Planning and Inspection Department
Planning Division
1500 Warburton Avenue
Santa Clara, CA 95050
Ph: (408) 615-2450

Appeal Form

Instructions

Use this form to appeal a decision of the Architectural Review Committee or Planning Commission. **All appeals must be filed in the Planning Division within seven calendar days of the action being appealed**.

Appeals from the Architectural Review Committee are made to the Planning Commission and will be set for hearing on the next available Planning Commission agenda. Appeals from the Planning Commission are made to the City Council and will be placed on the subsequent City Council Agenda to set a hearing date. Please contact the Planning Division at the number listed above with any inquiries about the process.

Please print, complete, and sign this form before mailing or delivering to the City, along with the fee payment, and supporting documentation, letters, etc. (if any).

Appeal Fees

Appeal Fees are set by the Municipal Code of the City of Santa Clara and are subject to annual review. Please call the Planning Division for the current Appeal Fee. **Fee payment must be received by the City of Santa Clara before this form submittal can be certified as complete**.

Appeal fees may be paid by cash, check, or with VISA, MasterCard, or American Express, at the Permit Center at City Hall. Alternatively, checks or money orders made payable to City of Santa Clara can be mailed or delivered to Planning Division, City Hall, 1500 Warburton Avenue, Santa Clara, California 95050.

Appellant Declaration

Name: Collin McCarthy on behalf of California Unions for Reliable Energy

Street Address: 520 Capitol Mall, Suite 350

City, State, Zip Code: Sacramento, CA 95814

Phone number: (916) 444-6201

E-mail address: cmccarthy@adamsbroadwell.com

In accordance with the provisions of the Municipal Code of the City of Santa Clara, I hereby appeal the following action of the:

☑ Architectural Review Committee ☐ Planning Commission

at it's meeting of 4-18-2018 .
(date)

Agenda Item No.: 8.F

File No.(s): PLN2017-12535 / CEQ2017-01034

Address:/APN(s): 2305 Mission College Blvd. APN: 104-13-096

Appellant Statement
(If more space is required, attach a separate sheet of paper.)

Action being appealed:

Please see attached letter.

Reason for Appeal:

Please see attached letter.

Certification of Authenticity

Beware, you are subject to prosecution if you unlawfully submit this form. Under penalty of law, transmission of this form to the City of Santa Clara is your certification that you are authorized to submit it and that the information presented is authentic.

Signature of Appellant

4-24-2018
Date

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April 24, 2018

Via Overnight Mail:

Planning Division
City Hall
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Via Email Only:
Steve Le
Planning Division
Email: sle@santaclaraca.gov

Re: **Appeal of the Adoption of a Mitigated Negative Declaration and Architectural Approval for 2305 Mission College Boulevard Data Center (PLN2017-12535 & CEQ2017-01034)**

Dear Planning Division:

We are writing on behalf of California Unions for Reliable Energy ("CURE"), Anthony Hernández and Edme Hernández (collectively, "Appellants") to appeal the April 18, 2018 decision of City of Santa Clara ("City") Architectural Committee ("Committee") to adopt a Mitigated Negative Declaration ("MND") and grant Architectural Approval for the 2305 Mission College Boulevard Data Center Project ("Project"). At the April 18, 2018 public hearing, the Architectural Committee accepted the City staff's recommendation and adopted the MND and approved the Project subject to certain conditions.

The Project, proposed by PR III 2305 Mission College Boulevard, LLC, involves the construction of a 495,610 square-foot data center facility that would include 60 megawatts ("MW") of informational technology power, a generator yard,

an equipment yard for battery and electrical equipment, and parking. The Project would include 120 diesel-fueled engine generators to provide 75 MW of backup power generation capacity. The Project also proposes to construct a new 90 megavolt amps Silicon Valley Power electrical substation. The 15.7-acre Project site is located at 2305 Mission College Boulevard in the City of Santa Clara.

On April 12, 2018, CURE filed extensive comments on the deficiencies of MND, which were prepared with the assistance of technical expert Dr. Phyllis Fox, Ph.D, PE. CURE's comments, as well as Dr. Fox's comments and curricula vitae are incorporated by reference as if fully set forth herein and are attached to this letter as Attachment 1. Additionally, we appeared on behalf of CURE at the Committee's April 18, 2018 public meeting and provided oral comments on the Project. The written and oral comments must be included as part of the Project's record.

I. Statement of Interest

CURE is a coalition of labor organizations whose members construct, operate, and maintain powerplants and other industrial facilities throughout California. CURE encourages sustainable development of California's energy and natural resources. Environmental degradation destroys cultural and wildlife areas, consumes limited water resources, causes air and water pollution, and imposes other stresses on the environmental carrying capacity of the State. Environmental degradation also jeopardizes future jobs by making it more difficult and expensive for industry to expand in Santa Clara, and by making it less desirable for businesses to locate and for people to live and recreate in the area. Continued environmental degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn, reduce future employment opportunities for CURE's participating organizations and their members. CURE therefore has a direct interest in enforcing environmental laws and minimizing project impacts that would degrade the environment.

CURE's participating organizations and their members also live, recreate, work, and raise families in the City of Santa Clara and Santa Clara County. CURE, its participating organizations and their members stand to be directly affected by the Project's adverse environmental and health impacts. Members may also work on the Project itself, and would therefore be first in line to be exposed to any health and safety hazards that the Project may create.

Similarly, Anthony Hernández and Edme Hernández live in the City of Santa Clara and would be directly affected by the Project's environmental and health and safety impacts.

II. Basis for the Appeal

Appellants raise three general grounds for this appeal. First, the City lacks permitting authority to approve the Project in the absence of a Small Power Plant Exemption, as required by the Warren Alquist Act, Public Resources Code section 25000 et seq. Second, the City failed to comply with the California Environmental Quality, Public Resources Code section 21000, et seq. and Title 14, California Code of Regulations section 15000 et seq. (collectively, "CEQA") when it adopted the MND and granted Architectural Approval for the Project. Third, the City lacks evidence to support its findings that the Project complies with the standards of design required for Architectural Approval set forth in the City Code.

First, the City lacks authority to approve the Project because it includes a thermal powerplant component – backup diesel generators – with a generating capacity greater than 50 megawatts (MW). Under the Warren Alquist Act, Public Resources Code section 25500, the California Energy Commission ("CEC") has exclusive jurisdiction to approve powerplants exceeding 50 megawatts of generating capacity. As seen in the case of other Santa Clara data center projects, diesel-fueled backup generators serving data center facilities are encompassed within the scope of the CEC's jurisdiction where the collective generating capacity exceeds 50 MW. The CEC may exempt thermal powerplants with a generating capacity of up to 100 MW if it finds that no substantial adverse impact on the environment or energy resources will result from the construction or operation of the proposed facility.[1] However, the granting of a Small Power Plant Exemption requires a CEC determination. Here, the project includes 120 diesel generators with a combined generating capacity of 75 MW and the Applicant has not obtained an SPPE, thus the Project remains subject to the powerplant siting jurisdiction of the CEC.

Second, the City's MND fails to comply with the requirements of CEQA. CURE's comments on the MND, including the expert comments submitted by Dr. Phyllis Fox, provide substantial evidence in support of a fair argument that the Project may result in potentially significant impacts on the environment. Specifically, CURE's comments provide substantial evidence supporting a fair

[1] Pub. Resources Code § 25541.

argument that the Project may result in significant environmental impacts as a result of operational noise from emergency equipment; indirect greenhouse gas emissions; nitrogen oxide emissions from backup generator operation; and construction-related particulate matter. Planning Division staff offered limited responses to some of the issues raised in CURE's comments in the hours before the Committee hearing. However, the City's responses do not resolve the issues raised in CURE's comments.

The City's responses also wholly failed to respond to the comments submitted by Dr. Fox, which identified the following omissions in the MND and potentially significant and unmitigated impacts of the Project:

- The Project description is not adequate to evaluate environmental impacts.
- Greenhouse gas (GHG) emissions are significant and unmitigated.
- The air quality analyses are incomplete because they fail to include any air dispersion modeling of Project construction and operational emissions to verify compliance with ambient air quality standards.
- Ozone impacts were not evaluated and are likely cumulatively significant.
- Maximum daily PM10 and PM2.5 emissions during construction are significant and unmitigated.
- Maximum daily NOx emissions during construction are likely significant and unmitigated when discrepancies in the CalEEMod inputs are resolved.
- Operational emissions are underestimated and the IS/MND does not contain sufficient information to correct the omissions.
- Daily NOx emissions from routine emergency operation of the diesel generators are significant and unmitigated.
- Noise impacts during emergency operation are significant and unmitigated.
- Battery impacts were not disclosed or evaluated.
- Cumulative impacts were not evaluated for most impact areas.[2]

Dr. Fox's comment letter was also omitted from the City's Staff Report to the Architectural Committee despite being timely submitted.

[2] Attachment 2. Letter from Collin McCarthy to Santa Clara Architectural Committee & Steve Le regarding 2305 Mission College Boulevard Data Center Project – Mitigated Negative Declaration and Architectural Approval (PLN2017-12535 and CEQ2017-01034)

Third, as explained in our April 18, 2018 letter to the Architectural Committee members, the Project's potentially significant and unmitigated impacts show that the Committee lacks substantial evidence to make the findings required to grant Architectural Approval under the Santa Clara City Code. Santa Clara City Code section 18.76.020, subsection (c), provides that the Committee must find that the Project is based on the following standards of architectural design, among others:

> (2) That the design and location of the proposed development and its relation to neighboring developments and traffic is such that it will not impair the desirability of investment or occupation in the neighborhood, will not unreasonably interfere with the use and enjoyment of neighboring developments, and will not create traffic congestion or hazard.
> …
> (4) That the granting of such approval will not, under the circumstances of the particular case, materially affect adversely the health, comfort or general welfare of persons residing or working in the neighborhood of said development, and will not be materially detrimental to the public welfare or injurious to property or improvements in said neighborhood.[3]

As our comments on the MND demonstrate, substantial evidence shows that the Project may have several significant impacts on the environment notwithstanding the proposed mitigation measures. These impacts relate directly to the Project's potentially significant impacts on public health and the use and enjoyment of neighboring properties. The design and location of the proposed development and its relation to neighboring developments and traffic is such that it will unreasonably interfere with the use and enjoyment of neighboring developments. In addition, granting the approval may also materially affect adversely the health, comfort or general welfare of persons residing or working in the neighborhood of the Project, and be materially detrimental to the public welfare or injurious to property or improvements in said neighborhood.

III. Relief Requested

CURE requests that the City grant this appeal, rescind the April 18, 2018 Architectural Committee decision to adopt the MND and grant Architectural Approval. It is further requested that City abstain from considering any future

[3] S.C.C.C. § 18.76.020(c) (Underline added).

approval of the Project until the Applicant obtains a Small Power Plant Exemption from the California Energy Commission, consistent with the Warren-Alquist Act and the CEC's implementing regulations. By doing so, the City and public can ensure that all adverse environmental and public health impacts of the Project are adequately analyzed, disclosed, and mitigated as necessary as is required by law. The City and the public can also ensure that the approval of this powerplant project proceeds in the manner directed by law.

IV. Procedural Requirements for Appeals

CURE has satisfied the procedural requirements for an appeal of a decision of the Architectural Committee as set forth in the Santa Clara City Code. City Code, section 18.76.020(h) states:

> (h) In the event the applicant or others affected are not satisfied with the decision of the architectural committee, he may within seven days after such decision appeal in writing to the Planning Commission. Said appeal shall be taken by the filing of a notice in writing to that effect with the City Planner. The Planning Commission actions are appealable to the City Council in accordance with the procedures set forth in SCCC 18.108.060. The architectural committee may refer any application for architectural consideration to the Planning Commission for its decision with the same effect as if an appeal had been taken.

Here, the Architectural Committee made its decision on the adoption of the MND and approval of the Project on April 18, 2018. This letter and the attached appeal form constitute notice in writing of the appeal.

We have also enclosed a check for $400.00 for the appeal fee for non-applicants.

Thank you for your consideration of this appeal to the Planning Commission.

Sincerely,

Collin S. McCarthy

CSM:ljle

Attachments

Attachment 1

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April 12, 2018

Via Email & Overnight Mail:

Steve Le
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Email: sle@santaclaraca.gov

Re: 2305 Mission College Boulevard Data Center Project Initial Study and Mitigated Negative Declaration Comments (PLN2017-12535 and CEQ2017-01034)

Dear Mr. Le:

We are writing on behalf of California Unions for Reliable Energy ("CURE") to provide comments on the Initial Study and proposed Mitigated Negative Declaration ("IS/MND") prepared by the City of Santa Clara ("City") for the 2305 Mission College Boulevard Data Center Project ("Project"). The 15.7-acre Project site is located at 2305 Mission College Boulevard in the City of Santa Clara. The site is currently occupied by a two-story 358,000 square-foot office building and parking lot. PR III 2305 Mission College Boulevard, LLC ("Applicant") is proposing to demolish the existing development to construct a 495,610 square-foot data center facility, including a generator yard, equipment yard, underground storage, and parking. The Project will include a total of 120 diesel-fueled engine generators to provide 75 megawatts ("MW") of backup power generation capacity and a new 90 megavolt amps electrical substation.

Based on our review of the IS/MND, we conclude that the document fails to comply with the requirements of the California Environmental Quality Act ("CEQA"). First, as explained more fully below, the IS/MND fails to adequately describe several elements of the Project and a result fails to disclose information that is necessary to meaningfully assess the impacts that the Project may have on

human health and the environment. Additionally, the IS/MND fails to identify all of the Project's potentially significant impacts and to propose mitigation to avoid or lessen impacts to a less than significant level. As explained in these comments, there is more than a fair argument that the Project will cause significant air quality and noise impacts. Furthermore, substantial evidence supports a fair argument that the Project's greenhouse gas ("GHG") emissions will result in a cumulatively considerable contribution to global climate change and are therefore significant. For each of these reasons, the City cannot approve the Project until an Environmental Impact Report ("EIR") is prepared that adequately discloses and analyzes the Project's potentially significant impacts and incorporates all feasible mitigation to avoid or lessen these impacts.

Finally, as discussed in Section X below, because the Project includes a thermal powerplant component exceeding 50 MW, the City cannot approve the Project until the California Energy Commission issues a certification or exemption pursuant to its exclusive powerplant siting authority.

These comments were prepared with the assistance of technical expert Dr. Phyllis Fox, Ph.D, CEQ, PE, DEE. Dr. Fox's technical comments and curriculum vitae are attached to this letter as Attachment 1 and are submitted to the City in addition to the comments contained herein.[1]

I. Statement of Interest

These comments are submitted on behalf of CURE. CURE is a coalition of labor organizations whose members construct, operate, and maintain powerplants and other industrial facilities throughout California. CURE encourages sustainable development of California's energy and natural resources. Environmental degradation destroys cultural and wildlife areas, consumes limited water resources, causes air and water pollution, and imposes other stresses on the environmental carrying capacity of the State. Environmental degradation also jeopardizes future jobs by making it more difficult and expensive for industry to expand in Santa Clara, and by making it less desirable for businesses to locate and for people to live and recreate in the area. Continued environmental degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn,

[1] Attachment 1. Dr. P. Fox, Comments on the Initial Study/Mitigated Negative Declaration (IS/MND) for the 2305 Mission College Boulevard Data Center (Apr. 5, 2018) ("Fox Comments").

reduce future employment opportunities for CURE's participating organizations and their members. CURE therefore has a direct interest in enforcing environmental laws and minimizing project impacts that would degrade the environment.

CURE's participating organizations and their members also live, recreate, work, and raise families in the City of Santa Clara and Santa Clara County. Thus, CURE, its participating organizations and their members stand to be directly affected by the Project's adverse environmental and health impacts. Members may also work on the Project itself, and would therefore be first in line to be exposed to any health and safety hazards that the Project may create.

II. Applicable Legal Standard

The California Environmental Quality Act ("CEQA") has two basic purposes, neither of which the IS/MND satisfies in this case.

First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.[2] In the context of CEQA, "environment" means the physical conditions that exist within the affected area and include land, air, water, minerals, flora, fauna, noise, or objects of historic or aesthetic significance.[3] Under CEQA and the CEQA Guidelines, if a project is not exempt and may cause a significant effect on the environment, the lead agency must prepare an EIR.[4]

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and the implementation of all feasible mitigation measures.[5] If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[6]

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[2] 14 C.C.R. § 15002(a)(1).
[3] Pub. Resources Code ("PRC") § 21060.5.
[4] PRC §§ 21100, 21151; 14 C.C.R. § 15064(a)(1), (f)(1).
[5] 14 C.C.R. § 15002(a)(2) and (3); see also, *Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564.
[6] PRC § 21081; 14 C.C.R. § 15092(b)(2)(A)-(B).

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an EIR, except in certain limited circumstances.[7] The EIR is the heart of CEQA[8] and 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."[9] An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project *may* have a significant effect on the environment."[10] The EIR aids an agency in identifying, disclosing, analyzing, and, to the extent possible, avoiding a project's significant environmental effects through implementing feasible mitigation measures.[11]

In certain limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement indicating that a project will have no significant impact. However, because "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process" by allowing the agency to dispense with the duty to prepare an EIR, negative declarations are allowed only in cases where there is not even a "fair argument" that the project will have a significant environmental effect.[12]

In some circumstances, a project with potentially significant impacts can be modified by the adoption of mitigation measures to reduce the impacts to a level of insignificance. In such cases, an agency may satisfy its CEQA obligations by preparing a mitigated negative declaration.[13] However, a mitigated negative declaration is also subject to the same "fair argument" standard. Thus, an EIR is required whenever substantial evidence in the record supports a "fair argument" that significant impacts may occur as a result of the project even with the imposition of mitigation measures.

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[7] See, e.g., PRC § 21100.
[8] *Dunn-Edwards v. Bay Area Air Quality Management Dist*. (1992) 9 Cal.App.4th 644, 652.
[9] *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs*. (2001) 91 Cal. App. 4th 1344, 1354 ("*Berkeley Jets*") (citing *Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 392); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[10] PRC § 21080(d) (emphasis added); 14 C.C.R. § 15064; see also *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927; *Mejia v. City of Los Angeles* (2005) 13 Cal. App. 4th 322.
[11] PRC § 21002.1(a); 14 C.C.R. § 15002(a), (f).
[12] *Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440; PRC §§ 21100, 21064.
[13] PRC § 21064.5; 14 C.C.R. § 15064(f)(2).

CEQA contains a strong presumption in favor of requiring a lead agency to prepare an EIR. The "fair argument" standard reflects this presumption. The fair argument standard is an exceptionally low threshold favoring environmental review in an EIR rather than a negative declaration.[14] As noted above, this standard requires preparation of an EIR if any substantial evidence in the record indicates that a project may have an adverse environmental effect.[15] As a matter of law, substantial evidence includes both expert and lay opinion based on fact.[16] Even if other substantial evidence supports a different conclusion, the agency nevertheless must prepare an EIR.[17]

With respect to the Project at hand, the IS/MND fails to satisfy either of CEQA's two most fundamental purposes. First, the IS/MND lacks critical information on several elements of the Project and thereby fails to inform the public and decisionmakers of the Project's potentially significant impacts on the environment and human health. Second, substantial evidence demonstrates that the Project may cause significant noise, air quality, and GHG-related impacts, and the IS/MND fails to include sufficient measures to avoid or lessen these impacts to less than significant level. CEQA requires that these impacts be analyzed in an EIR in order to inform the public and decisionmakers of the potential impacts from the Project, to consider alternatives, and to identify and incorporate mitigation measures to reduce these and other harmful impacts.[18]

III. The IS/MND Fails to Describe Critical Project Components and Is Inadequate As An Informational Document

The IS/MND first violates CEQA because it fails to adequately describe several components of the Project, including the Project's aboveground storage tanks and batteries. The IS/MND also fails to disclose information on the Project's anticipated electricity usage. The omission of this information renders the IS/MND

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[14] *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 928.

[15] 14 C.C.R. § 15064(f)(1); *Pocket Protectors,* 124 Cal.App.4th at 931.

[16] PRC § 21080(e)(1) (For purposes of CEQA, "substantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact."); 14 C.C.R. § 15064(f)(5).

[17] *Arviv Enterprises v. South Valley Area Planning Comm*. (2002) 101 Cal.App.4th 1333, 1346; *Stanislaus Audubon v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-151; *Quail Botanical Gardens v. City of Encinitas* (1994) 29 Cal.App.4th 1597.

[18] See *Security Environmental Systems v. South Coast Air Quality Management District* (1991) 229 Cal.App.3d 110.

inconsistent with CEQA's fundamental purpose of disclosure and inadequate as an informational document. It also prevents full consideration of the Project's potentially significant environmental impacts.

CEQA requires that before a negative declaration can be issued, the initial study must "provide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment."[19] Here, as Dr. Fox's comments explain, the IS/MND's failure to disclose information on several critical components of the Project makes it impossible for the public and decisionmakers to meaningfully evaluate the potential environmental impacts of the Project, to identify the required mitigation, and to assess the effectiveness of the mitigation measures proposed.

First, the IS/MND states that the Project will include twenty-four (24) 10,000-gallon aboveground diesel fuel storage tanks. However, the IS/MND glosses over potential impacts from these storage tanks, and offers no analysis to support its conclusion that hazardous materials and air quality impacts will be less than significant. The IS/MND indicates that "there would be minor evaporative emissions of ROG"[20] (reactive organic gases) from the aboveground storage tanks, but its discussion of the emissions is a single sentence that "emissions of ROG from fuel storage are expected to be negligible."[21] The IS/MND does not describe the type of diesel storage tanks to be used in the Project beyond stating that they will be double-walled tanks. As Dr. Fox notes, information on tank type, such as floating or fixed roof, is critical because ROG emissions from diesel storage tanks may vary, particularly on hot weather days.[22]

Furthermore, ROG emissions would occur during the transfer of diesel into the storage tanks. The IS/MND does not disclose fuel transfers as a source of emissions.[23] There is no information on how or how often diesel fuel will be delivered and transferred to the storage tanks, no discussion of the related potential impacts, and no discussion of what measures will be implemented to avoid such impacts from occurring.

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[19] 14 C.C.R. § 15063(c)(5).
[20] IS/MND at p. 33.
[21] Id. at p. 34.
[22] Fox Comments at p. 30.
[23] Id.

Second, the IS/MND mentions that backup battery equipment will be located in a separate equipment yard in the northern portion of the Project site.[24] However, with the exception of a few brief sentences indicating that batteries will be used in the Project, there is no explanation of what purpose the batteries will serve, or the potential impacts associated with large scale battery usage. Batteries can result in significant environmental and safety impacts depending on the type and arrangement of the batteries and their particular chemical makeup.[25] For example, it is widely known that lithium ion batteries pose serious and unique fire fighting challenges.[26] Water is a poor retardant due to the chemicals present in lithium ion batteries, and facility layout may prevent adequate fire-fighting access.[27] Additionally, battery transport, use, and disposal may result in hazardous materials impacts which are compounded by the Project site's proximity to residences, places of work, and major roadways.[28] None of these potential impacts are disclosed or evaluated in the IS/MND.

