitive receptors.[16] This recommendation reflects the most recent health risk assessment policy, and as such, the health risk for Project construction should be quantified and evaluated against the numerical significance threshold established by the Bay Area Air Quality Management District (BAAQMD). In an effort to demonstrate this, we prepared a simple screening-level health risk assessment. The results of our assessment, as described below, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact.

As of 2011, the EPA recommends AERSCREEN as the leading air dispersion model, due to improvements in simulating local meteorological conditions based on simple input parameters.[17] The model replaced SCREEN3, and AERSCREEN is included in OEHHA[18] and CAPCOA[19] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

We prepared a preliminary health risk screening assessment of the Project's construction emissions using the sum of on-site annual exhaust PM_{10} emissions from our updated CalEEMod model, as it incorporates more accurate, site-specific information.

Our updated model indicates that construction activities will generate approximately 1,531 pounds of DPM over a 729-day construction period. The AERSCREEN model relies on a continuous average

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[15] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[16] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18

[17] "AERSCREEN Released as the EPA Recommended Screening Model," USEPA, April 11, 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf

[18] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[19] "Health Risk Assessments for Proposed Land Use Projects," CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf

emissions rate to simulate maximum downwind concentrations from point, area, and volume emissions sources. To account for the variability in construction equipment usage over the six phases of Project construction, we calculated an average DPM emission rate by the following equation.

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{1{,}530.6\ lbs}{729\ days} \times \frac{453.6\ grams}{lb} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} \approx \mathbf{0.011023}\ {}^{g}/_{s}$$

Construction activity was simulated as a 1.1 acre rectangular area source in AERSCREEN, with dimensions of 150 meters by 30 meters. A release height of three meters was selected to represent the height of exhaust stacks on construction equipment, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generated maximum reasonable estimates of single hour downwind DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant may be estimated by multiplying the single-hour concentration by 10%.[20] The maximum single-hour downwind concentration in the AERSCREEN output was approximately 44.46 $\mu g/m^3$ DPM 25 meters downwind, a distance that is most representative of sensitive receptor locations adjacent to the Project site. The annualized average concentration for the sensitive receptors was estimated to be 4.446 $\mu g/m^3$.

We calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant receptors using applicable HRA methodologies prescribed by OEHHA. OEHHA recommends the use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[21] According to the revised guidance, quantified cancer risk should be multiplied by a factor of ten during the first two years of life (infant), and by a factor of three for the subsequent fourteen years of life (child aged two until sixteen). Furthermore, in accordance with guidance set forth by the BAAQMD, we used 95th percentile breathing rates for infants and children and 80th percentile breathing rates for adults.[22] We used a cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

[20] http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf
[21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf
[22] "Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines," BAAQMD, January 2010, *available at:* http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx, p. 2-3

Parameter	Description	Units	Adult	Child	Infant
C_{air}	Concentration	µg/m³	4.44	4.44	4.44
DBR	Daily breathing rate	L/kg-day	302	581	581
EF	Exposure Frequency	days/year	350	350	350
ED	Exposure Duration	years	2	2	2
AT	Averaging Time	days	25550	25550	25550
	Inhaled Dose	(mg/kg-day)	3.7E-05	7.1E-05	7.1E-05
CPF	Cancer Potency Factor	1/(mg/kg-day)	1.1	1.1	1.1
ASF	Age Sensitivity Factor	-	1	3	10
	Cancer Risk		**4.04E-05**	**2.33E-04**	**7.77E-04**

The excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors located 25 meters away are 40.4, 233, and 777 in one million, respectively. Consistent with OEHHA guidance, exposure was assumed to begin in the infantile stage of life to provide the most conservative estimates of air quality hazards. The adult, child, and infantile exposure for the sensitive receptors all exceed the BAAQMD threshold of 10 in one million. As a result, a refined health risk assessment must be prepared and included in a DEIR to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules.

Sincerely,

M Hagemann

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

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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
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the 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 from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for 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 worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- 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.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's 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.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- 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, Matt 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, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt 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, Matt 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 were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified 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, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He 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, Matt 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 his 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. He prepared geologic reports, conducted public 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.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- 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, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

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

- Advised 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.
- Shaped 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.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned 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.
- Established national protocol for the peer review of scientific documents.

Geology:

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

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized 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, Matt 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:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt 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.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental 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 and Public 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 at schools in Southern California, Los Angeles.

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

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in 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 Water in 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 a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. 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. Invited presentation to the California Assembly Natural Resources Committee.

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

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

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts 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 and State Underground Storage Tank Program managers.

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

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 Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality 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 Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

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

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

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, 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, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in 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 of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

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

JESSIE MARIE JAEGER

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

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES **B.S. CONSERVATION BIOLOGY & ENVIRONMENTAL SCIENCES** *JUNE 2014*

PROJECT EXPERIENCE

SOIL WATER AIR PROTECTION ENTERPRISE ***SANTA MONICA, CA***

AIR QUALITY SPECIALIST

SENIOR ANALYST: CEQA ANALYSIS & MODELING

- Calculated roadway, stationary source, and cumulative impacts for risk and hazard analyses at proposed land use projects.
- Quantified criteria air pollutant and greenhouse gas emissions released during construction and operational activities of proposed land use projects using CalEEMod and EMFAC2011 emission factors.
- Utilized AERSCREEN, a screening dispersion model, to determine the ambient air concentrations at sensitive receptor locations.
- Organized presentations containing figures and tables comparing results of particulate matter analyses to CEQA thresholds.
- Prepared reports that discuss results of the health risk analyses conducted for several land use redevelopment projects.

SENIOR ANALYST: GREENHOUSE GAS MODELING AND DETERMINATION OF SIGNIFICANCE

- Quantified greenhouse gas (GHG) emissions of a "business as usual" scenario for proposed land use projects using CalEEMod.
- Determined compliance of proposed projects with AB 32 GHG reduction targets, with measures described in CARB's Scoping Plan for each land use sector, and with GHG significance thresholds recommended by various Air Quality Management Districts in California.
- Produced tables and figures that compare the results of the GHG analyses to applicable CEQA thresholds and reduction targets.

PROJECT MANAGER: OFF-GASSING OF FORMALDEHYDE FROM FLOORING PRODUCTS

- Determined the appropriate standard test methods to effectively measure formaldehyde emissions from flooring products.
- Compiled and analyzed laboratory testing data. Produced tables, charts, and graphs to exhibit emission levels.
- Compared finalized testing data to Proposition 65 No Significant Risk Level (NSRL) and to CARB's Phase 2 Standard.
- Prepared a final analytical report and organized supporting data for use as Expert testimony in environmental litigation.
- Participated in meetings with clients to discuss project strategy and identify solutions to achieve short and long term goals.

PROJECT ANALYST: EXPOSURE ASSESSMENT OF CONTAMINANTS EMITTED BY INCINERATOR

- Reviewed and organized sampling data, and determined the maximum levels of arsenic, dioxin, and lead in soil samples.
- Determined cumulative and hourly particulate deposition of incinerator and modeled particle dispersion locations using GIS and AERMOD.
- Conducted risk assessment using guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA).
- Utilized LeadSpread8 to evaluate exposure, and the potential adverse health effects from exposure, to lead in the environment.
- Compared final results of assessment to the Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs).

ACCOMPLISHMENTS

- **Recipient**, Bruins Advantage Scholarship, University of California, Los Angeles ***SEPT 2010 – JUNE 2014***
- **Academic Honoree,** Dean's List, University of California, Los Angeles ***SEPT 2013 – JUNE 2014***
- **Academic Wellness Director**, UCLA Undergraduate Students Associated Council ***SEPT 2013 – JUNE 2014***
- **Student Groups Support Committee Member**, UCLA Undergraduate Students Associated Council ***SEPT 2012 – JUNE 2013***

2400 Valdez Street

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	229.00	Space	0.00	91,600.00	0
Apartments Mid Rise	225.00	Dwelling Unit	1.10	181,208.00	644
Strip Mall	23.46	1000sqft	0.00	23,465.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project description.

Construction Phase - Per construction CalEEMod output file.

Off-road Equipment - Per construction CalEEMod output file.

Off-road Equipment - Per construction CalEEMod output file.

Off-road Equipment - Per construction CalEEMod output file.

Off-road Equipment - Per construction CalEEMod output file.

Trips and VMT - Worker trips reflect construction CalEEMod output files. Utilized default vendor and hauling trips.

Demolition - (42,000 cy) x (2,400 lbs/cy) x (1 ton/2,000 lbs)= 50,400 tons (http://www.calrecycle.ca.gov/swfacilities/cdi/tools/Calculations.htm)

Grading - 42,000 cubic yards of excavated material exported (CEQA Analysis, p. 21).

Vehicle Trips - Trip rates reflect operational CalEEMod output file.

Energy Use - Energy use inputs reflect inputs used in construction CalEEMod output files. Construction output files state that these inputs are provided by the applicant.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	479.00
tblConstructionPhase	NumDays	200.00	65.00
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	NumDays	2.00	65.00
tblConstructionPhase	PhaseEndDate	7/30/2018	7/28/2018
tblConstructionPhase	PhaseEndDate	6/15/2018	6/14/2018
tblConstructionPhase	PhaseEndDate	10/26/2018	3/16/2018
tblConstructionPhase	PhaseStartDate	9/28/2016	9/27/2016
tblConstructionPhase	PhaseStartDate	3/17/2018	3/16/2018
tblConstructionPhase	PhaseStartDate	7/29/2018	12/16/2017
tblEnergyUse	LightingElect	741.44	1,230.49
tblEnergyUse	LightingElect	5.51	1,186.48
tblEnergyUse	NT24E	2,561.86	4,251.64

tblEnergyUse	NT24E	3.36	723.51
tblEnergyUse	NT24NG	1,662.00	619.47
tblEnergyUse	NT24NG	0.70	218.75
tblEnergyUse	T24E	312.05	517.88
tblEnergyUse	T24E	2.74	590.01
tblEnergyUse	T24NG	7,191.67	2,680.53
tblEnergyUse	T24NG	4.10	1,281.25
tblGrading	MaterialExported	0.00	42,000.00
tblLandUse	LandUseSquareFeet	225,000.00	181,208.00
tblLandUse	LandUseSquareFeet	23,460.00	23,465.00
tblLandUse	LotAcreage	2.06	0.00
tblLandUse	LotAcreage	5.92	1.10
tblLandUse	LotAcreage	0.54	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblTripsAndVMT	WorkerTripNumber	13.00	70.00
tblTripsAndVMT	WorkerTripNumber	208.00	400.00
tblTripsAndVMT	WorkerTripNumber	13.00	300.00
tblVehicleTrips	ST_TR	7.16	3.77
tblVehicleTrips	ST_TR	42.04	24.26
tblVehicleTrips	SU_TR	6.07	3.77
tblVehicleTrips	SU_TR	20.43	24.26
tblVehicleTrips	WD_TR	6.59	3.77
tblVehicleTrips	WD_TR	44.32	24.26

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					
2016	0.4641	3.5020	3.6304	6.6800e-003	0.7400	0.1777	0.9177	0.1356	0.1710	0.3066	0.0000	574.4424	574.4424	0.0576	0.0000	575.6529
2017	1.0027	5.8620	7.3915	0.0136	0.7475	0.3625	1.1100	0.2447	0.3550	0.5997	0.0000	1,097.6465	1,097.6465	0.1085	0.0000	1,099.9251
2018	0.7855	5.2301	6.3103	0.0130	0.6719	0.2676	0.9395	0.2252	0.2586	0.4838	0.0000	1,048.8827	1,048.8827	0.1076	0.0000	1,051.1416
Total	**2.2522**	**14.5941**	**17.3322**	**0.0333**	**2.1594**	**0.8078**	**2.9671**	**0.6055**	**0.7846**	**1.3901**	**0.0000**	**2,720.9716**	**2,720.9716**	**0.2737**	**0.0000**	**2,726.7196**

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					
2016	0.4641	3.5020	3.6304	6.6800e-003	0.4434	0.1777	0.6211	0.0907	0.1710	0.2617	0.0000	574.4421	574.4421	0.0576	0.0000	575.6526
2017	1.0026	5.8620	7.3915	0.0136	0.6425	0.3625	1.0050	0.1917	0.3550	0.5467	0.0000	1,097.6459	1,097.6459	0.1085	0.0000	1,099.9245
2018	0.7855	5.2301	6.3103	0.0130	0.5669	0.2676	0.8345	0.1722	0.2586	0.4308	0.0000	1,048.8822	1,048.8822	0.1076	0.0000	1,051.1410
Total	**2.2522**	**14.5941**	**17.3322**	**0.0333**	**1.6528**	**0.8078**	**2.4606**	**0.4546**	**0.7846**	**1.2392**	**0.0000**	**2,720.9701**	**2,720.9701**	**0.2737**	**0.0000**	**2,726.7181**

	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	23.46	0.00	17.07	24.92	0.00	10.86	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.5708	0.0224	1.9312	3.0000e-004		0.0456	0.0456		0.0456	0.0456	3.6891	8.6828	12.3719	9.5600e-003	3.1000e-004	12.6678
Energy	0.1938	1.7596	1.4639	0.0106		0.1339	0.1339		0.1339	0.1339	0.0000	19,555.8244	19,555.8244	0.8343	0.2002	19,635.3970
Mobile	0.7627	2.0067	7.8227	0.0160	1.0361	0.0275	1.0636	0.2785	0.0253	0.3038	0.0000	1,178.1409	1,178.1409	0.0424	0.0000	1,179.0322
Waste						0.0000	0.0000		0.0000	0.0000	26.0092	0.0000	26.0092	1.5371	0.0000	58.2884
Water						0.0000	0.0000		0.0000	0.0000	5.2021	36.3060	41.5082	0.5360	0.0130	56.7794
Total	**2.5273**	**3.7887**	**11.2178**	**0.0269**	**1.0361**	**0.2069**	**1.2431**	**0.2785**	**0.2048**	**0.4832**	**34.9004**	**20,778.9542**	**20,813.8546**	**2.9594**	**0.2134**	**20,942.1648**

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	1.5708	0.0224	1.9312	3.0000e-004		0.0456	0.0456		0.0456	0.0456	3.6891	8.6828	12.3719	9.5600e-003	3.1000e-004	12.6678
Energy	0.1938	1.7596	1.4639	0.0106		0.1339	0.1339		0.1339	0.1339	0.0000	19,555.8244	19,555.8244	0.8343	0.2002	19,635.3970
Mobile	0.7627	2.0067	7.8227	0.0160	1.0361	0.0275	1.0636	0.2785	0.0253	0.3038	0.0000	1,178.1409	1,178.1409	0.0424	0.0000	1,179.0322
Waste						0.0000	0.0000		0.0000	0.0000	26.0092	0.0000	26.0092	1.5371	0.0000	58.2884
Water						0.0000	0.0000		0.0000	0.0000	5.2021	36.3060	41.5082	0.5359	0.0129	56.7711
Total	2.5273	3.7887	11.2178	0.0269	1.0361	0.2069	1.2431	0.2785	0.2048	0.4832	34.9004	20,778.9542	20,813.8546	2.9593	0.2134	20,942.1565

	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	0.01	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	Demolition	Demolition	6/15/2016	9/27/2016	5	75	
2	Building Construction	Building Construction	9/27/2016	7/28/2018	5	479	
3	Site Improvements	Site Preparation	12/16/2017	3/16/2018	5	65	
4	Testing/Final Inspection	Building Construction	3/16/2018	6/14/2018	5	65	

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 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	2	8.00	162	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Air Compressors	6	8.00	78	0.48
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Site Improvements	Graders	1	8.00	174	0.41
Site Improvements	Off-Highway Trucks	2	8.00	400	0.38
Site Improvements	Rubber Tired Dozers	1	7.00	255	0.40
Site Improvements	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Testing/Final Inspection	Air Compressors	0		78	0.48
Testing/Final Inspection	Cranes	1	6.00	226	0.29
Testing/Final Inspection	Forklifts	1	6.00	89	0.20
Testing/Final Inspection	Generator Sets	1	8.00	84	0.74
Testing/Final Inspection	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Testing/Final Inspection	Welders	3	8.00	46	0.45

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
Demolition	5	70.00	0.00	4,984.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	400.00	43.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Improvements	5	300.00	0.00	5,250.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Testing/Final Inspection	7	208.00	43.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2016

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					0.5393	0.0000	0.5393	0.0817	0.0000	0.0817	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1126	1.1479	0.8824	1.0800e-003		0.0630	0.0630		0.0590	0.0590	0.0000	100.0039	100.0039	0.0260	0.0000	100.5506
Total	**0.1126**	**1.1479**	**0.8824**	**1.0800e-003**	**0.5393**	**0.0630**	**0.6022**	**0.0817**	**0.0590**	**0.1406**	**0.0000**	**100.0039**	**100.0039**	**0.0260**	**0.0000**	**100.5506**

3.2 Demolition - 2016

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	0.0557	0.7477	0.6111	1.8800e-003	0.0421	9.7900e-003	0.0518	0.0116	9.0000e-003	0.0206	0.0000	171.9638	171.9638	1.2800e-003	0.0000	171.9906
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	0.0100	0.0149	0.1434	2.8000e-004	0.0238	2.0000e-004	0.0240	6.3400e-003	1.9000e-004	6.5200e-003	0.0000	21.6730	21.6730	1.2300e-003	0.0000	21.6987
Total	**0.0657**	**0.7625**	**0.7545**	**2.1600e-003**	**0.0659**	**9.9900e-003**	**0.0759**	**0.0179**	**9.1900e-003**	**0.0271**	**0.0000**	**193.6367**	**193.6367**	**2.5100e-003**	**0.0000**	**193.6894**

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					0.2427	0.0000	0.2427	0.0367	0.0000	0.0367	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1126	1.1479	0.8824	1.0800e-003		0.0630	0.0630		0.0590	0.0590	0.0000	100.0038	100.0038	0.0260	0.0000	100.5505
Total	**0.1126**	**1.1479**	**0.8824**	**1.0800e-003**	**0.2427**	**0.0630**	**0.3056**	**0.0367**	**0.0590**	**0.0957**	**0.0000**	**100.0038**	**100.0038**	**0.0260**	**0.0000**	**100.5505**

3.2 Demolition - 2016

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	0.0557	0.7477	0.6111	1.8800e-003	0.0421	9.7900e-003	0.0518	0.0116	9.0000e-003	0.0206	0.0000	171.9638	171.9638	1.2800e-003	0.0000	171.9906
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	0.0100	0.0149	0.1434	2.8000e-004	0.0238	2.0000e-004	0.0240	6.3400e-003	1.9000e-004	6.5200e-003	0.0000	21.6730	21.6730	1.2300e-003	0.0000	21.6987
Total	**0.0657**	**0.7625**	**0.7545**	**2.1600e-003**	**0.0659**	**9.9900e-003**	**0.0759**	**0.0179**	**9.1900e-003**	**0.0271**	**0.0000**	**193.6367**	**193.6367**	**2.5100e-003**	**0.0000**	**193.6894**

3.3 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2153	1.3636	1.0274	1.5800e-003		0.1014	0.1014		0.0997	0.0997	0.0000	134.5348	134.5348	0.0224	0.0000	135.0050
Total	**0.2153**	**1.3636**	**1.0274**	**1.5800e-003**		**0.1014**	**0.1014**		**0.0997**	**0.0997**	**0.0000**	**134.5348**	**134.5348**	**0.0224**	**0.0000**	**135.0050**

3.3 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0178	0.1500	0.2124	3.6000e-004	9.5900e-003	2.2600e-003	0.0119	2.7600e-003	2.0800e-003	4.8300e-003	0.0000	32.3292	32.3292	2.6000e-004	0.0000	32.3347
Worker	0.0528	0.0781	0.7538	1.5000e-003	0.1253	1.0700e-003	0.1263	0.0333	9.8000e-004	0.0343	0.0000	113.9378	113.9378	6.4500e-003	0.0000	114.0732
Total	**0.0706**	**0.2281**	**0.9662**	**1.8600e-003**	**0.1349**	**3.3300e-003**	**0.1382**	**0.0361**	**3.0600e-003**	**0.0391**	**0.0000**	**146.2670**	**146.2670**	**6.7100e-003**	**0.0000**	**146.4079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2153	1.3636	1.0274	1.5800e-003		0.1014	0.1014		0.0997	0.0997	0.0000	134.5346	134.5346	0.0224	0.0000	135.0048
Total	**0.2153**	**1.3636**	**1.0274**	**1.5800e-003**		**0.1014**	**0.1014**		**0.0997**	**0.0997**	**0.0000**	**134.5346**	**134.5346**	**0.0224**	**0.0000**	**135.0048**

3.3 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0178	0.1500	0.2124	3.6000e-004	9.5900e-003	2.2600e-003	0.0119	2.7600e-003	2.0800e-003	4.8300e-003	0.0000	32.3292	32.3292	2.6000e-004	0.0000	32.3347
Worker	0.0528	0.0781	0.7538	1.5000e-003	0.1253	1.0700e-003	0.1263	0.0333	9.8000e-004	0.0343	0.0000	113.9378	113.9378	6.4500e-003	0.0000	114.0732
Total	**0.0706**	**0.2281**	**0.9662**	**1.8600e-003**	**0.1349**	**3.3300e-003**	**0.1382**	**0.0361**	**3.0600e-003**	**0.0391**	**0.0000**	**146.2670**	**146.2670**	**6.7100e-003**	**0.0000**	**146.4079**

3.3 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7297	4.7566	3.8032	5.9400e-003		0.3396	0.3396		0.3340	0.3340	0.0000	505.4499	505.4499	0.0784	0.0000	507.0958
Total	**0.7297**	**4.7566**	**3.8032**	**5.9400e-003**		**0.3396**	**0.3396**		**0.3340**	**0.3340**	**0.0000**	**505.4499**	**505.4499**	**0.0784**	**0.0000**	**507.0958**

3.3 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0628	0.5064	0.7681	1.3400e-003	0.0361	7.3600e-003	0.0435	0.0104	6.7700e-003	0.0172	0.0000	119.7736	119.7736	9.3000e-004	0.0000	119.7932
Worker	0.1761	0.2633	2.5247	5.6300e-003	0.4720	3.8400e-003	0.4758	0.1256	3.5400e-003	0.1291	0.0000	412.9773	412.9773	0.0222	0.0000	413.4432
Total	**0.2390**	**0.7697**	**3.2927**	**6.9700e-003**	**0.5081**	**0.0112**	**0.5193**	**0.1359**	**0.0103**	**0.1462**	**0.0000**	**532.7509**	**532.7509**	**0.0231**	**0.0000**	**533.2364**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.7297	4.7566	3.8032	5.9400e-003		0.3396	0.3396		0.3340	0.3340	0.0000	505.4493	505.4493	0.0784	0.0000	507.0952
Total	**0.7297**	**4.7566**	**3.8032**	**5.9400e-003**		**0.3396**	**0.3396**		**0.3340**	**0.3340**	**0.0000**	**505.4493**	**505.4493**	**0.0784**	**0.0000**	**507.0952**

3.3 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0628	0.5064	0.7681	1.3400e-003	0.0361	7.3600e-003	0.0435	0.0104	6.7700e-003	0.0172	0.0000	119.7736	119.7736	9.3000e-004	0.0000	119.7932
Worker	0.1761	0.2633	2.5247	5.6300e-003	0.4720	3.8400e-003	0.4758	0.1256	3.5400e-003	0.1291	0.0000	412.9773	412.9773	0.0222	0.0000	413.4432
Total	**0.2390**	**0.7697**	**3.2927**	**6.9700e-003**	**0.5081**	**0.0112**	**0.5193**	**0.1359**	**0.0103**	**0.1462**	**0.0000**	**532.7509**	**532.7509**	**0.0231**	**0.0000**	**533.2364**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3729	2.5022	2.1502	3.4300e-003		0.1693	0.1693		0.1666	0.1666	0.0000	290.7302	290.7302	0.0422	0.0000	291.6158
Total	**0.3729**	**2.5022**	**2.1502**	**3.4300e-003**		**0.1693**	**0.1693**		**0.1666**	**0.1666**	**0.0000**	**290.7302**	**290.7302**	**0.0422**	**0.0000**	**291.6158**

3.3 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0341	0.2647	0.4243	7.7000e-004	0.0209	3.9400e-003	0.0248	5.9900e-003	3.6200e-003	9.6100e-003	0.0000	67.9097	67.9097	5.3000e-004	0.0000	67.9208
Worker	0.0902	0.1366	1.2990	3.2500e-003	0.2723	2.1300e-003	0.2744	0.0724	1.9700e-003	0.0744	0.0000	229.4075	229.4075	0.0118	0.0000	229.6543
Total	**0.1243**	**0.4013**	**1.7233**	**4.0200e-003**	**0.2932**	**6.0700e-003**	**0.2992**	**0.0784**	**5.5900e-003**	**0.0840**	**0.0000**	**297.3171**	**297.3171**	**0.0123**	**0.0000**	**297.5750**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3729	2.5022	2.1502	3.4300e-003		0.1693	0.1693		0.1666	0.1666	0.0000	290.7298	290.7298	0.0422	0.0000	291.6155
Total	**0.3729**	**2.5022**	**2.1502**	**3.4300e-003**		**0.1693**	**0.1693**		**0.1666**	**0.1666**	**0.0000**	**290.7298**	**290.7298**	**0.0422**	**0.0000**	**291.6155**

3.3 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0341	0.2647	0.4243	7.7000e-004	0.0209	3.9400e-003	0.0248	5.9900e-003	3.6200e-003	9.6100e-003	0.0000	67.9097	67.9097	5.3000e-004	0.0000	67.9208
Worker	0.0902	0.1366	1.2990	3.2500e-003	0.2723	2.1300e-003	0.2744	0.0724	1.9700e-003	0.0744	0.0000	229.4075	229.4075	0.0118	0.0000	229.6543
Total	**0.1243**	**0.4013**	**1.7233**	**4.0200e-003**	**0.2932**	**6.0700e-003**	**0.2992**	**0.0784**	**5.5900e-003**	**0.0840**	**0.0000**	**297.3171**	**297.3171**	**0.0123**	**0.0000**	**297.5750**

3.4 Site Improvements - 2017

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					0.1909	0.0000	0.1909	0.0964	0.0000	0.0964	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0203	0.2195	0.1265	2.2000e-004		0.0102	0.0102		9.3700e-003	9.3700e-003	0.0000	20.1424	20.1424	6.1700e-003	0.0000	20.2721
Total	**0.0203**	**0.2195**	**0.1265**	**2.2000e-004**	**0.1909**	**0.0102**	**0.2010**	**0.0964**	**9.3700e-003**	**0.1057**	**0.0000**	**20.1424**	**20.1424**	**6.1700e-003**	**0.0000**	**20.2721**

3.4 Site Improvements - 2017

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	8.6300e-003	0.1086	0.0962	3.0000e-004	0.0349	1.4000e-003	0.0363	8.7700e-003	1.2900e-003	0.0101	0.0000	27.3905	27.3905	2.0000e-004	0.0000	27.3946
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	5.0800e-003	7.6000e-003	0.0728	1.6000e-004	0.0136	1.1000e-004	0.0137	3.6200e-003	1.0000e-004	3.7200e-003	0.0000	11.9128	11.9128	6.4000e-004	0.0000	11.9263
Total	**0.0137**	**0.1162**	**0.1690**	**4.6000e-004**	**0.0485**	**1.5100e-003**	**0.0500**	**0.0124**	**1.3900e-003**	**0.0138**	**0.0000**	**39.3033**	**39.3033**	**8.4000e-004**	**0.0000**	**39.3209**

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					0.0859	0.0000	0.0859	0.0434	0.0000	0.0434	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0203	0.2195	0.1265	2.2000e-004		0.0102	0.0102		9.3700e-003	9.3700e-003	0.0000	20.1424	20.1424	6.1700e-003	0.0000	20.2720
Total	**0.0203**	**0.2195**	**0.1265**	**2.2000e-004**	**0.0859**	**0.0102**	**0.0961**	**0.0434**	**9.3700e-003**	**0.0527**	**0.0000**	**20.1424**	**20.1424**	**6.1700e-003**	**0.0000**	**20.2720**

3.4 Site Improvements - 2017

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	8.6300e-003	0.1086	0.0962	3.0000e-004	0.0349	1.4000e-003	0.0363	8.7700e-003	1.2900e-003	0.0101	0.0000	27.3905	27.3905	2.0000e-004	0.0000	27.3946
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	5.0800e-003	7.6000e-003	0.0728	1.6000e-004	0.0136	1.1000e-004	0.0137	3.6200e-003	1.0000e-004	3.7200e-003	0.0000	11.9128	11.9128	6.4000e-004	0.0000	11.9263
Total	**0.0137**	**0.1162**	**0.1690**	**4.6000e-004**	**0.0485**	**1.5100e-003**	**0.0500**	**0.0124**	**1.3900e-003**	**0.0138**	**0.0000**	**39.3033**	**39.3033**	**8.4000e-004**	**0.0000**	**39.3209**

3.4 Site Improvements - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1909	0.0000	0.1909	0.0964	0.0000	0.0964	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0984	1.0379	0.6382	1.1900e-003		0.0476	0.0476		0.0438	0.0438	0.0000	108.9906	108.9906	0.0339	0.0000	109.7031
Total	**0.0984**	**1.0379**	**0.6382**	**1.1900e-003**	**0.1909**	**0.0476**	**0.2385**	**0.0964**	**0.0438**	**0.1401**	**0.0000**	**108.9906**	**108.9906**	**0.0339**	**0.0000**	**109.7031**

3.4 Site Improvements - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0460	0.5428	0.5151	1.6700e-003	0.0426	7.6100e-003	0.0502	0.0116	7.0000e-003	0.0186	0.0000	148.0388	148.0388	1.1000e-003	0.0000	148.0619
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	0.0248	0.0376	0.3572	8.9000e-004	0.0749	5.9000e-004	0.0755	0.0199	5.4000e-004	0.0205	0.0000	63.0871	63.0871	3.2300e-003	0.0000	63.1549
Total	**0.0708**	**0.5804**	**0.8723**	**2.5600e-003**	**0.1175**	**8.2000e-003**	**0.1257**	**0.0315**	**7.5400e-003**	**0.0390**	**0.0000**	**211.1258**	**211.1258**	**4.3300e-003**	**0.0000**	**211.2169**

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					0.0859	0.0000	0.0859	0.0434	0.0000	0.0434	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0984	1.0379	0.6382	1.1900e-003		0.0476	0.0476		0.0438	0.0438	0.0000	108.9905	108.9905	0.0339	0.0000	109.7030
Total	**0.0984**	**1.0379**	**0.6382**	**1.1900e-003**	**0.0859**	**0.0476**	**0.1335**	**0.0434**	**0.0438**	**0.0872**	**0.0000**	**108.9905**	**108.9905**	**0.0339**	**0.0000**	**109.7030**

3.4 Site Improvements - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0460	0.5428	0.5151	1.6700e-003	0.0426	7.6100e-003	0.0502	0.0116	7.0000e-003	0.0186	0.0000	148.0388	148.0388	1.1000e-003	0.0000	148.0619
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	0.0248	0.0376	0.3572	8.9000e-004	0.0749	5.9000e-004	0.0755	0.0199	5.4000e-004	0.0205	0.0000	63.0871	63.0871	3.2300e-003	0.0000	63.1549
Total	**0.0708**	**0.5804**	**0.8723**	**2.5600e-003**	**0.1175**	**8.2000e-003**	**0.1257**	**0.0315**	**7.5400e-003**	**0.0390**	**0.0000**	**211.1258**	**211.1258**	**4.3300e-003**	**0.0000**	**211.2169**

3.5 Testing/Final Inspection - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0839	0.5628	0.4497	7.1000e-004		0.0342	0.0342		0.0331	0.0331	0.0000	59.5984	59.5984	0.0120	0.0000	59.8497
Total	**0.0839**	**0.5628**	**0.4497**	**7.1000e-004**		**0.0342**	**0.0342**		**0.0331**	**0.0331**	**0.0000**	**59.5984**	**59.5984**	**0.0120**	**0.0000**	**59.8497**

3.5 Testing/Final Inspection - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0148	0.1147	0.1839	3.3000e-004	9.0400e-003	1.7100e-003	0.0107	2.6000e-003	1.5700e-003	4.1600e-003	0.0000	29.4275	29.4275	2.3000e-004	0.0000	29.4323
Worker	0.0203	0.0308	0.2927	7.3000e-004	0.0614	4.8000e-004	0.0618	0.0163	4.4000e-004	0.0168	0.0000	51.6932	51.6932	2.6500e-003	0.0000	51.7488
Total	**0.0351**	**0.1455**	**0.4766**	**1.0600e-003**	**0.0704**	**2.1900e-003**	**0.0726**	**0.0189**	**2.0100e-003**	**0.0209**	**0.0000**	**81.1207**	**81.1207**	**2.8800e-003**	**0.0000**	**81.1811**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0839	0.5628	0.4497	7.1000e-004		0.0342	0.0342		0.0331	0.0331	0.0000	59.5983	59.5983	0.0120	0.0000	59.8496
Total	**0.0839**	**0.5628**	**0.4497**	**7.1000e-004**		**0.0342**	**0.0342**		**0.0331**	**0.0331**	**0.0000**	**59.5983**	**59.5983**	**0.0120**	**0.0000**	**59.8496**

3.5 Testing/Final Inspection - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0148	0.1147	0.1839	3.3000e-004	9.0400e-003	1.7100e-003	0.0107	2.6000e-003	1.5700e-003	4.1600e-003	0.0000	29.4275	29.4275	2.3000e-004	0.0000	29.4323
Worker	0.0203	0.0308	0.2927	7.3000e-004	0.0614	4.8000e-004	0.0618	0.0163	4.4000e-004	0.0168	0.0000	51.6932	51.6932	2.6500e-003	0.0000	51.7488
Total	**0.0351**	**0.1455**	**0.4766**	**1.0600e-003**	**0.0704**	**2.1900e-003**	**0.0726**	**0.0189**	**2.0100e-003**	**0.0209**	**0.0000**	**81.1207**	**81.1207**	**2.8800e-003**	**0.0000**	**81.1811**

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	0.7627	2.0067	7.8227	0.0160	1.0361	0.0275	1.0636	0.2785	0.0253	0.3038	0.0000	1,178.1409	1,178.1409	0.0424	0.0000	1,179.0322
Unmitigated	0.7627	2.0067	7.8227	0.0160	1.0361	0.0275	1.0636	0.2785	0.0253	0.3038	0.0000	1,178.1409	1,178.1409	0.0424	0.0000	1,179.0322

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	848.25	848.25	848.25	1,893,604	1,893,604
Enclosed Parking with Elevator	0.00	0.00	0.00		
Strip Mall	569.14	569.14	569.14	876,494	876,494
Total	1,417.39	1,417.39	1,417.39	2,770,098	2,770,098

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
Apartments Mid Rise	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.542590	0.062129	0.167184	0.110637	0.030730	0.004573	0.019109	0.050292	0.001784	0.003671	0.005678	0.000201	0.001421

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	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
	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	17,637.9291	17,637.9291	0.7975	0.1650	17,705.8297
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	17,637.9291	17,637.9291	0.7975	0.1650	17,705.8297
NaturalGas Mitigated	0.1938	1.7596	1.4639	0.0106		0.1339	0.1339		0.1339	0.1339	0.0000	1,917.8953	1,917.8953	0.0368	0.0352	1,929.5673
NaturalGas Unmitigated	0.1938	1.7596	1.4639	0.0106		0.1339	0.1339		0.1339	0.1339	0.0000	1,917.8953	1,917.8953	0.0368	0.0352	1,929.5673

5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	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
	kBTU/yr	tons/yr										MT/yr					
Strip Mall	3.51975e+007	0.1898	1.7254	1.4493	0.0104		0.1311	0.1311		0.1311	0.1311	0.0000	1,878.2726	1,878.2726	0.0360	0.0344	1,889.7035
Apartments Mid Rise	742500	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7700e-003	2.7700e-003		2.7700e-003	2.7700e-003	0.0000	39.6226	39.6226	7.6000e-004	7.3000e-004	39.8638
Enclosed Parking with Elevator	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		**0.1938**	**1.7596**	**1.4639**	**0.0106**		**0.1339**	**0.1339**		**0.1339**	**0.1339**	**0.0000**	**1,917.8953**	**1,917.8953**	**0.0368**	**0.0352**	**1,929.5673**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	742500	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7700e-003	2.7700e-003		2.7700e-003	2.7700e-003	0.0000	39.6226	39.6226	7.6000e-004	7.3000e-004	39.8638
Enclosed Parking with Elevator	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
Strip Mall	3.51975e+007	0.1898	1.7254	1.4493	0.0104		0.1311	0.1311		0.1311	0.1311	0.0000	1,878.2726	1,878.2726	0.0360	0.0344	1,889.7035
Total		**0.1938**	**1.7596**	**1.4639**	**0.0106**		**0.1339**	**0.1339**		**0.1339**	**0.1339**	**0.0000**	**1,917.8953**	**1,917.8953**	**0.0368**	**0.0352**	**1,929.5673**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.35e+006	392.7311	0.0178	3.6700e-003	394.2430
Enclosed Parking with Elevator	617384	179.6041	8.1200e-003	1.6800e-003	180.2955
Strip Mall	5.86625e+007	17,065.5939	0.7717	0.1597	17,131.2912
Total		**17,637.9291**	**0.7975**	**0.1650**	**17,705.8297**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.35e +006	392.7311	0.0178	3.6700e-003	394.2430
Enclosed Parking with Elevator	617384	179.6041	8.1200e-003	1.6800e-003	180.2955
Strip Mall	5.86625e +007	17,065.5939	0.7717	0.1597	17,131.2912
Total		**17,637.9291**	**0.7975**	**0.1650**	**17,705.8297**

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	1.5708	0.0224	1.9312	3.0000e-004		0.0456	0.0456		0.0456	0.0456	3.6891	8.6828	12.3719	9.5600e-003	3.1000e-004	12.6678
Unmitigated	1.5708	0.0224	1.9312	3.0000e-004		0.0456	0.0456		0.0456	0.0456	3.6891	8.6828	12.3719	9.5600e-003	3.1000e-004	12.6678

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	0.1876					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1571					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1745	2.9700e-003	0.2500	2.2000e-004		0.0364	0.0364		0.0364	0.0364	3.6891	5.9493	9.6384	8.8700e-003	3.1000e-004	9.8778
Landscaping	0.0516	0.0195	1.6813	9.0000e-005		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	2.7335	2.7335	2.6900e-003	0.0000	2.7900
Total	**1.5708**	**0.0224**	**1.9313**	**3.1000e-004**		**0.0456**	**0.0456**		**0.0456**	**0.0456**	**3.6891**	**8.6828**	**12.3719**	**9.5600e-003**	**3.1000e-004**	**12.6678**

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	0.1876					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1571					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1745	2.9700e-003	0.2500	2.2000e-004		0.0364	0.0364		0.0364	0.0364	3.6891	5.9493	9.6384	6.8700e-003	3.1000e-004	9.8778
Landscaping	0.0516	0.0195	1.6813	9.0000e-005		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	2.7335	2.7335	2.6900e-003	0.0000	2.7900
Total	**1.5708**	**0.0224**	**1.9313**	**3.1000e-004**		**0.0456**	**0.0456**		**0.0456**	**0.0456**	**3.6891**	**8.6828**	**12.3719**	**9.5600e-003**	**3.1000e-004**	**12.6678**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	41.5082	0.5359	0.0129	56.7711
Unmitigated	41.5082	0.5360	0.0130	56.7794

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	14.6597 / 9.24196	37.1370	0.4792	0.0116	50.7900
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	1.73774 / 1.06507	4.3712	0.0568	1.3700e-003	5.9895
Total		**41.5082**	**0.5360**	**0.0130**	**56.7794**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	14.6597 / 9.24196	37.1370	0.4791	0.0116	50.7826
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	1.73774 / 1.06507	4.3712	0.0568	1.3700e-003	5.9886
Total		**41.5082**	**0.5359**	**0.0129**	**56.7711**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	26.0092	1.5371	0.0000	58.2884
Unmitigated	26.0092	1.5371	0.0000	58.2884

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	103.5	21.0096	1.2416	0.0000	47.0838
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	24.63	4.9997	0.2955	0.0000	11.2046
Total		**26.0092**	**1.5371**	**0.0000**	**58.2884**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	103.5	21.0096	1.2416	0.0000	47.0838
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	24.63	4.9997	0.2955	0.0000	11.2046
Total		**26.0092**	**1.5371**	**0.0000**	**58.2884**

9.0 Operational Offroad

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

10.0 Vegetation

ATSDR Agency for Toxic Substances & Disease Registry

Toxic Substances Portal - Total Petroleum Hydrocarbons (TPH)

Toxic Substances Portal

- Total Petroleum Hydrocarbons (TPH)
  - ToxFAQs™
  - Public Health Statement
  - Toxicological Profile
- ... More Resources

Environmental Health Substances Map

Select a state:

Alabama Get Map

This map displays locations where *Total Petroleum Hydrocarbons (TPH)* is known to be present.

On This Page

ToxFAQs™ for Total Petroleum Hydrocarbons (TPH)

(*Hidrocarburos Totales de Petróleo (TPH)*)

August 1999

PDF Version, 157 KB

This fact sheet answers the most frequently asked health questions about total petroleum hydrocarbons (TPH). For more information, you may call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

top

Highlights

TPH is a mixture of many different compounds. Everyone is exposed to TPH from many sources, including gasoline pumps, spilled oil on pavement, and chemicals used at home or work. Some TPH compounds can affect your nervous system, causing headaches and dizziness. TPH has been found in at least 23 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

top

What are total petroleum hydrocarbons (TPH)?

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site.

TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components. However, it is likely that samples of TPH will contain only some, or a mixture, of these chemicals.

top

What happens to total petroleum hydrocarbons (TPH) when they enter the environment?

- TPH may enter the environment through accidents, from industrial releases, or as byproducts from commercial or private uses.
- TPH may be released directly into water through spills or leaks.
- Some TPH fractions will float on the water and form surface films.
- Other TPH fractions will sink to the bottom sediments.
- Bacteria and microorganisms in the water may break down some of the TPH fractions.
- Some TPH fractions will move into the soil where they may stay for a long time.

top

How might I be exposed to total petroleum hydrocarbons (TPH)?

- Everyone is exposed to TPH from many sources.
- Breathing air at gasoline stations, using chemicals at home or work, or using certain pesticides.
- Drinking water contaminated with TPH.
- Working in occupations that use petroleum products.
- Living in an area near a spill or leak of petroleum products.
- Touching soil contaminated with TPH.

top

How can total petroleum hydrocarbons (TPH) affect my health?

Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.

top

How likely are total petroleum hydrocarbons (TPH) to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a] pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC.

top

Is there a medical test to show whether I've been exposed to total petroleum hydrocarbons (TPH)?

There is no medical test that shows if you have been exposed to TPH. However, there are methods to determine if you have been exposed to some TPH compounds. Exposure to kerosene can be determined by its smell on the breath or clothing. Benzene can be measured in exhaled air and a breakdown product of benzene can be measured in urine. Other TPH compounds can be measured in blood, urine, breath, and some body tissues.

top

Has the federal government made recommendations to protect human health?

There are no regulations or advisories specific to TPH. The following are recommendations for some of the TPH fractions and compounds:

The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration has set an exposure limit of 500 parts of petroleum distillates per million parts of air (500

top

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Immune system: Body organs and cells that fight disease.

Pesticides: Chemicals used to kill pests.

top

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological Profile for total petroleum hydrocarbons (TPH). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

top

Where can I get more information?

If you have questions or concerns, please contact your community or state health or environmental quality department or:

For more information, contact:
Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences
1600 Clifton Road NE, Mailstop F-57
Atlanta, GA 30329-4027
Phone: 1-800-CDC-INFO · 888-232-6348 (TTY)
Email: Contact CDC-INFO

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

Information line and technical assistance:
Phone: 888-422-8737

To order toxicological profiles, contact:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

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top

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A-Z Index

CalRecycle

Construction/Demolition and Inert Debris Tools and Resources

Calculations

Solid Waste Cleanup Program Weights and Volumes for Project Estimates

Description of Materials	Approximate Pounds/Cubic Yard	Remarks
Burn Dump Debris/Ash	800-1000 1500-1800 2300	Dry Loose Wet for Dust Suppression Wet mixed with soil
Construction Debris, Asphalt or Concrete: Loose	2400	
Construction Debris, Wood ; Uncompacted	400	Increase up to 100% if compacted using heavy equipment
Earth	2100 3000	Loose/Dry. Plus 30% when compacted. Excavated/Wet
Gravel or Crushed Stone Loose/Dry	2600	Increase 20% if wet
Household Trash	800	
Liquid Waste	1600	202 gal./cubic yard ~ 7 Lbs./Gal. E.g. Antifreeze, Waste Oil, Solvent
Metals, Un-compacted	600	e.g. Appliances, Metal Siding
Sand, Loose/Dry	2400	Increase 20% if damp and 30% if wet/compacted
Stone, Graded 8" max. Loose	2700	e.g. Gabion Construction. Increase 10% consolidated in place
Tire Burn Ash	500-800	
Tires, Auto and Pickup	220	Average 10 tires per cubic yard
Tires, OTR	See Remarks	Average 500 pounds per tire
Tires, Truck	480	Average 4 tires per cubic yard
Vehicles, Auto and Pickup	See Remarks	Use 3000 Pounds/Vehicle
Wood Chips, Shredded/Dry Wood Chips/Bark w/30% Soil	300 800	
Yard Waste (Vegetation) Loose	600	

Determination of Weights and Volumes of Onsite Materials

Volume

Pile volume can best be estimated by determining the area of the base and then multiplying by the average height of the pile. In many cases the base of a pile will resemble a rectangle where area is length times width (L x W). In other cases the pile may more closely resemble a triangle or other polygon. Use the appropriate geometry to calculate the base area. For average height, this usually must be estimated since often it is not prudent to climb a pile to get more exact height measurements. The height may be estimated by using a known reference (e.g., fellow inspector) for reference. Cubic yards can be determined by dividing cubic feet by 27. Depending upon the accuracy of the assumed measurements, the estimated volume could be within 10-15 percent of the actual volume.

Weight

The weight (tonnage) of a pile is determined by multiplying the volume by the density. CalRecycle's Solid Waste Cleanup Program has developed approximate pounds per cubic yard (lbs/cu yd) estimates for various materials. The actual density depends on the homogeneous nature (uniformity) of the pile in both void space and material type. Unless the entire pile can be visualized, it will be difficult to determine an accurate tonnage estimate. Please note that density values in the table are general (rough) estimates only and the actual density could be up to (or exceed) a factor of three (either larger or smaller) depending upon the actual density of the material.

Determination of maximum weights and volumes that can be received:

Tons permitted to be received per day x 30 days = Maximum amount on site at any one time

Helpful formulas:

___ feet high X ___ feet wide X ___ feet long = ___ cubic feet/27 cubic feet per cubic yard = ___ cubic yards

___ cubic yards X 27 cubic feet per cubic yard = ___ cubic feet = height X width X length

Example:

The pile is 20 feet high X 40 feet wide X 253.1 feet long. This equates to about 202,479 cubic feet/27 cubic feet per cubic yard = approximately 7500 cubic yards.

___ cubic yards X ___ pounds per cubic yard (waste conversion factor) = ____ pounds/2000 pounds per ton = ____ tons

___ tons X 2000 pounds per ton/pounds per cubic yard = ___ cubic yards X 27 cubic feet per cubic yard = height X width X length

Example:

7500 cubic yards of wood X 400 pounds per yard (unchipped wood debris) = 3,000,000 pounds/2000 pounds per ton = 1500 tons

Last updated: January 23, 2004
Construction, http://www.calrecycle.ca.gov/LEA/Training/
Melissa Hoover-Hartwick: mailto:Melissa.Hoover-Hartwick@calrecycle.ca.gov (916) 341-6813

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

APR 11 2011

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: AERSCREEN Released as the EPA Recommended Screening Model

FROM: Tyler Fox, Leader
Air Quality Modeling Group, C439-01

TO: EPA Regional Modeling Contacts

INTRODUCTION

In August 2010, EPA released a beta version of AERSCREEN with draft user's guide and test cases, taking public comment until September 30, 2010. These comments ranged from "bug" fixes to suggested AERSCREEN enhancements. After incorporating "bug" fixes and user comments, EPA released version 11060 of AERSCREEN on March 11, 2010 with a subsequent update, version 11076, on March 17, 2010. Version 11076 corrected an error found in version 11060. The release package includes AERSCREEN (Fortran source code and executable), a User's Guide, the MAKEMET meteorological data generator, and AERSCREEN test cases. AERSCREEN uses the AERMOD executable, ensuring consistency with the refined model, and also utilizes the BPIPPRM building processor and AERMAP terrain preprocessor as needed to account for building downwash and terrain effects. AERSCREEN can be found on the Support Center for Regulatory Atmospheric Modeling (SCRAM) website:
http://www.epa.gov/ttn/scram/dispersion_screening.htm#aerscreen

RECOMMENDATION OF AERSCREEN AS SCREENING MODEL

The recommended simple terrain screening model in *The Guideline on Air Quality Models* (*Guideline*, published as Appendix W to 40 CFR Part 51) has been SCREEN3. However, AERSCREEN (the single source screening version of AERMOD) is now available as a full release or non-beta version. This memorandum clarifies the replacement of SCREEN3 with AERSCREEN as the recommended screening model.

With respect to AERSCREEN replacing SCREEN3, the preamble of the 2005 rule promulgating AERMOD as the preferred *Guideline* model for a wide range of regulatory applications in all types of terrain states (See 70 FR at 68221):

> "With respect to a screening version of AERMOD, a tool called AERSCREEN is being developed with a beta version expected to be publicly available in Fall 2005. SCREEN3 is the current screening model in the *Guideline,* and since SCREEN3 has been successfully applied for a number of years, we believe that SCREEN3 produces an acceptable degree of conservatism for regulatory applications and may be used until AERSCREEN or a similar technique becomes available and tested for general application."

This language clearly implies that AERSCREEN will become the recommended screening model once it is released. In addition, since AERSCREEN is the screening version of AERMOD, EPA's preferred model for near-field dispersion, it follows that AERSCREEN would become the recommended screening model once available. The SCREEN3 model is essentially a screening version of the ISCST3 model, which was replaced by AERMOD, and is subject to the same limitations as ISCST3.

Similar to SCREEN3, AERSCREEN allows for user entry of emission inputs, source coordinates, building information (for downwash), receptor information, and meteorological information in a quick and easy fashion, either through an input file, or interactive prompts. However, AERSCREEN incorporates several enhancements relative to the SCREEN3 model. For example, AERSCREEN generates application-specific worst-case meteorology, via MAKEMET, that takes full advantage of the boundary layer scaling algorithms implemented in the AERMET meteorological processor using representative minimum and maximum ambient air temperatures, and site-specific surface characteristics (albedo, Bowen ratio, and surface roughness). AERSCREEN incorporates the PRIME downwash algorithms that are part of the AERMOD refined model and utilizes the BPIPPRIM tool to provide a detailed analysis of downwash influences on a direction-specific basis. AERSCREEN also incorporates AERMOD's complex terrain algorithms and utilizes the AERMAP terrain processor to account for the actual terrain in the vicinity of the source on a direction-specific basis.

The question has also arisen about the role of screening modeling and refined dispersion modeling under Appendix W. Section 2.2 of the *Guideline*, explains that:

> "[t]he purpose of such [screening] techniques is to eliminate the need of more detailed modeling for those sources that clearly will not cause or contribute to ambient concentrations in excess of either the National Ambient Air Quality Standards (NAAQS) or the allowable prevention of significant deterioration (PSD) concentration increments. If a screening technique indicates that the concentration contributed by the source exceeds the PSD increment or the increment remaining to just meet the NAAQS, then the second level of more sophisticated models should be applied."

In recent years, the use of screening models has been largely replaced with refined dispersion modeling because of advancements in computing power and the wider availability of

representative meteorological data that are needed to apply refined models. In this context, the primary regulatory purpose for application of a screening model would be to determine whether site-specific meteorological data would be required for a proposed source if no other representative meteorological data are readily available. However, a screening model such as AERSCREEN can also be a useful tool to estimate potential impacts during the design and planning stages of a project.

SUMMARY

In summary,

- AERSCREEN has been released and is available on the SCRAM web site.
- AERSCREEN is based on AERMOD, EPA's preferred near-field dispersion model, and replaces SCREEN3 as the recommended screening model based on the *Guideline on Air Quality Models*.

If there are any questions regarding AERSCREEN, please contact James Thurman of EPA's Air Quality Modeling Group at (919) 541-2703 or thurman.james@epa.gov.

cc: Richard Wayland, C304-02
Scott Mathias, C504-01
Raj Rao, C504-01
Dan deRoeck, C504-03
Elliot Zenick, OGC
Brian Doster, OGC
George Bridgers, C439-01
Roger Brode, C439-01
James Thurman, C439-01
Air Division Directors
Air Program Managers

Toxic Substances Portal - Cobalt

Toxic Substances Portal

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Environmental Health Substances Map

Select a state:
Alabama Get Map

This map displays locations where *Cobalt* is known to be present.

On This Page

ToxFAQs™ for Cobalt

(Cobalto)

April 2004

CAS#: 7440-48-4

PDF Version, 24 KB

This fact sheet answers the most frequently asked health questions about cobalt. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

top

Highlights

The general population is exposed to low levels of cobalt in air, water, and food. Cobalt has both beneficial and harmful effects on health. At low levels, it is part of vitamin B12, which is essential for good health. At high levels, it may harm the lungs and heart. This chemical has been found in at least 426 of the 1,636 National Priorities List sites identified by the Environmental Protection Agency (EPA).

top

What is cobalt?

Cobalt is a naturally occurring element found in rocks, soil, water, plants, and animals. Cobalt is used to produce alloys used in the manufacture of aircraft engines, magnets, grinding and cutting tools, artificial hip and knee joints. Cobalt compounds are also used to color glass, ceramics and paints, and used as a drier for porcelain enamel and paints.

Radioactive cobalt is used for commercial and medical purposes. ^{60}Co (read as cobalt sixty) is used for sterilizing medical equipment and consumer products, radiation therapy for treating cancer patients, manufacturing plastics, and irradiating food. ^{57}Co is used in medical and scientific research. It takes about 5.27 years for half of ^{60}Co to give off its radiation and about 272 days for ^{57}Co; this is called the half-life.

top

What happens to cobalt when it enters the environment?

- Cobalt enters the environment from natural sources and the burning of coal or oil or the production of cobalt alloys.
- In the air, cobalt will be associated with particles that settle to the ground within a few days.
- Cobalt released into water or soil will stick to particles. Some cobalt compounds may dissolve.

- Cobalt cannot be destroyed. It can change form or attach to or separate from particles. Radioactive decay is a way of decreasing the amount of radioactive cobalt in the environment.

top

How might I be exposed to cobalt?

- You can be exposed to low levels of cobalt by breathing air, eating food, or drinking water. Food and drinking water are the largest sources of exposure to cobalt for the general population.
- Working in industries that make or use cutting or grinding tools; mine, smelt, refine, or process cobalt metal or ores; or that produce cobalt alloys or use cobalt.
- The general population is rarely exposed to radioactive cobalt unless a person is undergoing radiation therapy. However, workers at nuclear facilities, irradiation facilities, or nuclear waste storage sites may be exposed to radiation from these sources.

top

How can cobalt affect my health?

Cobalt can benefit or harm human health. Cobalt is beneficial for humans because it is part of vitamin B12.

Exposure to high levels of cobalt can result in lung and heart effects and dermatitis. Liver and kidney effects have also been observed in animals exposed to high levels of cobalt.

Exposure to large amounts of radiation from radioactive cobalt can damage cells in your body from the radiation. You might also experience acute radiation syndrome that includes nausea, vomiting, diarrhea, bleeding, coma, and even death. This would be a rare event.

top

How likely is cobalt to cause cancer?

Nonradioactive cobalt has not been found to cause cancer in humans or animals following exposure in food or water. Cancer has been shown, however, in animals that breathed cobalt or when cobalt was placed directly into the muscle or under the skin. Based on the laboratory animal data, the International Agency for Research on Cancer (IARC) has determined that cobalt and cobalt compounds are possibly carcinogenic to humans.

Exposure to high levels of cobalt radiation can cause changes in the genetic materials within cells and may result in the development of some types of cancer.

top

How can cobalt affect children?

We do not know whether children differ from adults in their susceptibility to cobalt. However, it is likely that health effects in children would be similar those in adults. Studies in animals suggest that children may absorb more cobalt than adults from foods and liquids containing cobalt.

We do not know if exposure to cobalt will result in birth defects or other developmental effects in people. Birth defects have been observed in animals exposed to nonradioactive cobalt. Exposure to cobalt radiation can also result in developmental effects.

top

How can families reduce the risk of exposure to cobalt?

Children should avoid playing in soils near hazardous waste sites where cobalt may be present.

top

Is there a medical test to show whether I've been exposed to cobalt?

Cobalt levels can be tested in the urine and blood within a couple of days of exposure. Your doctor can take samples, but must send them to a laboratory to be tested. The amount of cobalt in your blood or urine can be used to estimate how much cobalt you were exposed to. However, these tests cannot predict whether you will experience any health effects.

Two types of tests are available for radioactive cobalt. One is to see if you have been exposed to a large dose of radiation, and the other is to see if radioactive cobalt is in your body. The first looks for changes in blood cell counts or in your chromosomes that occur at 3 to 5 times the annual occupational dose limit. It cannot tell if the radiation came from cobalt. The second type of test involves examining your blood, feces, saliva, urine, and even your entire body. It is to see if cobalt is being excreted from or remains inside your body. Either the doctor's office collects and sends the samples to a special lab for testing, or you must go to the lab for testing.

top

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.1 milligrams of nonradioactive cobalt per cubic meter of workplace air (0.1 mg/m^3) for an 8-hour workday and 40-hour work week.

The Nuclear Regulatory Commission limits radioactive cobalt in workplace air to $1x10^{-5}$ microcurie per milliliter (µCi/mL) for ^{57}Co and $7x10^{-8}$ µCi/mL for ^{60}Co. EPA has set an average annual drinking water limit of 1000 picocurie per liter (pCi/L) for ^{57}Co or 100 pCi/L for ^{60}Co so the public radiation dose will not exceed 4 millirem.

top

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. Toxicological Profile for cobalt. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

top

Where can I get more information?

If you have questions or concerns, please contact your community or state health or environmental quality department or:

For more information, contact:
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Division of Toxicology and Human Health Sciences
1600 Clifton Road NE, Mailstop F-57
Atlanta, GA 30329-4027
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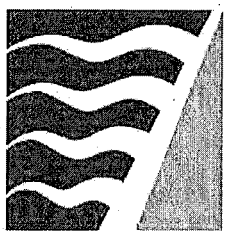

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

BAAQMD

Air Toxics NSR Program

Health Risk Screening Analysis

(HRSA) Guidelines

January 2010

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CA 94109

BAAQMD Air Toxics NSR Program
Health Risk Screening Analysis (HRSA) Guidelines

1. INTRODUCTION

This document describes the Bay Area Air Quality Management District's guidelines for conducting health risk screening analyses. Any health risk screening analysis (HRSA) that is required pursuant to Regulation 2 Permits, Rule 1 General Requirements or Rule 5 New Source Review of Toxic Air Contaminants shall be conducted in accordance with these guidelines.