Third, the IS/MND fails to disclose the Project's anticipated electricity usage. According to the IS/MND, "[t]he primary function of the data center is to house computer servers, which require electricity and cooling 24 hours a day to operate."[29] With 60 MW of "information technology power"[30] and supporting equipment operating 24 hours a day, it is likely the Project's electricity demand is substantial. And while it may be assumed that the anticipated electricity usage is at least 75MW based on the Project's backup generating capacity, it is never stated that the backup generators would provide the equivalent amount of electricity needed for operations in a daily, non-emergency scenario. As discussed further below, the Project's substantial electricity demand will contribute to Project emissions as result of power generation, particularly GHGs.[31] These emissions are an environmental effect resulting from the Project. Without disclosing the Project's total energy demand, it is impossible to meaningfully evaluate the MND's analysis

[24] IS/MND at p. 6.
[25] See Fox Comments at pp. 33-34.
[26] Id. at p. 33.
[27] Id.
[28] Id.
[29] IS/MND at p. 63 ("Data centers are an energy-intensive land use, requiring more electricity than other types of development.").
[30] Id. at p. 6.
[31] See Fox Comments at p. 3.

of Project emissions and to determine whether the City's conclusions are supported by substantial evidence.

In the absence of the above information on the Project's diesel storage tanks, batteries, and electricity usage, the IS/MND's project description is inadequate. Moreover, the IS/MND does not provide a sufficient factual basis, or substantial evidence, to support a determination that hazardous materials, air quality, and GHG impacts resulting from the Project will be less than significant. The City must disclose this information so that the public and decisionmakers can assess all of the Project's potentially significant impacts and ensure that the Project impacts are mitigated to a less than significant level.

IV. Substantial Evidence Supports A Fair Argument That The Project's Greenhouse Gas Emissions May Be Significant

A. The IS/MND Consistency Analysis Does Not Establish the Project's GHG Emissions Would Be Less Than Signficant

The IS/MND concludes that the Project's GHG emissions would not have a significant impact on the environment because the Project is consistent with the City of Santa Clara Climate Action Plan ("CAP") and other plans, policies, and regulations adopted for the purpose of reducing GHG emissions.[32] However, as explained more fully below, the IS/MND fails to establish that the Project's consistency with these plans and programs will ensure that the Project's contribution to global climate change is not cumulatively considerable. Furthermore, by relying on a qualitative consistency analysis, rather than calculating the Project's emissions, the IS/MND fails to disclose to the public significant GHG emissions that will result from the Project's energy usage. This approach conflicts with CEQA Guidelines section 15064.4(a), which instructs lead agencies to "make a good-faith effort . . . to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project."

As Dr. Fox's comments demonstrate, substantial evidence supports a fair argument that the Project's GHG emissions may be significant notwithstanding the Project's consistency with the Santa Clara CAP, General Plan, and other state and

[32] IS/MND at p. 70.

regional reduction programs. Accordingly, the City must prepare an EIR to disclose, analyze, and mitigate the Project's GHG emissions.

1. Consistency with the CAP and General Plan Does Not Support a Determination that GHG Emissions Would Be Less Than Significant

The CEQA Guidelines provide that a lead agency may analyze and mitigate GHG emissions resulting from certain activities in a defined geographic area in a qualified plan for the reduction of GHG emissions.[33] Lead agencies may then tier from or incorporate the analysis and mitigation contained in a GHG reduction plan when considering individual projects within the plan's scope. If the lead agency determines that an individual project is consistent with an adopted GHG reduction plan, it may be presumed that the Project's incremental contribution to climate change would be less than cumulatively considerable, or less than significant.[34]

CEQA Guidelines section 15064 specifies how to demonstrate consistency with a greenhouse gas reduction plan. That section states: "When relying on a plan, regulation or program [for the reduction of GHG emissions], the lead agency should explain how implementing the plan, regulation or program ensures that the project's incremental contribution to the cumulative effect is not cumulatively considerable." Additionally, the consistency analysis "must identify those requirements specified in the plan that apply to the project, and if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project."[35] However, "[i]f there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project."[36]

Here, the IS/MND considers the Project's consistency with the CAP and General Plan as its threshold of significance. First, the IS/MND considers whether

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[33] 14 C.C.R. § 15183.5; see also 14 C.C.R. §§ 15064(h)(3), 15064.4
[34] 14 C.C.R. § 15064.4(b); see also BAAQMD CEQA Guidelines (May 2017), pp. 4-4, 4-7.
[35] 14 C.C.R. § 15183.5(b)(2); BAAQMD CEQA Guidelines (May 2017), p. 4-4 ("A project must demonstrate its consistency by identifying and implementing all applicable feasible measures and policies from the GHG Reduction Strategy into the project.").
[36] 14 C.C.R. § 15183.5(b)(2).

or not the Project "conforms to the applicable reduction measures in the City's CAP."[37] The IS/MND also considers the Project's consistency with relevant provisions of the City of Santa Clara General Plan. The CAP, which was adopted in 2013 and is now part of the City's General Plan, is a qualified GHG reduction plan for purposes of CEQA.[38] The CAP identifies a series of measures intended to ensure the City "achieve[s] it fair share of statewide emissions reductions for the 2020 timeframe consistent with AB 32, the Global Warming Solutions Act."[39] As directed by the CEQA Guidelines, the IS/MND includes a section outlining the applicable CAP and General Plan provisions. The IS/MND then briefly describes how these measures apply to the Project. On this basis, the IS/MND concludes that the Project is consistent with the CAP and General Plan and therefore its GHG emissions will be less than significant.[40]

The IS/MND's conclusion that the Project will not result in significant GHG impacts because it is consistent with the City's CAP is not supported by substantial evidence for two reasons. First, because the CAP was adopted to achieve 2020 emissions reduction targets, consistency with the CAP does not support a determination that impacts will be less than significant beyond that year. Since the CAP was adopted, the state of California has adopted a more aggressive GHG emissions reduction target of 40 percent below 1990 levels by 2030.[41] This target was set in accordance with the latest scientific evidence regarding the degree of reduction needed to avoid further contributing to the devastating impacts of climate change.[42] As the City's CAP pre-dates the latest standards and scientific data, compliance with its measures alone does not provide substantial evidence that the Project's GHG impacts would be less than significant during the Project's operational life.

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[37] IS/MND at p. 63
[38] See 14 C.C.R. § 15183.5(b)(1); Santa Clara Climate Action Plan, p.8 (Dec. 3, 2013), *available at* http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan/climate-action-plan.
[39] IS/MND at p. 62.
[40] Id. at p. 70.
[41] Health & Safety Code § 38566 (SB 32).
[42] California's 2017 Climate Change Scoping Plan, California Air Resources Board pp. ES2-ES3, 2 (Nov. 2017), *available at* https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm; see also *Cleveland National Forest Foundation,* 3 Cal. 5th at 519 ("CEQA requires public agencies . . . to ensure that [greenhouse gas impact] analysis stay in step with evolving scientific knowledge and state regulatory schemes.")

CEQA requires that lead agencies consider the long term impacts of projects with long term operations, particularly in the context of GHG emissions.[43] As we approach the year 2020, the California Supreme Court and has counseled against relying on consistency with 2020 targets to evaluate the impacts of long term projects.[44] In *Center for Biological Diversity v. Department of Fish and Wildlife*, the California Supreme Court explained that, "over time consistency with year 2020 goals will become a less definitive guide, especially for long-term projects that will not begin operations for several years. An EIR taking a goal-consistency approach to CEQA significance may in the near future need to consider the project's effects on meeting longer term emissions reduction targets." Here, this passage is particularly relevant as it is likely the Project will not even commence operations prior to 2020. In short, the fact that the Project will not interfere with, or is consistent with, achieving the City's 2020 GHG reduction targets tells the public and decisionmakers little, if anything, about the significance of the Project's GHG emissions during the course of its entire operational life.

Second, as Dr. Fox's comments further explain, the majority of the applicable CAP and General Plan measures listed in the IS/MND do not even address the Project's primary source of GHGs. For example, with regard to transportation-related GHG emissions, the CAP requires that the project achieve "a 25 percent vehicle miles traveled (VMT) reduction, with 10 percent coming from [transportation demand program] measures."[45] However, as Dr. Fox comments demonstrate, transportation-related emissions make up just .043% of the Project's overall GHG-emissions.[46] Thus, the fact that the Project is "consistent" with the CAP in this area does little to reduce the Project's GHG emissions.[47]

The same holds true for the CAP's water conservation measures, waste reduction measures, and off-road equipment requirements. According to the IS/MND, these three categories make up the remainder of the CAP measures applicable to the Project.[48] For each, the IS/MND provides a brief paragraph

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[43] See 14 C.C.R. § 15126.2 (discussing impacts both during the "initial and continued phases of the project"); see also *Natural Resources Defense Council v. City of Los Angeles* (2002) 103 Cal.App.4th 268 (CEQA requires examination of the environmental impacts of "the entire project, from start to finish").
[44] *Center for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 62 Cal. 4th 204, 224.
[45] IS/MND at p. 67.
[46] Fox Comments at p. 6.
[47] Id.
[48] IS/MND at p. 66-67.

indicating that the Project is consistent. However, two of the three (waste reduction and off-road equipment) only apply to Project construction. For the third, water conservation, the IS/MND does not explain the effect these measures will have on the Project's operational GHG emissions. The McLaren Data Center IS/MND showed that approximately 99% of that project's operational GHG emissions were the result of the data center energy demand, with slightly less than half a percent attributable to vehicle travel.[49] Thus, even assuming water usage was responsible for the remaining emissions, water conservation measures, while important, will do very little to reduce the Project's total GHG emissions.

Further, with respect to the Project's consistency with relevant General Plan policies, these policies similarly do not address GHG emissions resulting from electricity generation needed for the Project.[50] In fact, the applicable policies relate to largely the same categories as the CAP measures (water conservation, waste disposal). And again, the IS/MND also fails to explain what effect these measures will have in terms of reducing or mitigating the Project's overall operational GHG emissions.

In sum, the fact that the Project is consistent with the City's CAP and General Plan does not provide substantial evidence that GHG emissions will be less than cumulatively considerable, or less than significant. Because the City's CAP was prepared to achieve the City's 2020 GHG emission reduction targets, compliance with the CAP measures at most supports a determination that the Project will not impede the achievement of the City's 2020 targets. Moreover, of the CAP and General Plan measures applicable, few address the Project's primary source of GHG emissions, and the IS/MND wholly fails to explain how these measures will "ensure[] that the project's incremental contribution to the cumulative effect is not cumulatively considerable." As discussed further below, because substantial evidence supports a fair argument that the Project's GHG emissions may be significant notwithstanding its consistency with the City's GHG reduction plans and programs, an EIR must be prepared.

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[49] Proposed Mitigated Negative Declaration and Initial Study McLaren Data Center Project, File No(s): PLN2016-12246/CEQ2016-01023, City of Santa Clara, Appendix B, p. 8 (Feb. 2017), http://santaclaraca.gov/Home/Components/BusinessDirectory/BusinessDirectory/167/3650?npage=2 ("Electricity usage makes up nearly 99% of the operational Project GHG emissions, with mobile sources making up slightly under half a percent.") ("McLaren IS/MND").
[50] IS/MND at pp. 68-69; Fox Comments at pp. 10-12.

2. The IS/MND's Conclusion That The Project Is Consistent With Regional and State GHG Reduction Plans Is Unsupported

In addition to considering the Project's consistency with the City's CAP, the IS/MND purports to consider the Project's consistency with other regional and statewide efforts to reduce GHG emissions. Specifically, the IS/MND includes sections addressing the Project's consistency with the Bay Area 2017 Clean Air Plan, Plan One Bay Area/SB 375, the 2009 California Climate Change Adaptation Strategy, and the California Air Resources Board's Climate Change Scoping Plan.[51] However, the IS/MND's "consistency analysis" for these plans and programs consists of little more than conclusory statements that the Project is generally consistent with the overarching purpose of the program. Relying on these conclusory statements, the IS/MND's plan consistency section concludes:

> As discussed above, the project would not conflict with plans, policies or regulations adopted for the purpose of reducing the emissions of GHG. Therefore, the project would not conflict with any currently adopted local plans, policies, or regulations pertaining to GHG emissions and would not generate greenhouse gas emissions that would have a significant impact on the environment.

Contrary to the IS/MND's conclusion, however, the IS/MND offers no evidence that consistency with the above mentioned plans will avoid a significant impact on the environment as a result of the Project's GHG emissions. For example, for the Bay Area 2017 Clean Air Plan, the IS/MND explains that the Plan "identifies a range of control measures that make up the Clean Air Plan's control strategy for emissions including GHGs." However, rather than explaining how the Project is consistent with the "range of control measures" identified in the Clean Air Plan, the IS/MND includes two sentences stating that "energy efficiency measure have been included in the design and operation of the electrical and mechanical systems on the site. This is in keeping with the general purpose of Energy Sector Control Measures in the Clean Air Plan."[52]

[51] Id. at pp. 69-70.
[52] IS/MND at p. 69.

Similarly, for its consistency analysis with SB 375, the IS/MND includes one sentence that "[t]he project has a low concentration of employment and would not contribute to a substantial increase in passenger vehicle travel within the region."[53]

Finally, after a paragraph describing the Climate Change Scoping Plan, the IS/MND again includes one conclusory statement that "[t]he project would be generally consistent with the Climate Change Scoping Plan, as updated[.]"[54]

As with the CAP consistency analysis, the IS/MND's consistency analysis for regional and statewide GHG reductions plans and programs wholly fails to explain how the Project's consistency with such plans supports its conclusion that the Project would not generate GHG emissions that would have a significant impact on the environment. Conclusory statements that the Project would be "generally consistent with" or "keeping with the general purpose" are not substantial evidence that impacts will be less than significant, as CEQA requires.[55] Moreover, because none of the plans and programs identified address data centers, where the majority of GHG emissions derive from electricity usage, finding that the Project is consistent is of minimal import in this case.[56]

B. Substantial Evidence Supports A Fair Argument That The Project's GHG Emissions Would Result In A Significant Impact

The BAAQMD CEQA Guidelines provide the following thresholds of significance for operational-related GHG emissions for land use development projects:

> Compliance with a qualified GHG Reduction Strategy; or annual emissions less than 1,100 metric tons per years (MT/yr) of CO2e; or 4.6 MT CO2e/SP/yr (residents + employees).[57]

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[53] Id.
[54] Id. at p. 70.
[55] Id. at pp. 69-70.
[56] 14 C.C.R. § 15064.4(b)(3) (Providing that consistency with adopted regulations and requirements is relevant for assessing a project's impacts if such requirements "reduce or mitigate the project's incremental contribution to greenhouse gas emissions.").
[57] BAAQMD CEQA Guidelines (May 2017), p. 2-4.

The IS/MND considers the Project's "compliance with a qualified GHG Reduction Strategy" as the threshold of significance for the Project's operational emissions. However, as discussed above, the IS/MND fails to demonstrate that compliance with the City's CAP and General Plan will reduce or mitigate the Project's GHG emissions to a less than significant level. In order to more accurately evaluate the significance of the Project's impacts, Dr. Fox conducted an analysis of the Project's GHG emissions and compared her results to BAAQMD's other, numeric threshold.[58]

The main text of the IS/MND does not disclose the Project's GHG emissions from sources other than emergency generators. However, in reviewing the IS/MND and air quality appendix, Dr. Fox found that the CalEEMod outputs buried in Appendix A do contain an estimation of a portion of the Project's operational GHG emissions.[59] As an initial matter, these calculations are effectively hidden from all non-expert members of the public. There is also no explanation of how these GHG emissions were calculated, and the CalEEMod model does not include GHGs from energy generation. Nevertheless, the output files show that the unmitigated GHG emissions from Project operations are 1,720 MT CO2e per year, excluding generators and energy usage.[60] This alone exceeds the BAAQMD significance threshold of 1,100 MT CO2e per year, but still does not include the Project's primary source of GHG emissions.

To determine the Project's GHG emissions resulting from electricity usage, Dr. Fox looked to emissions calculations prepared for a similar Santa Clara data center project, the McLaren Data Center Project.[61] The City initially approved the McLaren Data Center Project in 2017.[62] The projected energy demand of the McLaren Data Center Project was 76 MW, compared to the Project's 75 MW.[63] The McLaren Data Center will also be served by Silicon Valley Power. Thus, the two projects will rely on the same sources for electricity generation. The McLaren IS/MND Greenhouse Gas Technical Report indicates that the project would emit

[58] Fox Comments at pp. 4-5.
[59] Id. at p. 3.
[60] Id. at p. 4.
[61] Id. at p. 4.
[62] Architectural Review Committee, City of Santa Clara, Minutes Wednesday, March 29, 2017, *available at* http://santaclaraca.gov/government/about-santa-clara/meetings/-toggle-allpast/-npage-19.
[63] McLaren IS/MND at p. ii (total project demand is 76 MW).

153,850 MT CO2e per year, 99 percent of which (152,262 MT CO2e/year) was attributed to the data center's energy usage.[64]

Relying on the McLaren Data Center calculations, Dr. Fox determined that the Project's GHG emissions from energy usage would be approximately 151,826 MT CO2e per year.[65] When added to the 1,720 MT CO2e per year from other sources disclosed in the CalEEMod outputs, the Project's total operational GHG emissions are 153,546 MT CO2e per year.[66] This figure is 89 times higher than the GHG emissions disclosed in Appendix A, and exceeds the BAAQMD significance threshold for land use projects by a factor of 140.[67]

Because the overwhelming majority of the Project's operational GHG emissions will not be reduced by the City's CAP and General Plan measures, finding that the Project is consistent with the CAP does not support a determination that the Project's GHG impacts will be less than significant. Moreover, as Dr. Fox's comments provide, substantial evidence shows that the Project's GHG emissions will be cumulatively considerable and therefore significant notwithstanding the Project's alleged consistency with a GHG reduction plan.[68] The City must prepare an EIR to disclose and analyze the Project's GHG emissions, and to incorporate all feasible mitigation.

V. Substantial Evidence Supports a Fair Argument That the Project Will Cause Significant Noise Impacts

Appendix G to the IS/MND explains that the Project's emergency equipment, including the backup generators and battery switchgear, would generate significant operational noise impacts. To reduce these impacts to a less than significant level, the IS/MND contains two mitigation measures addressing operational noise: First, MM NOI-1 requires that "[n]o more than nine powerblocks (45 generators) located on the western boundary of the generator yard may be tested simultaneously."[69] Second, MM NOI-2 provides that "[n]oise attenuation measures will be subject to demonstration of effectives in meeting the City's noise standards, to the satisfaction

[64] McLaren IS/MND, Appendix B, p. 8.
[65] Fox Comments at p. 4 n. 15.
[66] Id. at p. 4.
[67] Id. at p. 5.
[68] Id. at pp. 4-5.
[69] IS/MND at p. 95.

of the City's Planning Division, prior to approval of building permits."[70] The IS/MND concludes that "[w]ith implementation of MM NOI-1 and MM NOI-2, noise levels at adjacent property lines would be below the requirements established in the City Code" and therefore less than significant with mitigation incorporated.[71] Additionally, the IS/MND concludes that, "assuming emergency testing occurs for no more than four hours in a twenty-four (24) hour period,"[72] the Project "would not result in significant increases in ambient noise levels at adjacent receptors."[73]

As explained further below, the IS/MND's conclusion that noise impacts will be mitigated to less than a significant level is unsupported for two reasons. First, the IS/MND does not disclose or evaluate the noise levels resulting from simultaneous operation of all generators. Rather, it bases its conclusion that impacts would be less than significant on the fact that the City's noise ordinance does not apply during emergency situations and therefore would not be violated. However, the IS/MND's analysis in this regard is in clear conflict with the requirement of CEQA to consider the Project's effects on the surrounding environment, not simply whether it will comply with City law. Second, the IS/MND fails to incorporate the mitigation measures that the attached noise assessment demonstrates are necessary to reduce noise impacts to a less than significant level. Instead, the IS/MND incorporates a variation of one of the recommended measures, while erroneously excluding the others.

For each of these reasons, the IS/MND's determination that noise impacts would be less than significant is not supported by substantial evidence. Noise levels generated by the Project's equipment remain significant and unmitigated.

A. The IS/MND Fails to Disclose and Analyze Noise Impacts that May Result from the Operation of Backup Generators

The first flaw of the IS/MND's noise analysis is that it is prepared as though the Project's backup generators will only be used for maintenance and testing purposes. This misleading approach ignores the reality that the backup generators

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[70] Id. at p. 96.
[71] Id.
[72] IS/MND, Appendix G, p. 9 (showing that the "Project L_{dn}" displayed in IS/MND Table 4.12-4 was calculated assuming emergency generators are tested for no more than four hours in a 24 hour period.)
[73] IS/MND at p. 96.

were included in the Project for a reason and will be used simultaneously when the Project's primary power supply is interrupted. It also prevents the public and decisionmakers from conducting an informed evaluation of the Project's potential noise impacts. Neither the IS/MND nor Appendix G disclose to the reader the sound levels that would result from all 120 generators operating simultaneously.[74] Further, in considering whether the Project would result in a significant increase over ambient noise levels, the projected noise level displayed in the IS/MND was calculated assuming emergency generators operate for no more than four hours in a day.[75]

Contrary to the IS/MND's depiction of the Project's backup generators, SVP's outage history demonstrates that all 120 backup generators will be called on to operate throughout the year. The Silicon Valley Power website shows that the utility has experienced 41 power outages across its entire service area over the course of the last year and a half.[76] These power outages ranged in duration from five minutes to more than five hours, with causes ranging from equipment failure to balloons to animal contact.[77] As these figures show, disruptions to the Project's power supply may reasonably be expected throughout the Project's operational life and all generators will be required to operate simultaneously.

The omission of impacts from all generators operating simultaneously not only renders the IS/MND deficient as an informational document, it renders the City's determination that noise impacts would be less than significant not supported by substantial evidence. The fact that "[e]mergency equipment such as backup generators are not required to meet noise code during emergency operations [per section 9.10.070(a) of the Santa Clara City Code]" does not support a determination that noise impacts would be less than significant under CEQA. While compliance with applicable noise limits is a relevant consideration, CEQA ultimately requires consideration of the Project's effect on the surrounding

[74] See IS/MND, Appendix G, p.8 (Sound pressure levels displayed are the result of 9 powerblocks and 11 powerblocks tested simultaneously).
[75] Id. at p. 9.
[76] Silicon Valley Power, Outage History, http://www.siliconvalleypower.com/svp-and-community/outages-and-alerts/outages/outage-history (last visited Apr. 11, 2018).
[77] Id.

environment notwithstanding it's compliance with applicable City laws.[78] As the City's own analysis shows, noise levels will be highest during emergency situations when all generators are required to operate at once. However, these impacts are never disclosed or analyzed in the IS/MND.

The mitigation measures required will not reduce noise impacts resulting from simultaneous operation of all backup generators. MM NOI-1 does not mitigate noise levels other than during routine testing. MM NOI-2 requires a demonstration that noise attenuation measures are sufficient to meet City noise standards, which the IS/MND expressly states do not apply when the backup generators are actually needed. Thus, the determination that noise impacts would be mitigated to a less than significant level by MM NOI-1 and MM NOI-2 alone is unsupported. The City's own evidence supports a fair argument that noise impacts may be significant.

B. The IS/MND Fails to Incorporate the Measures Required to Mitigate Noise Impacts to a Less Than Significant Level

In addition to failing to disclose and evaluate the Project's potentially significant noise impacts during reasonably foreseeable disruptions to the Project's power supply, the IS/MND's determination that noise impacts will be mitigated to a less than significant level is refuted by its own noise assessment. Specifically, the IS/MND fails to incorporate restrictions that the noise assessment shows are needed for the Project to comply with the City's noise limits during routine testing. Accordingly, the IS/MND must be revised to incorporate enforceable mitigation measures consistent with the restrictions specified in Appendix G otherwise noise impacts remain significant.

The IS/MND explains that the generators and PCS modules must comply with the City's noise code during routine testing.[79] The applicable noise limits[80] at each of the Project's property lines are listed in the IS/MND as follows:

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[78] See also CEQA Guidelines, Appendix G (Noise checklist directing lead agencies to consider whether the project would result in "a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?")
[79] IS/MND at p. 95.
[80] IS/MND, Appendix G at p. 4; Santa Clara Muni. Code § 9.10.040

Property Line	Daytime Noise Limit [dBA]	Nighttime Noise Limit [dBA]
1. Residential to North	55	50
2. Public Space to West	55	50
3. Light Industrial to East	70	70
4. Planned Development to South	65	60

Appendix G concludes that "the *daytime* noise limits will be met if no more than (9) powerblocks (45 generators) and eleven (11) PCS modules are tested simultaneously."[81] Additionally, Appendix G specifies: "To meet code limits at all property lines, *no more than four (4) powerblocks along the west end of the generator yard may be tested simultaneously*."[82] With these restrictions in place, sound pressure levels would be 54 dBA at receivers 1 and 2, 59 dBA at receiver 3, and 54 dBA at receiver 4, and therefore would be below *daytime limits*.[83]

As the above statements demonstrate, the IS/MND's conclusion that noise impacts will be less than significant with the incorporation of mitigation measures MM NOI-1 and MM NOI-2 is inconsistent with Appendix G. First, despite a brief statement in the IS/MND that "testing would be conducted between the hours of 7:00 AM and 10:00 PM," there is no enforceable restriction on the time equipment testing may occur at the Project. In the absence of an enforceable time restriction, nighttime noise limits at both the north and west property lines would be exceeded during testing (54 dBa during testing compared to 50 dBA nighttime noise limit).

Second, Appendix G states that, "[t]o meet code limits at all property lines, no more than <u>four</u> powerblocks along the west end of the generator yard may be tested simultaneously."[84] However, MM NOI-1 erroneously sets the limit on simultaneous testing at nine powerblocks on the western boundary.[85] There are nine powerblocks along the west end of the property alone.[86] Thus, the Applicant could test all nine

[81] Id. at p. 8 (Italics added).
[82] Id. at p. 9 (Italics added).
[83] Id.
[84] Id.
[85] IS/MND at p. 95.
[86] IS/MND, Appendix G, p. 7, Figure 7.

western powerblocks simultaneously, resulting in a violation of City noise limits, without violating MM NOI-1.

Third, the mitigation measures imposed do not restrict testing of PCS modules. As noted above, Appendix G states that no more than 11 PCS modules may be tested simultaneously to remain in compliance with City noise limits.[87] The Project will feature 37 PCS Modules in total.[88] Thus, in the absence of a restriction on PCS Module testing, the IS/MND's conclusion that noise impacts will be less than significant during emergency equipment testing is again refuted by the City's own analysis.

In the absence of enforceable mitigation specifying that no more than four powerblocks along the west end of the generator yard may be tested simultaneously; no more than 11 PCS modules may be tested simultaneously with generator testing; and that all emergency equipment testing shall occur between the hours of 7:00 AM and 10:00 PM, the IS/MND's conclusion that impacts will be less than significant with mitigation is not supported by substantial evidence. Unless these restrictions are incorporated, noise impacts would be significant.

VI. Substantial Evidence Supports a Fair Argument That the Project May Result in Significant Air Quality Impacts

Project construction emissions were calculated using the California Emissions Estimator Model ("CalEEMod").[89] Dr. Fox reviewed the IS/MND's emissions calculations, including the CalEEMod outputs, and found that the IS/MND underestimates Project construction emissions.[90] As explained more fully below, entire categories of emissions, including fugitive dust emissions from off-road vehicles and wind erosion, are not accounted for in the construction emissions calculations. After recalculating Project construction emissions to account for these omissions, Dr. Fox concluded that impacts to air quality from construction-generated particulate matter may be significant.[91]

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[87] Id. at p. 8.
[88] Id. at p. 7, Table 5.
[89] IS/MND, Appendix A, p. 7. It is unclear which version of CalEEMod was used to calculate the Project's emissions. Appendix A at page 7 references both version 2016.3.1 and 2013.2.2.
[90] Fox Comments at pp. 19-27.
[91] Fox Comments at pp. 26-27.

Furthermore, because the CalEEMod model was run for an annual scenario only, with average daily emissions calculated by dividing annual emissions by 336 work days, the IS/MND's emissions calculations are inaccurate and its conclusions are unsupported. As Dr. Fox explains, CalEEMod can be run for three scenarios: annual or summer and winter with output in pounds per day. It also calculates maximum daily construction emissions. Here, the IS/MND's approach of determining daily emissions averages by division results in an inaccurate calculation of the Project's construction emissions as construction will occur over a 15 month period and emissions will vary depending on seasonal conditions.[92] Averaging emission also fails to account for the fact that construction phases may overlap in time, with multiple pieces of construction equipment operating simultaneously.

Because the IS/MND's emissions calculations are inaccurate, they cannot be relied on to support a determination that air quality impacts from Project construction will be less than significant. Moreover, as discussed further below, substantial evidence supports a fair argument that Project construction will result in significant particulate matter emissions from fugitive dust. Accordingly, an EIR must be prepared to accurately disclose and analyze the Project's construction emissions and to impose all feasible mitigation.

A. Construction Fugitive Dust Emissions Were Omitted from the IS/MND Emissions Calculations

The CalEEMod User's Guide states that the program does not account for fugitive dust emissions from off-road vehicle travel when calculating emissions.[93] This category of emissions includes fugitive dust generated by on-site haul trucks during construction activities.[94] On site haul trucks generate fugitive PM10 and PM2.5 emissions when traveling on unpaved surfaces within a project site, such as during site preparation and grading. Here, the IS/MND states that fugitive dust will be generated during Project construction. It also indicates that project construction will include site preparation, grading, and excavation for the 15.7 acre site. However, the IS/MND does not disclose the size or extent of unpaved surfaces,

[92] Id. at p. 19.
[93] Id. at p. 21.
[94] Id.; see also IS/MND at p. 31 ("During grading and construction activities, dust would be generated.")

or calculate fugitive dust emissions resulting from haul truck activities in these areas.

In order to more accurately calculate the Project's construction-related emissions, Dr. Fox calculated particulate matter emissions from on-site haul truck travel using EPA's air pollution emission factor equation for industrial unpaved roads.[95] Based on her calculations, which are detailed further in the attached comments, Dr. Fox determined that project construction would generate approximately 458 pounds per day of PM10, and approximately 46 pounds per day of PM2.5 as a result of off-road vehicle travel.[96]

Furthermore, the CalEEMod model also does not account for "fugitive dust generated by wind over land and storage piles." The CalEEMod Technical Paper acknowledges that this limitation "could result in underestimated fugitive dust emissions if high winds and loose soil are substantial characteristics for a given land use/construction scenario."[97] As Dr. Fox notes, windblown dust can be a significant source of fugitive PM10 and PM2.5, particularly in the Bay Area where frequent hot, dry high-wind events are common in spring and fall.[98] These emissions could result in public health impacts due to violations of state and federal ambient air quality standards for PM10 and PM2.5.

Because the IS/MND does not provide a separate emissions estimate for windblown dust from Project construction activities, Dr. Fox calculated windblown dust emissions using the AP-42 construction emission factor and information contained in the IS/MND. AP-42 includes a generic construction emission factor of 1.2 tons of total suspended material per acre per month of construction activity.[99] Assuming 2.5 acres are disturbed on the maximum day and that 90% of the total suspended material is PM10, Dr. Fox determined that PM10 emissions from wind erosion alone would be 180 lb/day.[100] Similarly, conservatively assuming that only 25% of PM10 wind erosion emissions are PM2.5, wind erosion PM2.5 emissions would be 45 lb/day.[101]

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[95] Id. at p. 21.
[96] Id. at pp. 21-24.
[97] Id. at p. 24.
[98] Id. at p. 25.
[99] Id.
[100] Id. at p. 25.
[101] Id. at pp. 25-26.

Alternatively, using the AP-42 "Industrial Wind Erosion" guidance and assuming a 2-minute wind speed of 30 mph, Dr. Fox estimated wind erosion PM10 emissions from a similar, but much smaller disturbed area at a construction site (4 acres disturbed) would be 60 lb/day of PM10 and 30 lb/day of PM2.5. However, she explains, "Wind erosion PM10 and PM2.5 emissions calculated using the AP-42 'Industrial Wind Erosion' methodology would be substantially higher if the entire disturbed area were included."[102]

B. Construction PM10 and PM2.5 Emissions Are Significant

Under CEQA, "the determination of whether a project may have a significant effect on the environment calls for careful judgment on the public of the public agency involved, based to the extent possible on scientific and factual data."[103] BAAQMD's CEQA guidelines do not establish a threshold of significance for fugitive dust PM10 and PM2.5 emissions; however, several other California air pollution control districts have adopted significance thresholds for fugitive dust construction emissions. For example, the Monterey Bay Unified Air Pollution Control District has established a significance threshold of 82 pounds per day for construction PM10 emissions; the South Coast Air Quality Management District has established thresholds of 150 pounds per day for PM10 and 55 pounds per day for PM2.5; and the Sacramento Metropolitan Air Quality Management District has established significance thresholds of 80 pounds per day for PM10 and PM2.5 if all feasible control measures are implemented. The CEQA Guidelines provide that "when adopting thresholds of significance, a lead agency may consider thresholds of significant previously adopted or recommended by other public agencies or recommended by experts provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." Here, when taken together, these agencies show a reasonable threshold of significance of construction emissions is 80-150 pounds per day for PM10 and zero-80 pounds per day for PM2.5. [104]

Dr. Fox's calculations demonstrate that when fugitive PM10 emissions are calculated to include off-road vehicle travel and wind erosion, total construction fugitive PM10 emissions may range from 524-648 pounds per day.[105] Furthermore,

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[102] Id. at p. 26.
[103] 14 C.C.R. § 15064(b).
[104] Fox Comments at p. 27.
[105] Id. at p. 28.

total fugitive PM2.5 emissions are approximately 79-94 pounds per day when off-road vehicle travel and wind erosion are accounted for.[106] As Dr. Fox notes, if all information necessary to calculate fugitive dust emissions were provided in the IS/MND, emissions levels would be higher.[107] These calculations support a fair argument that the Project's fugitive PM10 and PM2.5 emissions from construction activities are significant. Thus, the City must prepare an EIR to analyze construction impacts and to adopt all feasible mitigation.

VII. The IS/MND Failed to Evaluate Ozone Impacts

The IS/MND failed to determine whether increases in ozone precursors from the Project would cause or contribute to additional violations of ambient air quality standards for ozone. Appendix A states that, "[a]lthough the project could cause a cumulatively considerable net increase in ozone precursor emissions, they are no [sic] expected to cause or substantially contribute to a violation of an ozone ambient air quality standard."[108] However, the IS/MND provides no analysis or discussion to support this single conclusory statement.

The Bay Area Air Basin, the air basin in which the Project would be located, is designated as a serious nonattainment area for the state 1-hour ozone standard and as nonattainment for the federal 8-hour ozone standard.[109] As Dr. Fox's comments explain, increases in ozone precursor emissions from the Project, coupled with emissions from other projects in the area, may aggravate existing exceedances of ozone standards or result in additional exceedances. This is a potentially significant impact of the Project that is undisclosed in the IS/MND.

Ground-level ozone is not emitted directly into the air but is created by chemical reactions between NOx and VOCs.[110] The NOx and VOCs react in the presence of sunlight, creating ozone.[111] Ozone at ground level is a harmful air pollutant because of its adverse effects on people and the environment.[112] The public health impacts resulting from Ozone include:

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[106] Id. at p. 26.
[107] Id. at p. 28.
[108] IS/MND, Appendix A, p. 13.
[109] Fox Comments at p. 16; IS/MND, Appendix A, pp. 4, 7.
[110] Id. at p. 16.
[111] Id. at p. 16; IS/MND, Appendix A, p. 4.
[112] IS/MND, Appendix A, p. 4.

- making it more difficult to breathe deeply and vigorously;
- causing shortness of breath and pain when taking a deep breath;
- causing coughing and sore or scratchy throat;
- inflaming and damaging the airways;
- aggravating lung diseases such as asthma, emphysema, and chronic bronchitis;
- increasing the frequency of asthma attacks;
- making the lungs more susceptible to infection;
- continuing to damage the lungs even after symptoms have disappeared; and
- causing chronic obstructive pulmonary disease (COPD).[113]

Ozone also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas, and can cause significant damage during the growing season.[114]

In the Project at hand, sources of VOCs and NOx include Project construction equipment, backup generators, traffic, the generation of electricity, and the diesel storage tanks.[115] Emissions of NOx and VOCs from these sources will increase ambient ozone concentrations, may aggravate existing exceedances of ozone standards and perhaps cause additional exceedances. These exceedances translate directly into adverse health impacts on the affected population and environment.

As the IS/MND shows, the Project's unmitigated construction emissions would exceed BAAQMD thresholds for NOx. After mitigation, average daily construction emissions are estimated to just below the BAAQMD threshold at 51 pounds per day. Furthermore, Project operational emissions from generator testing alone are just below the BAAQMD threshold of significance with the timing restrictions of MM AIR-2 incorporated. These emissions do not account for emissions from actual use of the backup generators in the case of a power outage, which as discussed in section V (A) above, is a highly foreseeable scenario. Moreover, when emissions from nearby Projects, including similar data center

[113] Fox Comments at p. 16.
[114] Id. at p. 16.
[115] Id. at pp. 16-17.

Projects are taken into account, the Project's VOC and NOx emissions could be cumulatively considerable. These increases in ozone precursors should have automatically triggered an analysis of their impact on ambient ozone concentrations and the air basin's attainment status.

The IS/MND's conclusion that Project emissions are not expected to cause or substantially contribute to a violation of an ozone ambient air quality standard is unsupported. As Dr. Fox comments demonstrate, substantial evidence supports a fair argument that the Project may result in a cumulatively considerable net increase in ozone precursors, and may aggravate existing exceedances of ozone standards and or cause additional exceedances, which is a significant impact. Accordingly, the City must prepare an EIR to disclose and analyze the Project's impacts on ambient ozone concentrations, and to incorporate all feasible mitigation.

VIII. NOx Emissions From the Emergency Diesel Generators Are Significant and Unmitigated

To determine the maximum air quality impacts from the Project's backup diesel generators, the IS/MND calculated daily emissions assuming operation of all generators at 100% engine load one day per month.[116] The IS/MND shows that daily NOx emissions from all generators operating simultaneously totaled 57 pounds per day, which exceeds the BAAQMD threshold of significance of 54 pounds per day. To mitigate this significant impact, the IS/MND imposes mitigation measure MM AIR-2, which limits generator operation for maintenance and testing "shall be limited so that the combined operation of all engines does not exceed 100 hours per day in total." This limit applies to generator operation for testing and maintenance purposes only; the IS/MND does not include any restriction on generator operation when serving the data center.

As discussed in Dr. Fox's comments, assuming that exceeding 100-hours combined operation will result in an exceedance of BAAQMD significance thresholds for NOx emissions, it would take just 50 minutes of simultaneous operation of the Project's 120 generators to exceed NOx thresholds. As discussed above, SVP experienced multiple power outages in the last year, many of which exceeded 50 minutes. Under these conditions, it may reasonably be expected the Project's generators would exceed 100-hours of combined operation.

[116] IS/MND at p. 34.

Because MM AIR-2 does not address generator operation during emergency conditions, but rather only operations for maintenance and testing purposes, the IS/MND's conclusion that generators NOx emissions would be less than significant with mitigation incorporated is not supported by substantial evidence. The IS/MND shows that the combined operation of the Project's 120 generators would exceed significance thresholds in a reasonably foreseeable disruption to the Project's power supply. Thus, NOx emissions from operation of the Project's backup generators remain significant and unmitigated.

IX. The IS/MND Fails to Require All Feasible Mitigation

A. All Feasible Mitigation Must Be Required for Construction-Related Fugitive PM10 and PM2.5 Emissions

As demonstrated in section VI(B) above, substantial evidence supports a fair argument that fugitive PM10 and PM2.5 emissions from Project construction activities may be significant. CEQA requires that the City prepare an EIR to analyze these emissions and to implement all feasible mitigation measures when a potentially significant impact is identified. Currently, the IS/MND requires that the Applicant implement BAAQMD's recommended construction mitigation measures. However, as Dr. Fox notes, there are additional feasible mitigation measures to reduce fugitive PM emissions. Mitigation measures that have been required in recent CEQA documents or recommended by the U.S. EPA:[117]

- The number of pieces of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practicable number is operating at any one time.

- Signs shall be posted in designated areas and job sites to remind drivers and operators of the speed limit.

- Low rolling resistance tires shall be used on long haul class 8 tractor-trailers.

[117] Fox Comments at pp. 28-29.

- When soil will be disturbed by heavy equipment or vehicles, wet soil before disturbing it and continuously wet while digging to keep dust levels down.

- Water all grading areas at least four times daily as water evaporates quickly in hot climates, requiring more frequent watering than two times per day.

- Use a watering method that does not raise dust.

- Use the calcium chloride methods or salt crust process to achieve better dust control than with water alone.

- Use fine atomized sprays or mist sprays with droplet diameters of 60 um, produced by swirl-type pressure nozzles or pneumatic atomizers on watering trucks.

- Thoroughly clean equipment, vehicles, and other items before they are moved off-site.

- Continuously wet the soil before and while digging or moving the earth. Areas where bulldozers, graders, or skip steers operate are examples of areas where continuously wetting the soil should be required.

Additionally, methods of ensuring compliance or monitoring mitigation measures should be required. For example, monitoring of wind speed to determine when winds exceed 20 mph should be incorporated. Similarly, measures to ensure vehicles to not exceed 15 mph should be incorporated.

B. All Feasible Mitigation Must Be Required for GHG Emissions

As detailed in section IV above, substantial evidence supports a fair argument that the Project's GHG emissions may be significant notwithstanding its alleged consistency with the City's CAP. CEQA thus requires that all feasible mitigation be incorporated to avoid or lessen impacts resulting from the Project's GHG emissions. Dr. Fox's comments demonstrate that additional feasible mitigation measures are available to reduce the Project's GHG emissions.

First, the Project could reduce its GHG impacts by installing solar panels to the maximum extent feasible, including over parking spaces and any roof area not being used for cooling towers or other equipment. The Applicant could acquire additional land in the vicinity to install any additional PV panels required to offset 100% of the demand.

Second, the Applicant could be required to enter into a long-term (e.g., 20-year minimum) purchase agreement for renewable energy in which the provider is contractually bound to retire the renewable energy credits associated with the renewable energy on CARB's behalf.

Third, other building envelope and facility operation measures are feasible and should also be required. These include:

- Replace the diesel-powered generators with backup power from on-site solar coupled with battery backup. The Project currently includes batteries, but the IS/MND is silent on their capacity or use.

- Require bus stops, express lanes, and bus stop shelters for existing/planned transit service that supports the Project.

- Use traffic calming measures, including all internal sidewalks a minimum 5 feet wide, all sidewalks with vertical curbs, roadways routed to avoid "skewed intersections."

- Use the following traffic-calming features at internal and adjacent intersections: marked crosswalks, count-down signal times, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts, or mini-circles.

- Participate in funding off-site traffic improvements to reduce idling by increasing traffic flow through synchronized traffic signals.

- Use the following traffic-calming features on internal and adjacent streets: planter strips with trees, chicanes/chokers (variations in road width to discourage high-speed travel).

- Provide preferential parking for park-and-ride to incentivize carpooling, vanpooling, commuter bus, and electric vehicles.

- Require "cool parking" by, for example, providing tree cover to reduce the heat-island effect.

- Provide preferential parking for EV /CNG vehicles.

- Use only drought-resistant native trees, trees with low emissions and high carbon sequestration potential.

- Orient building to maximize shade in the summer and maximize solar access to walls and windows in the winter.

- Provide shade and/or use light-colored/high-albedo materials and/or open-grid pavement for at least 30% of the site's nonroof impervious surfaces, including parking lots, walkways, plazas, etc.; or place a minimum of 50% of parking spaces underground or covered by structured parking, or use an open-grid pavement system for a minimum of 50% of the parking lot area.

- Implement CALGreen Tier 2 standards or better.

- Use a chiller system that uses less energy, such as the cactus chiller.[118]

[118] Id. at pp. 13-14.

X. The City Lacks the Authority to Approve Powerplant Projects

In addition to the numerous deficiencies with the IS/MND described above, the City cannot approve the Project because the California Energy Commission ("CEC") has exclusive jurisdiction to approve powerplants, such as that included as part of the Project.

Under the Warren Alquist Act, Public Resources Code section 25500, the CEC has exclusive jurisdiction to certify all sites and related facilities for thermal power plants that generate 50 megawatt (MW) or more within California. For purposes of the Act, "thermal powerplant," is defined as "*any* stationary . . . electrical generating facility using any source of thermal energy, with a generating capacity of 50 MW or more . . . ."[119] As seen in the case of other Santa Clara data center projects, diesel-fueled backup generators serving data center facilities are encompassed with the scope of the CEC's jurisdiction where the collective generating capacity exceeds 50 MW. Here, the combined generating capacity of the Project's 120 backup diesel generators is 75 MW.

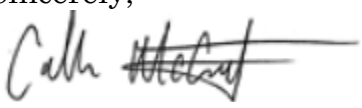
Under Public Resources Code section 25500, the siting authority of the CEC supersedes local approval of thermal powerplant facilities. The CEC may exempt thermal powerplants with a generating capacity of up to 100 megawatts if it finds that no substantial adverse impact on the environment or energy resources will result from the construction or operation of the proposed facility or from the modifications.[120] However, in the absence of a Small Power Plant Exemption ("SPPE"), construction of a powerplant project may not commence without first obtaining certification for any such site and related facility by the CEC.[121] Here, the Applicant has not obtained an SPPE, thus the Project remains subject to the siting jurisdiction of the CEC.

[119] PRC § 25120.
[120] PRC § 25541.
[121] PRC § 25517.

XI. CONCLUSION

For the foregoing reasons, we urge the City to withdraw the MND. The environmental impacts of the Project should be evaluated by the CEC in an EIR, or alternatively, pursuant to the agency's certified regulatory program.

Sincerely,



Collin S. McCarthy

CSM:ljl

ATTACHMENT 1

Comments

on the

Initial Study/Mitigated Negative Declaration (IS/MND)

for the

2305 Mission College Boulevard Data Center

Santa Clara, California

April 7, 2018

Phyllis Fox, PhD, PE
745 White Pine Avenue
Rockledge, FL 32955

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1. INTRODUCTION, SUMMARY, AND CONCLUSIONS

I have reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) for the 2305 Mission College Boulevard Data Center Project (Project).[1] The Project will be located at 2305 Mission College Boulevard, Santa Clara, California. The 15.7-acre Project site is currently occupied by a two-story 358,000 square foot (sq ft) office/R&D building and a parking lot. The Project proposes to demolish the existing development and to construct a new 495,600 sq ft, two-story data center, including generator yard, equipment yard, underground water storage, parking for 75 cars (with land banking), and a new Silicon Valley Power (SVP) substation. A total of 120 diesel-fueled engine generators will be installed within a screened generator yard west of the data center building, adjacent to San Tomas Aquino Creek. Interim emergency power will be provided by battery systems in the switchgear yard to the north of the building. Cooling will be provided by about 144 chillers on the roof of the proposed building.