In accordance with Regulation 2-5-402, these guidelines generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with State risk assessment and risk management policies and guidelines in effect as of June 1, 2009. Through the District's rule development process, these guidelines will periodically be updated to clarify procedures, amend health effects data, or incorporate other revisions to regulatory guidelines.

2. PROCEDURES

The procedures described below constitute the Regulation 2-5-603 Health Risk Screening Analysis Procedures. Any HRSA shall be completed by following the procedures described in the OEHHA Health Risk Assessment Guidelines for the Air Toxics Hot Spots Program that were adopted by OEHHA on October 3, 2003 and any State risk assessment and risk management policies and guidelines in effect as of June 1, 2009.

The OEHHA Health Risk Assessment Guidelines contain several sections which identify (a) the overall methodology, (b) the exposure assessment assumptions and procedures, and (c) the health effects data (cancer potency factors, chronic reference exposure levels, and acute reference exposure levels).

A summary of OEHHA's Health Risk Assessment Guidelines and an index of the relevant documents are located at:

http://www.oehha.ca.gov/air/hot_spots/index.html

OEHHA's risk assessment methodology is located at:

http://www.oehha.ca.gov/air/risk_assess/index.html

The exposure assessment and stochastic technical support document (Part IV of OEHHA's Risk Assessment Guidelines) is located at:

http://www.oehha.ca.gov/air/exposure_assess/index.html

The Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustments to Allow for Early Life Stage Exposures (May 2009) is located at:

http://www.oehha.ca.gov/air/hot_spots/tsd052909.html

The Technical Support Document for the Derivation of Noncancer Reference Exposure Levels is located at:

http://www.oehha.ca.gov/air/hot_spots/rels_dec2008.html

Sections 2.1 through 2.3 below clarify and highlight some of the exposure assessment procedures including exposure assumptions (e.g., breathing rate and exposure duration) and health effect values to be used for conducting HRSAs.

2.1 Clarifications of Exposure Assessment Procedures

This section clarifies and highlights some of the exposure assessment procedures that should be followed when conducting an HRSA. Please note that OEHHA is currently revising the Technical Support Document (TSD) for Exposure Assessment. When the revised TSD for Exposure Assessment is finalized and adopted, the District will revise the HRSA Guidelines accordingly.

2.1.1 Breathing Rate

On October 9, 2003, a statewide interim Risk Management Policy for inhalation-based residential cancer risk was adopted by the California Air Resources Board (ARB) and Cal/EPA's OEHHA (http://www.arb.ca.gov/toxics/rmpolicy.pdf). For the HRSA methodology used in the Air Toxics NSR Program, the District has conformed with these State guidelines and adopted the interim exposure assessment recommendations made by ARB and OEHHA. The interim policy recommends where a single cancer risk value for a residential receptor is needed or prudent for risk management decision-making, the potential cancer risk estimate for the inhalation exposure pathway be based on the breathing rate representing the 80th percentile value of the breathing rate range of values (302 L/kg-day).

To assess potential inhalation exposure to offsite workers, OEHHA recommends assuming a breathing rate of 149 L/kg-day. This value corresponds to a 70 kg worker breathing 1.3 m^3/hour (breathing rate recommended by USEPA as an hourly average for outdoor workers) for an eight-hour day.

For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95% percentile of daily breathing rates for children.

2.1.2 Exposure Time and Frequency

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors assuming exposure occurs 24 hours per day for 350 days per year. For a worker receptor, exposure is assumed to occur 8 hours per day for 245 days per year. However, for some professions (e.g., teachers) a different schedule may be more appropriate. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year.

2.1.3 Exposure Duration

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors based on a 70-year lifetime exposure. Although 9-year and 30-year exposure scenarios may be presented for information purposes, risk management decisions will be made based on 70-year exposure duration for residential receptors. For worker receptors, risk management decisions will be made based on OEHHA's recommended exposure duration of 40 years. Cancer risk estimates for children at school sites will be calculated based on a 9 year exposure duration.

2.2 Health Effects Values

Chemical-specific health effects values have been consolidated and are presented in Table 2-5-1 for use in conducting HRSAs. Toxicity criteria summarized in Table 2-5-1 represent health effects values that were adopted by OEHHA/ARB as of June 1, 2009. Although 8-hour RELs for six chemicals were adopted in December 2008, these 8-hour RELs will not be used in conducting HRSAs until OEHHA finalizes and adopts the revised TSD for Exposure Assessment. Prior to use in Regulation 2, Rule 5, any new or revised health effects values adopted by OEHHA/ARB after June 1, 2009 will be reviewed by the District through a rule development process. The District will evaluate the new criteria for implementation, enforcement, and feasibility of compliance with the project risk limits.

2.3 Cancer Risk Calculations

In accordance with OEHHA's revised health risk assessment guidelines (specifically, OEHHA's Technical Support Document (TSD) for Cancer Potency Factors, adopted June 1, 2009), calculation of cancer risk estimates should incorporate age sensitivity factors (ASFs).

The revised TSD for Cancer Potency Factors provides updated calculation procedures used to consider the increased susceptibility of infants and children to carcinogens, as compared to adults. The updated calculation procedure includes the use of age-specific weighting factors in calculating cancer risks from exposures of infants, children and adolescents, to reflect their anticipated special sensitivity to carcinogens. OEHHA recommends weighting cancer risk by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures that occur from 2 years through 15 years of age. These weighting factors should be applied to all carcinogens. For estimating cancer risk for residential receptors, the incorporation of the ASFs results in a cancer risk adjustment factor of 1.7. For estimating cancer risk for student receptors, a cancer risk adjustment factor of 3 should be applied. For estimating cancer risk for worker receptors, a cancer risk adjustment factor of 1 should be applied.

The cancer risk adjustment factors were developed based on the following:

Receptor	Age Bins	ASF	Duration	Cancer Risk Adjustment Factor
Resident	Third trimester to age 2 years	10	2.25/70	0.32
	Age 2 to age 16 years	3	14/70	0.60
	Age 16 to 70 years	1	54/70	0.77
	Total lifetime			***1.7***
Student	Age 2 to age 16 years	3	9 years	***3***
Worker	Age 16 to 70 years	1	40 years	***1***

Since the exposure duration for a student receptor (9 years), and worker receptor (40 years), falls within a single age bin, the student cancer risk adjustment factor is 3 and the worker cancer risk adjustment factor is 1.

Cancer risk adjustment factors should be used to calculate all cancer risk estimates. Please note that these ASFs represent default values. In cases where there are adequate data for specific carcinogen potency by age, OEHHA will recommend chemical-specific adjustments to cancer risk estimates. In addition, OEHHA is currently revising the TSD for Exposure Assessment. When the revised TSD for Exposure Assessment is finalized and adopted, the District will revise the HRSA Guidelines accordingly.

Below is the equation for calculating cancer risk estimates:

Cancer Risk = Dose * Cancer Risk Adjustment Factor * Cancer Potency Factor

2.4 Stochastic Risk Assessment

For a stochastic, multipathway risk assessment, the potential cancer risk should be reported for the full distribution of exposure from all exposure pathways included in the risk assessment. For risk management decisions, the potential cancer risk from a stochastic, multipathway risk assessment should be based on the 95th percentile cancer risk.

3. Assessment of Acrolein Emissions

Currently, CARB does not have certified emission factors or an analytical test method for acrolein. Therefore, since the appropriate tools needed to implement and enforce acrolein emission limits are not available, the District will not conduct a HRSA for emissions of acrolein. When the necessary tools are developed, the District will re-evaluate this specific evaluation procedure and the HRSA guidelines will be revised.

References

1 *"Air Toxics "Hot Spots" Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, ", OEHHA, August 2003*

2 *"Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part IV. Technical Support Document for Exposure Assessment and Stochastic Analysis", OEHHA, September 2000*

3 *"Air Toxics "Hot Spots" Program Risk Assessment Guideline, Technical Support Document for Cancer Potency Factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life stage exposures", OEHHA, May, 2009.*

4 *"Air Toxics "Hot Spots" Program Risk Assessment Guidelines Technical Support Document for the Determination of Noncancer Reference Exposure Levels", OEHHA, June 2008.*

5 *"Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites: Final Report", Integrated Risk Assessment Section, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, February, 2004.*

6 *"Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values", California Air Resources Board, updated February, 2009.*

Toxic Substances Portal - Lead

Toxic Substances Portal

- Lead
  - ToxFAQs
  - Public Health Statement
  - Toxicological Profile
  - ToxGuide
  - Medical Management Guidelines (MMG) for Acute Chemical Exposure
- ... More Resources

Environmental Health Substances Map

Select a state:

Alabama Get Map

This map displays locations where *Lead* is known to be present.

On This Page

ToxFAQs™ for Lead

Languages other than English

August 2007

CAS# 7439-92-1

PDF Version, 46 KB

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

top

Highlights

Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

top

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

top

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.

- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

top

How might I be exposed to lead?

- Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.
- Using health-care products or folk remedies that contain lead.

top

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. Highlevel exposure in men can damage the organs responsible for sperm production.

top

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

top

How does lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

top

How can families reduce the risk of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

top

Is there a medical test to show whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

top

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3-6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a blood lead level of 10 µg/dL to be a level of concern for children.

EPA limits lead in drinking water to 15 µg per liter.

top

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Lead *(Update)*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

top

Where can I get more information?

If you have questions or concerns, please contact your community or state health or environmental quality department or:

For more information, contact:
Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences
1600 Clifton Road NE, Mailstop F-57
Atlanta, GA 30329-4027
Phone: 1-800-CDC-INFO · 888-232-6348 (TTY)
Email: Contact CDC-INFO

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

Information line and technical assistance:
Phone: 888-422-8737

To order toxicological profiles, contact:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

Disclaimer
Some PDF files may be electronic conversions from paper copy or other electronic ASCII text files. This conversion may have resulted in character translation or format errors. Users are referred to the

original paper copy of the toxicological profile for the official text, figures, and tables. Original paper copies can be obtained via the directions on the toxicological profile home page, which also contains other important information about the profiles.

The information contained here was correct at the time of publication. Please check with the appropriate agency for any changes to the regulations or guidelines cited.

top

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  Atlanta, GA 30341
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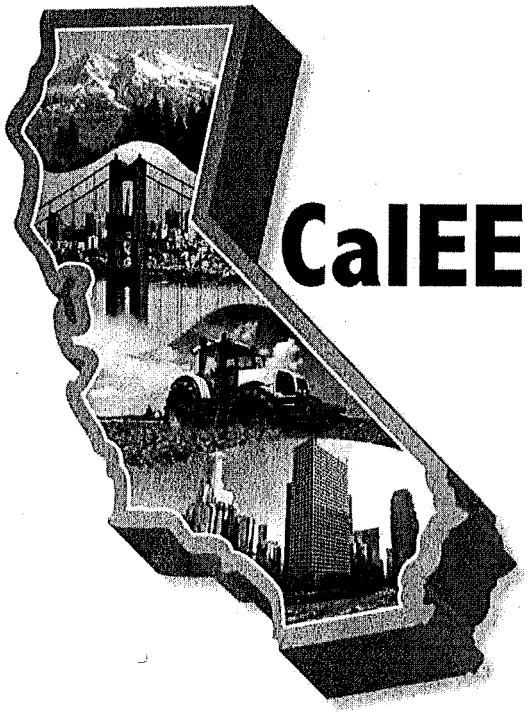
A-Z Index

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I
10. J
11. K
12. L
13. M
14. N
15. O
16. P
17. Q
18. R
19. S
20. T
21. U
22. V
23. W
24. X
25. Y
26. Z
27. #



CalEEMod®

California **E**missions **E**stimator **Mod**el®

User's Guide

Version 2013.2

Prepared for:
California Air Pollution Control Officers Association (CAPCOA)

Prepared by:
ENVIRON International Corporation and the California Air Districts

Date:
July 2013

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Contents

List of Appendices

1 Introduction

This User's Guide (Guide) to the California Emission Estimator Model (CalEEMod)® is meant to give the user an introduction on how to use the program as well as document the detailed calculations and default assumptions made in associated appendices. The purpose of CalEEMod is to provide a uniform platform for government agencies, land use planners, and environmental professionals to estimate potential emissions associated with both construction and operational use of land use projects. It is intended that these emission estimates are suitable for use in California Environmental Quality Act (CEQA) compliant documents for air quality and climate change impacts. In addition individual districts may develop additional uses for the model's emission estimates to show compliance with local agency rules.

CalEEMod utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default estimates use sources such as the United States Environmental Protection Agency (USEPA) AP-42 emission factors, California Air Resources Board (ARB) vehicle emission models, studies commissioned by California agencies such as the California Energy commission (CEC) and CalRecycle. In addition, local air districts were given the opportunity to provide default values and existing regulation methodologies to use in their specific regions. If no information was provided by local air districts, appropriate state-wide values were utilized if regional differences could not otherwise be defined. Since new information and regulations are always changing, local agencies should be consulted to determine any recommended values to use that may differ from the defaults currently used in CalEEMod. User's of CalEEMod should keep in mind the assumptions and limitations of the default data in CalEEMod. A large majority of the default data associated with locations and land use is based on surveys of existing land uses. Caution should be taken if the project deviates significantly from the types and features included in the survey that forms the substantial evidence supporting the default data. In these situations site specific data that is supported by substantial evidence should be used if available.

The model provides a number of opportunities for the user to change the defaults in the model, however, users are recommended to provide justification for changing the defaults (e.g., reference more appropriate data) in the "Remarks" box provided at the bottom of the screen. Further, the user is reminded that CalEEMod is an emissions model and not an enforcement mechanism, thus, the user should ensure correct data is inputted, including the choice and percent reduction of mitigation most applicable to the land use project being evaluated.

1.1 Purpose of Model

CalEEMod provides a simple platform to calculate both construction emissions and operational emissions from a land use project. It calculates both the daily max and annual average for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions which can be used in support of analyses in CEQA documents such as Environmental Impact Reports (EIRs) and Negative Declarations. In addition, default values for water and energy use are quantified which may be useful for other sections in an EIR or represent opportunities to incorporate the

rigorous site-specific information from the other EIR sections. Specifically the model aids the user in the following calculations:

- Short term construction emissions associated with demolition, site preparation, grading, building, coating, and paving from the following sources
  - Off-road construction equipment
  - On-road mobile equipment associated with workers, vendors, and hauling
  - Fugitive dust associated with grading, demolition, truck loading, and roads (Fugitive dust from wind blown sources such as storage piles are not quantified in CalEEMod which is consistent with approaches taken in other comprehensive models.)
  - Volatile emissions of reactive organic gasses (ROG) from architectural coating *(including painting on parking lots)* and paving.
- Operational emissions associated with the fully built out land use development
  - On-road mobile vehicle traffic generated by the land uses
  - Fugitive dust associated with roads
  - Volatile emissions of ROG from architectural coating
  - Emissions from off-road equipment (e.g., forklifts, cranes) used during operation
  - Off-road emissions from landscaping equipment
  - Volatile emissions of ROG from consumer products and cleaning supplies
  - Wood stoves and hearth usage
  - Natural gas usage in the buildings
  - Electricity usage in the buildings (GHG only)
  - Electricity usage from lighting in parking lots and lighting, ventilation and elevators in parking structures
  - Water usage by the land uses (GHG only)
  - Solid waste disposal by the land uses (GHG only)
- One-time vegetation sequestration changes
  - Permanent vegetation land use changes
  - New tree plantings
- Mitigation impacts to both short-term construction and operational emissions
- Several of the mitigation measures described in CAPCOA's Quantifying Greenhouse Gas Mitigation Measures[1] have been incorporated into CalEEMod.

[1] Available at : http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

2 Program Installation

The program is distributed and maintained by the California Air Pollution Control Officers Association[2]. The most recent version can be downloaded from www.caleemod.com.

2.1 Operating System Requirements

CalEEMod was programmed by ENVIRON using Microsoft SQL Compact Edition in conjunction with a Visual Basic Graphical User Interface (GUI). CalEEMod requires the following system requirements:

- Microsoft Windows XP, Vista, or 7 Operating System
- Microsoft .Net Framework 4 or higher
- 90 Mb hard drive space available

2.2 Installation Procedures

To install

1. Be sure to uninstall any previous versions of CalEEMod before installing a new version as some file names will be the same potentially confusing the computer. To uninstall for most computers, under Settings, Control Panel. Programs and Features, highlight CalEEMod .msi and .exe files and then click „uninstall."

2. Ensure you have the required Microsoft .Net framework 4 or higher installed on your machine. If not install this first. It is available free from Microsoft at http://www.microsoft.com/net/download.aspx

3. Download the installation files (setup.exe and CalEEMod_2013.2.msi).

4. Click the setup.exe file that you downloaded. This should walk you through the rest of the installation.

5. The default directory for CalEEMod is C:\CalEEMod\. The user may select alternative locations for installation[3]. The user will also be prompted to select to install CalEEMod for everyone who uses the computer or just the current user.

6. Click "Next" until the installation has completed. Then click close to exit the installer.

7. Click the link below to install SQL Server Compact 3.5 SP2

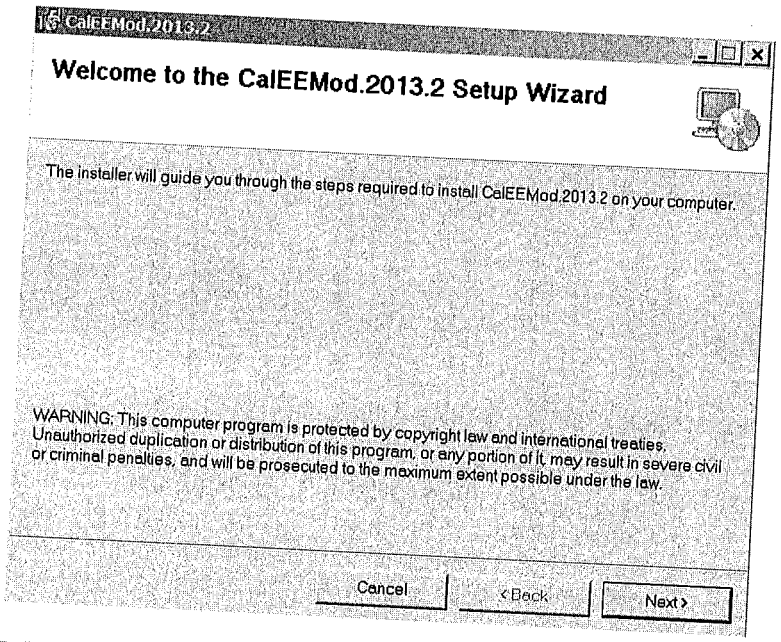
   http://www.microsoft.com/downloads/details.aspx?familyid=E497988A-C93A-404C-B161-3A0B323DCE24&displaylang=en

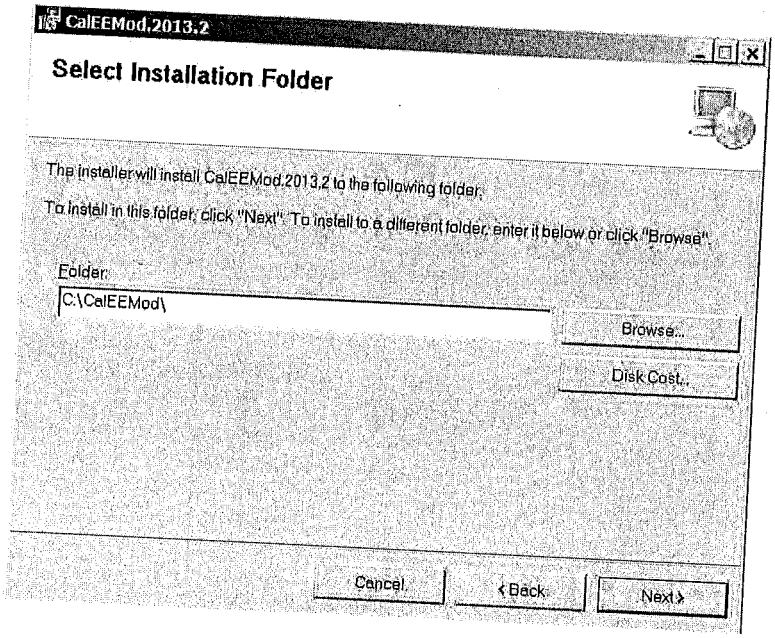
---

3 If you use windows Vista or 7, please be aware of file privileges which may not allow access rights to some folders during program operations such as C:\Program Files\

Once this file is downloaded, unzip the file anywhere on your computer and run the installation file (setup.exe). Be sure to follow the instructions on Microsoft's website and locate the appropriate .msi file. For 32-bit computers, one needs SSCERuntime_x86-ENU.msi and on a 64-bit computer, install both the 32-bit and the 64-bit version of the SQL Server Compact 3.5 SP2 MSI files. Existing SQL Server Compact 3.5 applications may fail if only the 32-bit version of the MSI file is installed on the 64-bit computer.

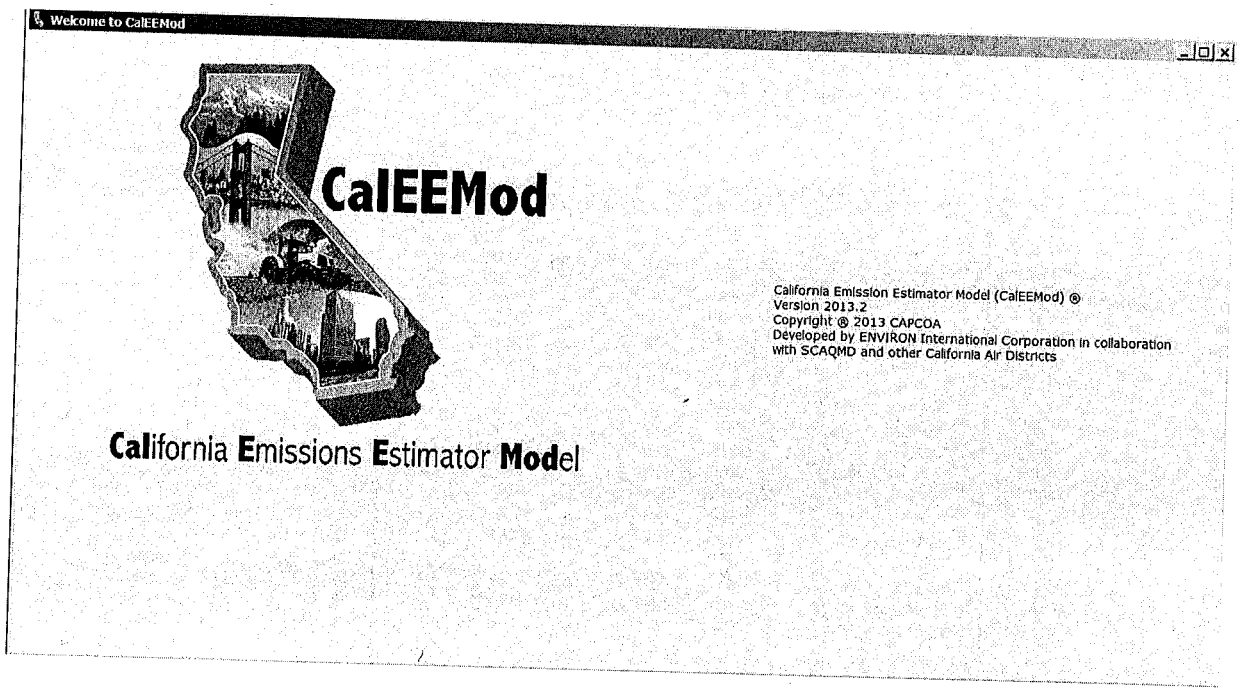
8. If you have any further trouble installing CalEEMod, make sure you have appropriate user privileges and the system requirements.





2.3 Starting CalEEMod

The installation will create a short cut icon on the desktop as well as add CalEEMod to the Programs available from the Start Button. Select CalEEMod from the program files or double click on the CalEEMod short cut. This will open CalEEMod.



3 Using CalEEMod

CalEEMod is designed as a linear series of screens with an individual purpose such as project characteristics, construction schedule and equipment, operational activity, mitigation measures, etc. The user is expected to input basic information about the project such as location, land use type (e.g., residential, commercial, retail, etc.) and its size. The functionality of the model is to populate later screens with pre-determined defaults based on basic project and location information provided by the user. However, if more accurate information is known, the user has the ability to override the defaults provided.

The figure on page 7 identifies some key features of CalEEMod which are described below.

1. Menu Bar: A drop down menu found on all screens. The "Home" menu controls file features such as New Project, Open Project, Save Project, and Save As Project. The "Help" will link to appropriate information for the relevant screen from this User's Guide. All other menus will allow navigation between screens in any order.

2. Screen Name: Identifies the name of the current screen.

3. Default Button: This button allows the restoration of program defaults if the user has changed any values on the screen. User entered values will be highlighted yellow to clearly indicate that they have been changed from the defaults. The user will be prompted if they would like to restore default for the current or last cell or the whole page. "Import CSV" will allow a user to load in a csv file for a specific data grid. "Cancel" cancels the previous action.

4. Remarks: This section at the bottom of each screen allows the user to enter comments regarding any user defined values entered on this screen. This is meant to assist reviewers of the program in determining justification for values selected.

5. Next Button: This button when clicked will take the user to the next sequential step. Later modules will also have a "Previous" button that will take the user back to the previous sequential step.

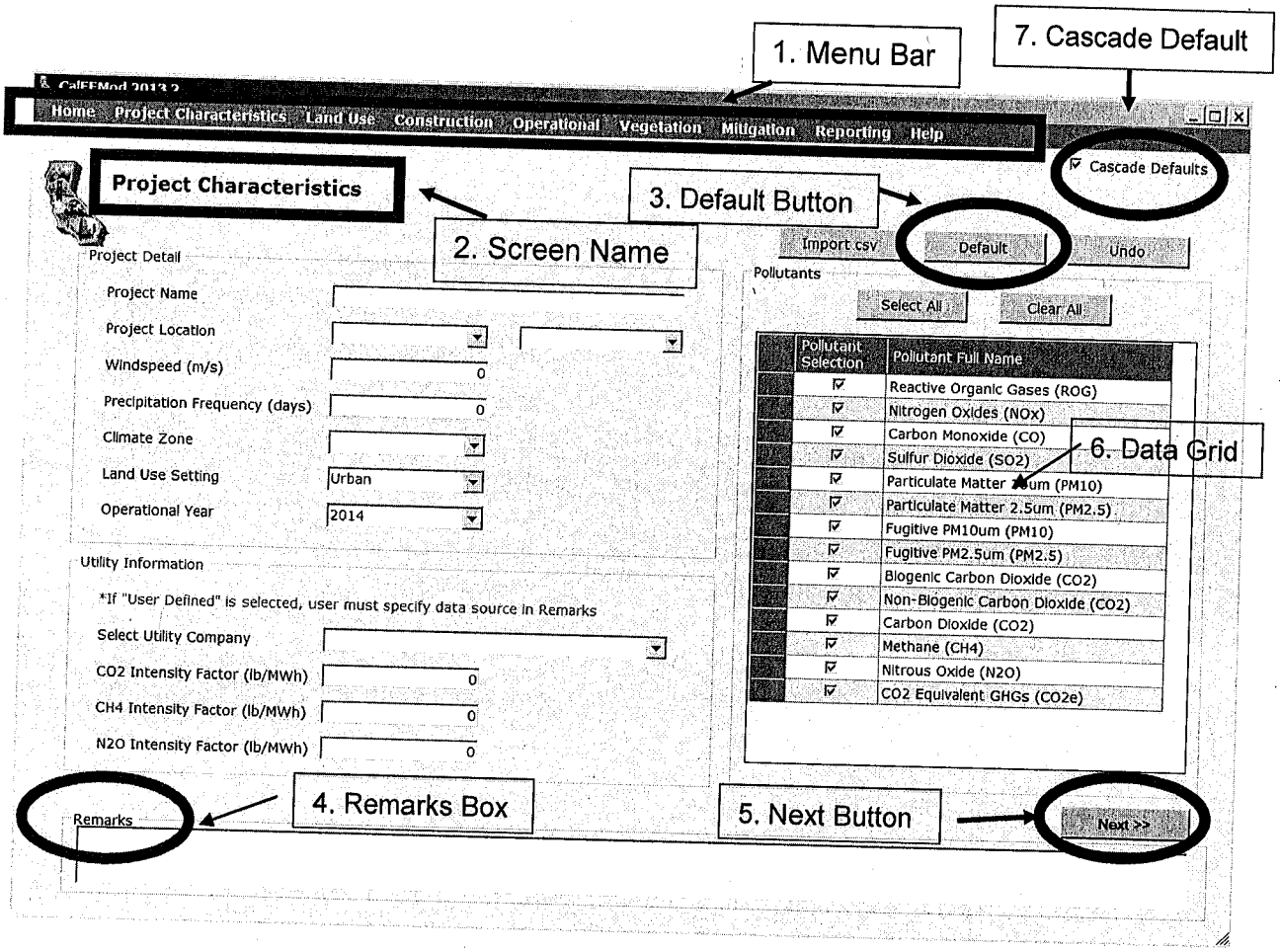
6. Data Grid: This is a common box where values for the variables defined across the top to be filled in. The number of rows will automatically be adjusted based on the number of rows of information required to define the information. The last row is indicated with an asterisk (*) and once information is started to be added to this row a new row will be added at the end. To delete a row select the desired row to delete, and hit the delete button on your keyboard (This is allowed unless the data grid is a fixed list such as the Pollutant selection list.). Scroll bars (both horizontal and vertical) will occur automatically if necessary.