Based on my review, I conclude the IS/MND is fundamentally defective in that it omits crucial information required to understand the Project's significant impacts, thus failing as an informational document under CEQA. Further, it fails to identify many significant impacts and to analyze others. Finally, impacts remain significant after mitigation. My analysis indicates the following omissions and significant and unmitigated impacts:

- The Project description is not adequate to evaluate environmental impacts.
- Greenhouse gas (GHG) emissions are significant and unmitigated.
- The air quality analyses are incomplete because they fail to include any air dispersion modeling of Project construction and operational emissions to verify compliance with ambient air quality standards.
- Ozone impacts were not evaluated and are likely cumulatively significant.
- Maximum daily PM10 and PM2.5 emissions during construction are significant and unmitigated.
- Maximum daily NOx emissions during construction are likely significant and unmitigated when discrepancies in the CalEEMod inputs are resolved.
- Operational emissions are underestimated and the IS/MND does not contain sufficient information to correct the omissions.
- Daily NOx emissions from routine emergency operation of the diesel generators are significant and unmitigated.
- Noise impacts during emergency operation are significant and unmitigated.
- Battery impacts were not disclosed or evaluated.
- Cumulative impacts were not evaluated for most impact areas.

In sum, in my opinion the IS/MND is substantially deficient and does not fulfill its mandate as an informational document under CEQA to inform the public of potential impacts.

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[1] City of Santa Clara, 2305 Mission College Boulevard Data Center Project, March 2018; available at http://www.santaclaraca.gov/Home/Components/BusinessDirectory/BusinessDirectory/221/3649.

Further, the IS/MND fails to identify significant impacts, fails to require adequate mitigation for significant impacts, and inappropriately defers analyses. An EIR should be prepared to evaluate and mitigate impacts.

My resume is included in Exhibit 1 to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports (EIRs), including CEQA/NEPA documentation; risk assessments; and litigation support. I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley. I am a licensed professional engineer in California.

I have prepared comments, responses to comments, and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use, and other areas for well over 500 CEQA documents. This work includes EIRs, Initial Studies, Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs). My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal. Rptr. 2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal. 4th 310 and has supported the record in many other CEQA cases.

2. GREENHOUSE GAS EMISSIONS ARE SIGNIFICANT AND UNMITIGATED

The IS/MND concluded that greenhouse gas (GHG) emissions would be less than significant with implementation of efficiency measures and Best Management Practices (BMPs) in combination with the green power mix used by its electricity provider, SVP.[2] The IS/MND reached this conclusion without stating any significance threshold, without disclosing total GHG emissions, without providing any supporting GHG emission calculations[3], without disclosing Project design details, and without performing a cumulative impact analysis.

The State CEQA Guidelines confirm the lead agency's discretion to determine the appropriate significance threshold, but require the preparation of an environmental impact report (EIR) if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or

[2] IS/MND, pdf 68-75.

[3] Appendix A includes the output of the CalEEMod model, which is a black box model that does not disclose underlying emission calculations. The GHG emissions from the CalEEMod runs were not cited in the IS/MND main text, but rather buried deep in Appendix A. Further, as explained in Comment 2.1, the major source of GHG emissions—supplying energy to the data center—is not included in the CalEEMod model.

requirements."[4] In my opinion, as supported below, there is substantial evidence that the GHG emissions are both individually and cumulatively considerable, requiring preparation of an EIR.

2.1. GHG Emissions Are Unsupported and Significantly Underestimated

An estimate of the construction and operational GHG emissions is required to evaluate impacts and identify mitigation. The BAAQMD CEQA guidelines contain a GHG significance threshold for stationary sources of 10,000 metric tons per year (MT/yr).[5] Stationary sources are those that would require a permit to operate from the BAAQMD.[6] GHG impacts from the diesel generators are below the BAAQMD's threshold of 10,000 MT CO_2e/yr and thus are not significant.

The BAAQMD CEQA guidelines also contain an operational GHG significance threshold for land use development projects of 1,100 MT of CO_2e/yr or 4.6 MT CO_2e/SP[7]/yr.[8] All of the GHG emissions from the Project, except those from the diesel generators, arise from land use development components of the Project.

The major source of GHG emissions from data centers is energy demand. The CalEEMod model that the IS/MND used to estimate GHG emissions[9] does not include energy demand from data centers, which is the major source of GHG emissions. These emissions must be separately calculated from data center energy demand. The IS/MND also does not disclose the unmitigated or mitigated data center energy demand of the Project, which is required to estimate GHG emissions from data centers. One may infer that the energy demand is at least 75 MW, as the Project includes 120 diesel-fueled 625-kWe emergency backup generators.[10] However, it is unclear whether the diesel generators are designed to supply 100% of the electricity demand of the Project. Thus, total data center energy demand could be greater than 75 MW.

Further, the main text of the IS/MND does not disclose the GHG emissions for any source other than emergency generators, does not disclose where the GHG emissions may be found, nor explain how they were calculated. My review indicates that a portion of the GHG emissions was estimated using the CalEEMod model, whose output is buried in Appendix A[11] to the IS/MND, where it would be generally inaccessible to non-expert members of the reviewing public. As explained in Comment 4, the CalEEMod model is a black box in which all

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[4] CEQA Guidelines, Section 15064.4.

[5] BAAQMD May 2017, Table D-2.

[6] BAAQMD May 2017, p. 2-4.

[7] SP = Service Population.

[8] BAAQMD May 2017, Table 2.1.

[9] IS/MND, Appendix A, pdf 26: (100)(1401/1720) = 81%.

[10] IS/MND, Appendix A, pdf 11.

[11] IS/MND, Appendix A, pdf 25-43.

of the underlying calculations are hidden from view. Thus, the estimated GHG emissions are unsupported as a practical matter and incomplete.

The CalEEMod model used to estimate GHG emissions does not calculate GHG emissions from energy use at data centers, which use far more energy than other uses included in the model.[12] Therefore, the CalEEMod model estimate of GHG emissions from electricity use is a substantial underestimate.

The IS/MND for the McLaren Data Center[13] did calculate GHG emissions from data center energy use. The McLaren IS/MND indicates that the data center would emit 152,262 MT CO_2e/yr, which is 99% of the total McLaren GHG emissions.[14]

A comparison of the unmitigated GHG emissions for the McLaren Data Center and the Project, for example, indicates that the Project IS/MND significantly underestimated GHG emissions by excluding data center energy demand (153,850 MT CO_2e/yr compared to 1,720 MT CO_2e/yr estimated in the IS/MND). The projected energy demand for the McLaren Data Center is 76 MW. The Project's energy demand is at least 75 MW, based on diesel generator capacity. Thus, the total GHG emissions from Project operation (excluding diesel generators) is 153,546 MT CO_2e/yr.,[15] which is 89 times higher than disclosed in the IS/MND. This is highly significant, as the proposed mitigation does not address mitigation for the data center energy demand, but rather only very minor sources of GHG emissions, such as mobile sources and water supply.

Thus, the IS/MND fails as an information document under CEQA for not including the major source of GHG emissions—data center energy demand. Further, the IS/MND fails as an information document for burying key information, which itself was inadequate, in appendices without citing them in the main text or explaining how they were calculated.

2.2. Mitigated GHG Emissions Are Significant

The BAAQMD CEQA significance threshold for operational GHG emissions from land use development projects is "compliance with a qualified GHG Reduction Strategy; or annual emissions less than 1,100 MT/yr."[16] The unmitigated GHG emissions from Project operation without data center demand are 1,720 MT/yr,[17] which exceeds the GHG numeric significance

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[12] *See, e.g.*, the CalEEMod User's Guide available at: http://www.caleemod.com/ and supporting emissions data at California Commercial End-Use Survey, available at http://capabilities.itron.com/CeusWeb/Chart.aspx.

[13] McLaren Data Center Project; available at: http://santaclaraca.gov/Home/Components/BusinessDirectory/BusinessDirectory/167/3650?npage=2.

[14] McLaren IS/MND, Appendix B, pdf 50, Table 13: (100)(152,262/153,850) = 99%.

[15] Revised Project GHG emissions, based on McLaren data center = (75 MW/76 MW)(153,850) = 151,826 MT CO_2e/yr + 1,720 MT CO_2e/yr = 153,546 MT CO_2e/yr.

[16] BAAQMD May 2017, p. 2-4 and Table 2-1.

[17] IS/MND, Appendix A, pdf 26.

threshold of 1,100 MT/yr. The total GHG emissions, including data center demand, are 153,546 MT CO_2e/yr, which exceeds the significance threshold by a factor of 140. Thus, the IS/MND must demonstrate compliance with a qualified GHG reduction strategy. As discussed in Comment 2.3, the proposed GHG mitigation does not come close to mitigating the significant operational GHG impact because the proposed GHG mitigation focuses on very minor sources of GHG emissions, such as mobile sources and water supply. Thus, GHG impacts are significant and unmitigated, requiring all feasible GHG mitigation and an EIR. Further, as explained in Comment 8, the IS/MND does not include a cumulative GHG impact analysis, even though many additional, high energy demand projects are planned in the general area.

The IS/MND relies on the City of Santa Clara's Climate Action Plan (CAP), the City of Santa Clara's General Plan, Bay Area 2017 Clean Air Plan, Plan One Bay Area/California Senate Bill 375, and applicable State climate change strategies and policies to mitigate GHG emissions.[18] However, as demonstrated below, the Project fails to comply with any of these plans. Further, none of these plans specifically addresses data centers, where the majority of the GHG emissions derive from electricity use. In fact, the mitigation measures in these plans do little to nothing to reduce GHG emissions from data centers. The IS/MND has failed to supplement its analysis with measures that would substantially reduce GHG emissions from the Project.

2.3. The Project Does Not Comply with a Qualified GHG Reduction Strategy

GHG impacts from all other Project emission sources except the stationary source diesel generators would be less than significant if the Project were consistent with the City's CAP, and applicable regulatory programs and policies adopted by California agencies. As demonstrated below, GHG impacts from other Project components remain significant after compliance with applicable regulatory programs and policies. Thus, GHG impacts are significant and unmitigated, requiring all feasible mitigation and the preparation of an EIR.

Further, the IS/MND lacks Project design details, essential to estimating GHG emissions, determining consistency with various climate action plans and policies, and assuring that the various mitigation measures arising from these plans and policies are enforceable. The IS/MND fails to disclose how the various mitigation measures, which are expressed in very general terms, will be enforced.

As explained below, the Project as described in the IS/MND is not consistent with any of the plans relied on to mitigate GHG impacts. These plans do not mitigate GHG emissions to insignificance. Further, the IS/MND does not provide substantial evidence to justify a less than significant impact because the mitigation measures reduce a very tiny fraction of the increase in GHG emissions. Mitigated emissions remain significant, requiring all feasible mitigation. Each plan relied on in the IS/MND is discussed below.

[18] IS/MND, pdf 71-126.

2.3.1. City of Santa Clara Climate Action Plan (CAP)

Most of the mitigation measures in this Plan are project design features that must be made enforceable by requiring the Applicant or its designee to submit building design plans to Santa Clara for review and approval before construction begins. These plans should have been in the IS/MND record to support its conclusions. They must demonstrate that each project component complies with the design features relied on as GHG mitigation. The City must hold the Applicant or its designee accountable for implementing the mitigation measures prior to issuing building permits. The enforcement method(s) also should have been in the IS/MND. Further, prior to the issuance of building permits, the Applicant or its designee shall establish and fund a dedicated account to implement the various subsidies and programs called for in the Project design features.[19]

2.3.1.1. Transportation and Land Use

The CAP states: "The City will require all new development … more than 10,000 nonresidential square feet to draft and implement a VMT reduction strategy that reduces drive-alone trips."[20] IS/MND Measure 6.1, Transportation Demand Management Program, requires the Project to reduce vehicle miles traveled (VMT) by 25%, with 10% from Transportation Demand Management (TDM) measures.[21] The IS/MND states, with no supporting analysis,[22] that the Project would reduce VMT by 25%, but fails to disclose what percentage of this reduction is from TDM measures.

The IS/MND lists four "examples of measures that could be included as part of the TDM Plan to reduce vehicle trips by 10% consistent with the City's CAP": (1) electric car charging stations, (2) secure bicycle parking facilities, (3) preferred carpool and vanpool parking, and (4) facilitation of ride sharing.[23] "Examples" are not requirements.

The IS/MND does not "require" these measures nor disclose the reduction in VMT achieved by each. Thus, the CAP mandatory 10% reduction is not enforceable. The IS/MND does not explain how compliance would be determined, nor reveal the GHG reductions that would be achieved. Thus, this measure is not enforceable and is not consistent with the CAP. Further, this measure does very little to reduce the Project's GHG emissions, as GHG emissions from mobile sources are only 0.043% of the total.[24]

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[19] *See, e.g.*, Newhall Ranch Draft Additional Environmental Analysis (Newhall DAEA), November 3, 2016, pp. 2-27/28 at pdf 58-59; available at https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=NewhallRanchDraftAEA.

[20] Santa Clara CAP, pdf 70.

[21] Santa Clara CAP, pdf 107.

[22] IS/MND, pdf 111.

[23] IS/MND, pdf 72.

[24] IS/MND, Appendix A, pdf 26: (100)(65/151,826) = 0.043%.

The CAP also requires all new developments to implement a TDM program to reduce "drive-alone trips," including transit subsidy passes, employer rideshare assistance, transit and rideshare assistance, transit and bicycle subsidies, emergency ride home services, telecommute/flex commute options, and car and bike-sharing solutions. The IS/MND lists electric car charging stations, secure bicycle parking facilities, dedicated parking spaces for low-emission vehicles, preferred carpool and vanpool parking, and facilitation of ride-sharing services as examples of measures that could be implemented in the Project,[25] and indicates an annual report outlining performance would be submitted to the Planning Division.[26]

The IS/MND estimates the TDM program would reduce the number of trips by about 25%, with 10% coming from TDM measures,[27] but fails to explain how this reduction would be accomplished or to support this estimate.[28] Further, the IS/MND does not include a traffic study to support any estimate of trip reductions. This measure also does very little to reduce the Project's GHG emissions, as GHG emissions from mobile sources are only 0.043% of the total disclosed GHG emissions and this measure would reduce only a tiny fraction of the 65 MT/yr of GHG emissions from mobile sources calculated in the CalEEMod model run.[29]

The Applicant has not committed to funding and managing the TDM program. There is no requirement to convert the various activities into GHG reductions. Who would coordinate, promote, and provide the various features of the TDM program? How many secure bicycle parking and dedicated parking spaces for low-emission vehicles would be provided? How would ride-sharing services be implemented? This measure should be modified to require funding by the Applicant through a Community Facilities District, County Service Area, or other nonrevocable funding mechanism.[30]

The TDM program is not enforceable and thus is not valid CEQA mitigation. The CARB Southern California Consolidation Project EIR requires an aggressive TDM program designed to encourage the use of alternative transportation options to driving alone in a conventional vehicle.[31] The program requires CARB to undertake or fund feasible GHG mitigation, including direct investment opportunities such as funding building retrofit programs that invest in: cool roofs, solar panels, solar water heaters, smart meters, energy-efficient lighting, energy-efficient appliances, energy-efficient windows, insulation, water conservation measures, and other similar retrofit measures associated with green buildings within the geographic area of the

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[25] IS/MND, pdf 72.

[26] IS/MND, pdf 35.

[27] IS/MND, pdf 72.

[28] IS/MND, pdf 72, 111.

[29] IS/MND, Appendix A, pdf 26: (100)(64.87/151,826) = 0.0000047%.

[30] CAPCOA, CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January 2008, Table 16, p. B-12; available at www.capcoa.org/download/CAPCOA+White+Paper.

[31] CARB, March 2017, p. 5.7-46/47.

BAAQMD. The results will be summarized in a report that quantifies the emissions and credits and provides supporting technical documentation.[32] Compliance will be determined as follows:[33]

> Implementation of this option has the potential to reduce operations-related GHG emissions from the transportation sector. The actual amount to be credited toward reductions under the Annual GHG Emissions Report will be based on survey of usage of these incentives. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'.

The CARB DEIR sets out a two-tier process for determining compliance. First, CARB will seek to directly undertake or fund feasible and cost-effective activities that reduce or sequester GHG emissions on a ton-per-ton basis as follows:

> Under this option, ARB will seek to directly undertake or fund feasible and cost-effective activities that reduce or sequester GHG emissions on a ton per ton basis to mitigate operational emissions. Direct investment opportunities include, but are not limited to, funding building retrofits programs that invest in: cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting (including, but not limited to, light bulb replacement), energy efficient appliances, energy efficient windows, insulation, water conservation measures, and any other similar retrofit measures associated with green buildings within the geographic area of the South Coast Air Quality Management District. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'.

If this is not successful, then and only then are carbon credits considered:[34]

> If the mitigation measures above do not reduce annual operational emission to zero, ARB may consider purchasing and retiring offsets from an accredited registry. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'..

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[32] CARB, March 2017, p. 5.7-47.

[33] CARB, March 2017, Table 1-1, p. 1-21.

[34] CARB, March 2017, Table 1-1, p. 1-22 and p. 5.7-47 ("If the mitigation measures above do not reduce annual operational emission to zero, ARB may consider purchasing and retiring offsets from an accredited registry.").

In contrast, the IS/MND does not set out any method to estimate resulting GHG reductions or to ensure that GHG emission reductions are enforceable, with no requirement to measure or report to the CEQA lead agency. At a minimum, the IS/MND must include a detailed analysis of the effectiveness and likely implementation for each component of the TDM.

2.3.1.2. Electric Vehicle Parking

The CAP recommends that 5% of all new parking be designated for electric vehicle charging.[35] The Project will initially include 75 parking spaces,[36] which may be expanded to 661 spaces in the event the land use changes to something other than a data center in the future.[37] In fact, prior to Project approval, the Applicant must submit a plan to the City demonstrating that the site could accommodate 661 parking spaces to meet the City Code.[38] The IS/MND states that proposed measures include implementing electric vehicle parking and dedicating parking spaces for low-emission vehicles, but fails to disclose the number of spaces.[39] Thus, this measure is not required or enforceable and is not consistent with the CAP, which requires a minimum of 4 EV charging spaces and a recommended level of 5% of all parking spaces.[40] Further, as noted in Comment 2.3.1.1, this measure does very little to reduce the Project's GHG emissions, as GHG emissions from mobile source are only 0.043% of the total GHG emissions. Thus, this measure would do very little to reduce the 65 MT CO_2e/yr of GHG emissions from mobile sources.

2.3.1.3. Urban Cooling

The CAP requires new parking lots to be surfaced with low-albedo materials to reduce heat gain.[41] The IS/MND indicates only that the parking lot would be "paved."[42] The IS/MND does not contain building plans and other Project details that are essential to determine compliance with various plans and policies to demonstrate consistency. Thus, this measure is not enforceable and is not consistent with the CAP, which requires that parking lots be surfaced with low-albedo materials. Further, this measure does very little to reduce the Project's area

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[35] Santa Clara CAP, pdf 72, 77.

[36] IS/MND, pdf 12, 112.

[37] IS/MND, pdf 112.

[38] IS/MND, pdf 112.

[39] IS/MND, pdf 35, 70.

[40] IS/MND, pdf 110.

[41] Santa Clara CAP, pdf 73-74, 113.

[42] IS/MND, pdf 11.

source GHG emissions of 0.00715 MT CO_2e/yr[43] because GHG emissions from area sources are only 0.0000047% of the total disclosed GHG emissions.[44]

2.3.1.4. Solar

The City must also reduce GHG emissions beyond 2020 levels. The City adopted a 2035 reduction target of 834,400 MT CO_2e/yr, to be met by additional measures beyond those proposed for 2020. These include customer-installed 10,000 kW of solar on about 2,000 residential homes, nonresidential buildings, parking garages, parking lots, and other feasible areas.[45] The IS/MND includes "[d]edicated roof space for future solar,"[46] but fails to identify how much, or commit to a timeline that would meet the 2035 target. Thus, this measure is not enforceable and is not consistent with the CAP. The IS/MND should require the installation of solar panels over all parking spaces and any roof area not being used for cooling towers or other equipment, as recommended by the BAAQMD for the McLaren Data Center.[47]

2.3.2. City of Santa Clara General Plan

As documented below, the Project is not consistent with the City of Santa Clara General Plan.

2.3.2.1. Section 5.10.2: Air Quality Goals and Policies

General Plan Section 5.10.2-P4 states: "Encourage measures to reduce greenhouse gas emissions to reach 30% below 1990 levels by 2020."[48] The IS/MND contains no demonstration that the proposed GHG mitigation would reduce GHG emissions to reach 30% below 1990 levels by 2020. Thus, the IS/MND is inconsistent with General Plan Section 5.10.2.

2.3.2.2. Section 5.10.3: Energy Goals and Policies

General Plan Section 5.10.3-G1 states: "Energy supply and distribution maximizes the use of renewable resources" and section 5.10.3-P3 states: "Maximize the efficient use of energy throughout the community by achieving adopted electricity efficiency targets…." Neither of these goals and policies is required or otherwise addressed in the IS/MND.

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[43] IS/MND, Appendix A, pdf 26, Section 2.2, Category = Area (7.1500e-003 MT/yr).

[44] IS/MND, Appendix A, pdf 26: (100)(0.00715/151,826) = 0.0000047%.

[45] Santa Clara CAP, Table 11, pdf 77, 116.

[46] IS/MND, pdf 70.

[47] Letter from Jean Roggenkamp, Deputy Executive Officer, BAQMD, to Yen Han Chen, Associate Planner, City of Santa Clara, Re: Mitigated Negative Declaration for the McLaren Data Center Project, March 8, 2017; available in "McLaren Response to Comments", pdf 8 at: http://santaclaraca.gov/Home/Components/BusinessDirectory/BusinessDirectory/167/3650?npage=2.

[48] General Plan, pdf 86.

The Project's energy provider, SVP, allows residents and businesses to "choose renewable energy for 100 percent of their energy usage."[49] The IS/MND contains no requirement to maximize the use of renewable energy, let alone 100%. The Project's emissions from electricity use could be significantly reduced by purchasing all of its electricity from Santa Clara Green Power, which is available through Silicon Valley Power, the identified power provider.[50] Alternatively, the GHG emissions from electricity demand also could be further reduced by requiring the installation of on-site solar panels to the maximum extent feasible and acquiring additional land in the vicinity to install the needed PV panels. The Applicant could also enter into a long-term (20-year minimum) purchase agreement for renewable energy in which the provider is contractually bound to retire the Renewable Energy Credits (RECs) associated with the renewable energy on CARB's behalf.[51] Thus, the IS/MND is inconsistent with General Plan Section 5.10.3.

2.3.2.3. Section 5.10.4: Water Goals and Policies

General Plan Section 5.10.4-P6 states: "Maximize the use of recycled water for construction, maintenance, irrigation and other appropriate applications." The IS/MND indicates that recycled water would only be used for landscape irrigation.[52] No recycled water is proposed for construction. Thus, the IS/MND is not consistent with this General Plan policy.

2.3.2.4. Section 5.11.2: Global Climate Change

This section relies on prior sections, discussed above. Thus, the IS/MND's GHG mitigation measures are not consistent with the General Plan's global climate change goals.

2.3.3. Bay Area Clean Air Plan

As documented below, the IS/MND GHG mitigation program is not consistent with the Bay Area Clean Air Plan.

2.3.3.1. Decarbonize Electricity Production (EN1)

This measure states: "Engage with PG&E, municipal electric utilities and CCEs to maximize the amount of renewable energy contribution to the production of electricity within the Bay Area as well as electricity imported into the region. Work with local governments to implement local renewable energy programs…"[53] As discussed in Comment 2.3.2.2, the IS/MND does not comply with this measure.

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[49] General Plan, pdf 87.

[50] *See* 3/8/17 BAAQMD letter, p. 2 and IS/MND, pdf 68.

[51] *See, e.g.*, CARB, March 2017, Table 1-1, p. 1-2.

[52] IS/MND, pdf 12, 70, 71, 74.

[53] Bay Area Clean Air Plan, Attachment A, pdf 144, Table 5-3: Energy Control Measures.

The Project's energy provider, Silicon Valley Power (SVP), allows residents and businesses to "choose renewable energy for 100 percent of their energy usage."[54] The IS/MND contains no requirement to maximize the use of renewable energy. As discussed in Comment 2.3.2.2, the emissions from electricity use could be significantly reduced by purchasing all necessary electricity from Santa Clara Green Power, which is available through SVP.[55] Alternatively, the GHG emissions from electricity demand also could be further reduced by requiring the installation of on-site solar panels to the maximum extent feasible and acquiring additional land in the vicinity to install the needed PV panels. The Applicant could also enter into a long-term (20-year minimum) purchase agreement for renewable energy in which the provider is contractually bound to retire the RECs associated with the renewable energy on CARB's behalf.[56] Thus, the IS/MND is inconsistent with measure EN1 of the Bay Area Clean Air Plan.

2.3.3.2. Decrease Electricity Demand (EN2)

This measure states: "Work with local governments to adopt additional energy-efficiency policies and programs…. Work with partners to develop messaging to decrease electricity demand during peak times."[57] The IS/MND does not require working with local governments to adopt additional energy-efficiency policies and programs, or to work with anyone to reduce electricity demand during peak hours. Thus, the IS/MND is inconsistent with measure EN2 of the Bay Area Clean Air Plan.

2.3.3.3. Water Control Measures (WR2)

This measure states "increase on-site water recycling in new and existing buildings…"[58] The IS/MND indicates that recycled water will be used for landscape irrigation. However, it does not require the use of recycled water for any other use, such as plumbing fixtures and construction dust control. Further, the IS/MND does not identify all uses of water,[59] preventing further comment on compliance with this measure. It is unclear, for example, whether water would be used for cooling or fire fighting.

2.4. Additional Feasible GHG Mitigation Measures

The mitigated GHG emissions remain significant because the IS/MND mitigation measures address Project components that contribute very little of the total Project increase in GHG emissions. The majority of non-stationary source GHG emissions, 98.7%,[60] are from

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[54] General Plan, pdf 87.

[55] *See* 3/8/17 BAAQMD letter, p. 2 and IS/MND, pdf 68.

[56] *See, e.g.*, CARB, March 2017, Table 1-1, p. 1-2.

[57] Bay Area Clean Air Plan, Attachment A, pdf 144, Table 5-3: Energy Control Measures.

[58] Bay Area Clean Air Plan, Attachment A, Table 5-8.

[59] IS/MND, Appendix H.

[60] Percent of non-stationary source GHG emissions from data center = (100)(151,826/153,850) = 98.7%.

producing electricity to supply the data center. The emissions from electricity use could be significantly reduced by purchasing all electricity from Santa Clara Green Power, which is available through Silicon Valley Power, the identified power provider or other options identified in Comment 2.3.2.2[61]

The GHG emissions from electricity demand also could be further reduced by requiring the installation of on-site solar panels to the maximum extent feasible and acquiring additional land in the vicinity to install any additional PV panels required to offset 100% of the demand. Alternatively, the Applicant could enter into a long-term (20-year minimum) purchase agreement for renewable energy in which the provider is contractually bound to retire the RECs associated with the renewable energy on CARB's behalf.[62]

In addition, other building envelope and facility operation measures are feasible and should also be required. These include:[63,64,65,66]

- Replace the diesel-powered generators with backup power from on-site solar coupled with battery backup. The Project currently includes batteries, but the IS/MND is silent on their capacity or use.
- Require bus stops, express lanes, and bus stop shelters for existing/planned transit service that supports the Project.
- Use traffic calming measures, including all internal sidewalks a minimum 5 feet wide, all sidewalks with vertical curbs, roadways routed to avoid "skewed intersections."
- Use the following traffic-calming features at internal and adjacent intersections: marked crosswalks, count-down signal times, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts, or mini-circles.
- Participate in funding off-site traffic improvements to reduce idling by increasing traffic flow through synchronized traffic signals.[67]
- Use the following traffic-calming features on internal and adjacent streets: planter strips with trees, chicanes/chokers (variations in road width to discourage high-speed travel).
- Provide preferential parking for park-and-ride to incentivize carpooling, vanpooling, commuter bus, and electric vehicles.

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[61] *See* 3/8/17 BAAQMD letter, p. 2 and IS/MND, pdf 68.

[62] *See, e.g.*, CARB, March 2017, Table 1-1, p. 1-2.

[63] CAPCOA 2008, Appendix B, Table 16, pp. B-1 to B-31.

[64] SLAFC, December 2017.

[65] MJPA, June 2017, Table 4.6-5, p. 4.6-43.

[66] SLAFC, December 2017, Table ES-1.

[67] MJPA, June 2017, Table 4.6-5, p. 4.6-43, Policy 6.1.

- Require "cool parking" by, for example, providing tree cover to reduce the heat-island effect.
- Provide preferential parking for EV /CNG vehicles.
- Use only drought-resistant native trees, trees with low emissions and high carbon sequestration potential.[68]
- Orient building to maximize shade in the summer and maximize solar access to walls and windows in the winter.
- Provide shade and/or use light-colored/high-albedo materials and/or open-grid pavement for at least 30% of the site's nonroof impervious surfaces, including parking lots, walkways, plazas, etc.; or place a minimum of 50% of parking spaces underground or covered by structured parking, or use an open-grid pavement system for a minimum of 50% of the parking lot area.
- Implement CALGreen Tier 2 standards or better.[69]
- Use a chiller system that uses less energy, such as the cactus chiller.[70]

3. AMBIENT AIR QUALITY IMPACTS WERE NOT EVALUATED

The IS/MND assessed air quality impacts of Project construction and operation by comparing daily and annual emissions estimated using the CalEEMod model with CEQA significance thresholds published by the BAAQMD.[71,72] The operational thresholds are based on "maximum annual emissions" and "average daily" emissions. The construction thresholds are based on "daily average" emissions. However, these thresholds do not address all potential air quality impacts. Significant ambient air quality impacts can occur over different averaging periods.

The National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), which determine the amount of various pollutants that can be present in ambient air without causing adverse health and other impacts, must also be attained

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[68] MJPA, June 2017, p. 4.6-34 ("water efficient landscaping: No turf; only drought tolerant plants"). The Newland Sierra DEIR allows warm-season turf grass in rear and side yards of single-family homes. (PDF-25).

[69] Newland Sierra DEIR, p. 2.7-19.

[70] Charles Babcock, Aligned Energy Chills Data Centers with Cool Efficiency, October 20, 2016; available at: https://www.informationweek.com/data-centers/aligned-energy-chills-data-centers-with-cool-efficiency-/d/d-id/1327218?.

[71] BAAQMD, California Environmental Quality Act Air Quality Guidelines, May 2017, Table 2-1 and 2-4; available at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

[72] The IS/MND is ambiguous as to which version of the BAAQMD's CEQA guidelines it relied on. The IS/MND at pdf 33 states: "The analysis in this Initial Study is based upon the general methodologies in the most recent BAAQMD CEQA Air Quality Guidelines (dated May 2012).". Elsewhere, the IS/MND cites to the May 2011 BAAQMD CEQA Guidelines. *See* IS/MND, pdf 33, Table 4.3-1, sources (dated May 2011); Appendix A, pdf 6, note 2 and pdf 6, 7, 10, 12, 30; Appendix D. The "most recent version" of the BAAQMD CEQA Guidelines is dated May 2017, which is the version that should have been relied on.

and maintained during Project construction and operation. The BAAQMD's CEQA significant thresholds in lb/day and ton/yr do not assure that these standards are met. These air quality criteria are summarized in Table 1.

Table 1:
CAAQS and NAAQS Applicable to the Project

Table C.1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards[a]		
		Standards[b, c]	Attainment Status[d]	Primary[c,e]	Secondary[c,f]	Attainment Status[g]
Ozone	1-hour	0.09 ppm (180 µg/m³)	N (Serious)	–[h]	Same as Primary Standard	–[h]
	8-hour	0.070 ppm (137 µg/m³)	–	0.075 ppm (147 µg/m³)		N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m³)	A	35 ppm (40 mg/m³)	–	U/A
	8-hour	9 ppm (10 mg/m³)		9 ppm (10 mg/m³)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	–	0.053 ppm (100 µg/m³)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (339 µg/m³)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m³)	–	A
	24-hour	0.04 ppm (105 µg/m³)	A	0.14 ppm (365 µg/m³)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m³)	
	1-hour	0.25 ppm (655 µg/m³)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m³	N	–[h]	Same as Primary Standard	U
	24-hour	50 µg/m³		150 µg/m³		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m³	N	15 µg/m³	Same as Primary Standard	N[i]
	24-hour	–	–	35 µg/m³		
Lead[j]	30-day Average	1.5 µg/m³	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m³	Same as Primary Standard	–

The NAAQS, other than ozone, PM, and those based on annual average or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM10 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The PM2.5 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The CAAQS for ozone, CO, SO2 (1- and 24-hour), NO2, and PM are not to be exceeded ever. All other CAAQS are not to be equaled or exceed.[73]

The significance thresholds relied on in the IS/MND, based on maximum annual and average daily emissions, do not allow determination of compliance with NAAQS and CAAQS, which are based on different averaging times. Compliance with these standards can only be determined by estimating emission rates consistent with each standard and using air dispersion modeling—for example, AERMOD—to convert the emissions into ambient concentrations.

[73] BAAQMD May 2017, Table C.1, pp. C-14.

The IS/MND does not contain any dispersion modeling to determine compliance with NAAQS or CAAQS. The BAAQMD significance thresholds in average lb/day and maximum ton/yr are not a substitute for dispersion modeling to determine compliance with NAAQS and CAAQS because, among other reasons, the averaging times differ materially. A lb/day or ton/yr average allows smoothing out the peaks that occur over shorter periods of time, such as on a 1-hour or 24-hour basis. These peaks are the basis of many NAAQS and CAAQS and frequently result in violations of NAAQS and CAAQS. See Table 1. For example, multiple pieces of construction equipment could be operating simultaneously over a 1-hour period, resulting in short-term peaks. These short-term peaks are smoothed out and disappear in a daily average calculated from the maximum annual emission rates, as are BAAQMD daily CEQA significance thresholds. Thus, the IS/MND fails as an informational document under CEQA for failing to demonstrate compliance with NAAQS and CAAQS during Project construction and operation.

3.1. The IS/MND Failed to Evaluate Ozone Impacts

The Bay Area Air Basin, the area in which the Project is located, is designated as a serious nonattainment area for the state 1-hour ozone standard and as nonattainment for the federal 8-hour ozone standard. See Table 1. The DEIR failed to determine whether the increases in ozone precursors (NOx, VOC), which were underestimated, would affect the ozone attainment classification of the Basin or cause or contribute to additional violations of ozone standards.

Ground-level ozone is not emitted directly into the air but is created by chemical reactions between NOx and VOCs emitted primarily by construction equipment, the increase in traffic due to the Project, and emissions from diesel storage tanks (which were omitted from the IS/MND). The NOx and VOCs react in the presence of sunlight, creating ozone. Ozone at ground level is a harmful air pollutant because of its adverse effects on people and the environment. The public health impacts include:

- making it more difficult to breathe deeply and vigorously;
- causing shortness of breath and pain when taking a deep breath;
- causing coughing and sore or scratchy throat;
- inflaming and damaging the airways;
- aggravating lung diseases such as asthma, emphysema, and chronic bronchitis;
- increasing the frequency of asthma attacks;
- making the lungs more susceptible to infection;
- continuing to damage the lungs even after symptoms have disappeared; and
- causing chronic obstructive pulmonary disease (COPD).[74]

[74] U.S. EPA, Health Effects of Ozone Pollution; available at https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution.

Ozone also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas, and can cause significant damage during the growing season.[75] None of these potential impacts from increases in ozone precursors was considered in the IS/MND.

The primary sources of Project VOCs and NOx are exhaust from construction equipment and direct, induced increases in traffic from the Project, and the generation of electricity to support the data center. The increases in NOx and VOC from Project construction and operation will increase ambient ozone concentrations, aggravating existing exceedances of ozone standards and perhaps result in additional exceedances, a potentially significant and unidentified impact.

The IS/MND made no attempt to determine if the Project's VOC and NOx emissions coupled with those from other planned projects in the area (Comment 8) could affect the classification of the Bay Area Air Basin with respect to ozone, or impact the health of sensitive receptors in the vicinity of the Project or elsewhere.

These increases in ozone precursors should have automatically triggered an analysis of their impact on ambient ozone concentrations and the Basin's attainment status. Both the State and Federal ozone standards are set to protect public health. Exceedances translate directly into adverse health impacts on the affected population. Further, these unmitigated increases could interfere with the BAAQMD's ability to comply with its State Implementation Plans, designed to bring it into compliance with ozone standards. These are serious impacts with serious consequences that should result in denial of the Project if they are not mitigated.

4. CALEEMOD IS INAPPROPRIATE FOR CALCULATING THE PROJECT'S CONSTRUCTION AND OPERATIONAL EMISSIONS

The IS/MND relies on the CalEEMod program to calculate construction and operational emissions. CalEEMod is a database program distributed by the California Air Pollution Control Officers' Association (CAPCOA) for use in preparing many emission inventory types. CalEEMod, however, is not reliable for calculating fugitive dust and other emissions from the Project's construction activities and emissions from generating electricity to support data center.

First, CalEEMod is in many ways a "black box," where the actual emission calculations and coding are not available to the user or reviewer. As used in the IS/MND, CalEEMod does not display individual calculations from construction fugitive dust activities, but rather groups the output by site location, activity, and year without disclosing any emission calculations. Thus, the reported construction and operational emissions are unsupported.

Second, CalEEMod does not include the correct emission calculation methodologies for many of the most significant construction activities. For example, CalEEMod lacks the ability to calculate fugitive dust emissions from wind erosion. Thus, the construction emissions reported in the IS/MND are incomplete and underestimated.

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[75] *Ibid.*

Third, CalEEMod uses an inappropriate unpaved road emission factor in calculating fugitive dust emissions from onsite hauling, grading, and other activities. These are the most significant sources of PM10 and PM2.5 emissions during construction activities. CalEEMod uses the AP-42 emission factor for unpaved public roads when calculating construction fugitive dust emissions.[76] As specified in the AP-42 emission factor for unpaved roads, there are two emission calculation equations: one for industrial roads, and another for public roads. The unpaved public road emission factor is limited to vehicles weighing between 1.5 and 3.0 tons.[77] Haul trucks and other construction equipment weigh far more. The industrial unpaved emission factor in AP-42, which is designed for vehicles weighing from 2 to 290 tons, is the appropriate equation to use in calculating haul truck trips and construction equipment operating in unpaved areas. Using inappropriate unpaved road emission factors results in substantial underpredictions of fugitive PM10 and PM2.5 emissions.

Fourth, CalEEMod does not include any fugitive PM emissions from unpaved on-site haul roads.

Fifth, CalEEMod does not estimate emissions from supplying electricity to the data center, which is the major source of criteria pollutant emissions from the Project.

Finally, CalEEMod is not recognized in the BAAQMD CEQA guidelines that the Project relied on, or the most current version of the BAAQMD's CEQA guidelines, to estimate construction or operational emissions. All recent versions of the BAAQMD CEQA guidelines, including the most recent, recommend the use of the URBEMIS model.[78] The BAAQMD guidelines also recommend that direct and indirect greenhouse gas emissions be estimated using the BAAQMD Greenhouse Gas Model.[79] The IS/MND contains no justification for deviating from the BAAQMD CEQA guidelines that it asserts it relied on, only when estimating emissions.

5. CONSTRUCTION EMISSIONS ARE UNDERESTIMATED AND SIGNIFICANT

5.1. CalEEMod Emissions Were Modeled Only for Annual Emissions

CalEEMod can be run for three different scenarios: annual emissions with an output in tons per year, and winter and summer emissions with outputs in pounds per day. The IS/MND ran the model for only the annual condition and converted annual emissions into daily emissions by dividing by 365 days per year. This underestimates daily emissions for three reasons.

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[76] CAPCOA, CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod, October 2017, p. 30); available at http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf.

[77] EPA, AP-42, Section 13.2.2—Unpaved Roads, November 2006, Table 13.2.2-3; available at http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf.

[78] BAAQMD May 2017, Sections 3-1, 3-5, 4, Table 4-2 and B-1.

[79] BAAQMD May 2017, p. 4-5.

First, construction is expected to last for 336 days,[80] not 365 days. Thus, average daily emissions are underestimated as annual emissions should have been converted to daily by dividing by 336 days. Regardless, "average" daily emissions calculated from annual emissions are not the correct metric to assess daily emissions. The maximum daily emissions must be used to address NAAQS and CAAQS compliance.

Second, given the construction duration, construction will definitely occur in the summer. In fact, most of the construction will occur in the summer when weather conditions are more favorable. A major source of reactive organic gas (ROG) emissions during construction is evaporative emissions from construction equipment. These evaporative emissions are much higher in the summer. Thus, the IS/MND has underestimated daily ROG emissions during construction. The choice of only an annual run would also underestimate operational ROG emissions from mobile sources.

Third, ROG emissions from the diesel storage tanks, which were not included in the operational emissions, would be much higher in the summer than on an average annual basis.

Fourth, running the model only for the annual condition will underestimate daily emissions because on a daily basis, multiple pieces of construction equipment would be operating simultaneously and/or construction phases will overlap[81]. This effect would be averaged out by converting annual emissions into daily emissions by dividing by the number of days in a year, as in the IS/MND.

5.2. Applicant-Provided Inputs Disagree With Modelled Inputs

The CalEEMod output includes a section called: "User Entered Comments & Non-Default Data."[82] We requested that the City provide these Applicant inputs.[83] The produced documents disclose discrepancies between the information produced in response to our PRA and the actual CalEEMod inputs, which underestimate construction emissions. The Applicant inputs produced in our PRA that differ from the inputs that were modeled are summarized in Table 2.

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[80] IS/MND, Appendix A, pdf 9.

[81] IS/MND, Appendix A, pdf 27, 3.0 Construction Detail shows that construction phases overlap significantly.

[82] IS/MND, Appendix A, pdf 23, Section 1.3.

[83] Email from Sheila M. Sannadan to Steve Le and Robin Kettner re 2305 Mission College Blvd Data Center Project – MND (Mar. 28, 2018).

Table 2:
Applicant-Provided vs. Actual CalEEMod Input

PHASE	Applicant[84] (hrs/day)	CalEEMod[85] (hrs/day)
Demolition		
Crushing/Processing Equipment	8	2
Excavators	8	4
Rubber-Tired Dozers	8	4.8
Tractors/Loaders/Backhoes	8	4.8
Site Preparation		
Graders	8	4
Rubber Tired Dozers	8	4
Tractors/Loaders/Backhoes	8	4
Building Exterior		
Cranes	10	4.2
Tractors/Loaders/Backhoes	8	6
Welders	10	5

Without running the CalEEMod from scratch, the impact of these underestimates cannot be determined. Re-running is not feasible given the short time allotted for review. However, I note that the "mitigated" construction NOx emissions are 51 lb/day[86], compared to the BAAQMD's CEQA significance threshold of 54 lb/day.[87] Small changes such as these could easily push the mitigated NOx emissions over the CEQA significance threshold, resulting in a significant construction NOx impact.

Further, the normal workday at a construction site is 8 hours. The Applicant-provided CalEEMod input indicates construction hours of 7 AM to 5:00 PM, or 10 hours total. Assuming a 1-hour lunch break, the total daily construction time would be 9 hours. This change alone, from the standard 8 hr/day to 9 hr/day, would increase mitigated NOx emissions from 51 lb/day to 57 lb/day[88], which exceeds the construction NOx significance threshold of 54 lb/day. Thus, mitigated construction NOx emissions are likely significant, but the record does not contain sufficient information to support either the claimed mitigated emissions, or their replacement.

5.3. Trip Length Is Underestimated

Construction emissions from worker, vendor, and off-site hauling depend on the distance traveled. The IS/MND assumed trip lengths of 10.8 miles for workers, 7.3 miles for

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[84] Aligned AQ Construction Data Request Form

[85] IS/MND, Appendix A, pdf 27.

[86] IS/MND, pdf 36.

[87] IS/MND, pdf 36.

[88] Revised NOx emissions = (51 lb/day)(9 hr/day/8 hr/day) = 57 lb/day.

vendors, and 20.0 miles for hauling,[89] without providing any support whatsoever or imposing mitigation that would limit trip lengths to the assumed distances. The assumed distances are very small, particularly for workers who typically travel great distances to construction sites. Thus, emissions of all pollutants from worker, vendor, and off-site hauling are underestimated.

5.4. PM10 And PM2.5 Emissions Are Underestimated and Significant

5.4.1. Fugitive Dust Emissions from Off-Road Truck Travel Within the Site Are Omitted

The CalEEMod model does not include fugitive dust from off-road vehicle travel,[90] which must be separately calculated. This includes fugitive dust from on-site haul trucks. Haul truck activities will generate fugitive PM2.5 and PM10 emissions when traveling on unpaved roads and other unpaved areas within the Project site during site preparation and grading. The 15-acre construction site[91] will include unpaved roads, but the IS/MND fails to identify them, provide a supported estimate of their length, or calculate emissions from them.

CalEEMod uses the AP-42 emission factor for unpaved public roads when calculating construction fugitive dust emissions.[92] As specified in the AP-42 emission factor for unpaved roads, there are two emission calculation equations: one for industrial roads and another for public roads. The unpaved public road emission factor is limited to vehicles weighing between 1.5 and 3.0 tons.[93] The haul trucks assumed to service the Project weigh approximately 32 tons, on average, as detailed below. The industrial unpaved emission factor in AP-42, which is designed for vehicles weighing from 2 to 290 tons, is the appropriate equation to use in calculating haul truck trips on unpaved roads.

The industrial unpaved road emission factor is the most appropriate equation for the weight and use of the Project's haul trucks. The IS/MND assumes (without providing any calculations) that the emissions generated from this activity are mitigated by limiting the truck travel speed to 15 miles per hour.[94]

I calculated particulate matter emissions from on-site haul truck travel using EPA's air pollution emission factor equation for industrial unpaved roads.[95] This equation is as follows:

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[89] Appendix A, pdf 28.

[90] CalEEMod User's Guide, p. 2 ("Fugitive dust [emissions] from … off-road vehicle travel, are not quantified in CalEEMod…").

[91] IS/MND, Appendix A, pdf 8. Note that pdf 3 states the area as 15.7 acres.

[92] CAPCOA, CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod, October 2017, p. 30); available at http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf

[93] EPA, AP-42, Section 13.2.2—Unpaved Roads, November 2006, Table 13.2.2-3.

[94] IS/MND, Appendix A, pdf 10.