7. Cascade Default: CalEEMod version 2013.2 introduces a new feature freezing the downloading of programmed defaults. Each input screen displays a box called "cascade default" automatically checked to populate defaults in future screens. However, if the "cascade default" box is unchecked, no defaults will be populated in subsequent screens. Unless all the necessary input parameters required for a proper analysis are known, it is recommended the user runs the model at least once with "cascade default" clicked on to allow the defaults to be populated. Then, if the user would like to change project parameters (e.g., number of dwelling units, building square footage, etc) without cascading new defaults in later screens, then uncheck the "cascade default" box when in the land use screen. This feature will prove useful for those users who override the defaults with specific project information (e.g., construction schedule, construction equipment, water use, energy use, etc.) and would like to evaluate different project scenarios with the same basic project information (i.e., land use type, location). If unchecking the "cascade default" box, the user should also be aware of the following:

    - *All* subsequent screens will freeze defaults
    - Changes to screens after land use (e.g., adding a new construction phase) will not cascade defaults relating to that change or add new tabs (e.g., trips and VMT, dust material movement) so any necessary input information will have to be added manual or impact will not be calculated
    - If changing or adding a land use type (e.g., from single family housing to a hospital), the future screens will not reflect the new land use type so some calculations (e.g., impacts from energy and water use) will not be properly performed

If a land use type is changed or added, it is recommended to click on the "cascade default" so the future screens can be populated with appropriate defaults and included in the analysis.

The next sections will give you some quick details on how to get started with a project in CalEEMod. Section 4 gives more specific details about each individual screen the user can encounter in CalEEMod.



3.1 Home

This is the part of the file menu bar that controls the file saving and opening features. The available options are:

- New Project
- Open Project
- Save
- Save As
- Exit

The user should select Open Project if they wish to load in a project that has been previously saved. Note that this will remove any information that has been entered into the GUI unless it has been saved to a file. Save will save the currently loaded project database as a Microsoft Excel file that can be used to open this project again into CalEEMod. Save As will allow the user to change the name of the saved project file. Exit will close CalEEMod. The Microsoft Excel file can be edited following the format of the save file to quickly make edits outside of the Graphical User Interface (GUI). The user will still need to use the GUI for reporting of results. This can be most useful in making changes to construction lists. Individual tabs can be loaded in as a .csv file in various places in CalEEMod to minimize the data entry.

3.2 Defining a Project

In order to define a project, the user will have to enter information on both the Project Characteristics screen and land use screen. After entering information on these two screens, CalEEMod will populate all of the other information required to calculate unmitigated construction (unless there is demolition, grading, or site preparation) and operation emissions using default data. Demolition, grading, and site preparation requires additional information regarding the amount of material to be demolished and material (debris, soil, etc) transported to or from the site that is entered on the appropriate construction screens. If site specific information will not be used, the user can jump to entering mitigation measures followed by reporting. If the user has any site-specific information that will replace the default information, this should be entered on the appropriate screens and provide justification for the change in the "Remarks" section at the bottom of each screen before moving on to mitigation and reporting. This justification for the default override will be printed in the report so the user is encouraged to provide a robust reasoning to allow for seamless review of the analysis.

3.3 Altering Default Data

CalEEMod was designed to allow for ease in changing default assumptions. Site-specific information that is supported with substantial evidence required by CEQA, is preferred when it is available. However, it is often the case that site-specific information is not available. CalEEMod was designed to assume reasonable default assumptions supported by substantial evidence to

the degree available at the time of programming. CalEEMod is based on fully adopted methods and data. Therefore, draft methods and data are not used as defaults.

3.4 Mitigation

Common construction mitigation measures that impact the calculations in CalEEMod have been incorporated as options for the user to select. At this time, required mitigation measures to comply with individual fugitive dust rules have not been incorporated in unmitigated calculations due to different interpretations of CEQA guidance regarding required mitigation.

Several mitigation measures from CAPCOA's Quantifying Greenhouse Mitigation Measures have been incorporated including combinations and caps when using multiple mitigation measures. Some mitigation measures are not as amenable to simple input information or are less common in their use and therefore not included at this time. CalEEMod was designed to include typical mitigation measures that are some of the more effective measures available to development projects. If mitigation measures are not available as options in CalEEMod, the user can likely alter values in the program that will allow for adjustment of hand calculated reductions due to mitigation that may be less common. This will require separate runs of CalEEMod files in order to properly account for unmitigated and mitigated scenarios.

3.5 Reporting

This is the part of the program that allows the user to select predefined reports that will display the emission calculation results. The user will be able to view these on a screen and save as either a Microsoft Excel file or a pdf file.

4 Detailed Program Screens

4.1 Project Characteristics

The project characteristics screen is where the user enters key location, electricity company information and pollutants they want to analyze. The information on this screen needs to be entered before proper default information can be used in subsequent screens. Changes on this screen will result in over riding user defined data with defaults in subsequent screens where this information is used. Under the Project Detail section the user enters the Project Name which will appear in the reports. The user then selects information from drop down boxes or overrides the default values in the text boxes. Each of the information categories on this screen are described in more detail below.

Project Location

The user selects the region in which the project is located. The user first selects if they want to choose an Air District, Air Basin, County, or State-wide. The second drop down box will give the list of specific locations based on the first drop down box which the user selects. For counties

that are divided between air districts, air basins or district requested subregions; the county is followed by the sub-county area which can influence some of the default values selected by modules. Consult your lead agency on their preference for location. This primarily influences on-road vehicle emissions, trip lengths, water supply and treatment electricity use, solid waste disposal rates, amount of paved roads, days of landscaping equipment use, architectural coating emissions, and hearth usage.

Wind Speed and Precipitation Frequency

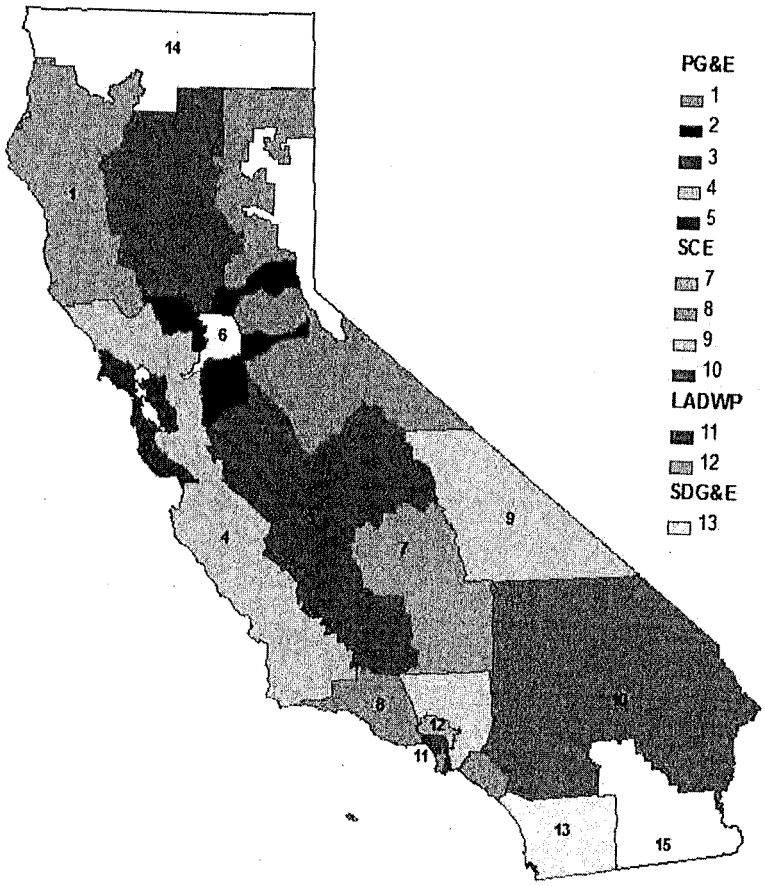
Selection of project location will fill in the default wind speed and precipitation frequency. The user can choose to override this information and type in a different value. The wind speed is in units of meters per second and is used in some fugitive dust calculations. Precipitation frequency is the number of days in a year that has precipitation greater than 0.01 inches in a day and is used in fugitive dust calculations.

Climate Zone

Selection of project location will restrict the climate zones available for the user to choose from based on the climate zones in the project location. The climate zones used are based on CEC forecasting climate zones (different than Title-24 building climate zones) as used in the California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS)[4]. The figure below indicates these climate zones. A spreadsheet is available in Appendix F, which allows the user to look up climate zones based on city or zipcodes if a user needs further assistance in selecting the appropriate climate zone.

4 CalEEMod v. 2013.2 has been updated to incorporate the October 2010 version of RASS.

CEC Forecast Climate Zones[5,6]



Land Use Setting

This is where the user indicates if the project is located in a rural or urban setting. The user should contact their local air districts for guidance on the appropriate land use setting to select as the definition used may differ based on the definitions used to support the urban and rural trip lengths in the relevant air basin.

5 Adapted from Figure ES-2 of CEC. 2010. Residential Appliance Saturation Survey. Available online at: http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF

6 White spaces represent areas served by other electric utilities not included in survey.

Operational Year

The user should indicate the first year the project will be fully operational that they wish to use as a basis for determining emission factors for all operational modules. CalEEMod can handle the following years: 1990, 2000, 2005, 2010-2025, 2030, 2035, and 2040. This was done to limit the file size associated with vehicle emission factors. CalEEMod is currently designed for one year that initiates the beginning of the full operation of the project. However, it is recognized that some projects could be phased so the operation of the project begins over more than one year. In that case, it is recommended the user run the model multiple times for the various input parameters for each operational year.

Utility Information

The user should select the appropriate electricity utility provider from the list or select "user defined". If a specific utility is entered, the default GHG intensity factors will be filled in. The user will need to enter values if "user defined" is selected. These values are used to determine the GHG emissions associated with electricity use in various modules. The default values are based on ARB's Local Government Operations Protocol (LGO)[7](CO_2), updated public utility protocols (CO_2), and E-Grid values (CH_4 and N_2O). The CO_2 intensity factor used as defaults in CalEEMod are based on the latest reporting year available for each of the different utilities. Table 1.2 in Appendix D provides the default CO_2 intensity factor used and reporting year from which the factor was identified for each of the utilities. As with other defaults in the model, if a new value is identified before the defaults are updated, the user has the ability to override the default and provide justification for the change in the "Remarks" section at the bottom of the "Project Characteristics" screen.

Pollutants

The list of pollutants to the right of the screen automatically has all boxes checked. Uncheck any pollutants you don't want reported. Some of the pollutants are a combination of other identified pollutants such as Carbon dioxide (CO_2) is made up of biogenic and non-biogenic carbon dioxide. CO_2 Equivalent GHGs is the Global Warming Potential (GWP) weighted value of all GHGs. GWPs are based on the IPCC's Second Assessment Report[8].

Remarks

The user can enter any remarks to describe the reasonable explanation and justification of non-default values or to add additional detail regarding the basis for information used such as relevant EIR sections. These remarks are included in the report and will assist a reviewer in understanding the reasons for a change in the default value (e.g., new trip rate based on a project specific traffic study conducted by (*reputable traffic engineers*)).

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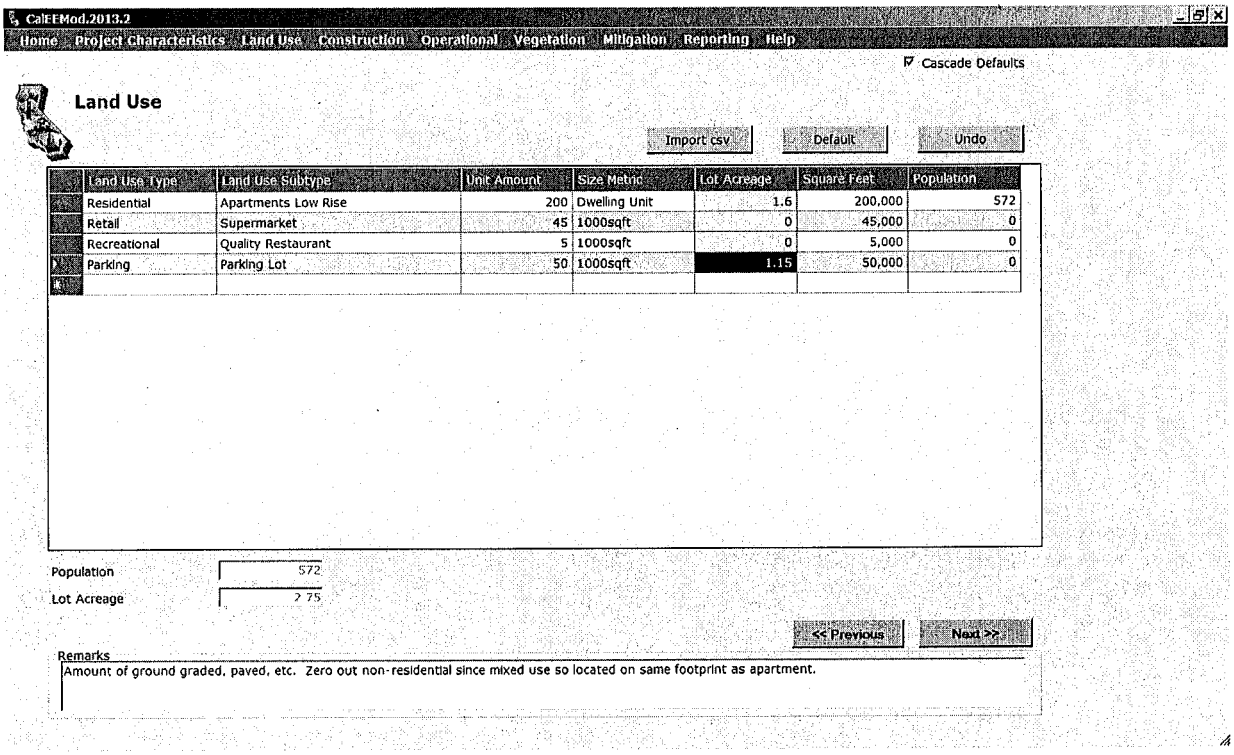
7 Available at: http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

8 Available at: http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf

4.2 Land Use

This screen is used to define the specific land uses that will occur at the project site. The land uses, size features and population are used throughout CalEEMod in determining default variables and calculations.



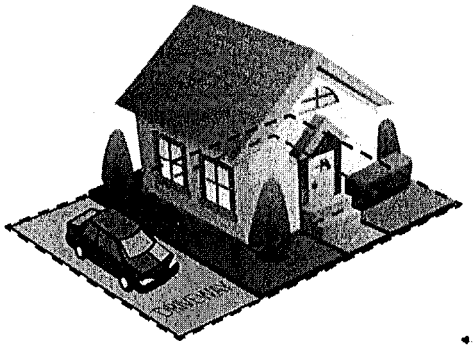
Land Use Type

The user selects from the drop down list of the primary land use types: Commercial, Educational, Industrial, Residential, Retail, Recreational, and ***Parking***. The 63 different land uses types were chosen for inclusion in CalEEMod because each has an established trip rate critical for mobile source calculations.

This program specifically designates parking areas as a separate land use rather than as a part of an associated non-residential land use (e.g., commercial buildings, retail facilities, etc.). Due to the nature of the available data, parking (i.e., driveway) for residential land uses have been incorporated (see discussion under Lot Acreage) so no separate parking land use needs to be identified. For a better understanding of how CalEEMod treats parking based on the footprint and lot acreage of residential and non-residential land uses, please refer to the following figure. As depicted, the lot acreage of a residential land use includes the parking and building footprint. For non-residential land uses, the lot acreage is the same as the building footprint so parking needs to be added as a separate land use.

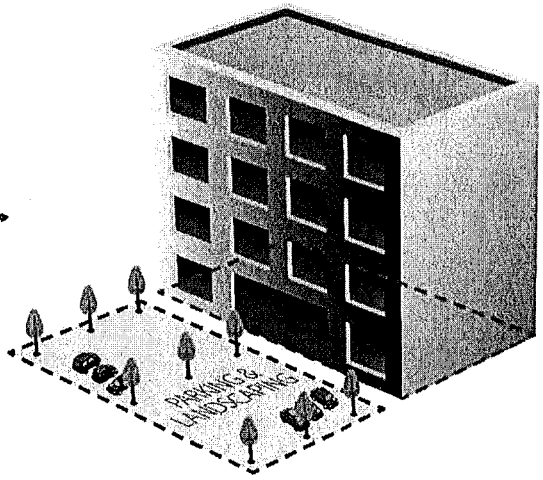
CalEEMod Default Lot Acreage for Res and Non Res Land Uses

RESIDENTIAL
SINGLE FAMILY DWELLING



Lot acreage & building footprint are NOT equal. Lot acreage includes grading for parking & landscaping.

NON-RESIDENTIAL
COMMERCIAL OFFICE BUILDING



Lot acreage & building footprint are equal; add parking as separate land use and assign associated square footage and acreage.

For the parking land use, two primary options are available: parking lots or parking structure (e.g.,garages). There are four types of parking structures for the user to choose – enclosed, enclosed with an elevator, unenclosed, or unenclosed with an elevator. The reason for the specific description is to properly calculate energy impacts from ventilation and elevator operation. Parking as a separate land use made the estimate of default acreage and paving area easier.

For those land uses not listed (e.g., roads, underground parking, pipelines, etc.) each land use type has a "User Defined" land use subtype associated with it that the user can select if the other land use subtypes do not describe or reflect the project being analyzed. It is critical to understand that there is no default data (including size metric) associated with the "User Defined" land uses and all information that is based on these land uses will need to be entered by the user otherwise no emissions will be calculated. Also, whatever size metric (e.g., per acre, per 1000 square foot, etc.) the user chooses for the "User Defined" land use needs to be applied to all subsequent default values (e.g., gallons of water used *per acre* or *per 1000 square foot*) associated with that "User Defined" land use. An alternative approach would be to choose a land use that most closely fits the proposed project and allow the model to populate with pre-

determined defaults. Then, go back through the model and modify the defaults with any known specific project information.

Land Use Subtype

Tabbing over to the next column in a row, the user selects from a drop down list of available land use subtypes based on the primary land use type selected. The user also has the option to select a "User Defined" land use subtype, however, as discussed above, no default data will be available and the user will have to enter in subsequent screens the appropriate values. Land use subtypes are based primarily on the ITE land use definitions used for (mobile source) trip generation rate information. In some cases similar generalized land uses or surrogate data was mapped to some land use subtypes in order to generate the default data needed for various modules.

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
	RESIDENTIAL	
Apartments High Rise	High-rise apartments are units located in rental buildings that have more than 10 levels and most likely have one or more elevators.	222
Apartments Low Rise	Low-rise apartments are units located in rental buildings that have 1-2 levels.	221
Apartments Mid Rise	Mid-rise apartments in rental buildings that have between 3 and 10 levels.	223
Condo/Townhouse	These are ownership units that have at least one other owned unit within the same building structure.	230
Condo/Townhouse High Rise	These are ownership units that have three or more levels.	232
Congregate Care (Assisted Living)	These facilities are independent living developments that provide centralized amenities such as dining, housekeeping, transportation and organized social/recreational activities. Limited medical services may or may not be provided.	253
Mobile Home Park	Mobile home parks consist of manufactured homes that are sited and installed on permanent foundations and typically have community facilities such as recreation rooms, swimming pools and laundry facilities.	240
Retirement Community	These communities provide multiple elements of senior adult living. Housing options may include various combinations of senior adult housing, congregate care, assisted living, and skilled nursing care aimed at allowing the residents to live in one community as their medical needs change.	255
Single Family Housing	All single-family detached homes on individual lots typical of a suburban subdivision	210

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
EDUCATIONAL		
Day-Care Center	A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas and playgrounds.	565
Elementary School	Elementary schools typically serve students attending kindergarten through the fifth or sixth grade. They are usually centrally located in residential communities in order to facilitate student access and have no student drivers.	520
High School	High schools serve students who have completed middle or junior high school.	530
Junior College (2Yr)	This land use includes two-year junior, community, or technical colleges.	540
Junior High School	Junior High schools serve students who have completed elementary school and have not yet entered high school.	522
Library	A library is a facility that consists of shelved books; reading rooms or areas; and sometimes meeting rooms.	590
Place Of Worship	A church is a building in which public worship services are held. A church houses an assembly hall or sanctuary; it may also house meeting rooms, classrooms and occasionally dining catering or party facilities.	560
University/College (4Yr)	This land use includes four-year universities or colleges that may or may not offer graduate programs.	550
RECREATIONAL		
Arena	Arenas are large indoor structures in which spectator events are held. These events vary from professional ice hockey and basketball to non-sporting events such as concerts, shows, or religious services. Arenas generally have large parking facilities, except when located in or around the downtown of a large city.	460
City Park	City parks are owned and operated by a city.	411
Fast Food Restaurant W/O Drive Thru	This land use includes fast-food restaurants without drive-through windows. Patrons generally order at a cash register and pay before they eat.	933
Fast Food Restaurant With Drive Thru	This category includes fast-food restaurants with drive-through windows.	934
Golf Course	Golf courses include 9, 18, 27 and 36 hole courses. Some sites may also have driving ranges and clubhouses with a pro shop, restaurant, lounge and banquet facilities.	430
Health Club	These are privately-owned facilities that primarily focus on individual fitness or training. Typically they provide exercise classes; weightlifting, fitness and gymnastics equipment; spas; locker rooms; and small restaurants or snack bars.	492

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
High Turnover (Sit Down Restaurant)	This land use consists of sit-down, full-service eating establishments with turnover rates of approximately one hour or less. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain.	932
Hotel	Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants; cocktail lounges; meeting and banquet rooms or convention facilities; limited recreational facilities and other retail and service shops.	310
Motel	Motels are places of lodging that provide sleeping accommodations and often a restaurant. Motels generally offer free on-site parking and provide little or no meeting space and few supporting facilities.	320
Movie Theater (No Matinee)	Movie theaters consist of audience seating, single or multiple screens and auditoriums, a lobby and a refreshment stand. Movie theaters without matinees show movies on weekday evenings and weekends only; there are no weekday daytime showings.	443
Quality Restaurant	This land use consists of high quality, full-service eating establishments with typical turnover rates of at least one hour or longer. Quality restaurants generally do not serve breakfast, some do not serve lunch; all serve dinner. This type of restaurant usually requires reservations and is generally not part of a chain. Patrons commonly wait to be seated, are served by a waiter, order from menus and pay for meals after they eat.	931
Racquet Club	These are privately-owned facilities that primarily cater to racquet sports.	491
Recreational Swimming Pool	This is a typical recreational swimming pool that may be associated with community centers, parks, swim clubs, etc.	
PARKING		
Enclosed Parking Structure	This is an enclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting and ventilation, and will be more than one floor with no elevator.	
Enclosed Parking with Elevator	This is an enclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting and ventilation, and will be more than one floor with an elevator.	
Other Asphalt Surfaces	This is an asphalt area not used as a parking lot (e.g., long driveway, basketball court, etc.)	
Other Non-Asphalt Surfaces	This is a non-asphalt area (e.g., equipment foundation, loading dock area, etc.).	
Parking Lot	This is a typical single surface parking lot typically covered with asphalt. This land use will require lighting.	
Unenclosed Parking Structure	This is an unenclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting but not ventilation. It will be more than one floor with no elevator.	
Unenclosed Parking with Elevator	This is a unenclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting but not ventilation. It will be more than one floor with an elevator.	

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
RETAIL		
Automobile Care Center	An automobile care center houses numerous businesses that provide automobile-related services, such as repair and servicing; stereo installation; and seat cover upholstering.	942
Convenience Market (24 Hour)	These markets sell convenience foods, newspapers, magazines and often beer and wine. They do not have gasoline pumps.	851
Convenience Market With Gas Pumps	These markets sell gasoline, convenience foods, newspapers, magazines and often beer and wine. This includes convenience markets with gasoline pumps where the primary business is the selling of convenience items, not the fueling of motor vehicles.	853
Discount Club	A discount club is a discount store or warehouse where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires and appliances. Many items are sold in large quantities or in bulk.	857
Electronic Superstore	These are free-standing facilities that specialize in the sale of electronic merchandise.	863
Free-Standing Discount Store	Discount stores offer centralized cashiering and sell products that are advertised at discount prices. These stores offer a variety of customer services and maintain long store hours seven days a week.	815
Free-Standing Discount Superstore	The discount superstore is similar to the free-standing discount stores with the addition that they also contain a full-service grocery department under the same roof that shares entrances and exits with the discount store area.	813
Gasoline/Service Station	This land use includes gasoline/service stations where the primary business is the fueling of motor vehicles. They may also have ancillary facilities for servicing and repairing motor vehicles.	944
Hardware/Paint Store	These stores sell hardware and paint supplies and are generally free-standing buildings.	816
Home Improvement Superstore	These are free-standing facilities that specialize in the sale of home improvement merchandise.	862
Regional Shopping Center	A shopping center is an integrated group of commercial establishments that is planned, developed, owned and managed as a unit. A shopping center's composition is related to its market area in terms of size, location and type of store.	820
Strip Mall	Small strip shopping centers contain a variety of retail shops and specialize in quality apparel, hard goods and services such as real estate offices, dance studios, florists and small restaurants.	814

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
Supermarket	Supermarkets are free-standing retail stores selling a complete assortment of food: food preparation and wrapping materials; and household, cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies and video rental areas.	850
COMMERCIAL		
Bank (With Drive-Through)	Drive-in banks provide banking facilities for motorists who conduct financial transactions from their vehicles; many also serve patrons who walk into the building.	912
General Office Building	A general office building houses multiple tenants where affairs of businesses commercial or industrial organizations or professional persons or firms are conducted. If information is known about individual buildings, it is suggested that this land use be used instead of the more generic office park.	710
Government (Civic Center)	A group of government buildings that are interconnected by pedestrian walkways.	733
Government Office Building	This is an individual building containing either the entire function or simply one agency of a city, county, state, federal, or other governmental unit.	730
Hospital	A hospital is any institution where medical or surgical care and overnight accommodations are provided to non-ambulatory and ambulatory patients. However, it does not refer to medical clinics or nursing homes.	610
Medical Office Building	This is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility.	720
Office Park	Office parks are usually suburban subdivisions or planned unit developments containing general office buildings and support services, such as banks, restaurants and service stations, arranged in a park-or campus-like atmosphere. This should be used if details on individual buildings are not available.	750
Pharmacy/Drugstore W/O Drive Thru	These are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products and general merchandise. The drug stores in this category do not contain drive-through windows.	880

Table 1: Land Use Sub Type Descriptions

Land UseSubType	Description[1]	ITE Number
Pharmacy/Drugstore With Drive Thru	These are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products and general merchandise. The drug stores in this category contain drive-through windows.	881
Research & Development	R&D centers are facilities devoted almost exclusively to R&D activities. The range of specific types of businesses contained in this land use category varies significantly. R&D centers may contain offices and light fabrication areas.	760
INDUSTRIAL		
General Heavy Industry	Heavy industrial facilities usually have a high number of employees per industrial plant and are generally limited to the manufacturing of large items.	120
General Light Industry	Light industrial facilities are free-standing facilities devoted to a single use. The facilities have an emphasis on activities other than manufacturing and typically have minimal office space. Typical light industrial activities include printing, material testing and assembly of data processing equipment.	110
Industrial Park	Industrial parks contain a number of industrial or related facilities. They are characterized by a mix of manufacturing, service and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities.	130
Manufacturing	Manufacturing facilities are areas where the primary activity is the conversion of raw materials or parts into finished products. It generally also has office, warehouse, R&D functions at the site.	140
Refrigerated Warehouse-No Rail	This is a warehouse that has refrigeration but no rail spur.	150
Refrigerated Warehouse-Rail	This is a warehouse that has refrigeration and a rail spur.	150
Unrefrigerated Warehouse-No Rail	This is a warehouse that does not have refrigeration and no rail spur.	150
Unrefrigerated Warehouse-Rail	This is a warehouse that does not have refrigeration but has a rail spur.	150

1. Based on land use descriptions in ITE Trip Generation 8th Edition. In September 2012, ITE published the 9th edition that updated some of the trip rates from the 8th edition. The updates are not yet incorporated into CalEEMod. However, the user has the ability to override the trip rate default but is expected to justify the change in the "Remarks" section at the bottom of the Operational -Mobile screen.

Unit Amount

Tabbing over to the next column, the user enters the appropriate size of the land use in terms of the size metric selected. This will be used to calculate the rest of the columns in this datagrid.

Size Metric

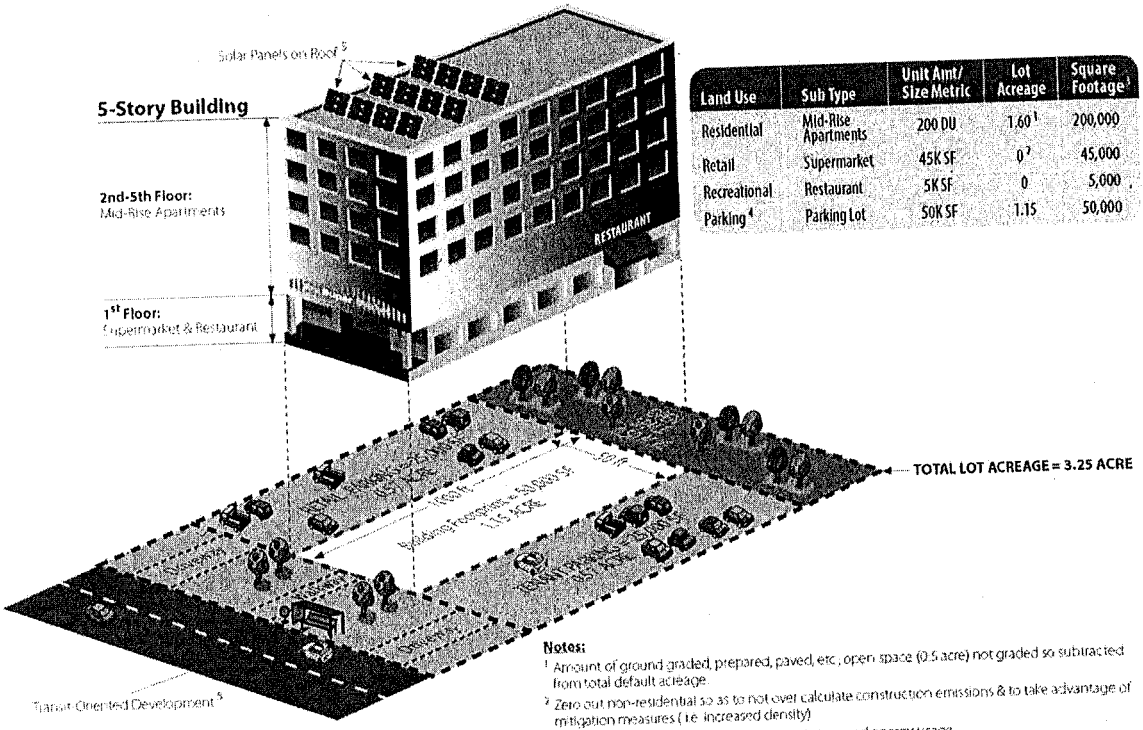
Tabbing over to the next column in the land use identification row, the user can select another size metric unit if it is available for that land use subtype. For example, a school land use allows the user to define its size by the number of students, building square footage, or number of employees. Please note that the square footage, which is used for calculating such impacts as architectural coatings and energy use, relates to the total building square footage and not the building footprint or lot acreage (which is used for housing density as well as grading and site preparation calculations).

Lot Acreage (datagrid)

The user should override the default value if known. For multi-use, multistory building, the square footage should be preserved for each individual land use and the acreage assigned to the residential portion or split between non-residential land uses if there is no residential. The figure below provides an example of a mixed use project and how to apply the appropriate square footage and acreage for an accurate calculation of air quality impacts.

Acreage is used to estimate housing density as needed for calculations (see Table 2) and total acreage for the project is used in assigning construction default data (e.g., grading, site preparation, etc.). Based on ITE data, CalEEMod is able to estimate the acres per dwelling unit (DU) for residential land use. For example, 10 apartments in a low rise will need a 0.625 acre lot (10 DU divided by 16 acres/DU). According to the California Energy Commission's Residential Appliance Saturation Survey (RASS), low rise apartments are 1000 square foot per DU (see Table 2.1) so the building footprint is 0.23 acres (10 DU x 1000 sq ft/DU divided by 43,560 sq ft per acre). Thus, the lot space beyond the residential footprint accounts for driveway and landscaping.

Example of Mixed Use Project in CalEEMod



Land Use	Sub Type	Unit Amt/ Size Metric	Lot Acreage	Square Footage[3]
Residential	Mid-Rise Apartments	200 DU	1.60[1]	200,000
Retail	Supermarket	45K SF	0[2]	45,000
Recreational	Restaurant	5K SF	0	5,000
Parking[4]	Parking Lot	50K SF	1.15	50,000

Notes:

[1] Amount of ground graded, prepared, paved, etc., open space (0.5 acre) not graded so subtracted from total default acreage

[2] Zero out non-residential so as to not over calculate construction emissions & to take advantage of mitigation measures (i.e. increased density)

[3] Used to calculate architectural coating emissions and energy usage

[4] Add parking as a separate land use and enter its associated acreage and square footage

[5] Enter mitigation measures under the mitigation tab

Table 2: Default Housing Density

Land Use Sub Type	Density (Dwelling Units/Acre)
Single Family Housing	3
Apartments low rise	16
Apartments mid rise	38
Apartments high rise	62
Condo/townhouse	16
Condo/townhouse high rise	64
Mobile Home Park	8
Retirement Community	5
Congregate care (Assisted Living)	16

1. Based on the density assumed in ITE Trip Generation 8th Edition

Square Footage

The user should override the default value if known. This is the total building square footage.

Population (datagrid)

This is the population estimated for the land use identified. The user should override the default value if known.

Population and Lot Acreage (text box)

This is the total population and acreage of all land uses entered in the data grid. This is for informational purposes of values that will be used by the program and can"t be changed by the user.

4.3 Construction

The construction screen introduces the first of a tabbed structure subscreens. There are seven subscreens for construction with each one listed in the grey area under the screen name. To jump to different subscreens: the user can use the next and previous buttons, click on the grey tab name, or use the menu bar. Default information is based on a survey of construction sites grouped by construction phase and lot acreage performed by SCAQMD which can be found in Appendix E. The default construction equipment list and phase length are most appropriate for the size and types surveyed while the survey has been extrapolated to indicate default values, more detailed site specific equipment and phases are highly suggested in these cases for the most accurate results.

4.3.1 Construction Phase

This is the screen where the user enters the type of each construction phase and the date range of these phases. The date of the construction phase is critical in determining the correct emission factor for the off-road equipment since CARB"s factors change each year. Default phases are based on the total lot acreage of the project. Depending on the project being modeled, not all phases will be necessary (e.g., not all projects require demolition). In addition multiple phases of similar types may be used for large projects with build out in stages. If the project has demolition, grading, and site preparation phases, additional project specific data will need to be entered on Demolition subscreen and Dust from Material Movement subscreen.

Phase Name

The user should enter a unique name for the phase in the text box.

Phase Type

The user selects from the drop down list the type of construction phase: Site preparation, demolition, grading, building construction, paving, and architectural coating. This influences the types of calculations and default assumptions for on-road vehicle trips and fugitive emissions that occur in subsequent construction subscreens. The definitions of the default data phases are as follows:

- *Demolition* involves tearing down of buildings or structures.
- *Site Preparation* involves clearing vegetation (grubbing and tree/stump removal) and stones prior to grading.
- *Grading* involves the cut and fill of land to ensure the proper base and slope for the construction foundation.
- *Building Construction* involves the construction of structures and buildings.
- *Architectural Coating* involves the application of coatings to both the interior and exterior of buildings or structures and includes parking lot striping as well as painting of the walls of parking structures.
- *Paving* involves the laying of concrete or asphalt such as in parking lots or roads.

Start Date and End Date

The user can enter with the aid of a calendar, the start and end dates. The default start date is 1/1/2014 starting with demolition with subsequent phases starting the next day after the previous phase's end date. Changes to these cells will alter the total days estimated for the phase.

Days per Week

The user can select from a drop down box the number of days per week (5, 6, or 7) the project will operate. Five days per week is assumed to be Monday through Friday, and six days per week is Monday through Saturday.

Total Days

The total number of days in the construction phase is indicated. If the end date or the days per week are changed, clicking in this cell will recalculate the number of days. If the total number of days for a phase is changed, then once leaving this cell, the program will adjust the end date based on the start date for that phase.

4.3.2 Off-Road Equipment

This subscreen shows the off-road equipment usage for each phase. Since equipment lists can be lengthy, the user must go through a different subscreen for each phase. This is done by selecting the appropriate phase name from the drop down list or the Previous or Next buttons located next to the phase name. The emission calculations associated with this screen are from off-road equipment engine use based on the equipment list and phase length. The fugitive emissions from off-road equipment performing work are associated with additional information in other construction screens.

The user enters in the datagrid each piece of equipment in the phase in a new row. The user enters the unit amount and hours per day of equipment usage. Horsepower and load factors are loaded with the default average values of the mode tier according to population based on OFFROAD2011, but the user can override these values. Since CalEEMod is restricted in the

years of OFFROAD emission factors, CalEEMod will use the lower end year if a construction year is in between a year of OFFROAD values in the database. For example if a construction phase is in 2027, CalEEMod will use OFFROAD emission factors from 2025.

For site specific construction equipment lists including equipment not specifically listed can be added under the Other Equipment categories or Off-Highway Trucks listed in CalEEMod matching the closest in horsepower to the missing equipment for each phase the construction equipment is operating. For inclusion of water trucks and cement trucks specifically can be considered in two ways although both of those trucks were part of the SMAQMD vendor trip survey during construction. The first is to use the Off-Highway Trucks category in this screen. The second is to add these as additional vendor trips in the Trips and VMT screen.

4.3.3 Dust from Material Movement

This subscreen is used to enter the information necessary to calculate the fugitive dust emissions associated with grading phases. Three distinct fugitive dust calculations are performed as described in Appendix A: dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading the dirt into haul trucks. These methods have been adapted from USEPA's AP-42 method for Western Coal Mining. The user needs to enter the amount of material imported and exported to the site in order for CalEEMod to estimate hauling trips correctly from material transport. There is an option to select either ton of debris or cubic yards. The user also selects if the import and export of material are phased. If they are phased a truck comes in with material and leaves with another load of material to export. Non-phased trips have one-way of the haul trip performed with an empty truck. Phasing material import and export reduces the number of haul trips. The number of acres that are displayed represent the total acres traversed by grading equipment assuming a blade width of 12 feet. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday. See Appendix A for the equipment specific grading rates.

4.3.4 Demolition

This subscreen is used to enter the amount of material that is demolished if demolition phases are selected. The user can enter either the ton of material or the building square footage. Fugitive dust emissions from the demolition are then calculated. Demolition fugitive dust emissions are based on the methodology described in the report prepared for the USEPA by Midwest Research Institute, Gap Filling PM_{10} Emission Factors for Selected Open Area Dust Sources.

4.3.5 Trip and VMT

This subscreen is used to provide the number and length of on-road vehicle trips for workers, vendors, and hauling. It also allows the user to select different weightings of vehicle fleet mixes and is either the EMFAC mix for the region, or an mix of the vehicle classes listed. HHDT,MHDT is a 50/50 percent mix of heavy-heavy duty trucks and medium-heavy duty trucks. LDA,LDT1,

LDT2 is 50/25/25 percent mix of light duty autos, light duty truck class 1 and light duty truck class 2. Since CalEEMod is restricted in the years of EMFAC emission factors, CalEEMod will use the lower end year if a construction year is in between a year of EMFAC values in the database. For example if a construction phase is in 2027, CalEEMod will use EMFAC emission factors from 2025.

The number of workers is 1.25 times the number of pieces of equipment for all phases except building construction and architectural coating. Building construction estimates the number of workers based on the types of land use and their size based on an analysis of a study conducted by SMAQMD. This study and its analysis are included in Appendix E. The number of workers for architectural coating is based on 20% of the building construction workers.

The number of vendor trips for building construction phase is based on a study performed by SMAQMD based on land use types and their size. As noted earlier, the SMAQMD trip survey during construction counted cement and water trucks as vendor trips. These values were placed under the "building construction" phase in CalEEMod. If the "building construction" phase is being eliminated and there are known water (and/or cement) trucks, it is recommended to consider those vendor trips under another phase or accounted for as OFFROAD equipment. Hauling trips are based on the assumption that a truck can handle 20 tons (or 16 cubic yards) of material per load. Assuming one load of material, CalEEMod considers a haul truck importing material will have a return trip with an empty truck (2 trips). Similarly, the haul truck to take material away will have an arrival trip in an empty truck (2 trips). Thus, each trip to import and export material is considered as two separate round trips (4 trips) unless the "phase" box is clicked. Then, a haul truck trip to import material will be the same haul truck to export material (2 trips).

4.3.6 On-Road Fugitive Dust

This subscreen defines the variables that will be used to determine the fugitive dust emissions from construction on-road vehicles over paved and unpaved roads. The emission calculations are based on USEPA"s AP-42 Janaury 2011 paved road and November 2006 unpaved roads emission factors. The variables in this datagrid are the same as those defined in the appropriate AP-42 sections.

4.3.7 Architectural Coatings

This subscreen allows the user to override any of the default interior and exterior surface area estimated for residential and non-residential buildings. In addition, each of these surface types has a different emission factor indicating the VOC content of the paint in grams per liter. See Appendix A for the method of estimating surface areas to be coated from building square footage.

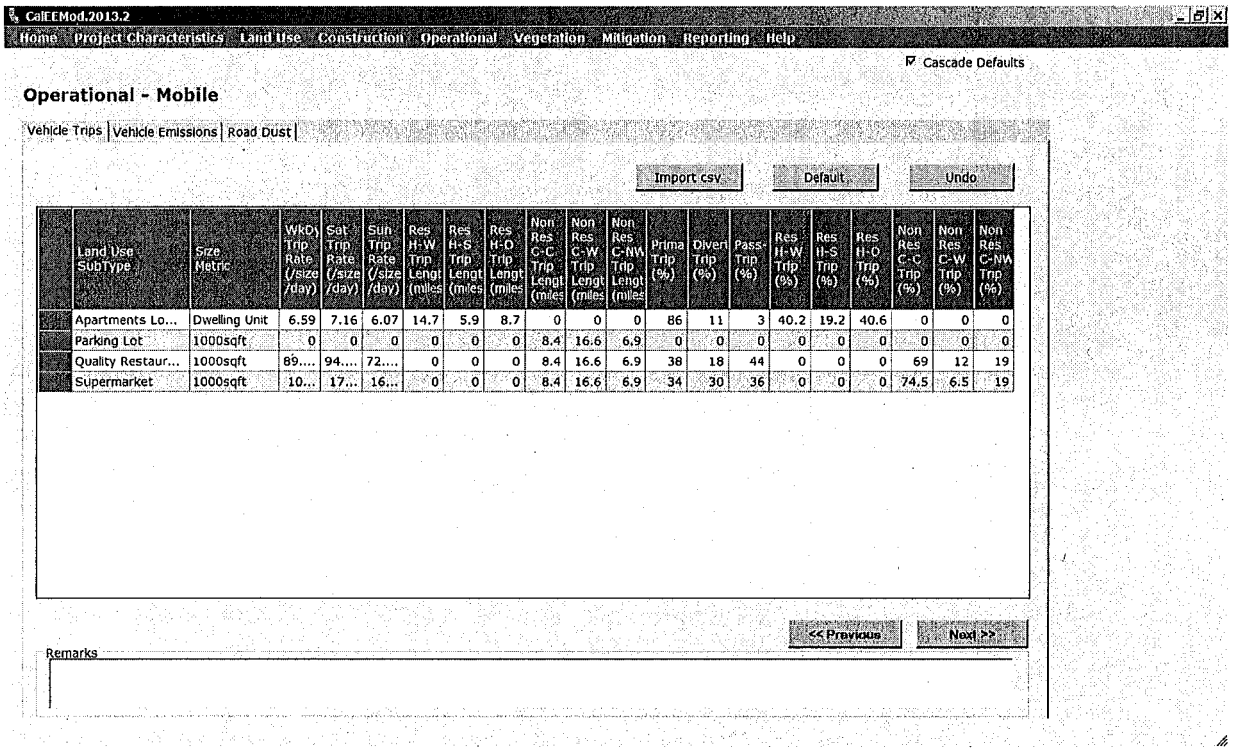
4.4 Operational Mobile

The operational mobile screen is made up of 3 subscreens: Vehicle Trips, Vehicle Emissions, and Road Dust. These screens are used in defining the information necessary to calculate the emissions associated with operational on-road vehicles.

4.4.1 Vehicle Trips

This subscreen's datagrid lists the trip rate, trip lengths, trip purpose, and trip type percentages for each land use subtype in the project. The user can edit any of this information by entering a new value in the appropriate cell. Trip rates are in terms of the size metric (square footage or dwelling unit) defined on the land use screen and are listed for weekday, Saturday and Sunday if available. Trip lengths are for primary trips. Trip purposes are primary, diverted, or pass-by trips. Diverted trips are assumed to take a slightly different pass than a primary trip and are assumed to be 25% of the primary trip lengths. Pass-by trips are assumed to be 0.1 miles in length and are a result of no diversion from the primary route. Residential trip types are defined as home-work (H-W), home-shop (H-S), and home-other (H-O). Non-residential trip types are defined as commercial –customer (C-C), commercial-work (C-W), and commercial-nonwork (C-NW) such as delivery trips. See Appendix A for the equations and methodology used to calculate motor vehicle emissions from the operation of a project.

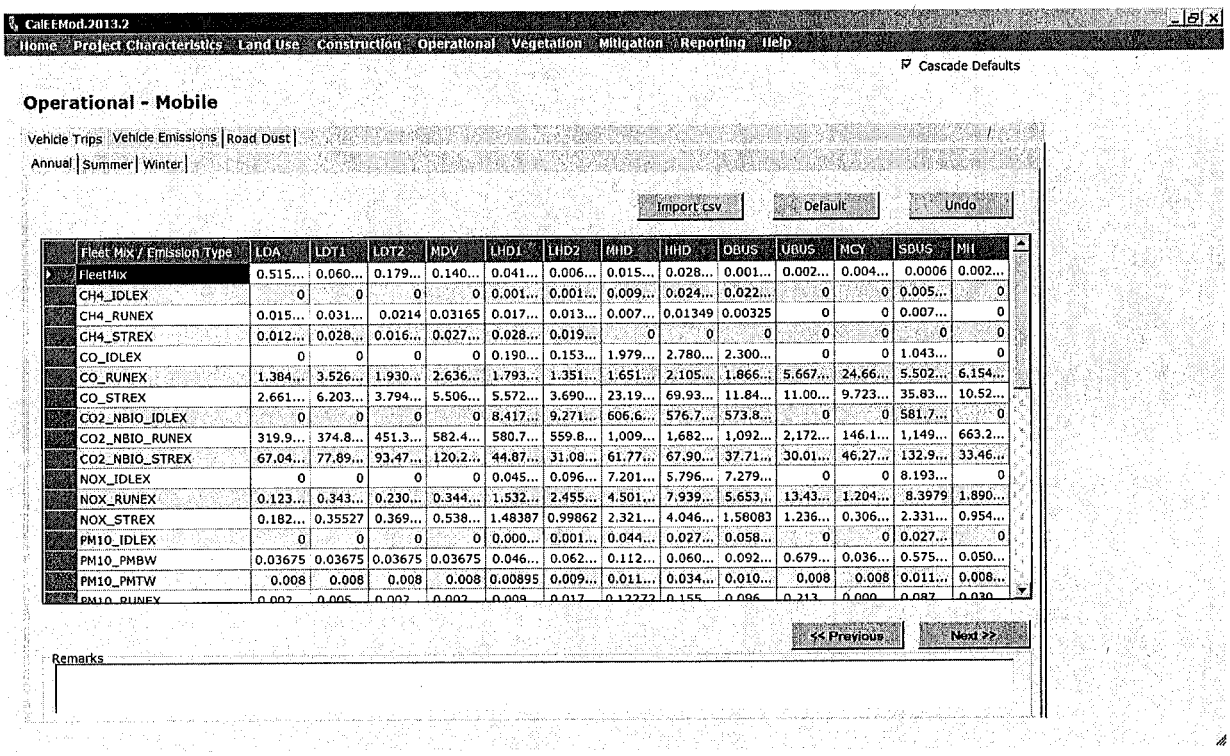
In most cases the trip rate is based on ITE's average trip rate for the respective land use category. For warehouses, SCAQMD evaluated the primary data from ITE along with other recent studies regarding warehouses and concluded that it was more appropriate to break out the warehouses based on access to a rail spur and refrigeration. In addition, they concluded that it was more appropriate to use the maximum values from the studies. A detail memorandum describing the justification for these values is contained in Appendix E.



4.4.2 Vehicle Emissions

This subscreen is a large datagrid containing the detailed vehicle emission factors and fleet mix based on EMFAC2011. See Appendix A for information on how these emission factors were developed based on burden mode EMFAC runs including effects from Pavley (Clean Car Standards) and Low Carbon Fuel Standards. Pavley and Low Carbon Fuel Standards are applicable for future years and do not impact EMFAC values prior to these regulations implementations (i.e, 1990, 2000, 2005, etc). It is anticipated that most users will not edit data in this subscreen. There is a separate tab for annual, summer, and winter emission values. If the user wants to alter the breakdown of fuel types (catalytic, non-catalytic, other) within a vehicle class, they will have to provide their own data as this will likely be an infrequent change due to CEQA enforceability requirements. For details on how EMFAC data was processed see Appendix A.

This screen along with the previous screen (Vehicle Trips) will calculate the emissions associated with on-road motor vehicle use. It does not include the fugitive dust emissions from travel over roads as these are associated with the next screen (Road Dust).



4.4.3 Road Dust

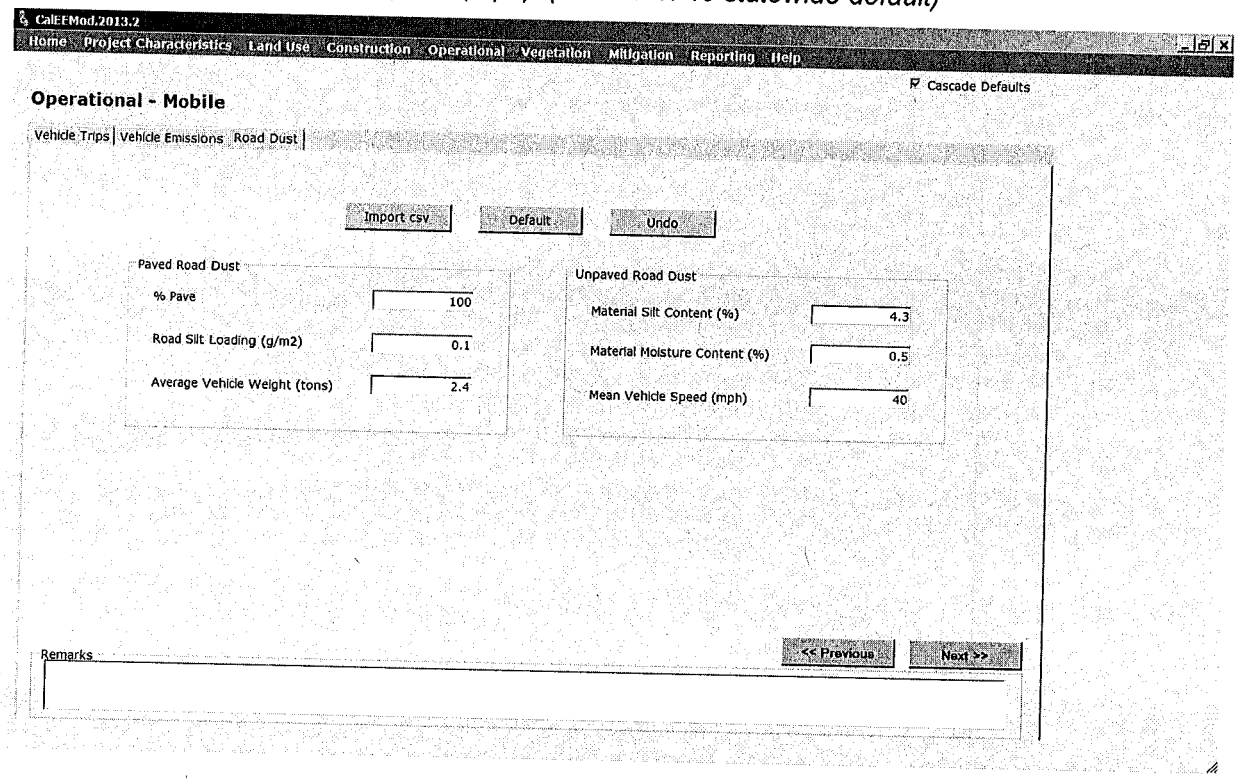
This subscreen is used to change any of the default values that are used in the USEPA's AP-42 methods for calculating fugitive emissions from paved and unpaved roads. The defaults for the road dust (e.g., material silt content, material moisture content,) are statewide averages, but the user has the ability to override the defaults if data specific to the project is known. Local jurisdictions can also provide guidance to users as to what default properly reflects known regional road dust parameters.

For the San Luis Obispo region, users are recommended to provide the following road dust parameters overriding the statewide defaults:

9.3 for "Material Silt Content (%)" *(instead of 4.3 statewide default)*

0.1 for "Material Moisture Content (%)" *(instead of 0.5 statewide default)*

32.4 for "Mean Vehicle Speed (mph)" *(instead of 40 statewide default)*

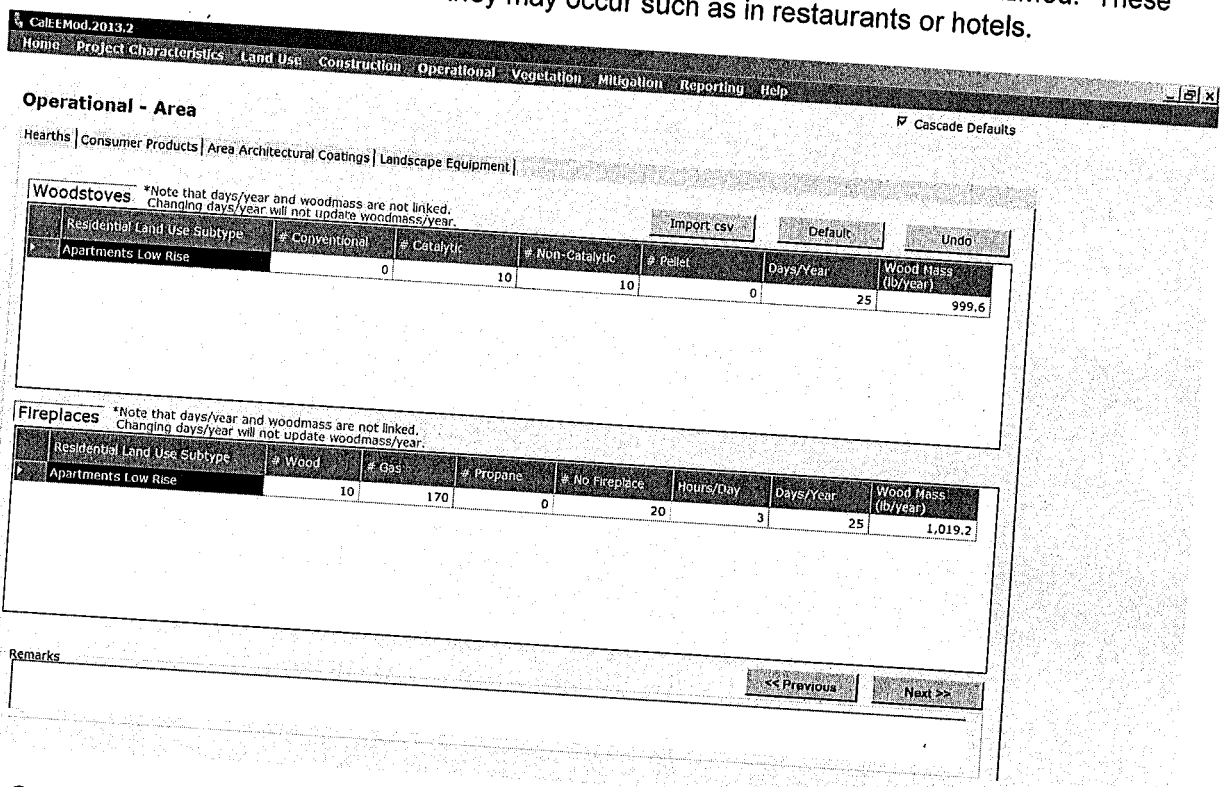


4.5 Area

The area source screen consists of four subscreens: Hearths, Consumer Products, Area Architectural Coatings, and Landscaping Equipment. Natural gas emission variables from all uses except hearths are included in the energy use screen.

4.5.1 Hearths and Woodstoves

This subscreen allows the user to enter the number of woodstoves and hearths of various types as well as the usage of these devices. Woodstoves are separate from fireplaces since a home may have both and these devices may have different use patterns. The number of devices that is entered for each device type represents the total number of devices installed in the dwelling units for a particular land use. See Appendix A for emissions calculation methodology and details of variables that the user can not override. Some of these emissions may be classified as biogenic and are therefore reported as CO_2-Biogenic. For most locations a default percent of hearths and stoves was provided by districts and is multiplied through. The number was chosen for CalEEMod instead of a percentage to allow for incorporation of various districts rules regarding hearths and woodstoves in new residences without having specialized screens. Commercial land uses by default do not have any hearths or woodstoves in CalEEMod. These are included for those cases where they may occur such as in restaurants or hotels.



The San Joaquin Valley jurisdiction has a regulatory limit on the number of hearths depending upon the type and number of residential development. The regulatory limit is generated by CalEEMod but all the input parameters (e.g., unit density, etc.) are necessary to determine the value. Thus, the regulatory limit is disclosed during the reporting stage under the "Default Value" box in the report. The model, however, calculates emission impacts from the number of hearths inputted on the Area source screen (listed under the "New Value" column in the report). Therefore, if the user wants to calculate emissions from regulatory limit, the report needs to be run to determine the regulatory limit and the user needs to go back to the Area source screen to

input that value and re-run the report. If the user chooses to calculate emissions from a different number of hearths (e.g, a number of hearths less than the regulatory limit), then that number needs to be inputted on the Area source screen to properly calculate emissions. Again, the report will provide the regulatory limit under the "Default Value" column and the user input value under "New Value" column.

4.5.2 Consumer Products

Consumer products are various solvents used in non-industrial applications which emit VOCs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries. SCAQMD has developed an emission factor based on the total of all building square footage for both residential and non-residential buildings. Details of how this emission factor was developed can be found in Appendix E. The user can change this emission factor if they have more relevant data.

4.5.3 Area Architectural Coating

This subscreen has text boxes for the reapplication rate and paint VOC content for each building surface type. The reapplication rate is the frequency at which surfaces get repainted every year. A default of 10% is used which means that 10% of the surface area is repainted each year so all surfaces are completely repainted once every 10 years. Daily emissions divide the annual rate by 365 days per year. This is based on assumptions used by SCAQMD in their district rules regarding architectural coatings. Some districts provided details on their coating regulations that phase in over time which have been incorporated to the extent feasible given the general classifications of paint (interior or exterior for residential and non-residential). As not all districts submitted their architectural coating regulations, consult your local agency for any suggested values that may be lower than the state regulations.