[95] *Id.*, p. 13.2.2-4.

$$E = [k(s/12)^a * (W/3)^b] * [(365-P)/365]$$

Where:

E = emission factor in the same units as k

k = particle size multiplier:

0.15 lb/vehicle mile traveled (VMT) for PM2.5

1.50 lb/VMT for PM10[96]

s = road surface silt percentage (%)

W = average weight of vehicles (tons)

a = constant (0.9 for both PM2.5 and PM10)

b = constant (0.45 for both PM2.5 and PM10)

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period

The values used for any of the variables in the above equation—s, W, and P—will have an impact on the final result; that is, the calculated particulate matter emission rates. Each of these inputs is discussed below.

Silt content (s)

Silt content is the fraction of silt in the unpaved road surface materials, with silt being defined as particles smaller than 75 micrometers in diameter.[97] USEPA provides typical silt percentage values for unpaved roads at industrial facilities. My analysis uses an unpaved road silt fraction of 8.5%, which is the average silt fraction for construction sites listed by the USEPA.[98]

Truck weight (W)

Vehicle weights are the other main component of the AP-42 emission factor for calculating PM2.5 and PM10 emission rates from unpaved roads. It is the average vehicle weight that is used for the emission calculation (usually the average of loaded and unloaded truck weights).[99]

The IS/MND does not provide information on truck weights and thus fails as an informational document under CEQA because this information is required to estimate PM10

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[96] *Id.*, Table 13.2.2-2.

[97] *Id.*, p.13.2.2-1.

[98] *Id.*, Table 13.2.2-1.

[99] *Id.*, p.13.2.2-6.

and PM2.5 emissions. The CalEEMod emission calculation file identifies the construction haul trucks as being HHDT class.[100] For my emission rate analysis, I calculated a mean truck weight of 34.6 tons, as follows:

Unloaded truck weight: 16.5 tons (33,000 lbs)[101]
Haul truck load: 18 cubic yards[102]
Material density: 1.7 tons/cubic yard[103]
Haul truck material weight: 18 yd^3 * 1.7 tons/yd^3 = 30.6 tons
Loaded truck weight: = 16.5 tons + 30.6 tons = 47.1 tons
Average unloaded/loaded haul truck weight: (16.5 tons + 47.1 tons)/2 = 31.8 tons

For comparison, the USEPA, in developing AP-42 Section 13.2.1, identifies an average vehicle weight of 35 tons for heavy-duty diesel trucks.[104] Heavier trucks result in higher fugitive dust emission because emissions increase as the weight of the trucks increase.

Rainfall correction (P)

Short-term PM2.5 and PM10 emission rates should not be calculated using a rainfall correction, as there are many consecutive days in Santa Clara when there is no rainfall. Accordingly, my unpaved road fugitive dust emission rate calculations did not apply a rainfall correction to 24-hour PM2.5 and PM10 emission rates.

Calculation of PM10 and PM2.5 emissions

Based on the above assumptions, the particulate matter emission factors for PM10 and PM2.5 are:

$$E_{PM10} = [1.5 \text{ lb/VMT } (8.5/12)^{0.9} * (31.8 \text{ tons}/3)^{0.45}] * [(365-0)/365]$$

$$E_{PM10} = \mathbf{3.18 \text{ lb/VMT}}$$

$$E_{PM2.5} = [0.15 \text{ lb/VMT } (8.5/12)^{0.9} * (31.8 \text{ tons}/3)^{0.45}] * [(365-0)/365]$$

$$E_{PM2.5} = \mathbf{0.32 \text{ lb/VMT}}$$

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[100] IS/MND, Appendix A, pdf 28 ("hauling vehicle class").

[101] Vehicle Weight Classes & Categories; available at https://www.afdc.energy.gov/data/10380.

[102] https://www.google.com/search?q=haul+truck+load+cubic+yards&oq=haul+truck+load+cubic+yards&aqs=chrome..69i57.6002j0j7&sourceid=chrome&ie=UTF-8.

[103] SImetric, Density of Materials (sand with gravel, wet); available at https://www.simetric.co.uk/si_materials.htm.

[104] USEPA, Emission Factor Documentation for AP-42, Section 13.2.1, January 2011, p. 4-37; http://www3.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s0201.pdf.

The use of these emission factors to calculate PM10 and PM2.5 emissions requires an estimate of on-site and off-site vehicle miles traveled (VMT) by haul trucks on unpaved roads. The IS/MND reports an on-site hauling length of 0.5 miles[105] and a maximum of 288 hauling trips during grading.[106] Assuming the hauling distance is round trip (the CalEEMod User's Guide indicates that the hauling distance is a one-way distance, so emissions could be double the below estimate[107]), the particulate matter emissions would be:

E_{PM10} = (3.18 lb/VMT)(288 trips/day)(0.5 mi/trip)

E_{PM10} = 458 lb/day

$E_{PM2.5}$ = (0.32 lb/VMT)(288 trips/day)(0.5 mi/trip)

$E_{PM2.5}$ = 46 lb/day

5.4.2. Fugitive Dust Emissions from Wind Erosion Were Omitted

Windblown dust can be a significant source of fugitive PM10 and PM2.5 dust. CalEEMod does not estimate "fugitive dust generated by wind over land and storage piles"[108] because of the number of input parameters required—such as soil type, moisture content, wind speed, etc. The CalEEMod Technical Paper states that this limitation "could result in underestimated fugitive dust emissions if high winds and loose soil are substantial characteristics for a given land use/construction scenario."[109]

In addition, the CalEEMod User's Guide reminds the reviewer in two more instances that wind erosion emissions from disturbed soil and storage piles are not calculated by the model: "Fugitive dust from windblown sources such as storage piles is not quantified in CalEEMod, which is consistent with approaches taken in other comprehensive models."[110]

Some fugitive dust mitigation measures required by some districts, including many of them proposed in the IS/MND, do not apply because the fugitive dust sources they mitigate is not quantified by CalEEMod. In particular, this includes fugitive dust generated by wind over land and storage piles. As they are not quantified, it is not appropriate to apply the reduction.[111]

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[105] IS/MND, Appendix A, pdf 15.

[106] IS/MND, Appendix A, pdf 27-28: 5,780 hauling trips during grading/20 days of grading = 288 trips/day during grading.

[107] CalEEMod User's Guide, p. 35.

[108] CalEEMod User's Guide, p. 55; available at http://www.caleemod.com/.

[109] CalEEMod, Technical Paper, Methodology Reasoning and Policy Development of the California Emission Estimator Model, July 2011, p. 4.

[110] CalEEMod, User's Guide, *op. cit.,* p. 3.

[111] CalEEMod, User's Guide, *op. cit.*, p. 40.

The IS/MND does not provide separate emission estimates for windblown dust from the areas that would be graded or otherwise disturbed and thus has underestimated fugitive PM10 and PM2.5 emissions.

Frequent hot, dry high-wind events in the Bay Area, of up to 40–50 mph, typically occur in spring and fall and are known as Diablo winds. These are similar to the Santa Ana winds in Southern California. They can cause substantial emissions of fugitive dust particulate matter, particularly from disturbed surfaces. Further, winds blow at night. Thus, unless the construction contractor is required to water throughout the night to maintain soil moisture, wind erosion would occur in the period when the water from the last watering event in the evening has evaporated and before the first watering event in the morning. This is of particular concern during the hot summer months, when average high temperatures can exceed 100 F. The IS/MND's mitigation measures contain no requirement to water throughout the night.

As high winds can reach 30 to 50 mph, even up to hurricane speeds,[112] they can raise significant amounts of dust, even when conventional tracking and other such controls are used to control dust, often prompting alerts from air pollution control districts. The IS/MND did not include any wind data, not even a wind rose, which is commonly found in CEQA documents. If high winds occurred during grading, cut and fill, or soil movement, or from bare graded soil surfaces during non-working hours, even if periodically wetted, significant amounts of fugitive dust would be released. These emissions could result in public health impacts due to violations of state and federal ambient air quality standards for PM10 and PM2.5. PM10 and PM2.5 emissions from these events were not included in the IS/MND, and no air dispersion modeling was conducted to evaluate their impact on local ambient air quality.

Wind erosion emissions are typically calculated using methods in AP-42,[113] which require detailed information on site topography, wind profiles, and dispersion modeling. The IS/MND does not include any calculations of wind erosion emissions or their resulting ambient air quality impacts. Further, none of the information required to estimate wind erosion emissions is included or cited in the IS/MND. Thus, the IS/MND fails as an information document under CEQA.

In the absence of this information, AP-42 includes a generic construction emission factor of 1.2 tons of total suspended material per acre per month of construction activity.[114] Assuming 2.5 acres are disturbed on the maximum day[115] and that 90% of the total suspended material is PM10, PM10 emissions from wind erosion alone would be 180 lb/day.[116] Similarly,

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[112] Daphne Thompson, The Diablo Winds of California; available at https://blog.wdtinc.com/the-devil-winds-of-california.

[113] U.S. EPA, AP-42, Section 13.2.5, Industrial Wind Erosion; available at https://www3.epa.gov/ttnchie1/ap42/ch13/final/c13s0205.pdf.

[114] AP-42, Section 13.2.3.3: Heavy Construction Operations, p. 13.2.3-1.

[115] IS/MND, Appendix A, pdf 27: 50 acres of grading/20 days = 2.5 acres/day.

[116] Wind erosion PM10 emissions: [(1.2 ton/acre/month)(2,000 lb/ton)(2.5 acres)(1 month)/(30 day/month)][0.9] = **180 lb/day.**

conservatively assuming that only 25% of PM10 wind erosion emissions are PM2.5, wind erosion PM2.5 emissions would be 45 lb/day.[117]

The maximum daily unmitigated and mitigated fugitive PM10 emissions reported in the IS/MND are 4.4 lb/day.[118] Adding wind erosion PM10 emissions, which represent the maximum day, increases construction fugitive PM10 emission from 4.4 lb/day estimated in the IS/MND to 184 lb/day, which exceeds the upper end of the PM10 significance threshold of 150 lb/day established by other air districts, as discussed in Comment 5.4.3.

The maximum daily unmitigated and mitigated fugitive PM2.5 emissions reported in the IS/MND are 1.7 lb/day.[119] Adding wind erosion PM2.5 emissions of 45 lb/day, which represent the maximum day, increases construction fugitive PM2.5 emission from 1.7 lb/day estimated in the IS/MND to 47 lb/day.

Alternatively, using the AP-42 "Industrial Wind Erosion" guidance and assuming a 2-minute wind speed of 30 mph, I estimated wind erosion PM10 emissions from a similar, but much smaller disturbed area at a construction site (4 acres disturbed) would be **60 lb/day of PM10 and 30 lb/day of PM2.5.** Wind erosion PM10 and PM2.5 emissions calculated using the AP-42 "Industrial Wind Erosion" methodology would be substantially higher if the entire disturbed area were included.

5.4.3. Construction PM10 And PM2.5 Emissions Are Significant and Unmitigated

The total PM10 and PM2.5 emissions, adjusted as estimated above, are summarized in Table 3.

Table 3:
Revised Unmitigated Construction Emissions

Emission Source	PM10 (lb/day)	PM2.5 (lb/day)
Unmitigated Fugitive PM10[120]	4.4	1.7
Unpaved Roads (Comment 5.3.1)	458	46
Wind Erosion (Comment 5.3.2)	60–184	30-45
Unmitigated Exhaust PM10[121]	1.6	1.5
Total PM10	**524-648**	**79-94**

[117] Wind erosion PM2.5 emissions: [(1.2 ton/acre/month)(2,000 lb/ton)(2.5 acres)(1 month)/(30 day/month)][0.9][0.25] = **45 lb/day.**

[118] IS/MND, Appendix A, pdf 25-26, Section 2.1: (0.7994 ton/yr)(2,000 lb/ton)/365 day/yr = 4.38 lb/day.

[119] IS/MND, Appendix A, pdf 25-26, Section 2.1: (0.3058 ton/yr)(2,000 lb/ton)/365 day/yr = 1.68 lb/day.

[120] IS/MND, Appendix A, pdf 25, Section 2.1: Unmitigated Fugitive PM10 = (0.7994 ton/yr)(2000 lb/ton)/365 day/yr = 4.38 lb/day.

[121] *Ibid*.

Wind erosion PM10 emissions plus unpaved road fugitive PM10 emissions estimated in Comments 5.3.1 and 5.3.2, plus unmitigated PM10 reported in the IS/MND, yield total fugitive PM10 emissions of 524 to 648 lb/day. Similarly, wind erosion PM2.5 emissions plus unpaved road fugitive PM2.5 emissions estimated in Comment 5.3.1, plus unmitigated PM2.5 reported in the IS/MND, yield total fugitive PM2.5 emissions of 79 to 94 lb/day.

The IS/MND did not establish a CEQA significance threshold for fugitive dust PM10 and PM2.5 emissions from construction, but rather only a threshold for exhaust PM10 and PM2.5 emissions.[122] Instead, the IS/MND assumes that PM10 and PM2.5 construction emissions are not significant if basic construction mitigation measures are required.[123] This conclusion is based on the BAAQMD's CEQA Guidelines. The BAAQMD CEQA guidelines only establish a CEQA significance threshold for construction exhaust emissions, set at 82 lb/day for PM10 and 54 lb/day for PM2.5.[124]

The BAAQMD CEQA guidelines fail to establish a CEQA significance threshold for fugitive dust PM10 and PM2.5 emissions from construction. Instead, the BAAQMD CEQA Guidelines and the IS/MND tacitly assume, with no support, that all construction PM10 and PM2.5 fugitive dust construction emissions are not significant if certain basic construction mitigation measures are required.[125] This is incorrect, because construction PM10 and PM2.5 emissions can and routinely do cause violations of NAAQS and CAAQS, or contribute to existing violations, when these measures are used, thus resulting in a significant ambient air quality impact. Therefore, I reviewed CEQA guidelines of other air districts to establish a significance threshold for total construction PM10 and PM2.5 emissions.

The Monterey Bay Unified Air Pollution Control District (MBUAPCD) has established a PM10 significance threshold for construction emissions of 82 lb/day.[126] The South Coast Air Quality Management District (SCAQMD) has established a PM10 significance threshold for construction emissions of 150 lb/day and for PM2.5 emissions of 55 lb/day.[127] The Sacramento Metropolitan Air Quality Management District (SMAQMD) has established a significance threshold for PM10 of 80 lb/day and 14.6 ton/yr and for PM2.5 of 80 lb/day and 14.6 ton/yr, if all feasible BACT/BMPs[128] are applied, and zero otherwise.[129] Zero is appropriate here as all

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[122] IS/MND, Appendix A, pdf 7, Table 1.

[123] IS/MND, Appendix A, pdf 9.

[124] BAAQMD, California Environmental Quality Act Air Quality Guidelines, May 2017, Table 2-1 and 2-4; available at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

[125] BAAQMD May 2017, Section 8.1.2, Tables 8-2 and 8-3.

[126] Monterey Bay Unified Air Pollution Control District, Guidelines for Implementing the California Environmental Quality Act, Revised February 2016, p. 4.

[127] SCAQMD, SCAQMD Air Quality Significance Thresholds; available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

[128] BMP = Best Management Practice.

feasible mitigation is not required in the IS/MND. Thus, a reasonable range for establishing the significance of construction emissions is 80 to 150 lb/day for PM10 and 0 to 80 lb/day for PM2.5.

The revised construction fugitive PM10 emissions in Table 3 are 524 to 628 lb/day and for PM2.5, they are 79 to 94 lb/day. Total PM10 and PM2.5 emissions would be significantly higher if other errors and omissions discussed in Comment 5 are corrected. Therefore, construction PM10 and PM2.5 emissions are significant.

5.4.4. All Feasible Construction Fugitive Dust PM10 and PM2.5 Mitigation Must Be Required

The IS/MND requires "standard" fugitive dust mitigation measures[130] based on the BAAQMD's "basic construction mitigation measures."[131,132] However, the IS/MND does not contain any demonstration that these general measures are sufficient to reduce fugitive PM10 emissions below a CEQA significance threshold, or set out any process to assure that they are implemented. In my experience, this slate of measures would not substantially mitigate construction fugitive PM10 impacts.

First, three of the measures address exhaust emissions, not fugitive PM10 emissions. These include limiting idling time and equipment tuning.

Second, no method(s) are set out to assure compliance—for example, no monitoring of wind speed is required to determine when winds exceed 20 mph and no method to determine when vehicle speeds exceed 15 mph is identified. Simultaneous occurrence of excavation, grading, and ground-disturbing construction shall be limited but the CalEEMod inputs show significant overlap will occur. Finally, the emission sources that are addressed in these basic measures are not the sources that were omitted from the CalEEMod calculations (wind erosion and off-road fugitive dust). Thus, they do not mitigate fugitive PM10 and PM2.5 emissions.

Third, most of the mitigation measures are not enforceable or are not valid mitigation. Limiting idling time to 5 minutes is not valid CEQA mitigation as it is required by 13 CCR 2449[d][3], 2485. Water would be applied twice per day, but no guidance is provided as to timing or method. The timing and method determine the effectiveness.

Construction fugitive PM10 and PM2.5 emissions are highly significant as they exceed CEQA construction significance thresholds set by three air districts. The IS/MND contains no demonstration that the mitigation measures imposed would reduce PM10 and PM2.5 emissions

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[129] SMAQMD, http://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable5-2015.pdf.

[130] IS/MND, pdf 33, Table 4.3-1; pdf 36-38.

[131] BAAQMD May 2017, Tables 8-2 and 8-3.

[132] IS/MND, pdf 37-38.

to insignificance, as calculated in Comment 5. In fact, they would not. Therefore, all feasible mitigation is required.

Additional feasible construction mitigation measures are included in CEQA guidelines of various air quality management districts and have been required in recent CEQA documents,[133,134,135,136,137] or are recommended by the U.S. EPA.[138] Some additional feasible mitigation measures for these sources that should be required for this Project are as follows:

- The number of pieces of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practicable number is operating at any one time.
- Signs shall be posted in designated areas and job sites to remind drivers and operators of the speed limit.
- Low rolling resistance (LRR) tires shall be used on long haul class 8 tractor-trailers.[139]
- When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
- Water all grading areas at least four times daily as water evaporates quickly in a hot climate such as that at the Project site, requiring more frequent watering than two times per day.
- Use a watering method that does not raise dust.

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[133] SWCA Environmental Consultants, Draft Initial Study and Mitigated Negative Declaration for the California American Water Slant Test Well Project, Prepared for City of Marina, May 2014, available at https://www.scribd.com/document/227412385/Draft-Initial-Study-and-Mitigated-Negative-Declaration.

[134] MBUAPCD 2008, Table 8-2 to 8-4, and 8-7.

[135] Chevron Refinery Modernization Project EIR, Volume 1, March 2014, Chapter 4.8, Greenhouse Gases; and Chapter 9, Mitigation Measure Monitoring and Reporting Program; available at https://s3.amazonaws.com/chevron/Volume+1_DEIR_r1.pdf.

[136] San Luis Obispo County Air Pollution Control District, CEQA Air Quality Handbook, April 2012, http://www.slocleanair.org/images/cms/upload/files/CEQA_Handbook_2012_v1.pdf.

[137] Bay Delta Conservation Plan RDEIR/SDEIS, 2015; http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-S/App_22E_Gen_Conform_Determin.pdf.

[138] Verified Technologies List; http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-S/App_22E_Gen_Conform_Determin.pdf.

[139] EPA, Verified Technologies for SmartWay and Clean Diesel, Learn About Low Rolling Resistance (LRR) New and Retread Tire Technologies; available at https://www.epa.gov/verified-diesel-tech/learn-about-low-rolling-resistance-lrr-new-and-retread-tire-technologies; EPA, Verified Technologies for SmartWay and Clean Diesel, SmartWay Verified List for Low Rolling Resistance (LRR) New and Retread Tire Technologies; available at https://www.epa.gov/verified-diesel-tech/smartway-verified-list-low-rolling-resistance-lrr-new-and-retread-tire.

- Use the calcium chloride method or salt crust process to achieve better dust control than with water alone.
- Use fine atomized sprays or mist sprays with droplet diameters of 60 um, produced by swirl-type pressure nozzles or pneumatic atomizers on watering trucks.[140]
- Thoroughly clean equipment, vehicles, and other items before they are moved off-site to other work locations.
- Continuously wet the soil before and while digging or moving the earth. Areas where bulldozers, graders, or skid steers operate are examples where continuously wetting the soil should be required.

All feasible mitigation must be required when an impact is significant and unavoidable. Thus, the IS/MND should be revised to include these additional mitigation measures and recirculated for public review.

6. OPERATIONAL EMISSIONS ARE UNDERESTIMATED

6.1. Diesel Storage Tanks

The Project includes 24 10,000 gallon aboveground diesel storage tanks, one beneath each block of five generators.[141] The IS/MND states that "there would be minor evaporative emissions of ROG from the twenty-four 10,000 gallon aboveground diesel storage tanks…."[142] The IS/MND did not provide any design information on these tanks nor estimate their ROG emissions. However, based on my experience, ROG emissions from diesel storage tanks can be substantial, especially on hot summer days such as those that occur in the Project area. Because the IS/MND does not contain any design details for these tanks—for example, fixed or floating roof—I cannot estimate these emissions.

In addition to emissions from the tanks themselves, ROG emissions would occur during transfer of diesel into the tanks from various fugitive sources. The IS/MND does not even disclose this source of emissions.

6.2. Emergency Diesel Generators

The IS/MND estimated average daily emissions from diesel generator operation, assuming operation of all generators at 100% engine load in a single day, resulting in NOx emissions of 57 lb/day. As this exceeded the BAAQMD CEQA significance threshold of 54 lb/day, the IS/MND imposed mitigation measure MM AIR-2, limiting generator operation for maintenance and testing so that the combined operation of all engines does not exceed 100

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[140] Amar Solanki, Dust Suppression System, p. 15-19, 25; available at https://www.slideshare.net/abhi24mining/prevention-suppression-of-dust.

[141] IS/MIND, pdf 38.

[142] IS/MND, Appendix A, pdf 11.

hr/day in total.[143] This limit only applies to generator testing, not generator operation during an emergency. The IS/MND does not include any emissions from operation during an emergency, which can reasonably be expected to occur, as otherwise, there would not be 120 backup generators.

Assuming the same 100-hour limit during emergency operations, which would be required to keep NOx emissions below the significance threshold, only 25 generators could operate for 4 hours, 50 generators for 2 hours, or 100 generators for 1 hour on any given day.[144] This means that during an emergency, such as an extended power outage, if all generators were required, the facility could only operate for about 50 minutes before exceeding the BAAQMD significance threshold for NOx. Power outages could last much longer than 50 minutes, particularly during emergency conditions, such as during an earthquake, storm, or fire, which would interrupt power supplies. Under these conditions, it can be reasonably expected that all generators could operate more than 100 hr/day, as the services they support could be essential to addressing the emergency conditions. In fact, it is contrary to the Project design to limit emergency operation of these generators because they must be available when needed to address emergency conditions, which could easily exceed a combined 100 hr/day. Thus, average daily generator emissions can be reasonably expected to be much higher than disclosed in IS/MND Table 4.3-4. The NOx emissions, for example, could exceed the significance threshold of 54 lb/day under emergency operation. The battery system[145] could supply some of this emergency power. However, the IS/MND is silent on the battery system design and its function in the Project.

In sum, mitigation measure MM AIR-2 does not address generator operation during emergency conditions, but rather only operation during maintenance and testing. Thus, daily NOx emissions from routine emergency operation of the diesel generators are significant and unmitigated. These emissions could be reduced below the significance threshold by requiring selective catalytic reduction (SCR) on each generator and limiting operation of the diesel generators to 100 hours during emergency operation.