If changing the operational architectural coating VOC content (e.g., lower VOC content limit), the User is advised to change the architectural coating VOC content under the Area Mitigation screen where the operational coating VOC content defaults will not change unless prompted. If not, the model assumes the value on the mitigation screen is the "New Value" (as listed in report). In the case of applying a lower VOC content limit on the operational architectural coating screen, the unchanged mitigation value ("New Value") will be higher. However, unless the box is checked on the Area Mitigation screen next to the coating type, the model will not calculate a mitigated emissions value.

4.5.4 Landscape Equipment

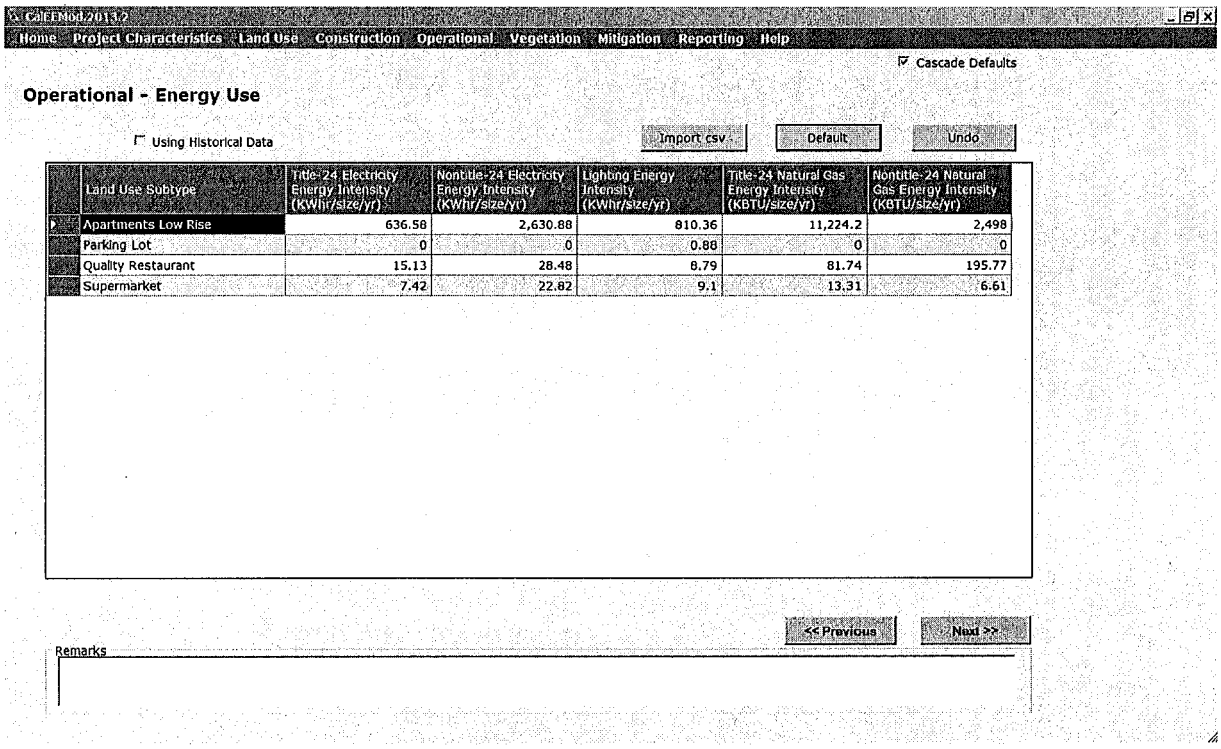
This subscreen has two text boxes to show the number of snow days or summer days. In addition, the defaults consider a realistic number of days which the landscaping equipment would be operated. For example, landscaping at commercial facilities typically do not take place during a weekend or during the summer at educational facilities that are not open. The number of days are applied to the appropriate landscape equipment types available in OFFROAD2011 using the average horsepower and load factors of the population mode. The

derivation of emission factors used for each equipment type from OFFROAD2011 is described in Appendix A.

4.6 Energy Use

The energy use screen is used to gather the information necessary to estimate the emissions associated with building electricity and natural gas usage (non-hearth). The electricity energy use is in kilowatt hours per size metric for each land use subtype and natural gas use is in kiloBritish Thermal Units (kBTU) per size metric for each land use subtype. The California Energy Code contains energy conservation standards applicable to all residential and non-residential buildings throughout California, including schools. The electricity use is split into three areas: Title-24, non-Title 24, and lighting. The Title 24 of the California Code of Regulations, known as the California Building Standards Code (or "Title 24"), uses are defined as the major building envelope systems covered by Part 6 (California Energy Code) of Title 24 such as space heating, space cooling, water heating, and ventilation. Lighting was separated out since it can be both part and not part of Title-24. Since lighting is not considered as part of the building envelope energy budget, CalEEMod does not consider lighting to have any further association with Title 24 references in the program. Non-Title 24 is everything else such as appliances and electronics. Natural gas is just distinguished as Title 24 or Non-Title 24. The default values are based on the CEC sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies[9]. For climate zones not included in these surveys a data from the closest climate zone was used as a surrogate. Since these studies are based on older buildings, adjustments have been made to account for changes to Title 24 building codes as described in Appendix A. A user should select the use historical box if they only want an adjustment to the 2005 standards which were in effect when ARB developed its Scoping Plan 2020 No Action Taken predictions. After selecting the historical button, the user must also click the default button to load the historical default values.

9 CEC. October 2010. Residential Appliance Saturation Survey. Available online at: http://www.energy.ca.gov/appliances/rass
CEC. 2006. Commercial End-Use Survey. Available online at: http://www.energy.ca.gov/ceus/



4.7 Water and Wastewater Use

This module only estimates the land uses contribution of GHG emissions associated with supplying and treating the water and wastewater. This screen is used to enter the amount of water in gallons used indoors and outdoors for each land use subtype[10]. The indoor water is also used to estimate the amount of wastewater. The electricity intensity for various phases of providing water is broken out. Depending on the specific water supply used or treatment method used these numbers can vary over a wide range. Supplying water is bringing the water from its primary source such as the ground, river, or snowpack to the treatment plant. Distributing the water is bringing the water from the treatment plant to the end users. The electricity intensities are multiplied by the utility intensity factors for the GHGs and are classified as indirect emissions. The default electricity intensity is from the CEC"s 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and

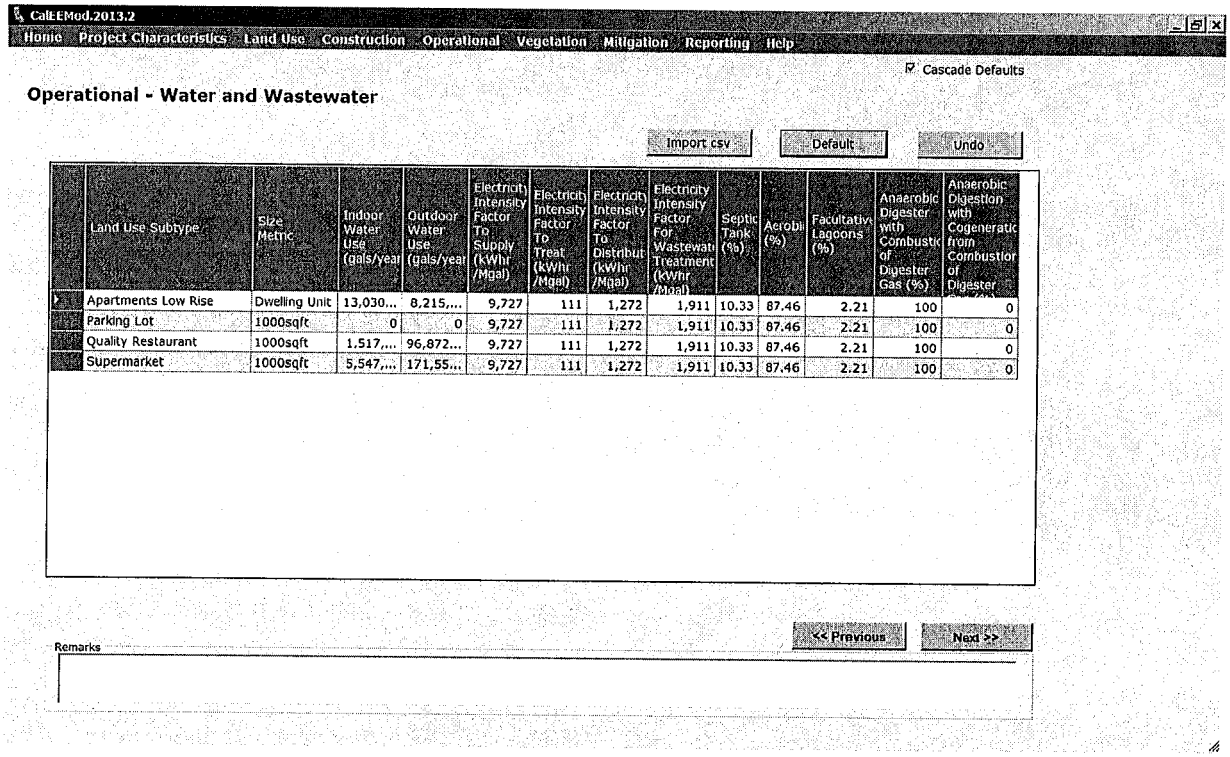
10 Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Published by the Pacific Institute for Studies in Development, Environment, and Security. Full report available online at: http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf. Appendices available online at: http://www.pacinst.org/reports/urban_usage/appendices.htm

Dziegielewski; B.; Kiefer, J.C.; Optiz, E.M.; Porter, G.A.; Lantz, G.L.; DeOreo, W.B.; Mayer, P.W.; Nelson, J.O. 2000. Commercial and Institutional End Uses of Water. Published by the American Water Works Association Research Foundation.

Northern California Golf Association. Improving California Golf Course Water Efficiency. http://www.owue.water.ca.gov/docs/2004Apps/2004-079.pdf

Southern California[11]. The location will automatically select the appropriate values if using these defaults. Since the electricity can vary greatly based on locations, the user should override these values if they have more specific information regarding their specific water supply and treatment.

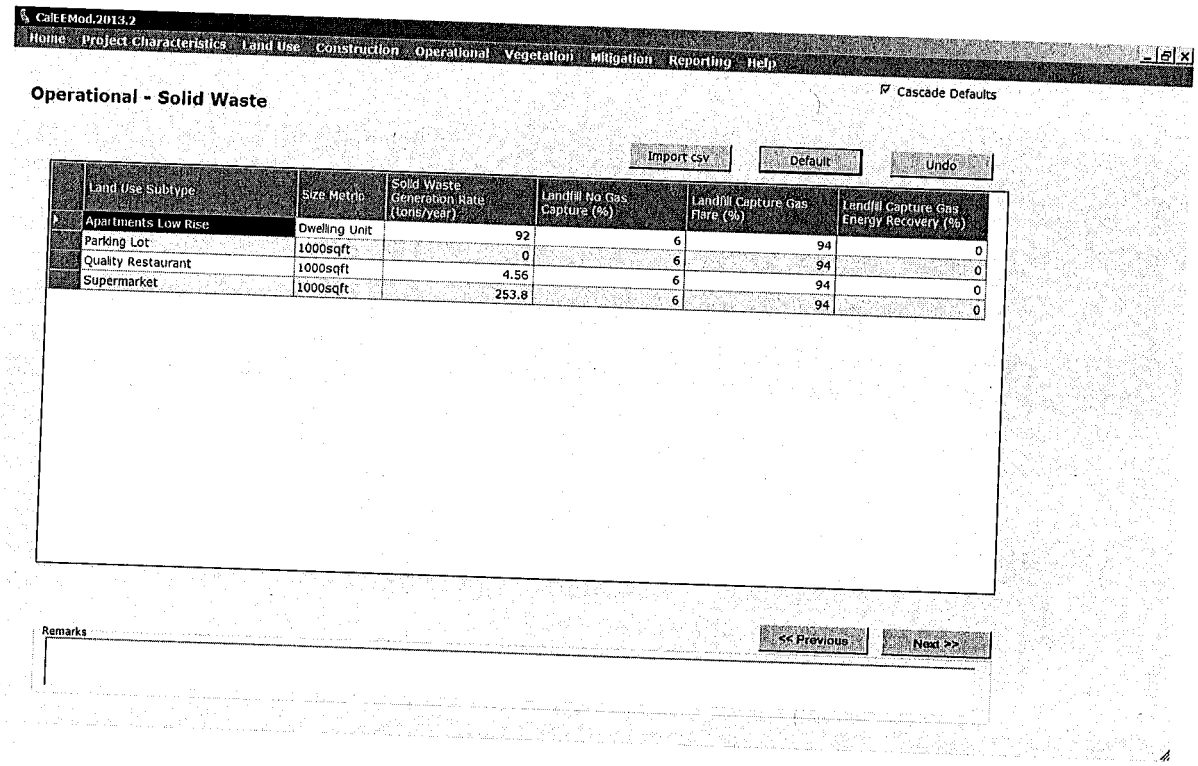
Wastewater may also have direct emissions of GHGs. These depend on the type of wastewater treatment system (e.g., septic, aerobic or lagoons) used and therefore the wastewater treatment type percentages are variables. In addition, the model calculates impacts if the solids are digested either through an anaerobic digester or with co-generation from combustion of digester gas. Each type has associated GHG emission factors. Some of these may be classified as biogenic. Not all of the biogenic emissions are accounted for since there are not adequate emissions factors at this time. Refer to Appendix A on how to properly change the defaults, if necessary, and the methodology used to calculate impacts from wastewater treatment.



[11] CEC-500-2006-118.

4.8 Solid Waste

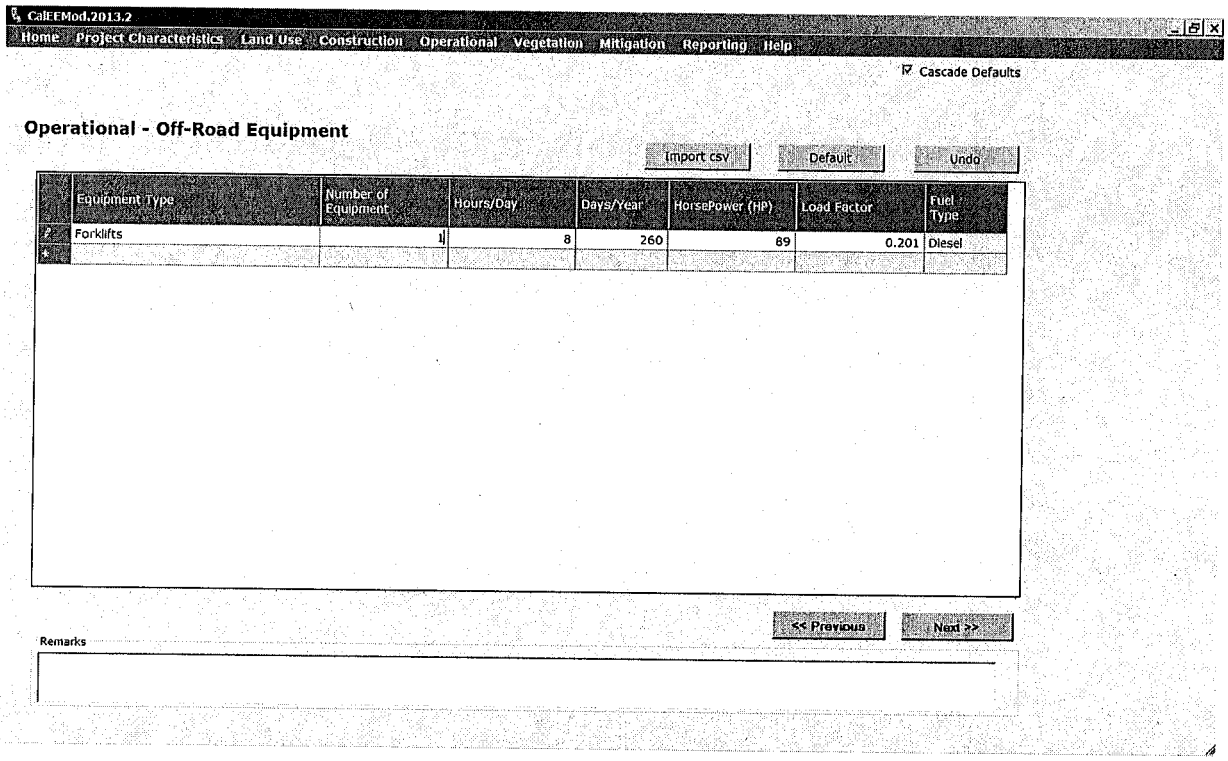
The solid waste module determines the GHG emissions associated with disposal of solid waste into landfills. In order to estimate the eventual contribution of GHG emissions from solid waste for the waste disposed by a land use annually, the total amount of carbon dioxide and methane that would be evolved over the span of many years is calculated. This is based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste[12]. Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on Calrecycle data. The amount of methane emitted depends on characteristics of the landfill, and therefore the default percentage is based on the types of landfills assumed by ARB in their GHG emission inventories. Portions of these emissions are biogenic. The defaults for the gas capture (e.g., no capture, flaring, energy recovery) are statewide averages, but the user has the ability to override the defaults if the gas capture is known. Local jurisdictions can also provide guidance to users as to what default properly reflects known regional solid waste gas capture. Users in the Santa Barbara region are recommended to apply 100% landfill capture gas flare overriding the statewide default to reflect a more accurate regional solid waste activity.



12 IPCC. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 5 Waste.

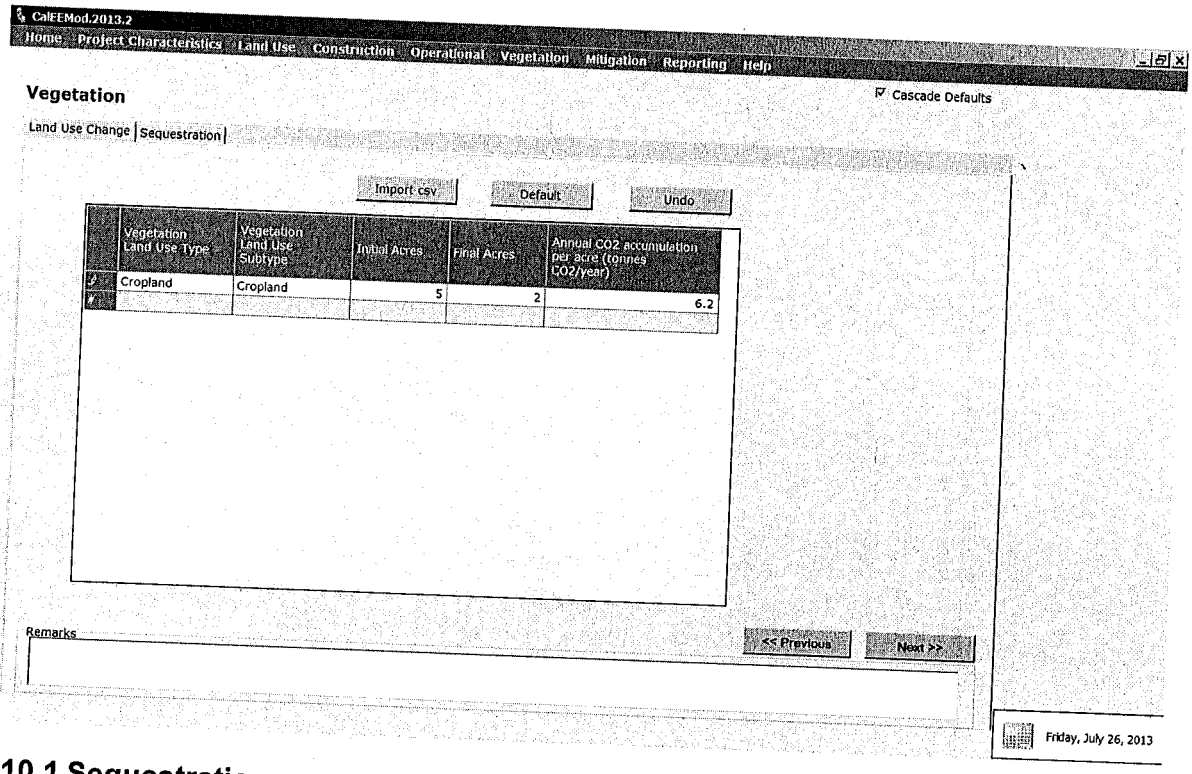
4.9 Off-Road Equipment

A new sub-screen under Operational allows the user to identify any off-road equipment used during operational activities (e.g., forklifts, cranes, loaders, generator sets, pumps, pressure washers, etc.) at the project site. Because such equipment cannot be assumed to be needed for a particular land use project, a user needs to provide the input in order for CalEEMod to calculate the resulting emissions from equipment operation. A dropdown list of off-road equipment is provided for the user to identify each piece of equipment. The model requires the following specific information per equipment type. The user would need to provide the number of pieces for each equipment type. The model assumes an operation activity of 8 hours per day and 260 days per year, as well as the horsepower and load factor of the equipment type, but the user has the ability to override the default assumptions with project specific information. Finally, the model assumes diesel fuel, but a dropdown menu is provided to allow the user to choose bio-diesel or compressed natural gas (CNG) if known to power the equipment.



4.10 Vegetation

The vegetation module is used to estimate the one-time change in carbon sequestration capacity of a vegetation land use type. The methods used are based on IPCC[13]. The user enters the vegetation land use type, the initial and final acreage of the vegetation land use type, and the annual carbon dioxide equivalent accumulation per acre if the user chooses to over ride the default value. Settlement land use acreage is not considered since it is a net zero at steady state unless trees are added.



4.10.1 Sequestration

This subscreen to vegetation is used to estimate the GHG emissions associated with the sequestration of net new trees added to the project site. Consistent with IPCC recommendations a 20 year active growth period is assumed. The user enters the tree type or miscellaneous if it is not known, and the total number of trees. The user can override the default carbon sequestration rate.

4.11 Mitigation

The mitigation module screen consists of six subscreens that the user can indicate and supply the necessary information to estimate the emissions after mitigation measures have been implemented. The mitigation measures included in CalEEMod are largely based on the recent

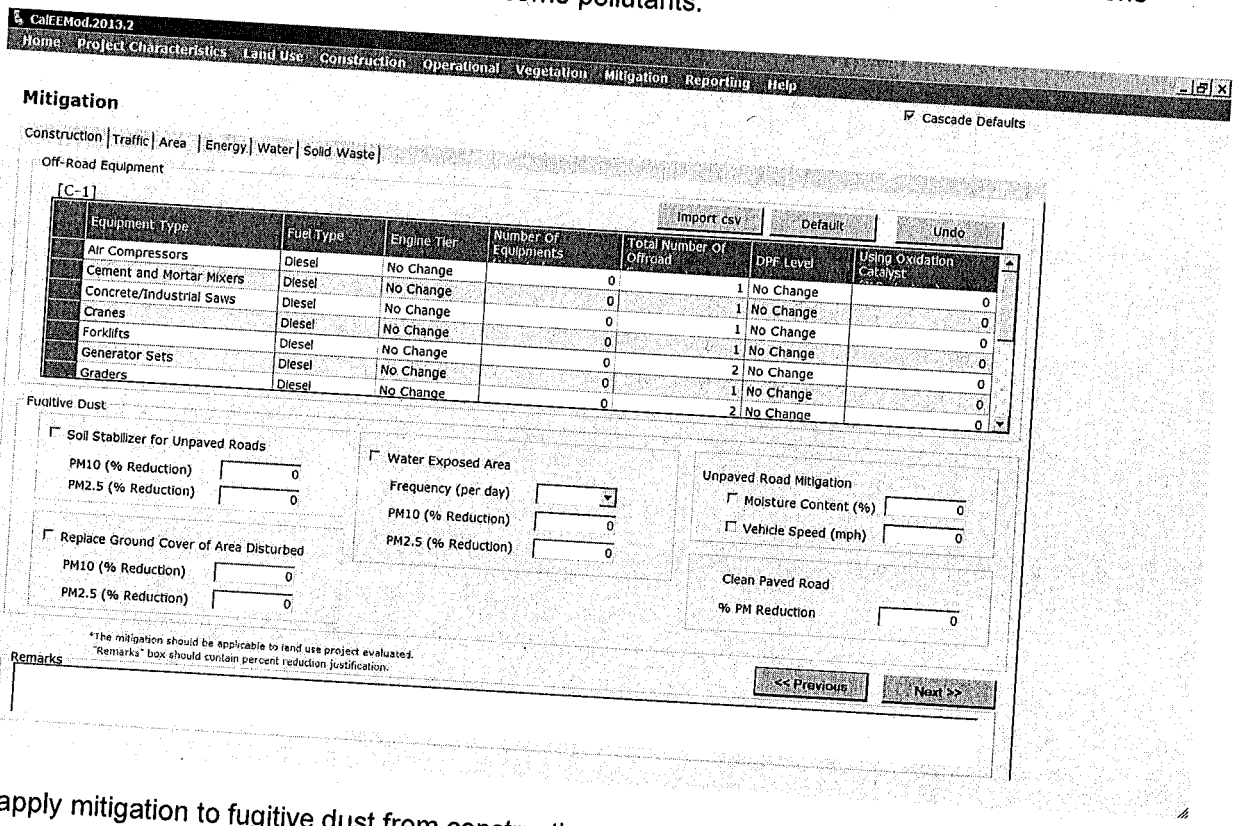
13 IPCC. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4.

CAPCOA Quantifying Greenhouse Gas Mitigation Measures (http://www.capcoa.org/wp-content/uploads/downloads/2010/09/CAPCOA-Quantification-Report-9-14-Final.pdf) document. To assist the user in understanding each measure by referencing back to the CAPCOA document, the CAPCOA measure numbers are provided next to the listed measures in CalEEMod. Therefore, this user"s guide focuses on key aspects of the program screens that user"s should pay attention to.

4.11.1 Construction Mitigation

This screen consists of a datagrid to apply mitigation to off-road construction equipment and check boxes with supplemental information for fugitive dust emissions.

To apply mitigation to construction equipment, the user selects the equipment type the number of equipment noting the total number displayed based on construction equipment lists, and type of mitigation to apply. If substantial evidence supporting reductions was available at the time of development, options include fuel type (diesel, CNG, electric, hybrid, biodiesel), engine tier (typically will select Tier 4), diesel particulate filter tiers (Tier 3 being the best), and oxidative catalyst reduction. The program estimates how much if any increase or decrease in emissions to apply for each pollutant. Some mitigation measures have trade-offs in pollutant reductions and therefore may result in increases of some pollutants.



To apply mitigation to fugitive dust from construction, the user selects the check box in front of the mitigation measure name, and enters in the appropriate information in the drop down or text

boxes. Some fugitive dust mitigation required by some districts do not appear here since the fugitive dust source they mitigate is not quantified by CalEEMod in particular this includes fugitive dust generated by wind over land and storage piles. Since they are not quantified it is not appropriate to apply the reduction. The construction mitigation to use alternative fuel for construction equipment is consistent with the mitigation number C-1 in the CAPCOA Quantifying GHG Mitigation document.