7. NOISE IMPACTS DURING EMERGENCY OPERATION ARE SIGNIFICANT

The noise analysis concluded that the Project will comply with exterior noise limits in the City of Santa Clara Municipal Code SCCC 9.10.040 and General Plan only if no more than nine powerblocks and eleven PCS modules are tested simultaneously during daytime hours (7AM to 10 PM)[146] for no more than 4 hours in a 24-hr period.[147] The noise analysis also

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[143] IS/MND, pdf 40, MM AIR-2.

[144] For example, 25 generators x 4 hr/generator = 100-hr run time; 50 generators x 2 hr/generator = 100-hr run time; 100 generators x 1 hr/generator = 100-hr run time.

[145] IS/MND, pdf 11, 25, 94, 100.

[146] IS/MND, Appendix G, pdf 11.

[147] IS/MND, Appendix G, pdf 10.

concluded that "[t]o meet code limits at all property lines, no more than four (4) powerblocks along the west end of the generator yard may be tested simultaneously."[148]

The IS/MND concluded that noise impacts were significant and imposed noise mitigation measures NOI-1 and NOI-2.[149] However, these mitigation measures fail to limit testing to daytime hours and exclude the eleven PCS modules, pursuant to the Appendix G noise analysis. Further, these measures fail to limit operation to no more than four powerblocks along the west end of the generator yard. Thus, noise impacts from the mitigated Project remain significant.

Further, the noise analysis notes emergency equipment (generators and PCS modules in the run state) are not required to meet noise codes during emergency operation, per Section 9.10.070(a) of the Santa Clara Municipal Code.[150] Noise impacts would be significant during emergency conditions when more than nine powerblocks and eleven PCS modules are operating. This condition could occur during power outages. Extensive emergency operation could occur, for example, during earthquakes or other natural disasters.

The IS/MND concedes that a project would normally be considered to have a significant impact if noise levels conflict with adopted environmental standards or plans, "or if noise levels generated by the project would substantially increase existing noise levels at noise-sensitive receivers on a permanent or temporary basis."[151]

The noise impact analysis demonstrates that the Project would have a significant noise impact if more than nine powerblocks and eleven PCS modules operated simultaneously. The noise impact analysis also failed to analyze emergency operation due to the Municipal Code exemption. Thus, the noise analysis is incomplete. More than nine powerblocks and eleven PCS modules would be required during emergency operation. The IS/MND failed to identify this significant impact or impose any mitigation. This impact could and should be mitigated by installing sound barriers between the noise sources and the nearby residential receptors, or imposing other noise mitigation.

8. CUMULATIVE IMPACTS WERE NOT EVALUATED

The IS/MND does not include a cumulative impact assessment that evaluates the Project's impacts on air quality, GHGs, hydrology and water quality, noise and vibration, traffic, and utilities combined with those of other proposed projects. Cumulative impacts were only evaluated for cancer risk.[152]

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[148] IS/MND, Appendix A, pdf 10.

[149] IS/MND, pdf 99-100.

[150] IS/MND, Appendix G, pdf 9.

[151] IS/MND, pdf 101.

[152] IS/MND, Table 4.3-7, pdf 44.

My research indicates that 20 additional projects are planned in the City of Santa Clara between 2018 and 2030.[153] These additional projects will affect ambient air quality, public health risk, the availability of utilities, and other impact areas. For example, one of these is the McLaren Data Center, which is similar to the Project. As to the availability of power for this project, Silicon Valley Power wrote to the applicant Vantage:[154]

> Silicon Valley Power is immediately able to provide 27 MW capacity to the project site upon the completion of an onsite substation by Vantage. To provide an additional 73 MW of power, per Vantage's request, is conditional upon the restructuring of our existing electrical loop referred to as the Southern Loop. SVP is actively pursuing increased capacity in this area due to the growing power need of existing businesses as well as future planned projects, such as Vantage's. The planning for breaking the loop in two has already begun and project completion is expected to be in the year 2020.

9. BATTERY IMPACTS WERE NOT EVALUATED

The Project includes backup battery equipment located in a separate equipment yard in the northern portion of the Project site near Agnew Road.[155] However, the IS/MND fails to disclose any information about these batteries, explain how the backup battery equipment would be used, or to estimate any impacts from the batteries. Batteries can result in significant impacts, depending on the type of battery (e.g., lithium-ion batteries) and the specific electrolyte used in the battery.

It is well known, for example, that lithium-ion battery fires are some of the most difficult fires to suppress. Lithium-ion batteries have high power-to-density ratios that allow them to store large amounts of energy. When a lithium-ion battery catches fire, this stored energy coupled with the materials in the battery make it difficult to suppress or extinguish.[156]

In fact, there is a fair argument that hazardous material impacts would be significant during battery transport, use, and disposal due to the proximity of major roadways and residential housing. Conventional sprinkler systems have failed in similar applications because water is a poor fire retardant for the chemicals present in lithium-ion batteries.

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[153] City of Santa Clara, City of Santa Clara Urban Water Management Plan; available at www.santaclaraca.gov/uwmp.

[154] Letter from Kevin Keating, SVP, to Justin Thomas, Vantage Data Centers, Re: 725 and 651 Mathew, Santa Clara, CA, November 3, 2016; available at http://santaclaraca.gov/Home/Components/BusinessDirectory/BusinessDirectory/167/3650?npage=2 (McLaren Data Center Project MND, Appendix H – Silicon Valley Power Will Serve Letter).

[155] IS/MND, pdf 11, 25, 94.

[156] Jeremy Snow, Suppressing Lithium Ion Battery Fires; available at http://venturaaerospace.com/news/suppressing-lithium-ion-battery-fires/.

Further, the layout of battery facilities can prevent adequate fire-fighting access. The IS/MND does not contain any information on battery system layout. Fire conditions within a battery storage facility are distinct from those addressed in existing fire codes and require site-specific analysis and mitigation design, which is missing from the IS/MND.

Hazards associated with battery systems are normally analyzed by identifying all feasible failure modes, identifying the specific chemicals and the rates at which they could be released during each failure mode, and estimating chronic, acute, and cancer impacts at the locations of sensitive receptors. The IS/MND contains no analysis at all of impacts of the battery storage facility, thus failing as an informational document.

EXHIBIT 1

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Environmental Management
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Rockledge, FL 32955
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Dr. Fox has over 40 years of experience in the field of environmental engineering, including air pollution control (BACT, BART, MACT, LAER, RACT), greenhouse gas emissions and control, cost effectiveness analyses, water quality and water supply investigations, hydrology, hazardous waste investigations, environmental permitting, nuisance investigations (odor, noise), environmental impact reports, CEQA/NEPA documentation, risk assessments, and litigation support.

EDUCATION

Ph.D. Environmental/Civil Engineering, University of California, Berkeley, 1980.
M.S. Environmental/Civil Engineering, University of California, Berkeley, 1975.
B.S. Physics (with high honors), University of Florida, Gainesville, 1971.

REGISTRATION

Registered Professional Engineer: Arizona (2001-2014: #36701; retired), California (2002-present; CH 6058), Florida (2001-2016; #57886; retired), Georgia (2002-2014; #PE027643; retired), Washington (2002-2014; #38692; retired), Wisconsin (2005-2014; #37595-006; retired)
Board Certified Environmental Engineer, American Academy of Environmental Engineers, Certified in Air Pollution Control (DEE #01-20014), 2002-2014; retired)
Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice (QEP #02-010007, 2001-2015: retired).

PROFESSIONAL HISTORY

Environmental Management, Principal, 1981-present
Lawrence Berkeley National Laboratory, Principal Investigator, 1977-1981
University of California, Berkeley, Program Manager, 1976-1977
Bechtel, Inc., Engineer, 1971-1976, 1964-1966

PROFESSIONAL AFFILIATIONS

American Chemical Society (1981-2010)
Phi Beta Kappa (1970-present)
Sigma Pi Sigma (1970-present)

Who's Who Environmental Registry, PH Publishing, Fort Collins, CO, 1992.
Who's Who in the World, Marquis Who's Who, Inc., Chicago, IL, 11th Ed., p. 371, 1993-present.
Who's Who of American Women, Marquis Who's Who, Inc., Chicago, IL, 13th Ed., p. 264, 1984-present.
Who's Who in Science and Engineering, Marquis Who's Who, Inc., New Providence, NJ, 5th Ed., p. 414, 1999-present.
Who's Who in America, Marquis Who's Who, Inc., 59th Ed., 2005.
Guide to Specialists on Toxic Substances, World Environment Center, New York, NY, p. 80, 1980.
National Research Council Committee on Irrigation-Induced Water Quality Problems (Selenium), Subcommittee on Quality Control/Quality Assurance (1985-1990).
National Research Council Committee on Surface Mining and Reclamation, Subcommittee on Oil Shale (1978-80)

REPRESENTATIVE EXPERIENCE

Performed environmental and engineering investigations, as outlined below, for a wide range of industrial and commercial facilities including: petroleum refineries and upgrades thereto; reformulated fuels projects; refinery upgrades to process heavy sour crudes, including tar sands and light sweet crudes from the Eagle Ford and Bakken Formations; petroleum, gasoline and ethanol distribution terminals; coal, coke, and ore/mineral export terminals; LNG export, import, and storage terminals; crude-by-rail projects; shale oil plants; crude oil/condensate marine and rail terminals; coal gasification and liquefaction plants; oil and gas production, including conventional, thermally enhanced, hydraulic fracking, and acid stimulation techniques; underground storage tanks; pipelines; compressor stations; gasoline stations; landfills; railyards; hazardous waste treatment facilities; nuclear, hydroelectric, geothermal, wood, biomass, waste, tire-derived fuel, gas, oil, coke and coal-fired power plants; transmission lines; airports; hydrogen plants; petroleum coke calcining plants; coke plants; activated carbon manufacturing facilities; asphalt plants; cement plants; incinerators; flares; manufacturing facilities (e.g., semiconductors, electronic assembly, aerospace components, printed circuit boards, amusement park rides); lanthanide processing plants; ammonia plants; nitric acid plants; urea plants; food processing plants; wineries; almond hulling facilities; composting facilities; grain processing facilities; grain elevators; ethanol production facilities; soy bean oil extraction plants; biodiesel plants; paint formulation plants; wastewater treatment plants; marine terminals and ports; gas processing plants; steel mills; iron nugget production facilities; pig iron plant, based on blast furnace technology; direct reduced iron plant; acid regeneration facilities; railcar refinishing facility; battery manufacturing plants; pesticide manufacturing and repackaging facilities; pulp and paper mills; olefin plants; methanol plants;

ethylene crackers; alumina plants, desalination plants; selective catalytic reduction (SCR) systems; selective noncatalytic reduction (SNCR) systems; halogen acid furnaces; contaminated property redevelopment projects (e.g., Mission Bay, Southern Pacific Railyards, Moscone Center expansion, San Diego Padres Ballpark); residential developments; commercial office parks, campuses, and shopping centers; server farms; transportation plans; and a wide range of mines including sand and gravel, hard rock, limestone, nacholite, coal, molybdenum, gold, zinc, and oil shale.

EXPERT WITNESS/LITIGATION SUPPORT

- For the California Attorney General, assist in determining compliance with probation terms in the matter of People v. Chevron USA.
- For plaintiffs, assist in developing Petitioners' proof brief for National Parks Conservation Association et al v. U.S. EPA, Petition for Review of Final Administrative Action of the U.S. EPA, In the U.S. Court of Appeals for the Third Circuit, Docket No. 14-3147.
- For plaintiffs, expert witness in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1997-2000) at the Cemex cement plant in Lyons, Colorado. Reviewed produced documents, prepared expert and rebuttal reports on PSD applicability based on NOx emission calculations for a collection of changes considered both individually and collectively. Deposed August 2011. *United States v. Cemex, Inc.*, In U.S. District Court for the District of Colorado (Civil Action No. 09-cv-00019-MSK-MEH). Case settled June 13, 2013.
- For plaintiffs, in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1988 – 2000) at James De Young Units 3, 4, and 5. Reviewed produced documents, analyzed CEMS and EIA data, and prepared netting and BACT analyses for NOx, SO2, and PM10 (PSD case). Expert report February 24, 2010 and affidavit February 20, 2010. *Sierra Club v. City of Holland, et al.*, U.S. District Court, Western District of Michigan (Civil Action 1:08-cv-1183). Case settled. Consent Decree 1/19/14.
- For plaintiffs, in civil action alleging failure to obtain MACT permit, expert on potential to emit hydrogen chloride (HCl) from a new coal-fired boiler. Reviewed record, estimated HCl emissions, wrote expert report June 2010 and March 2013 (Cost to Install a Scrubber at the Lamar Repowering Project Pursuant to Case-by-Case MACT), deposed August 2010 and March 2013. *Wildearth Guardian et al. v. Lamar Utilities Board*, Civil Action No. 09-cv-02974, U.S. District Court, District of Colorado. Case settled August 2013.
- For plaintiffs, expert witness on permitting, emission calculations, and wastewater treatment for coal-to-gasoline plant. Reviewed produced documents. Assisted in

preparation of comments on draft minor source permit. Wrote two affidavits on key issues in case. Presented direct and rebuttal testimony 10/27 - 10/28/10 on permit enforceability and failure to properly calculate potential to emit, including underestimate of flaring emissions and omission of VOC and CO emissions from wastewater treatment, cooling tower, tank roof landings, and malfunctions. *Sierra Club, Ohio Valley Environmental Coalition, Coal River Mountain Watch, West Virginia Highlands Conservancy v. John Benedict, Director, Division of Air Quality, West Virginia Department of Environmental Protection and TransGas Development System, LLC*, Appeal No. 10-01-AQB. Virginia Air Quality Board remanded the permit on March 28, 2011 ordering reconsideration of potential to emit calculations, including: (1) support for assumed flare efficiency; (2) inclusion of startup, shutdown and malfunction emissions; and (3) inclusion of wastewater treatment emissions in potential to emit calculations.

- For plaintiffs, expert on BACT emission limits for gas-fired combined cycle power plant. Prepared declaration in support of CBE's Opposition to the United States' Motion for Entry of Proposed Amended Consent Decree. Assisted in settlement discussions. *U.S. EPA, Plaintiff, Communities for a Better Environment, Intervenor Plaintiff, v. Pacific Gas & Electric Company, et al.*, U.S. District Court, Northern District of California, San Francisco Division, Case No. C-09-4503 SI.
- Technical expert in confidential settlement discussions with large coal-fired utility on BACT control technology and emission limits for NOx, SO2, PM, PM2.5, and CO for new natural gas fired combined cycle and simple cycle turbines with oil backup. (July 2010). Case settled.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1998-99) at Gallagher Units 1 and 3. Reviewed produced documents, prepared expert and rebuttal reports on historic and current-day BACT for SO2, control costs, and excess emissions of SO2. Deposed 11/18/09. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Settled 12/22/09.
- For plaintiffs, expert witness on MACT, BACT for NOx, and enforceability in an administrative appeal of draft state air permit issued for four 300-MW pet-coke-fired CFBs. Reviewed produced documents and prepared prefiled testimony. Deposed 10/8/09 and 11/9/09. Testified 11/10/09. *Application of Las Brisas Energy Center, LLC for State Air Quality Permit*; before the State Office of Administrative Hearings, Texas. Permit remanded 3/29/10 as LBEC failed to meet burden of proof on a number of issues including MACT. Texas Court of Appeals dismissed an appeal to reinstate the permit. The Texas Commission on Environmental Quality and Las Brisas Energy Center, LLC sought to

overturn the Court of Appeals decision but moved to have their appeal dismissed in August 2013.

- For defense, expert witness in unlawful detainer case involving a gasoline station, minimart, and residential property with contamination from leaking underground storage tanks. Reviewed agency files and inspected site. Presented expert testimony on July 6, 2009, on causes of, nature and extent of subsurface contamination. *A. Singh v. S. Assaedi*, in Contra Costa County Superior Court, CA. Settled August 2009.
- For plaintiffs, expert witness on netting and enforceability for refinery being upgraded to process tar sands crude. Reviewed produced documents. Prepared expert and rebuttal reports addressing use of emission factors for baseline, omitted sources including coker, flares, tank landings and cleaning, and enforceability. Deposed. *In the Matter of Objection to the Issuance of Significant Source Modification Permit No. 089-25484-00453 to BP Products North America Inc., Whiting Business Unit, Save the Dunes Council, Inc., Sierra Club., Inc., Hoosier Environmental Council et al., Petitioners, B. P. Products North American, Respondents/Permittee,* before the Indiana Office of Environmental Adjudication. Case settled.
- For plaintiffs, expert witness on BACT, MACT, and enforceability in appeal of Title V permit issued to 600 MW coal-fired power plant burning Powder River Basin coal. Prepared technical comments on draft air permit. Reviewed record on appeal, drafted BACT, MACT, and enforceability pre-filed testimony. Drafted MACT and enforceability pre-filed rebuttal testimony. Deposed March 24, 2009. Testified June 10, 2009. *In Re: Southwestern Electric Power Company*, Arkansas Pollution Control and Ecology Commission, Consolidated Docket No. 08-006-P. Recommended Decision issued December 9, 2009 upholding issued permit. Commission adopted Recommended Decision January 22, 2010.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1989-1992) at Wabash Units 2, 3 and 5. Reviewed produced documents, prepared expert and rebuttal report on historic and current-day BACT for NOx and SO2, control costs, and excess emissions of NOx, SO2, and mercury. Deposed 10/21/08. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Testified 2/3/09. Memorandum Opinion & Order 5-29-09 requiring shutdown of Wabash River Units 2, 3, 5 by September 30, 2009, run at baseline until shutdown, and permanently surrender SO2 emission allowances.
- For plaintiffs, expert witness in liability phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for three historic modifications (1997-2001) at two portland cement plants involving three cement kilns. Reviewed produced documents, analyzed CEMS data covering subject period, prepared

netting analysis for NOx, SO_2 and CO, and prepared expert and rebuttal reports. *United States v. Cemex California Cement,* In U.S. District Court for the Central District of California, Eastern Division, Case No. ED CV 07-00223-GW (JCRx). Settled 1/15/09.

- For intervenors Clean Wisconsin and Citizens Utility Board, prepared data requests, reviewed discovery and expert report. Prepared prefiled direct, rebuttal and surrebuttal testimony on cost to extend life of existing Oak Creek Units 5-8 and cost to address future regulatory requirements to determine whether to control or shutdown one or more of the units. Oral testimony 2/5/08. Application for a Certificate of Authority to Install Wet Flue Gas Desulfurization and Selective Catalytic Reduction Facilities and Associated Equipment for Control of Sulfur Dioxide and Nitrogen Oxide Emissions at Oak Creek Power Plant Units 5, 6, 7 and 8, WPSC Docket No. 6630-CE-299.
- For plaintiffs, expert witness on alternatives analysis and BACT for NOx, SO2, total PM10, and sulfuric acid mist in appeal of PSD permit issued to 1200 MW coal fired power plant burning Powder River Basin and/or Central Appalachian coal (Longleaf). Assisted in drafting technical comments on NOx on draft permit. Prepared expert disclosure. Presented 8+ days of direct and rebuttal expert testimony. Attended all 21 days of evidentiary hearing from 9/5/07 – 10/30/07 assisting in all aspects of hearing. *Friends of the Chatahooche and Sierra Club v. Dr. Carol Couch, Director, Environmental Protection Division of Natural Resources Department, Respondent, and Longleaf Energy Associates, Intervener*. ALJ Final Decision 1/11/08 denying petition. ALJ Order vacated & remanded for further proceedings, Fulton County Superior Court, 6/30/08. Court of Appeals of GA remanded the case with directions that the ALJ's final decision be vacated to consider the evidence under the correct standard of review, July 9, 2009. The ALJ issued an opinion April 2, 2010 in favor of the applicant. Final permit issued April 2010.
- For plaintiffs, expert witness on diesel exhaust in inverse condemnation case in which Port expanded maritime operations into residential neighborhoods, subjecting plaintiffs to noise, light, and diesel fumes. Measured real-time diesel particulate concentrations from marine vessels and tug boats on plaintiffs' property. Reviewed documents, depositions, DVDs, and photographs provided by counsel. Deposed. Testified October 24, 2006. *Ann Chargin, Richard Hackett, Carolyn Hackett, et al. v. Stockton Port District*, Superior Court of California, County of San Joaquin, Stockton Branch, No. CV021015. Judge ruled for plaintiffs.
- For plaintiffs, expert witness on NOx emissions and BACT in case alleging failure to obtain necessary permits and install controls on gas-fired combined-cycle turbines. Prepared and reviewed (applicant analyses) of NOx emissions, BACT analyses (water injection, SCR, ultra low NOx burners), and cost-effectiveness analyses based on site visit, plant operating records, stack tests, CEMS data, and turbine and catalyst vendor design information. Participated in negotiations to scope out consent order. *United States v.*

Nevada Power. Case settled June 2007, resulting in installation of dry low NOx burners (5 ppm NOx averaged over 1 hr) on four units and a separate solar array at a local business.

- For plaintiffs, expert witness in appeal of PSD permit issued to 850 MW coal fired boiler burning Powder River Basin coal (Iatan Unit 2) on BACT for particulate matter, sulfuric acid mist and opacity and emission calculations for alleged historic violations of PSD. Assisted in drafting technical comments, petition for review, discovery requests, and responses to discovery requests. Reviewed produced documents. Prepared expert report on BACT for particulate matter. Assisted with expert depositions. Deposed February 7, 8, 27, and 28, 2007. *In Re PSD Construction Permit Issued to Great Plains Energy, Kansas City Power & Light – Iatan Generating Station, Sierra Club v. Missouri Department of Natural Resources, Great Plains Energy, and Kansas City Power & Light.* Case settled March 27, 2007, providing offsets for over 6 million ton/yr of CO2 and lower NOx and SO_2 emission limits.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications of coal-fired boilers and associated equipment. Reviewed produced documents, prepared expert report on cost to retrofit 24 coal-fired power plants with scrubbers designed to remove 99% of the sulfur dioxide from flue gases. Prepared supplemental and expert report on cost estimates and BACT for SO2 for these 24 complaint units. Deposed 1/30/07 and 3/14/07. *United States and State of New York et al. v. American Electric Power*, In U.S. District Court for the Southern District of Ohio, Eastern Division, Consolidated Civil Action Nos. C2-99-1182 and C2-99-1250. Settlement announced 10/9/07.
- For plaintiffs, expert witness on BACT, enforceability, and alternatives analysis in appeal of PSD permit issued for a 270-MW pulverized coal fired boiler burning Powder River Basin coal (City Utilities Springfield Unit 2). Reviewed permitting file and assisted counsel draft petition and prepare and respond to interrogatories and document requests. Reviewed interrogatory responses and produced documents. Assisted with expert depositions. Deposed August 2005. Evidentiary hearings October 2005. *In the Matter of Linda Chipperfield and Sierra Club v. Missouri Department of Natural Resources.* Missouri Supreme Court denied review of adverse lower court rulings August 2007.
- For plaintiffs, expert witness in civil action relating to plume touchdowns at AEP's Gavin coal-fired power plant. Assisted counsel draft interrogatories and document requests. Reviewed responses to interrogatories and produced documents. Prepared expert report "Releases of Sulfuric Acid Mist from the Gavin Power Station." The report evaluates sulfuric acid mist releases to determine if AEP complied with the requirements of CERCLA Section 103(a) and EPCRA Section 304. This report also discusses the formation, chemistry, release characteristics, and abatement of sulfuric acid mist in support of the claim that these releases present an imminent and substantial endangerment to public

health under Section 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"). *Citizens Against Pollution v. Ohio Power Company*, In the U.S. District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2-04-cv-371. Case settled 12-8-06.