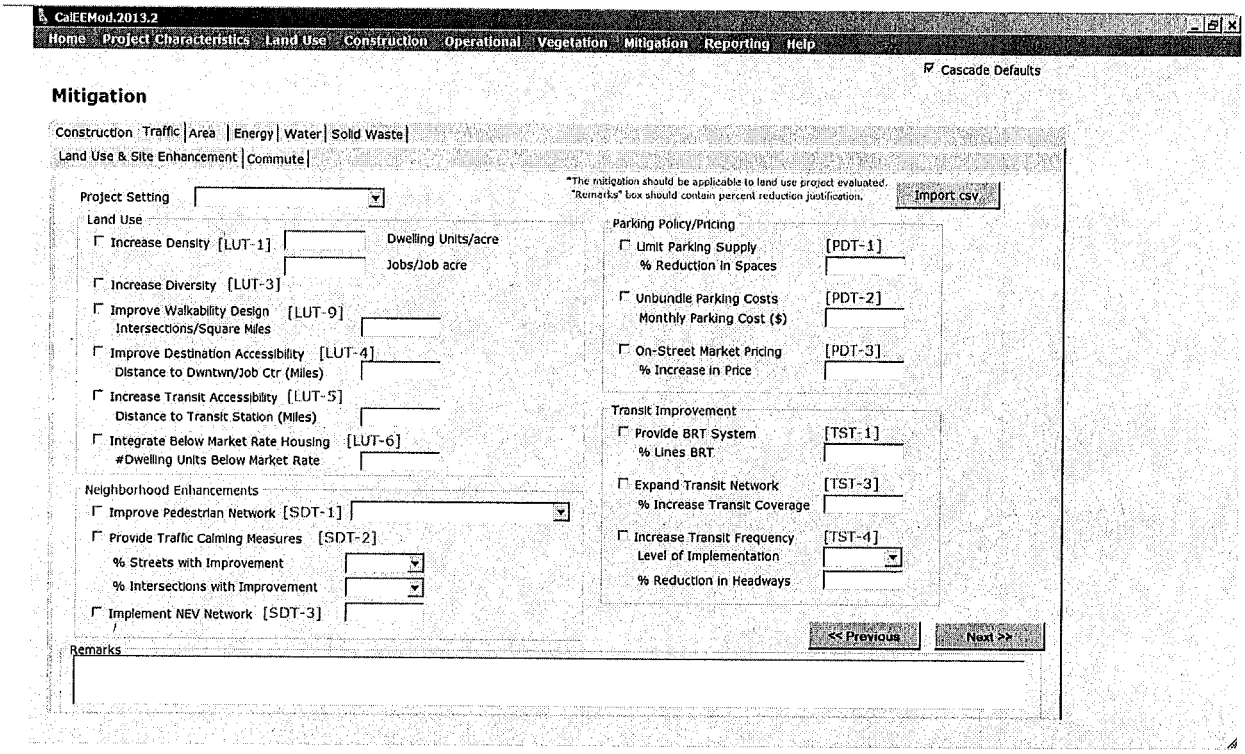
4.11.2 Traffic Mitigation

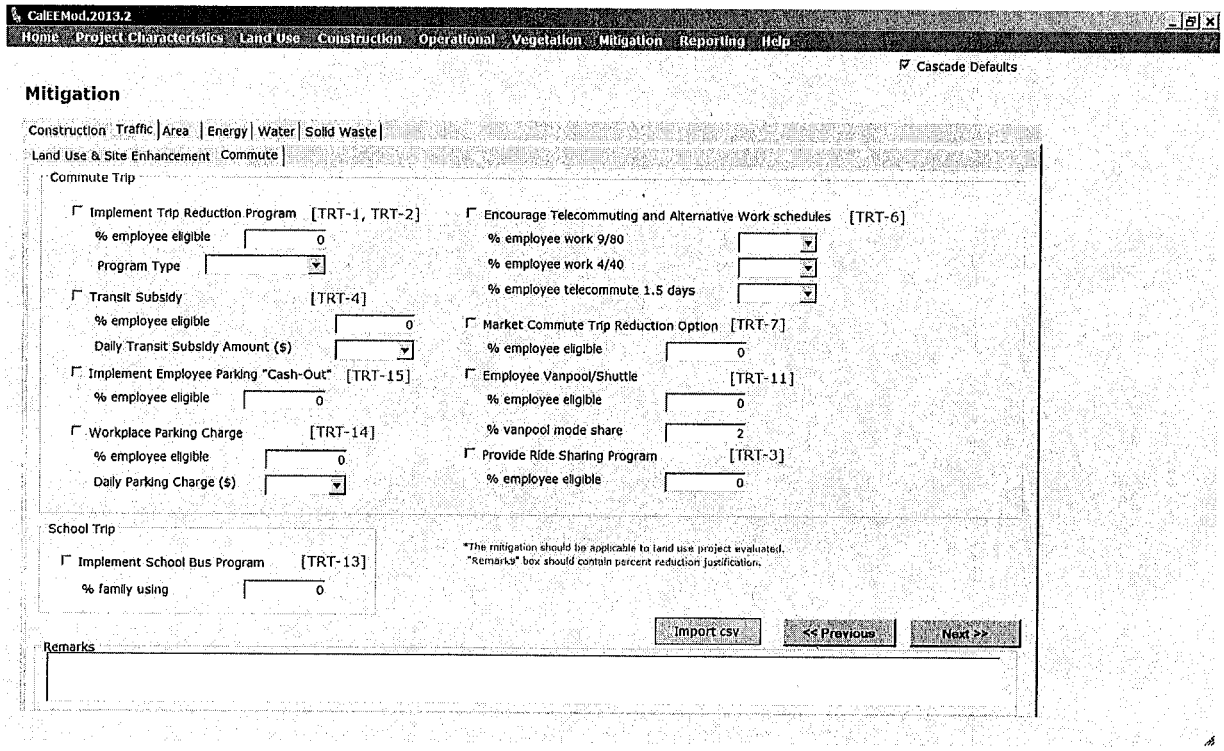
There are two traffic mitigation subscreens that the user can select from. First the user must select the Project Setting as defined in the CAPCOA document (pages 59-60).

- Low Density Suburban: An area characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb).
- Suburban Center: serves the population of the suburb with office, retail and housing which is denser than the surrounding suburb.
- Urban: an area which is located within the central city with higher density of land uses than you would find in the suburbs. It may be characterized by multi-family housing and located near office and retail.
- Urban Center *(known as "Compact Infill" in CAPCOA document)* : A project which is located within or contiguous with the central city. Examples may include redevelopment areas, abandoned sites, or underutilized older buildings/sites.

If the CAPCOA measure did not distinguish between suburban center and low density suburban, values for low density suburban were used. Similarly, if urban center and urban values were not distinguished urban values were used.

The user checks the box next to each mitigation measure and fills in the appropriate information as required. The maximum reduction caps defined in the CAPCOA Quantifying GHG Mitigation document are integrated into these calculations. The CAPCOA traffic mitigation measure numbers included in CalEEMod are the following: LUT-1, LUT-3, LUT-9, LUT-4, LUT-5, LUT-6, SDT-1, SDT-2, SDT-3, PDT-1, PDT-2, PDT-3, TST-1, TST-3, TST-4, TRT-1, TRT-2, TRT-4, TRT-15, TRT-14, TRT-6, TRT-7, TRT-11,TRT-3, and TRT-13. The NEV network mitigation measure assumes the low end of the CAPCOA recommendations.


CalEEMod.2013.2
Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help
Cascade Defaults
Mitigation
Construction Traffic Area Energy Water Solid Waste
Land Use & Site Enhancement Commute
Project Setting
*The mitigation should be applicable to land use project evaluated. "Remarks" box should contain percent reduction justification.
Import csv
Land Use
Increase Density [LUT-1]
Dwelling Units/acre
Jobs/Job acre
Increase Diversity [LUT-3]
Improve Walkability Design [LUT-9]
Intersections/Square Miles
Improve Destination Accessibility [LUT-4]
Distance to Dwntwn/Job Ctr (Miles)
Increase Transit Accessibility [LUT-5]
Distance to Transit Station (Miles)
Integrate Below Market Rate Housing [LUT-6]
#Dwelling Units Below Market Rate
Neighborhood Enhancements
Improve Pedestrian Network [SDT-1]
Provide Traffic Calming Measures [SDT-2]
% Streets with Improvement
% Intersections with Improvement
Implement NEV Network [SDT-3]
Parking Policy/Pricing
Limit Parking Supply [PDT-1]
% Reduction in Spaces
Unbundle Parking Costs [PDT-2]
Monthly Parking Cost ($)
On-Street Market Pricing [PDT-3]
% Increase in Price
Transit Improvement
Provide BRT System [TST-1]
% Lines BRT
Expand Transit Network [TST-3]
% Increase Transit Coverage
Increase Transit Frequency [TST-4]
Level of Implementation
% Reduction in Headways
<< Previous
Next >>
Remarks

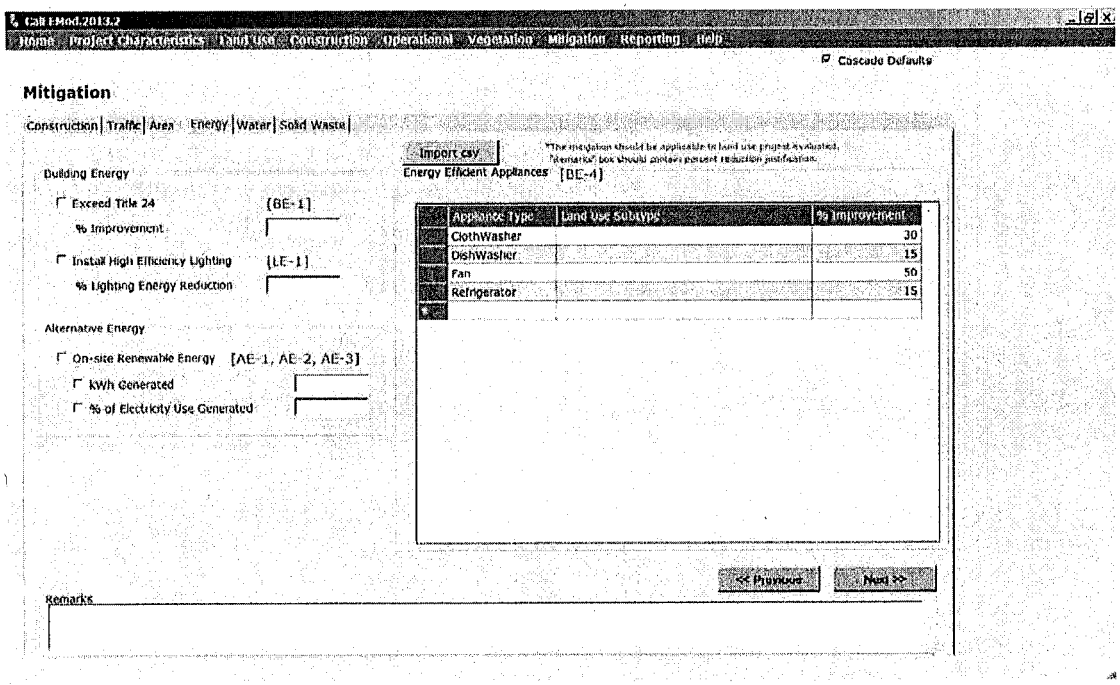

CalEEMod.2013.2
Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help
Cascade Defaults
Mitigation
Construction Traffic Area Energy Water Solid Waste
Land Use & Site Enhancement Commute
Commute Trip
Implement Trip Reduction Program [TRT-1, TRT-2]
% employee eligible
Program Type
Transit Subsidy [TRT-4]
% employee eligible
Daily Transit Subsidy Amount ($)
Implement Employee Parking "Cash-Out" [TRT-15]
% employee eligible
Workplace Parking Charge [TRT-14]
% employee eligible
Daily Parking Charge ($)
Encourage Telecommuting and Alternative Work schedules [TRT-6]
% employee work 9/80
% employee work 4/40
% employee telecommute 1.5 days
Market Commute Trip Reduction Option [TRT-7]
% employee eligible
Employee Vanpool/Shuttle [TRT-11]
% employee eligible
% vanpool mode share
Provide Ride Sharing Program [TRT-3]
% employee eligible
School Trip
Implement School Bus Program [TRT-13]
% family using
*The mitigation should be applicable to land use project evaluated. "Remarks" box should contain percent reduction justification.
Import csv
<< Previous
Next >>
Remarks

4.11.3 Area Mitigation

The user can select from a few area source mitigation measures by checking the appropriate box and supplying any additional information in the text boxes. These measures include all natural gas hearths, no hearths, electric landscaping equipment use, reduced VOC coatings, and reduced consumer product VOC content. The area landscaping mitigation to prohibit gas powered landscape equipment is consistent with the mitigation number A-1 in the CAPCOA Quantifying GHG Mitigation document.

4.11.4 Energy Mitigation

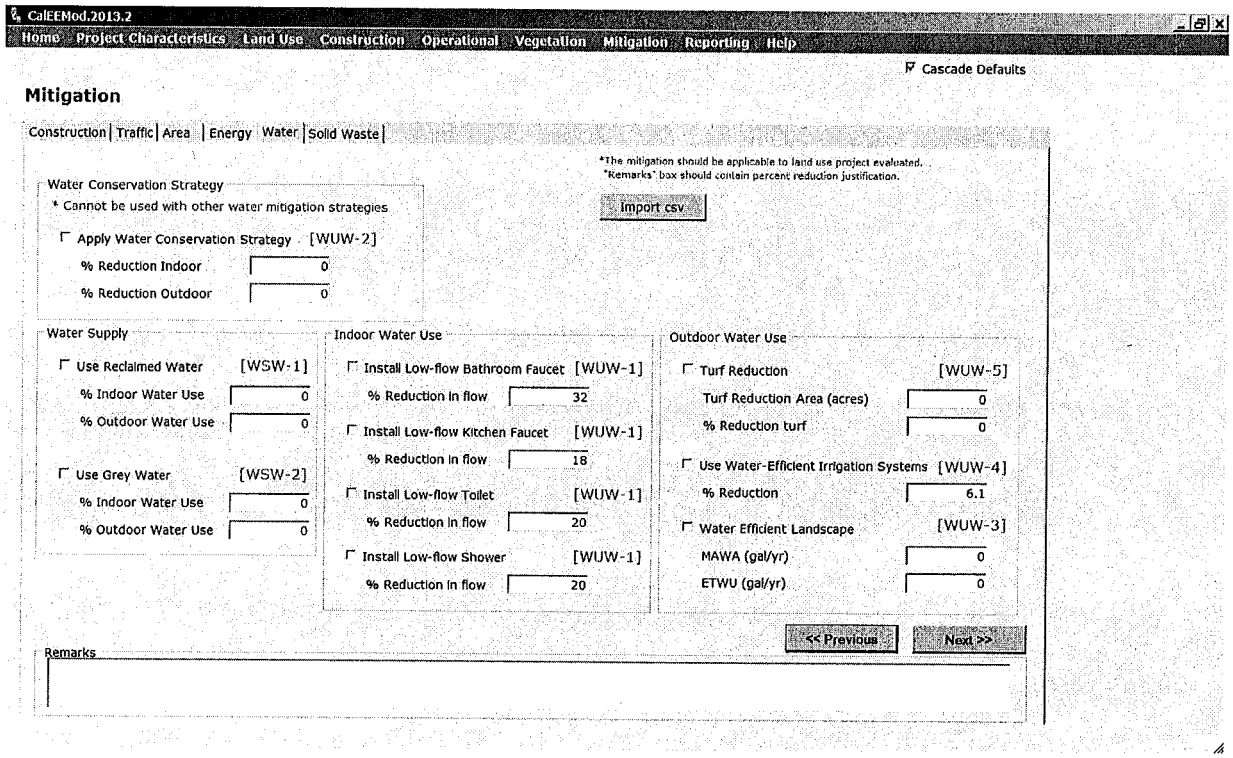
The user selects energy mitigation measures by using check boxes or a datagrid. These correspond to CAPCOA Mitigation Measures LE-1, BE-1, AE-1, AE-2, AE-3 and BE-4 as listed in the CAPCOA Quantifying GHG Mitigation document. The lighting is a percentage reduction in lighting as supplied by the user. The datagrid is used to enter the land use subtypes that will use energy efficient appliances. The percent improvement is the typical percent improvement above standard appliances according to the 2008 Energy Star Annual Report[14]. Alternative Energy has two methods to enter the amount of alternative energy. The first is the amount of kWhr generated. The second is the percentage of the total electricity use by buildings that is generated. At this time alternative energy methods that are not carbon neutral are not quantified. To apply the amount of alternative energy only one of the two methods (kWhr or percentage) needs to be entered for CalEEMod to calculate emission reductions.



14 Available at http://www.epa.gov/cpd/annualreports/annualreports.htm

4.11.5 Water Mitigation

Water mitigation can either be estimated as the percent reduction based on a water conservation strategy or the other individual mitigation measures. The CAPCOA Quantifying GHG Mitigation document includes water supply and use measures WSW-1 & 2, WUW-1 through 5. For CAPCOA Mitigation Measure WSW- 3 (Use Locally Sourced Water Supply), using locally-sourced water or water from less energy-intensive sources reduces the electricity and indirect CO_2 emissions associated with water supply and transport because water from local or nearby groundwater basins, nearby surface water and gravity-dominated systems have smaller energy-intensity factors. Therefore, for WSW-3, the user should alter the energy intensity values in water and run a separate CalEEMod run to accommodate these values.

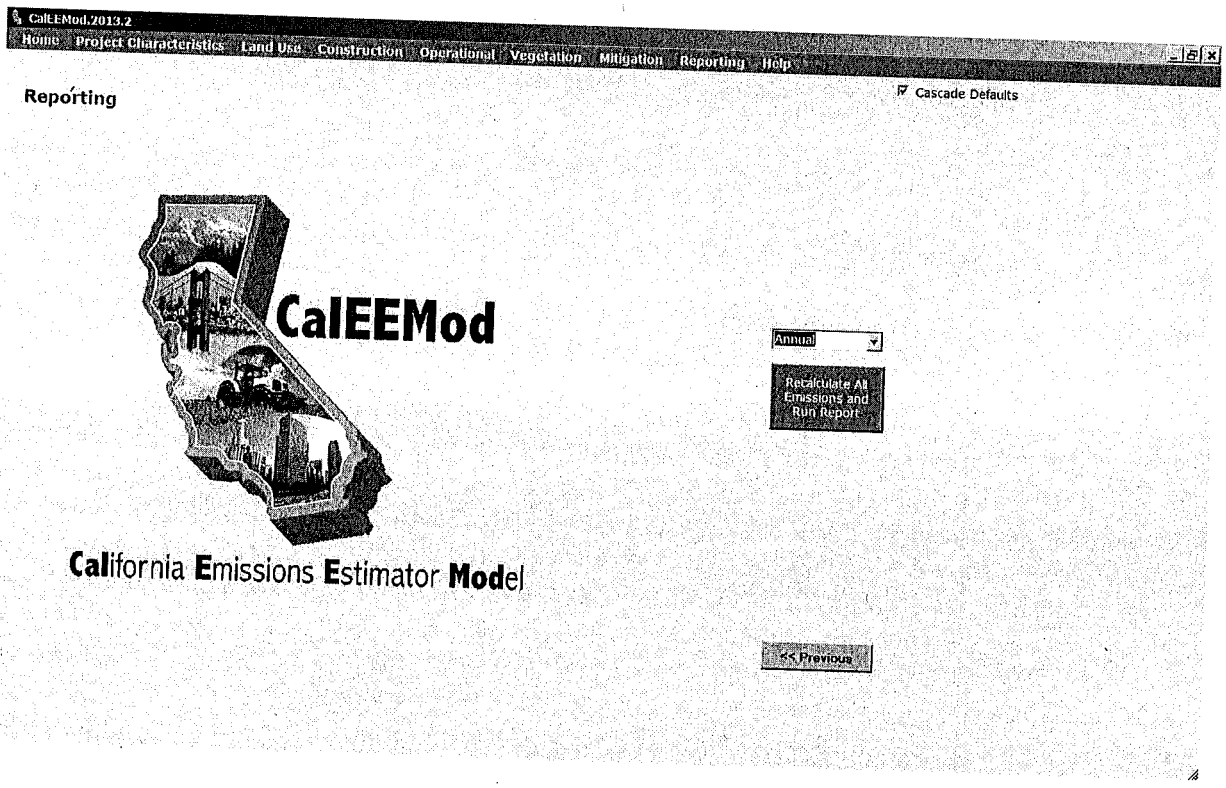


4.11.6 Solid Waste Mitigation

The user can get a reduction for recycling waste. This mitigation measure corresponds to CAPCOA Mitigation Measure: SW-1.

4.12 Reporting

The user initiates final calculations by selecting the report and clicking on the button. The available reports include: Annual, Summer (peak) Daily, Winter (peak) Daily and Mitigation. A separate report viewer will come up. From this report viewer, the user can view their report on-screen, print reports, save as Microsoft excel file or save as a pdf file, or in the case of the Mitigation report, a Microsoft doc file. The data in the excel file has already been calculated and placed in the grids as text, thus, for example, one cannot change an emission value and expect the report to change the summed total value. These values, however, can be copied to new excel spreadsheet for any further desired calculation with the data.



ATTACHMENT B

Memorandum

Date:	April 20, 2016
To:	Peterson Z. Vollmann, City of Oakland
From:	ICF International
Subject:	**2400 Valdez Project – Response to Comment Letter from Adams Broadwell Joseph & Cardozo**

The CEQA Analysis for the 2400 Valdez Street Project was published on March 28, 2016. This memorandum provides responses to the letter providing comments on the "Addendum" for the 2400 Valdez Street Project (PLN15-336) prepared by Adams Broadwell Joseph & Cardozo dated April 19, 2016, as well as the technical comments prepared by Matt Hagemann and Jessie Jaeger, which were attached to that letter (hereafter, collectively "Adams Broadwell submittal"). The responses are organized into the following topics, which correspond with the topics in the comment letter:

A) Consistency with the Broadway Valdez District Specific Plan (BVDSP)

B) Adequacy of the Project Description

C) Heath Risk Assessment (HRA)

D) Greenhouse Gas (GHG) Emissions analysis

E) Project-specific hazards

Section A. Response to Comment Regarding the Consistency with the BVDSP

Section A of the Adams Broadwell submittal asserts that the Project is inconsistent with the BVDSP because the conceptual development scenario in the BVDSP assumed commercial uses and not residential units. This assertion misunderstands how the BVDSP and its EIR analyzed the plan's environmental impacts. For reference, Table 1 in the CEQA Analysis includes a comparison of the BVDSP Development Program, Illustrative Development Program Map, and the proposed project.

First, Appendix D of the BVDSP is the "Illustrative Development Plan Program Map" that outlines conceptual dwelling unit counts and commercial use square footage. The BVDSP EIR actually assumed build-out conditions with certain "worst case" development assumptions in order to conservatively assess the BVDSP's full range of impacts on the environment. As part of this analysis, the City derived a maximum number of allowable trips under the full build-out scenario against which individual projects are measured. The BVDSP did not "lock in" precise land uses for this EIR analysis as suggested in the Adams Broadwell submittal. Rather, the BVDSP contemplated that uses would evolve and, as long as the impacts fall within the maximum development analyzed in the BVDSP EIR, additional CEQA analysis is

unnecessary. This is the case for the project. Specifically, with respect to traffic impacts, the trips generated by the project would fall within the trips analyzed in the BVDSP EIR as stated on page 4 of the CEQA Analysis:

> *Together with trips generated by other projects that are currently under construction, approved, or proposed for development in the Plan area, this would represent approximately 34 percent of the AM and 38 percent of the PM peak-hour trips anticipated in the BVDSP EIR, 57 percent of the AM and 54 percent of the PM peak-hour trips anticipated in the BVDSP EIR for the Valdez Triangle subarea, and 42 percent of the AM and 29 percent of the PM peak-hour trips anticipated in the BVDSP EIR for Subdistrict 2.*

Second, the fact that the project proposes mixed use with retail and residential instead of pure commercial does not render the project "inconsistent" with the BVDSP's goals and policies for purposes of CEQA. The project not only satisfies the pertinent CEQA provisions relied upon in the CEQA Analysis, but the project squarely conforms to the vision and goals set forth in the BVDSP. The project site is designated as Retail Priority Site 4a, which favors minimum retail requirements in order to attract a meaningful, ground floor presence to that section of Valdez Avenue. Importantly, the Project succeeds in advancing the key BVDSP goals and policies by:

- Attracting destination retail in order to reduce the City's sales tax leakage (LU-1);
- Catering to the City's comparison shopping needs (LU-8);
- Enhancing the identity of the BVDSP area as a retail destination (LU-1.1);
- Balancing retail with residential uses that contribute to the creation of a "24-hour" neighborhood (LU-1.3);
- Establishing the Broadway Valdez District as an attractive, transit-oriented and pedestrian-friendly mixed-use neighborhood with a core of complementary retail uses (LU-2.1);
- Featuring street-oriented retail in an attractive, pedestrian-oriented environment that provides vibrant, active sidewalks and safe public spaces (LU-8.6);
- Promoting a complementary mix of retail and residential uses that helps create a vibrant urban corridor that is active both day and night and on weekdays and weekends (LU-9.2).

The project is "consistent with the overlaying plan" and it also does not result in new or more significant impacts than previously analyzed. Therefore, the project appropriately relies on the BVDSP EIR and the preparation of a new EIR is unsubstantiated by the Adams Broadwell submittal.

Section B. Response to Comment Regarding the Adequacy of the Project Description

Section B of the Adams Broadwell submittal asserts that the CEQA Analysis fails to meet the requirements of CEQA because the Project Description does not include a description of on-site hazards. The CEQA Analysis includes a detailed project description, which includes detailed project characteristics, circulation, bicycle facilities, landscaping, employment, and construction information in accordance with CEQA. The analysis included throughout the CEQA Analysis also provides substantial evidence that, for each environmental topic, there are no unique or peculiar impacts that would occur for the project site. The BVDSP EIR assumed that hazardous materials typical of urban infill sites would

be present throughout the Plan Area. Therefore, the presence of hazardous materials on the site is not unique or peculiar to the project or the project site. Due to the depth of the water table and the depth of excavation proposed for many other projects in the Plan Area, construction dewatering is commonly required within the Plan Area. Dewatering activities are highly regulated to ensure the public health is protected. Therefore, the construction dewatering required for the project is not unique or peculiar to the project or the project site.

In addition, the potential for construction dewatering is adequately disclosed in the CEQA Analysis and sufficiently conveys the potential for impacts as required under CEQA. In addition to State regulations, Standard Condition of Approval (SCA)-HAZ-2 requires that all approved recommendations in the Phase I ESA and Phase II ESA (if applicable) be adhered to. In addition to complying with recommendations in the Phase I and II ESAs, as described in the attached letter prepared by ENGEO (included as Attachment A to this document), dewatering activities are regulated by the NPDES process overseen by the RWQCB. Adherence to this process ensures that pollutant discharge is minimized. Through compliance with State regulations, the project must ensure that impacts to workers, the public, and hydrological resources are not significant. Because of the regulated nature of dewatering activities for this kind of urban infill development, these activities would not result in significant impacts to the environment and would not require analysis in an EIR.

Section C. Response to Comment Regarding the Heath Risk Assessment

Section C of the Adams Broadwell submittal asserts that the Air Quality Screening Analysis prepared for the project incorrectly failed to consider the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter. The Air Quality Screening Analysis prepared for the project by ICF is included as Attachment E to the CEQA Analysis.

Page 4.2-27 of the BVDSP EIR specifies that the construction health risks would be minimized through application of SCA-AIR-1, which requires the following: exposed surfaces be watered; trucks hauling sand, soil, and other loose materials be covered; visible dirt track-out be removed daily; new roads, driveways, sidewalks be paved within one month of grading or as soon as possible, stockpiles be enclosed, covered, and watered twice daily; vehicle speeds on unpaved roads be limited; and idling time be limited. Diesel emissions would be minimized through the application of SCA-AIR-1. Specifically, subsections (g) and (h) of SCA-AIR-1 minimize idling; subsection (i) ensures that construction equipment is running in proper condition; subsection (j) specifies that portable equipment would be powered by electricity if available; subsection (u) requires that equipment meet emissions and performance requirements; subsection (v) requires the use of low volatile organic compound coatings; subsection (w) requires that equipment and diesel trucks be equipped with Best Available Control Technology; and subsection (x) requires that off-road heavy diesel engines meet the California Air Resources Board's most recent certification standard. The BVDSP EIR does not require a stand-alone health risk assessment for construction-related impacts. The construction-related health risk was conservatively assumed to be significant and unavoidable in the BVDSP EIR and construction associated with the project could not result in a more severe impact than what was previously disclosed and analyzed. Moreover, all applicable SCAs mentioned in the BDVSP EIR were applied to the CEQA analysis.

The risk reduction strategies laid out under Mitigation Measure AIR-4 do not apply to the project because the analysis shows that, based on conservative assumptions, the cumulative cancer risk to the project's sensitive receptors would be less than 100 in one million. The risk to surrounding sensitive

receptors, when combined with local cancer risks from cumulative sources within 1,000 feet, also would be less than 100 in one million. Bullet 1 of Mitigation Measure AIR-4 states that the first step in determining applicability of a Risk Reduction Plan is the demonstration using screening analysis or health risk assessment that risks are fewer than 100 in one million. Furthermore, the CEQA Analysis conservatively assumed that a generator would be on-site. Subsequent to the preparation of the CEQA Analysis, it has been determined that the project will not have a backup generator; therefore, the Risk Reduction Plan elements of Mitigation Measure AIR-4 do not apply.

Section D. Response to Comment Regarding the Greenhouse Gas Emissions Analysis

Section D of the Adams Broadwell submittal asserts that the GHG analysis incorrectly used California Emissions Estimator Model Version CalEEMod.2013.2.2 (CalEEMod) default values, did not analyze the total amount of demolition material, and inconsistent energy use values were inputted into CalEEMod. The Greenhouse Gases and Climate Change Screening Analysis prepared for the project by ICF is included as Attachment F of the CEQA Analysis.

The BVDSP EIR evaluated impacts related to GHG emissions from construction and operation anticipated under the BVDSP. The EIR identified motor vehicle use, water, gas, electrical use, loss of vegetation, and construction activities as contributing to generation of GHG emissions under the implementation of the BVDSP. Future projects and development implemented under the BVDSP would be required to be consistent with the City of Oakland Energy and Climate Action Plan, and with SCAs that would reduce GHG emissions during construction and operation of projects. Even with implementation of SCAs, the BVDSP EIR determined that GHG impacts would conservatively remain significant and avoidable.

The inputs into CalEEMod for the GHG analysis were based on the best information from the project applicant, 2400 Valdez, LLC, available at the time the analysis was prepared. Typically the CalEEMod default values are based on more conservative assumptions than what would be typical for this kind of urban infill development. If anything, use of the defaults would overstate the GHG emissions. In no case, however, are the GHG emissions estimated for the project by ICF "greatly underestimated" as asserted in the Adams Broadwell submittal.

The project would require excavation of only up to 42,000 cubic yards (cy) of material only. The CEQA Analysis inadvertently stated that an additional 42,000 cy of demolition materials would be required for the project. As such, in total, the project would require the export of 42,000 cy of material (not 84,000 cy). The GHG analysis correctly analyzes the export of 42,000 cy of material. Thus, GHG emissions based on 84,000 cy of excavation, as asserted in the Adams Broadwell submittal would overstate emissions.

The Adams Broadwell submittal correctly asserts that it is typical to conduct just one model run to estimate construction and operational emissions. In this case, the construction and operational data was not received at one time, so CalEEMod was run twice, which resulted in two output files. Conducting two separate model runs did not affect the integrity of the results. However, the construction CalEEMod output files in Appendix F-1 show unused construction output and vice versa (the operational CalEEMod output files show unused construction outputs). This is due to the method by which CalEEMod exports data. Nevertheless, the results from both CalEEMod runs indicate that construction emissions for all pollutants would be well below the Bay Area Air Quality Management District significance thresholds.

The GHG emission results, including the emissions per service population estimate of 45.1 MT CO2e/yr, presented in the Adams Broadwell submittal are highly unusual for any kind of urban infill project and appear to be grossly overstated when considering the appropriate BAAQMD methodology to establish significance.

The City's SCA 38 requires a project applicant to prepare a GHG Reduction Plan to increase energy efficiency and reduce GHG emissions to the greatest extent feasible below the BAAQMD CEQA thresholds. The City of Oakland has adopted the BAAQMD's CEQA thresholds of 1,100 metric tons CO_2e per year or 4.6 metric tons CO_2e per service population per year. As stated in Attachment F to the CEQA Analysis, the project's GHG emissions would be below 4.6 tons per year per service population but would exceed the emissions threshold of 1,100 metric tons per year. The analysis in Attachment F indicates that the project would not fall under any of the three scenarios that would require development of a GHG reduction plan under SCA 38. Therefore, the project would be consistent with the City of Oakland's Energy and Climate Action Plan, as well as the BVDSP, and a GHG reduction plan is not required. In the event the GHG emissions generated by the project exceeded the City's GHG thresholds, the project would be required to prepare a GHG Reduction Plan.

Based on the analysis above, the GHG analysis prepared for the project by ICF is accurate, adequate, and supported by substantial evidence.

Section E. Response to Comment Regarding Project-Specific Hazards

Section E of the Adams Broadwell submittal asserts that the CEQA Analysis failed to adequately analyze the site-specific hazards, including hazardous materials on the site and recommendations from the Phase I ESA. Regulatory Agency oversight is not required for the project site since no significant impacts have been identified. Based on the Phase II ESA soil data, it is not anticipated that any soil from the site would need to be disposed as Class I hazardous waste. As discussed previously, cobalt and lead concentrations detected at the site are statistically below the background concentrations observed in the San Francisco Bay Area, and concentrations of motor-oil are below the most recent residential screening levels. Therefore, regulatory review at the State or County level is not required for the project.

As discussed in the Phase I ESA[1] and Phase II ESA, two groundwater-monitoring wells currently exist on the site. According to a previous Phase II report, the monitoring wells had been previously installed by Lowney Associates as a part of their geotechnical investigation for the owner. Prior to grading and development activities at the site, well construction details would be evaluated, and these wells will be abandoned in accordance with the State and local regulations. As previously stated, SCA-HAZ-2 requires that all approved recommendations in the Phase I ESA and Phase II ESA (if applicable) be adhered to. The abandonment of wells is commonly required within the Plan Area. Therefore, the abandonment of wells required for the project is not unique or peculiar to the project or the project site.

---

[1] ENGEO. 2015. *Phase I Environmental Site Assessment, 2412 Valdez Street, Oakland, California.* Project No. 12238.000.000. July 28. (See Attachment G to the CEQA Analysis)

Attachment A

ENGEO
Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
12238.000.000

April 20, 2016

Ms. Erin Efner
ICF International
620 Folsom Street, 2nd Floor
San Francisco, CA 94107

Subject: 2400 Valdez Street
Oakland, California

RESPONSE TO ADAMS, BROADWELL, JOSEPH & CARDAZO COMMENTS

References:
1. Adams, Broadwell, Joseph and Cardazo; *Comments on the Addendum for the 2400 Valdez Street Project (PLN15-336)*; April 19, 2016.
2. SWAPE; *Comments on the 2400 Valdez Street Project*; April 13, 2016.

Dear Ms. Efner:

As requested we are providing our response to comments provided in the referenced Adams, Broadwell, Joseph and Cardazo (ABJC) and SWAPE letters regarding the subject site (Site).

As shown in the results of the Phase II sampling, the Site was found to be relatively "clean" compared to other sites in the Broadway Valdez. The analytes detected in the soil samples at the Site were either within background concentrations, or below the corresponding screening levels, with the exception of one isolated sample. Contrary to the assertion made by ABJC, concentrations of lead and cobalt are statistically below the background concentrations[1] observed in the San Francisco Bay Area. Moreover, concentrations of motor-oil detected in soil are below the most recent soil exposure Environmental Screening Levels (ELSs)[2] for residential land use established by the San Francisco Regional Water Quality Control Board (RWQCB). One isolated sample (out of a total of 21 discrete and composite samples) at a depth of 1 foot was reported with an elevated lead level; however, the deeper samples (5 and 10 feet) collected at this location exhibited lead at concentrations consistent with background levels.

[1] Kearney, Background Concentrations of Trace Metals and Major Elements in California Soils, March 1996.
[2] RWQCB, Soil Direct Exposure Human Health Screening Levels for Residential Land Use (Table S-1), February 2016.

As a part of the proposed development (garage excavation), soils will be excavated across the entire Site to a depth of approximately 25 feet. All soil to a depth of 25 feet will be excavated and properly disposed of offsite. The excavation and disposal of soil at the Site will comply with the protocols set forth in the Broadway Valdez Specific Plan EIR

- *Section B:*

Construction dewatering will be conducted at the Site as a part of the development activities. Groundwater samples collected during the phase II study exhibited low levels of volatile organic compounds (VOCs) at the Site, and dissolved metals at concentrations within the background levels, but in all cases groundwater results were below applicable discharge limits. A National Pollutant Discharge Elimination System (NPDES) permit will be applied for from the RWQCB for dewatering activities at the site, as per State regulations. The NPDES application includes all data from the Phase II. Construction water generated is planned to be discharged to the storm drain under this permit. Any necessary treatment (e.g. filtration or carbon treatment) required by this permit would be implemented prior to discharging in the storm drain.

- *Section E:*

Regulatory Agency oversight is not required for this Site, since no significant impacts have been identified. Based on the comprehensive Phase II soil data and ENGEO's professional experience, we concluded that no excavated soil will need to be disposed as Class I hazardous waste from the Site. As discussed previously, cobalt and lead concentrations detected at the Site are statistically below the background concentrations observed in the San Francisco Bay Area, and concentrations of motor-oil are below the most recent residential screening levels; therefore, regulatory review at the State or County level is not required for this project.

As discussed in the Phase I and Phase II reports, two groundwater-monitoring wells currently exist on the Site. According to a previous Phase II report, the monitoring wells had been previously installed by Lowney Associates as a part of their geotechnical investigation for the owner. Prior to grading and development activities at the Site, well construction details will be evaluated, and these wells will be abandoned in accordance with the State and local regulations.

If you have any questions about the contents of this letter or require additional information, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated

Divya Bhargava, PE
Senior Engineer

Shawn Munger, CHG
Principal

db/sm/bvv

ATTACHMENT C

SheppardMullin

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File Number: 16DW-218907

April 20, 2016

VIA ELECTRONIC MAIL ONLY

Chairman Jim Moore
and Members of the Planning Commission
City of Oakland
250 Frank Ogawa Plaza
Oakland, CA 94612

Re: 2400 Valdez—PLN15-336

Dear Chairman Moore and Members of the Planning Commission:

On behalf of The Hanover Company (Hanover), we are writing regarding the 2400 Valdez mixed-use project in Oakland, CA (Project). Hanover is very excited to bring this transformative project forward to enliven the Broadway Valdez District Specific Plan (BVDSP) area for the reasons set forth below. This letter also briefly refutes certain points raised in a comment letter submitted at about 5:00 PM yesterday.

I. The Hanover Proposal

A. The Project

Hanover proposes to develop a new seven-story, mixed-use building comprised of 225 dwelling units and approximately 23,000 square feet of ground floor retail. The majority of the retail space will be provided along the Valdez frontage at the intersection of 27th Street with a large floorplate able to attract and accommodate a large format retailer for the area which will complement the Project's new public plaza as envisioned in the BVDSP. Additional retail and restaurant space will be included along the Valdez Street frontage at the intersection of 24th Street. The residential lobby, parking and loading access will be located mid-block along Valdez.

B. BVDSP

The BVDSP vision was developed by way of thorough environmental and economic analysis with input from the City's decision-makers, landowners, developers, real estate experts, and community members. The result is a comprehensive planning framework for the BVDSP area that establishes goals, policies, and development regulations that govern the future growth for the area.

The Project is fully consistent with the BVDSP goals/policies because it seeks to create a new, mixed-use development located on a prominent, retail priority site within the Valdez Triangle. It is consistent with the underlying zoning because the Project is located on Retail Priority Site 4a, which requires a fixed amount of ground floor retail be provided in order to construct residential units above. The Project will activate a ground floor presence on the site with over 23,000 square feet of new retail space that will create a vibrant, pedestrian-oriented environment along Valdez Street, extending the new Valdez retail corridor all the way from Grand Avenue to 27th Street. The retail square footage is large enough to attract a desired anchor tenant for the neighborhood. The Project will reconfigure 27th and Valdez Streets to install the pedestrian plaza envisioned for that intersection in the BVDSP. Lastly, the Project will provide high density, residential units that will be in close proximity to transit and transform the area into a 24-hour neighborhood.

C. Public Benefits

The transformation of the Project site into a vibrant, activated mixed-use community will bring significant benefits to the City of Oakland (City). By conforming to the BVDSP goals and policies, the Project contributes significant public benefits to the community that are briefly summarized here:

- Provides 225 much-needed, market-rate residential units to the City's housing stock;
- Meets the requirement for Retail Priority Site 4a by providing 23,465 square feet of retail;
- Reconfigures 27th/Valdez to accommodate a pedestrian plaza for public use;
- Activates ground-floor retail with residences above that provide "eyes on the street' for a safer environment;
- Offers a clean, modern design with high quality materials that responds to its context by way of massing, use of color, and the inclusion of pedestrian-scaled detailing;
- Extends the Valdez retail corridor to 27th Street;
- Delivers both retail and housing uses in close proximity to transit;
- Contributes substantial economic benefit to the City through retail sales tax revenue and property taxes.

II. Response to "Comments on the Addendum for the 2400 Valdez Street Project" (Comments)

The BVDSP Environmental Impact Report (BVDSP EIR) analyzed the environmental impacts of the adoption and implementation of the BVDSP at full build out and provided project-level review for reasonably foreseeable development, such as the Project. The City Council certified the BVDSP EIR in accordance with the California Environmental Quality Act (CEQA) on June 7, 2014 and the analysis now is presumptively valid under California law. Since that certification, the City has created and relied upon a framework for analyzing projects within the BVDSP area called "CEQA Analysis," which separately and independently provides a basis for CEQA compliance. This framework relies on the following applicable streamlining and tiering sections of CEQA:

- **Community Plan Exemption**—CEQA Guidelines Section 15183, which allows streamlined environmental review for projects that are "consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified, except as might be necessary to examine whether there are project specific significant effects which are peculiar to the project or its site." Section 15183(c) specifies that "if an impact is not peculiar to the parcel or to the proposed project, has been addressed as a significant effect in the prior EIR, or can be substantially mitigated by the imposition of uniformly applied development policies or standards ... , then an EIR need not be prepared for the project solely on the basis of that impact."
- **Qualified Infill Exemption**—CEQA Guidelines Section 15183 .3 allows streamlining for certain qualified infill projects by limiting the topics subject to review at the project level, if the effects of infill development have been addressed in a planning level decision, or by uniformly applying development policies or standards. Infill projects are eligible if they are located in an urban area on a site that either has been previously developed or that adjoins existing qualified urban uses on at least 75 percent of the site's perimeter; satisfy the performance standards provided in CEQA Guidelines Appendix M; and are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy. No additional environmental review is required if the infill project would not cause any new specific effects or more significant effects, or if uniformly applicable development policies or standards would substantially mitigate such effects.
- **Addendum**—CEQA Guidelines Section 15164 states that an addendum to a certified EIR is allowed when minor changes or additions are necessary and none of the conditions for preparation of a subsequent EIR or Negative Declaration pursuant to Section 15162 are satisfied.

The City has relied upon this CEQA Analysis framework since 2014 for the following residential BVDSP projects—all of which have been approved and whose CEQA Analysis has gone unchallenged:

- 3093 Broadway
- 23rd and Valdez
- 2315 Valdez
- 2630 Broadway
- 2270 Broadway

Therefore, not only is this the first comment letter of its kind on the City's CEQA Analysis for BVDSP projects, but the Comments ignore the Project's reliance on the aforementioned exemptions and, instead, only call into question the Project's reliance on the "Addendum." By disregarding the City's reliance on separate and independent bases for the Project's CEQA compliance, the conclusions set forth in the Comments lack merit. As outlined in exhausting detail, the assumptions and conclusions in the Project's CEQA Analysis are supported by substantial evidence in accordance with CEQA, while none of the assertions presented in the Comments provide persuasive, additional substantial evidence that the Project would result in a

new, significant environmental impact or a substantial increase in the severity of an environmental impact than determined in the BVDSP EIR. In fact, the Comments reflect numerous misinterpretations of applicable CEQA thresholds for determining significance, and mistake many material facts about the Project to justify its conclusions. Therefore, we support the City's determination that the conclusions in the CEQA Analysis are valid and **preparation of an EIR is not warranted.**

III. Conclusion

Hanover is excited to deliver a viable, transformative mixed-use project on a retail priority site within the Valdez Triangle. The Hanover team has worked extensively with Planning Staff, the neighborhood and consultants to deliver a project that satisfies the spirit and intent of the BVDSP and its zoning. This is exemplified by providing the opportunity for large-format, destination retail in a pedestrian-friendly environment where residents can further benefit from the Project's close proximity to transit, services, shopping and entertainment. We urge the Planning Commission to accept Planning Staff's recommendation, approve the Project, and stay the course with respect to its ongoing reliance on CEQA Analysis under the BVDSP EIR.

Thank you for your consideration.

Sincerely,

//signed//

Jennifer Renk
for SHEPPARD MULLIN RICHTER & HAMPTON LLP

cc: Peterson Z. Vollman
Mark Wald, Esq.

SMRH:476754000.4

ATTACHMENT D

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

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April 27, 2016

Laura E. Horton
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd., Suite 1000
South San Francisco, CA 94080

Subject: **Response to Comments on the 2400 Valdez Street Project**

Dear Ms. Horton:

We have reviewed the April 20 2016 Memorandum the City's consultant ICF International, which addressed comments that we made on the 2400 Valdez Street Project ("Project") in a April 19, 2016 letter. The comment letter we prepared addressed deficiencies in the March 28, 2016 CEQA Analysis ("CEQA Analysis") and associated attachments. After our review, we maintain that the CEQA Analysis falls well short in describing and mitigating the Project's Hazards and Hazardous Waste, Air Quality, and Greenhouse Gas impacts. The County should not approve the Project until it prepares an environmental impact report (EIR) that adequately evaluates and mitigates the risks to health and the environment that will be caused by the Project.

Greenhouse Gas

Unsubstantiated Input Parameters Used to Estimate Project Emissions

In our April 19 letter, we concluded that the Project's Greenhouse Gas (GHG) Screening Analysis ("GHG Analysis") was flawed because the air pollution model relied upon demolition estimates and energy and natural gas usage factors that differ from those described in the CEQA Analysis. While the Memorandum, which includes responses to our comments on the CEQA Analysis, responds to our initial concern regarding the demolition estimates, clarifying that the Project "would require excavation of only up to 42,000 cubic yards (cy) of material," the Memorandum fails to address the discrepancy found between the energy and natural gas usage values used within the two air models (p. 4 of 5). As a result, the air pollution model prepared in the GHG analysis is still inaccurate and cannot be relied upon to determine Project significance. A revised air pollution model should be prepared and circulated for public review in an EIR in order to accurately assess the Project's GHG impact, and incorporate all feasible mitigation measures, including the City's Standard Conditions of Approval, available to reduce those impacts to less than significant levels.

Inconsistent Energy Use Input Values

In our April 19 letter, we found that the Energy Use and Natural Gas values inputted into the construction CalEEMod model were inconsistent with the Energy Use values inputted into the operational CalEEMod model. As a result, the Project's pollution models are inaccurate and should not be relied upon to determine Project significance.

To reiterate what was discussed in our April 19 letter, CalEEMod is an inclusive model that allows the user to model both construction and operational emissions for a proposed Project within the same model. As such, most CEQA evaluations estimate the Project's construction and operational emissions in one model. Contrary to this common practice, the CEQA Analysis prepares two separate CalEEMod models – one for construction and one for Project operation. Usually, when a user models construction and operational emissions separately, the input values for the scenario not being modeled during that run are set to zero to avoid any confusion. For example, if a user is estimating just the construction emissions of a proposed project, they would set each of the operational input values to zero, such as Energy and Natural Gas use. Review of the Project's CalEEMod output files, however, demonstrates that the CEQA Analysis failed to set the operational input values to zero for the construction run, and failed to set the construction input values to zero for the operational run. Not only did they fail to zero-out the appropriate inputs, they actually applied site-specific operational information to the construction model that was provided by the Applicant, but then failed to apply this same site-specific operational information to the operational model. This discrepancy between the operational input values present an important issue, as site-specific information for the operational model should have been utilized. By relying on the CalEEMod default values, rather than the site-specific information, the Project's operational model is inaccurate and should not be used to determine Project significance.

Specifically, the CEQA Analysis inputs site-specific Energy Use and Natural Gas values into the construction model, but then relies on CalEEMod default Energy Use and Natural Gas values for the operational model. As you can see in the excerpt below, every default Energy Use Value and default Natural Gas value within the construction model was adjusted to reflect Project-specific usage (default values in left column, site-specific values in right-most column) (CEQA Analysis, pp. 154).

tblEnergyUse	LightingElect	741.44	1,230.49
tblEnergyUse	LightingElect	5.51	1,186.48
tblEnergyUse	NT24E	2,561.86	4,251.64
tblEnergyUse	NT24E	3.36	723.51
tblEnergyUse	NT24NG	1,662.00	619.47
tblEnergyUse	NT24NG	0.70	218.75
tblEnergyUse	T24E	312.05	517.88
tblEnergyUse	T24E	2.74	590.01
tblEnergyUse	T24NG	7,191.67	2,680.53
tblEnergyUse	T24NG	4.10	1,281.25

The User Entered Comments provides insight on how these Project-specific values were derived, stating that they "Used an Excel spreadsheet to break down the applicant provided Energy and NG info" (CEQA Analysis, pp. 154). These Energy Use values, while adjusted in the construction model, reflect the Energy

Use that will occur during Project operation. The April 20 2016 Memorandum did not dispute this point. Therefore, the Project-specific Energy Use and Natural Gas values inputted into the construction model should have also been used within the Project's operational model. When we reviewed the operational model, however, we found that default Energy Use and Natural Gas values provided by CalEEMod were used, rather than the Project-specific values disclosed in the construction model (see excerpt below) (CEQA Analysis, pp. 179).

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	224,000.00	179,545.00
tblLandUse	LotAcreage	2.08	0.00
tblLandUse	LotAcreage	5.89	1.10
tblLandUse	Population	641.00	419.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblTripsAndVMT	HaulingTripNumber	213.00	5,250.00
tblVehicleTrips	ST_TR	7.16	3.77
tblVehicleTrips	ST_TR	49.97	24.26
tblVehicleTrips	SU_TR	6.07	3.77
tblVehicleTrips	SU_TR	25.24	24.26
tblVehicleTrips	WD_TR	6.59	3.77
tblVehicleTrips	WD_TR	42.94	24.26

CalEEMod provides recommended default values based on site specific information; however, if more specific project information is known, the user should change the default values and input project-specific values in an effort to accurately estimate emissions.[1] The User Entered Comments provided in the construction model clearly indicate that the non-default Energy Use values are specific to the Project's operational energy and natural gas consumption. Furthermore, the Project-specific Energy Use and Natural Gas values used within the construction model are much higher than the CalEEMod default values used within the operational model. By failing to include these Project-specific Energy Use and Natural Gas values within the operational model, the Project's operational emissions are greatly underestimated.

Updated Analysis Indicates Significant Greenhouse Gas Emissions

In response to the Memorandum, we prepared an updated air model using the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod"),[2] omitting all emissions related to material generated during demolition. The results of our analysis demonstrate that when correct input parameters are used, GHG emissions will still exceed both of the numerical thresholds provided under Scenario A, Criterion C.[3] As such, a GHG Reduction Plan must be prepared under SCA 38.

We inputted 229 parking spaces and 225 dwelling units into our updated model, which is consistent with information provided in the CEQA Analysis. Furthermore, we assumed that only 42,000 cubic yards of material would be generated during the excavation phase and that no additional material would be

[1] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/
[2] CalEEMod website, *available at*: http://www.caleemod.com/
[3] Refer to page 2 of this report for additional details on these numerical thresholds.

generated during demolition, which is consistent with the clarification provided in the Memorandum. Finally, we utilized the Project specific Energy Use and Natural Gas values provided in the construction model to estimate the Project's operational emissions (see table below).

Energy Use		
	Parameter	**Input Value**
Apartments Mid-Rise	Lighting Energy Intensity (KWhr/size/yr)	1,230.49
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	4,251.64
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	619.47
	Title-24 Electricity Energy Intensity (KWhr/size/yr	517.88
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	2,680.53
Strip Mall	Lighting Energy Intensity (KWhr/size/yr)	1,186.48
	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	723.51
	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr)	218.75
	Title-24 Electricity Energy Intensity (KWhr/size/yr	590.01
	Title-24 Natural Gas Energy Intensity (KBTU/size/yr)	1,281.25

When correct input parameters are used within the model, we find that the Project's operational emissions increase significantly when compared to the emissions estimated in the Project's GHG Screening Analysis. Furthermore, we find that the Project's operational GHG emissions exceed both of the numerical thresholds disclosed under Scenario A, Criterion C (1,100 $MTCO_2e/yr$ and the efficiency threshold of 4.6 $MTCO2_2/yr/sp$) (see tables below).

Total Project Emissions		
	Greenhouse Gas Emissions (MT CO2e/Yr)	
Activity	**CEQA Analysis**	**SWAPE Analysis**
Construction[4]	65	65
Operation	1,962	20,942
Total	**2,027**	**21,007**
Significance Threshold	1,100	1,100
Exceeds Threshold?	***Yes***	***Yes***

[4] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

Total Project Emissions		
	Greenhouse Gas Emissions Per Service Population (MT CO2e/SP/Yr)	
Activity	CEQA Analysis	SWAPE Analysis
Construction[5]	65	65
Operation	1,962	20,942
Total	**2,027**	**21,007**
Service Population[6]	466	466
Emissions Per Service Population	**4.3**	**45.1**
Significance Threshold	4.6	4.6
Exceeds Threshold?	*No*	***Yes***

As you can see in the tables above, our analysis demonstrates that the Project will produce approximately 21,007 MT CO_2e/year and approximately 45.1 MT CO_2e/sp/year when modeled correctly. Because both of the applicable thresholds are exceeded, the proposed Project does not comply with Scenario A, Criterion C (p. 4). As such, under Scenario A, the Project will require the development of a GHG Reduction Plan as set forth by SCA 38.

The Memorandum's conclusion states that an "emissions per service population estimate of 45.1 MT CO_2e/sp/year presented in the Adams Broadwell submittal are highly unusual for any kind of urban infill project" (p. 5 of 5). However, the reason the Project's GHG emissions are so high is not due to an error within our updated model, as is suggested within the Memorandum. Rather, it is due to the Project-specific Energy Use and Natural Gas values provided within the CEQA Analysis. Therefore, unless the Applicant can provide new, Project-specific Energy Use and Natural Gas values that are different to the ones provided in the CEQA Analysis, the emission estimates generated within our updated model are most representative of the Project's operational emissions. As such, the significance determination made within the CEQA Analysis is incorrect, as the Project will have a significant GHG impact. An EIR should be prepared to adequately evaluate the Project's GHG emissions, and a GHG Reduction Plan should be prepared prior to Project approval.

Air Quality

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

Our April 19 letter found that the CEQA Analysis fails to evaluate the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter (DPM) emissions released during Project construction. The Memorandum attempts to address our concerns on this matter, stating:

> "Section C of the Adams Broadwell submittal asserts that the Air Quality Screening Analysis prepared for the project incorrectly failed to consider the health risk posed to nearby sensitive

[5] Construction emissions were amortized over 40 years, which is consistent with methods used within the CEQA Analysis.

[6] Service Population refers to the total number of residents and employees the Project will generate.

receptors from exposure to diesel particulate matter. The Air Quality Screening Analysis prepared for the project by ICF is included as Attachment E to the CEQA Analysis.

Page 4.2-27 of the BVDSP EIR specifies that the construction health risks would be minimized through application of SCA-AIR-1, which requires the following: exposed surfaces be watered; trucks hauling sand, soil, and other loose materials be covered; visible dirt track-out be removed daily; new roads, driveways, sidewalks be paved within one month of grading or as soon as possible, stockpiles be enclosed, covered, and watered twice daily; vehicle speeds on unpaved roads be limited; and idling time be limited. Diesel emissions would be minimized through the application of SCA-AIR-1. Specifically, subsections (g) and (h) of SCA-AIR-1 minimize idling; subsection (i) ensures that construction equipment is running in proper condition; subsection (j) specifies that portable equipment would be powered by electricity if available; subsection (u) requires that equipment meet emissions and performance requirements; subsection (v) requires the use of low volatile organic compound coatings; subsection (w) requires that equipment and diesel trucks be equipped with Best Available Control Technology; and subsection (x) requires that off-road heavy diesel engines meet the California Air Resources Board's most recent certification standard. The BVDSP EIR does not require a stand-alone health risk assessment for construction-related impacts" (p. 3 of 5).

This justification, however, is incorrect for several reasons.

First, the Memorandum confuses the operational health risk assessment, which is included as Attachment E to the CEQA Analysis, with a construction health risk assessment, which was not conducted within the CEQA Analysis at all. To clarify, the CEQA Analysis fails to assess the health risk impacts from construction-related diesel particulate matter (DPM) emissions. As was discussed in our April 19 letter, by failing to quantify the risk associated with Project construction, the CEQA Analysis is inconsistent with guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, which was formally adopted in March of 2015.[7] This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 24 months, from June 2016 to June 2018. OEHHA recommends that all short-term projects lasting longer than two months be evaluated for cancer risks to nearby sensitive receptors.[8] This recommendation reflects the most recent health risk assessment policy, and as such, the health risk for Project construction should be quantified and evaluated against the numerical significance threshold established by the Bay Area Air Quality Management District (BAAQMD).

[7] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[8] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18

Second, simply because "the construction health risks would be minimized through application of SCA-AIR-1" does not justify the omission of an actual health risk assessment, as is suggested by the Memorandum (p. 3 of 5). Again, as was stated in our April 19 letter, although the Project would require implementation of Standard Conditions of Approval (SCAs) and Transportation Demand Management (TDM) to control construction emissions (p. 22), the risk should still be quantified to determine which measures must be applied to reduce DPM emissions and if the measures proposed under SCA-AIR-1 will reduce emissions to levels that will not cause a significant impact. Both the CEQA Analysis and the Memorandum fail to actually evaluate the adequacy of the mitigation measures listed under SCA-AIR-1. As a result, the Project's health risk assessment is incomplete, and should not be relied upon to determine Project significance.

Finally, simply because "the BVDSP EIR does not require a stand-alone health risk assessment for construction-related impacts" still does not justify the omission of a construction-related health risk assessment from the CEQA Analysis (p. 3 of 5). The BVDSP EIR is not the regulatory agency responsible for providing recommendations for health risk assessments in California. As a result, this justification for the omission of a proper, construction-related health risk assessment is inadequate.

Therefore, the screening-level health risk assessment we provided in our April 19 letter remains valid and its calculations undisputed by the City's consultant. The results of our assessment, as described in our previous letter, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact. As a result, a refined health risk assessment must be prepared and included in an EIR to examine the air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules.

Hazards and Hazardous Waste

Standard Conditions of Approval HAZ-1 through HAZ-3 include no provisions for the preparation of a soil management plan to govern safe handling of contaminated soils that have been documented at the Project site. The preparation of soil management plans is routine to protect health of workers and the public and an EIR should be prepared to include requirements for such a plan, as mitigation.

The Memorandum includes a consultant's report (Appendix A) that states:

> As a part of the proposed development (garage excavation), soils will be excavated across the entire Site to a depth of approximately 25 feet. All soil to a depth of 25 feet will be excavated and properly disposed of offsite. The excavation and disposal of soil at the Site will comply with the protocols set forth in the Broadway Valdez Specific Plan EIR (p. 2).

The Broadway Valdez Specific Plan EIR contains no specific provisions for the preparation of a soil management plan to ensure the safe excavation of soils at the project site under regulatory supervision. The preparation of such plans is routine where there are concerns that the public or workers may come into contact with conditions that may pose a health hazard. For example, at a 2014 Port of Oakland project, Standard Conditions of Approval were included as follow[9]

[9] http://www.portofoakland.com/pdf/environment/195_Hegenberger_DEIR-web.pdf, p. 2-5

4.D-1a: Prior to issuance of building permit, the project applicant shall notify the San Francisco Regional Water Quality Control Board (RWQCB) of planned construction activities. The applicant shall retain a qualified environmental consultant to prepare a Soil Management Plan to protect site workers and the environment. The Soil Management Plan should include pre-construction and pre-development controls, construction controls, and post construction controls along with any modifications or requests made by the RWQCB or DTSC (overseeing agency) into project specifications. Construction controls shall include the preparation of a health and safety plan along with the requirement that all workers including subcontractors have OSHA 40-hour health and training. The health and safety plan shall include at a minimum, a summary of the known contaminants at the site, a copy of the Material Data Safety Sheets for each contaminant, a description of required personal protective equipment to be worn by site workers, protocol for the discovery of any suspected contaminated materials during excavation, a map of the nearest emergency medical facility, and emergency contact information.

Consistent with other Oakland-area projects, an EIR should be prepared to include a requirement for the preparation of a soil management plan. The plan must be prepared by qualified professionals for submittal to the RWQCB to ensure protection of public health.

Sincerely,

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

Jessie Jaeger