- For petitioners, expert witness in contested case hearing on BACT, enforceability, and emission estimates for an air permit issued to a 500-MW supercritical Power River Basin coal-fired boiler (Weston Unit 4). Assisted counsel prepare comments on draft air permit and respond to and draft discovery. Reviewed produced file, deposed (7/05), and prepared expert report on BACT and enforceability. Evidentiary hearings September 2005. *In the Matter of an Air Pollution Control Construction Permit Issued to Wisconsin Public Service Corporation for the Construction and Operation of a 500 MW Pulverized Coal-fired Power Plant Known as Weston Unit 4 in Marathon County, Wisconsin*, Case No. IH-04-21. The Final Order, issued 2/10/06, lowered the NOx BACT limit from 0.07 lb/MMBtu to 0.06 lb/MMBtu based on a 30-day average, added a BACT SO2 control efficiency, and required a 0.0005% high efficiency drift eliminator as BACT for the cooling tower. The modified permit, including these provisions, was issued 3/28/07. Additional appeals in progress.
- For plaintiffs, adviser on technical issues related to Citizen Suit against U.S. EPA regarding failure to update New Source Performance Standards for petroleum refineries, 40 CFR 60, Subparts J, VV, and GGG. *Our Children's Earth Foundation and Sierra Club v. U.S. EPA et al.* Case settled July 2005. CD No. C 05-00094 CW, U.S. District Court, Northern District of California – Oakland Division. Proposed revisions to standards of performance for petroleum refineries published 72 FR 27178 (5/14/07).
- For interveners, reviewed proposed Consent Decree settling Clean Air Act violations due to historic modifications of boilers and associated equipment at two coal-fired power plants. In response to stay order, reviewed the record, selected one representative activity at each of seven generating units, and analyzed to identify CAA violations. Identified NSPS and NSR violations for NOx, SO_2, PM/PM10, and sulfuric acid mist. Summarized results in an expert report. *United States of America, and Michael A. Cox, Attorney General of the State of Michigan, ex rel. Michigan Department of Environmental Quality, Plaintiffs, and Clean Wisconsin, Sierra Club, and Citizens' Utility Board, Intervenors, v. Wisconsin Electric Power Company, Defendant*, U.S. District Court for the Eastern District of Wisconsin, Civil Action No. 2:03-CV-00371-CNC. Order issued 10-1-07 denying petition.
- For a coalition of Nevada labor organizations (ACE), reviewed preliminary determination to issue a Class I Air Quality Operating Permit to Construct and supporting files for a 250-MW pulverized coal-fired boiler (Newmont). Prepared about 100 pages of technical analyses and comments on BACT, MACT, emission calculations, and enforceability. Assisted counsel draft petition and reply brief appealing PSD permit to U.S. EPA Environmental Appeals Board (EAB). Order denying review issued 12/21/05. *In re*

Newmont Nevada Energy Investment, LLC, TS Power Plant, PSD Appeal No. 05-04 (EAB 2005).

- For petitioners and plaintiffs, reviewed and prepared comments on air quality and hazardous waste based on negative declaration for refinery ultra low sulfur diesel project located in SCAQMD. Reviewed responses to comments and prepared responses. Prepared declaration and presented oral testimony before SCAQMD Hearing Board on exempt sources (cooling towers) and calculation of potential to emit under NSR. Petition for writ of mandate filed March 2005. Case remanded by Court of Appeals to trial court to direct SCAQMD to re-evaluate the potential environmental significance of NOx emissions resulting from the project in accordance with court's opinion. California Court of Appeals, Second Appellate Division, on December 18, 2007, affirmed in part (as to baseline) and denied in part. *Communities for a Better Environment v. South Coast Air Quality Management District and ConocoPhillips and Carlos Valdez et al v. South Coast Air Quality Management District and ConocoPhillips.* Certified for partial publication 1/16/08. Appellate Court opinion upheld by CA Supreme Court 3/15/10. *(2010) 48 Cal.4th 310.*
- For amici seeking to amend a proposed Consent Decree to settle alleged NSR violations at Chevron refineries, reviewed proposed settlement, related files, subject modifications, and emission calculations. Prepared declaration on emission reductions, identification of NSR and NSPS violations, and BACT/LAER for FCCUs, heaters and boilers, flares, and sulfur recovery plants. *U.S. et al. v. Chevron U.S.A.*, Northern District of California, Case No. C 03-04650. Memorandum and Order Entering Consent Decree issued June 2005. Case No. C 03-4650 CRB.
- For petitioners, prepared declaration on enforceability of periodic monitoring requirements, in response to EPA's revised interpretation of 40 CFR 70.6(c)(1). This revision limited additional monitoring required in Title V permits. 69 FR 3203 (Jan. 22, 2004). *Environmental Integrity Project et al. v. EPA* (U.S. Court of Appeals for the District of Columbia). Court ruled the Act requires all Title V permits to contain monitoring requirements to assure compliance. *Sierra Club v. EPA*, 536 F.3d 673 (D.C. Cir. 2008).
- For interveners in application for authority to construct a 500 MW supercritical coal-fired generating unit before the Wisconsin Public Service Commission, prepared pre-filed written direct and rebuttal testimony with oral cross examination and rebuttal on BACT and MACT (Weston 4). Prepared written comments on BACT, MACT, and enforceability on draft air permit for same facility.
- For property owners in Nevada, evaluated the environmental impacts of a 1,450-MW coal-fired power plant proposed in a rural area adjacent to the Black Rock Desert and Granite Range, including emission calculations, air quality modeling, comments on proposed use permit to collect preconstruction monitoring data, and coordination with agencies and other interested parties. Project cancelled.

- For environmental organizations, reviewed draft PSD permit for a 600-MW coal-fired power plant in West Virginia (Longview). Prepared comments on permit enforceability; coal washing; BACT for SO_2 and PM10; Hg MACT; and MACT for HCl, HF, non-Hg metallic HAPs, and enforceability. Assist plaintiffs draft petition appealing air permit. Retained as expert to develop testimony on MACT, BACT, offsets, enforceability. Participate in settlement discussions. Case settled July 2004.
- For petitioners, reviewed record produced in discovery and prepared affidavit on emissions of carbon monoxide and volatile organic compounds during startup of GE 7FA combustion turbines to successfully establish plaintiff standing. *Sierra Club et al. v. Georgia Power Company* (Northern District of Georgia).
- For building trades, reviewed air quality permitting action for 1500-MW coal-fired power plant before the Kentucky Department for Environmental Protection (Thoroughbred).
- For petitioners, expert witness in administrative appeal of the PSD/Title V permit issued to a 1500-MW coal-fired power plant. Reviewed over 60,000 pages of produced documents, prepared discovery index, identified and assembled plaintiff exhibits. Deposed. Assisted counsel in drafting discovery requests, with over 30 depositions, witness cross examination, and brief drafting. Presented over 20 days of direct testimony, rebuttal and sur-rebuttal, with cross examination on BACT for NOx, SO_2, and PM/PM10; MACT for Hg and non-Hg metallic HAPs; emission estimates for purposes of Class I and II air modeling; risk assessment; and enforceability of permit limits. Evidentiary hearings from November 2003 to June 2004. *Sierra Club et al. v. Natural Resources & Environmental Protection Cabinet, Division of Air Quality and Thoroughbred Generating Company et al.* Hearing Officer Decision issued August 9, 2005 finding in favor of plaintiffs on counts as to risk, BACT (IGCC/CFB, NOx, SO_2, Hg, Be), single source, enforceability, and errors and omissions. Assist counsel draft exceptions. Cabinet Secretary issued Order April 11, 2006 denying Hearing Offer's report, except as to NOx BACT, Hg, 99% SO2 control and certain errors and omissions.
- For citizens group in Massachusetts, reviewed, commented on, and participated in permitting of pollution control retrofits of coal-fired power plant (Salem Harbor).
- Assisted citizens group and labor union challenge issuance of conditional use permit for a 317,000 ft^2 discount store in Honolulu without any environmental review. In support of a motion for preliminary injunction, prepared 7-page declaration addressing public health impacts of diesel exhaust from vehicles serving the Project. In preparation for trial, prepared 20-page preliminary expert report summarizing results of diesel exhaust and noise measurements at two big box retail stores in Honolulu, estimated diesel PM10 concentrations for Project using ISCST, prepared a cancer health risk assessment based on these analyses, and evaluated noise impacts.

- Assisted environmental organizations to challenge the DOE Finding of No Significant Impact (FONSI) for the Baja California Power and Sempra Energy Resources Cross-Border Transmissions Lines in the U.S. and four associated power plants located in Mexico (DOE EA-1391). Prepared 20-page declaration in support of motion for summary judgment addressing emissions, including CO_2 and NH_3, offsets, BACT, cumulative air quality impacts, alternative cooling systems, and water use and water quality impacts. Plaintiff's motion for summary judgment granted in part. U.S. District Court, Southern District decision concluded that the Environmental Assessment and FONSI violated NEPA and the APA due to their inadequate analysis of the potential controversy surrounding the project, water impacts, impacts from NH_3 and CO_2, alternatives, and cumulative impacts. *Border Power Plant Working Group v. Department of Energy and Bureau of Land Management*, Case No. 02-CV-513-IEG (POR) (May 2, 2003).
- For Sacramento school, reviewed draft air permit issued for diesel generator located across from playfield. Prepared comments on emission estimates, enforceability, BACT, and health impacts of diesel exhaust. Case settled. BUG trap installed on the diesel generator.
- Assisted unions in appeal of Title V permit issued by BAAQMD to carbon plant that manufactured coke. Reviewed District files, identified historic modifications that should have triggered PSD review, and prepared technical comments on Title V permit. Reviewed responses to comments and assisted counsel draft appeal to BAAQMD hearing board, opening brief, motion to strike, and rebuttal brief. Case settled.
- Assisted California Central Coast city obtain controls on a proposed new city that would straddle the Ventura-Los Angeles County boundary. Reviewed several environmental impact reports, prepared an air quality analysis, a diesel exhaust health risk assessment, and detailed review comments. Governor intervened and State dedicated the land for conservation purposes April 2004.
- Assisted Central California city to obtain controls on large alluvial sand quarry and asphalt plant proposing a modernization. Prepared comments on Negative Declaration on air quality, public health, noise, and traffic. Evaluated process flow diagrams and engineering reports to determine whether proposed changes increased plant capacity or substantially modified plant operations. Prepared comments on application for categorical exemption from CEQA. Presented testimony to County Board of Supervisors. Developed controls to mitigate impacts. Assisted counsel draft Petition for Writ. Case settled June 2002. Substantial improvements in plant operations were obtained including cap on throughput, dust control measures, asphalt plant loadout enclosure, and restrictions on truck routes.
- Assisted oil companies on the California Central Coast in defending class action citizen's lawsuit alleging health effects due to emissions from gas processing plant and leaking underground storage tanks. Reviewed regulatory and other files and advised counsel on merits of case. Case settled November 2001.

- Assisted oil company on the California Central Coast in defending property damage claims arising out of a historic oil spill. Reviewed site investigation reports, pump tests, leachability studies, and health risk assessments, participated in design of additional site characterization studies to assess health impacts, and advised counsel on merits of case. Prepare health risk assessment.
- Assisted unions in appeal of Initial Study/Negative Declaration ("IS/ND") for an MTBE phaseout project at a Bay Area refinery. Reviewed IS/ND and supporting agency permitting files and prepared technical comments on air quality, groundwater, and public health impacts. Reviewed responses to comments and final IS/ND and ATC permits and assisted counsel to draft petitions and briefs appealing decision to Air District Hearing Board. Presented sworn direct and rebuttal testimony with cross examination on groundwater impacts of ethanol spills on hydrocarbon contamination at refinery. Hearing Board ruled 5 to 0 in favor of appellants, remanding ATC to district to prepare an EIR.
- Assisted Florida cities in challenging the use of diesel and proposed BACT determinations in prevention of significant deterioration (PSD) permits issued to two 510-MW simple cycle peaking electric generating facilities and one 1,080-MW simple cycle/combined cycle facility. Reviewed permit applications, draft permits, and FDEP engineering evaluations, assisted counsel in drafting petitions and responding to discovery. Participated in settlement discussions. Cases settled or applications withdrawn.
- Assisted large California city in federal lawsuit alleging peaker power plant was violating its federal permit. Reviewed permit file and applicant's engineering and cost feasibility study to reduce emissions through retrofit controls. Advised counsel on feasible and cost-effective NOx, SOx, and PM10 controls for several 1960s diesel-fired Pratt and Whitney peaker turbines. Case settled.
- Assisted coalition of Georgia environmental groups in evaluating BACT determinations and permit conditions in PSD permits issued to several large natural gas-fired simple cycle and combined-cycle power plants. Prepared technical comments on draft PSD permits on BACT, enforceability of limits, and toxic emissions. Reviewed responses to comments, advised counsel on merits of cases, participated in settlement discussions, presented oral and written testimony in adjudicatory hearings, and provided technical assistance as required. Cases settled or won at trial.
- Assisted construction unions in review of air quality permitting actions before the Indiana Department of Environmental Management ("IDEM") for several natural gas-fired simple cycle peaker and combined cycle power plants.
- Assisted coalition of towns and environmental groups in challenging air permits issued to 523 MW dual fuel (natural gas and distillate) combined-cycle power plant in Connecticut. Prepared technical comments on draft permits and 60 pages of written testimony addressing

emission estimates, startup/shutdown issues, BACT/LAER analyses, and toxic air emissions. Presented testimony in adjudicatory administrative hearings before the Connecticut Department of Environmental Protection in June 2001 and December 2001.

- Assisted various coalitions of unions, citizens groups, cities, public agencies, and developers in licensing and permitting of over 110 coal, gas, oil, biomass, and pet coke-fired power plants generating over 75,000 MW of electricity. These included base-load, combined cycle, simple cycle, and peaker power plants in Alaska, Arizona, Arkansas, California, Colorado, Georgia, Florida, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Oregon, Texas, West Virginia, Wisconsin, and elsewhere. Prepared analyses of and comments on applications for certification, preliminary and final staff assessments, and various air, water, wastewater, and solid waste permits issued by local agencies. Presented written and oral testimony before various administrative bodies on hazards of ammonia use and transportation, health effects of air emissions, contaminated property issues, BACT/LAER issues related to SCR and SCONOx, criteria and toxic pollutant emission estimates, MACT analyses, air quality modeling, water supply and water quality issues, and methods to reduce water use, including dry cooling, parallel dry-wet cooling, hybrid cooling, and zero liquid discharge systems.
- Assisted unions, cities, and neighborhood associations in challenging an EIR issued for the proposed expansion of the Oakland Airport. Reviewed two draft EIRs and prepared a health risk assessment and extensive technical comments on air quality and public health impacts. The California Court of Appeals, First Appellate District, ruled in favor of appellants and plaintiffs, concluding that the EIR "2) erred in using outdated information in assessing the emission of toxic air contaminants (TACs) from jet aircraft; 3) failed to support its decision not to evaluate the health risks associated with the emission of TACs with meaningful analysis," thus accepting my technical arguments and requiring the Port to prepare a new EIR. See *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598.
- Assisted lessor of former gas station with leaking underground storage tanks and TCE contamination from adjacent property. Lessor held option to purchase, which was forfeited based on misrepresentation by remediation contractor as to nature and extent of contamination. Remediation contractor purchased property. Reviewed regulatory agency files and advised counsel on merits of case. Case not filed.
- Advised counsel on merits of several pending actions, including a Proposition 65 case involving groundwater contamination at an explosives manufacturing firm and two former gas stations with leaking underground storage tanks.
- Assisted defendant foundry in Oakland in a lawsuit brought by neighbors alleging property contamination, nuisance, trespass, smoke, and health effects from foundry operation.

Inspected and sampled plaintiff's property. Advised counsel on merits of case. Case settled.

- Assisted business owner facing eminent domain eviction. Prepared technical comments on a negative declaration for soil contamination and public health risks from air emissions from a proposed redevelopment project in San Francisco in support of a CEQA lawsuit. Case settled.
- Assisted neighborhood association representing residents living downwind of a Berkeley asphalt plant in separate nuisance and CEQA lawsuits. Prepared technical comments on air quality, odor, and noise impacts, presented testimony at commission and council meetings, participated in community workshops, and participated in settlement discussions. Cases settled. Asphalt plant was upgraded to include air emission and noise controls, including vapor collection system at truck loading station, enclosures for noisy equipment, and improved housekeeping.
- Assisted a Fortune 500 residential home builder in claims alleging health effects from faulty installation of gas appliances. Conducted indoor air quality study, advised counsel on merits of case, and participated in discussions with plaintiffs. Case settled.
- Assisted property owners in Silicon Valley in lawsuit to recover remediation costs from insurer for large TCE plume originating from a manufacturing facility. Conducted investigations to demonstrate sudden and accidental release of TCE, including groundwater modeling, development of method to date spill, preparation of chemical inventory, investigation of historical waste disposal practices and standards, and on-site sewer and storm drainage inspections and sampling. Prepared declaration in opposition to motion for summary judgment. Case settled.
- Assisted residents in east Oakland downwind of a former battery plant in class action lawsuit alleging property contamination from lead emissions. Conducted historical research and dry deposition modeling that substantiated claim. Participated in mediation at JAMS. Case settled.
- Assisted property owners in West Oakland who purchased a former gas station that had leaking underground storage tanks and groundwater contamination. Reviewed agency files and advised counsel on merits of case. Prepared declaration in opposition to summary judgment. Prepared cost estimate to remediate site. Participated in settlement discussions. Case settled.
- Consultant to counsel representing plaintiffs in two Clean Water Act lawsuits involving selenium discharges into San Francisco Bay from refineries. Reviewed files and advised counsel on merits of case. Prepared interrogatory and discovery questions, assisted in deposing opposing experts, and reviewed and interpreted treatability and other technical studies. Judge ruled in favor of plaintiffs.

- Assisted oil company in a complaint filed by a resident of a small California beach community alleging that discharges of tank farm rinse water into the sanitary sewer system caused hydrogen sulfide gas to infiltrate residence, sending occupants to hospital. Inspected accident site, interviewed parties to the event, and reviewed extensive agency files related to incident. Used chemical analysis, field simulations, mass balance calculations, sewer hydraulic simulations with SWMM44, atmospheric dispersion modeling with SCREEN3, odor analyses, and risk assessment calculations to demonstrate that the incident was caused by a faulty drain trap and inadequate slope of sewer lateral on resident's property. Prepared a detailed technical report summarizing these studies. Case settled.
- Assisted large West Coast city in suit alleging that leaking underground storage tanks on city property had damaged the waterproofing on downgradient building, causing leaks in an underground parking structure. Reviewed subsurface hydrogeologic investigations and evaluated studies conducted by others documenting leakage from underground diesel and gasoline tanks. Inspected, tested, and evaluated waterproofing on subsurface parking structure. Waterproofing was substandard. Case settled.
- Assisted residents downwind of gravel mine and asphalt plant in Siskiyou County, California, in suit to obtain CEQA review of air permitting action. Prepared two declarations analyzing air quality and public health impacts. Judge ruled in favor of plaintiffs, closing mine and asphalt plant.
- Assisted defendant oil company on the California Central Coast in class action lawsuit alleging property damage and health effects from subsurface petroleum contamination. Reviewed documents, prepared risk calculations, and advised counsel on merits of case. Participated in settlement discussions. Case settled.
- Assisted defendant oil company in class action lawsuit alleging health impacts from remediation of petroleum contaminated site on California Central Coast. Reviewed documents, designed and conducted monitoring program, and participated in settlement discussions. Case settled.
- Consultant to attorneys representing irrigation districts and municipal water districts to evaluate a potential challenge of USFWS actions under CVPIA section 3406(b)(2). Reviewed agency files and collected and analyzed hydrology, water quality, and fishery data. Advised counsel on merits of case. Case not filed.
- Assisted residents downwind of a Carson refinery in class action lawsuit involving soil and groundwater contamination, nuisance, property damage, and health effects from air emissions. Reviewed files and provided advise on contaminated soil and groundwater, toxic emissions, and health risks. Prepared declaration on refinery fugitive emissions. Prepared

deposition questions and reviewed deposition transcripts on air quality, soil contamination, odors, and health impacts. Case settled.

- Assisted residents downwind of a Contra Costa refinery who were affected by an accidental release of naphtha. Characterized spilled naphtha, estimated emissions, and modeled ambient concentrations of hydrocarbons and sulfur compounds. Deposed. Presented testimony in binding arbitration at JAMS. Judge found in favor of plaintiffs.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects from several large accidents as well as routine operations. Reviewed files and prepared analyses of environmental impacts. Prepared declarations, deposed, and presented testimony before jury in one trial and judge in second. Case settled.
- Assisted business owner claiming damages from dust, noise, and vibration during a sewer construction project in San Francisco. Reviewed agency files and PM10 monitoring data and advised counsel on merits of case. Case settled.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects. Prepared declaration in opposition to summary judgment, deposed, and presented expert testimony on accidental releases, odor, and nuisance before jury. Case thrown out by judge, but reversed on appeal and not retried.
- Presented testimony in small claims court on behalf of residents claiming health effects from hydrogen sulfide from flaring emissions triggered by a power outage at a Contra Costa County refinery. Analyzed meteorological and air quality data and evaluated potential health risks of exposure to low concentrations of hydrogen sulfide. Judge awarded damages to plaintiffs.
- Assisted construction unions in challenging PSD permit for an Indiana steel mill. Prepared technical comments on draft PSD permit, drafted 70-page appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analysis for electric arc furnace and reheat furnace and faulty permit conditions, among others, and drafted briefs responding to four parties. EPA Region V and the EPA General Counsel intervened as amici, supporting petitioners. EAB ruled in favor of petitioners, remanding permit to IDEM on three key issues, including BACT for the reheat furnace and lead emissions from the EAF. Drafted motion to reconsider three issues. Prepared 69 pages of technical comments on revised draft PSD permit. Drafted second EAB appeal addressing lead emissions from the EAF and BACT for reheat furnace based on European experience with SCR/SNCR. Case settled. Permit was substantially improved. See *In re: Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5 (EAB June 22, 2000).

- Assisted defendant urea manufacturer in Alaska in negotiations with USEPA to seek relief from penalties for alleged violations of the Clean Air Act. Reviewed and evaluated regulatory files and monitoring data, prepared technical analysis demonstrating that permit limits were not violated, and participated in negotiations with EPA to dismiss action. Fines were substantially reduced and case closed.
- Assisted construction unions in challenging PSD permitting action for an Indiana grain mill. Prepared technical comments on draft PSD permit and assisted counsel draft appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analyses for heaters and boilers and faulty permit conditions, among others. Case settled.
- As part of a consent decree settling a CEQA lawsuit, assisted neighbors of a large west coast port in negotiations with port authority to secure mitigation for air quality impacts. Prepared technical comments on mobile source air quality impacts and mitigation and negotiated a $9 million CEQA mitigation package. Represented neighbors on technical advisory committee established by port to implement the air quality mitigation program. Program successfully implemented.
- Assisted construction unions in challenging permitting action for a California hazardous waste incinerator. Prepared technical comments on draft permit, assisted counsel prepare appeal of EPA permit to the Environmental Appeals Board. Participated in settlement discussions on technical issues with applicant and EPA Region 9. Case settled.
- Assisted environmental group in challenging DTSC Negative Declaration on a hazardous waste treatment facility. Prepared technical comments on risk of upset, water, and health risks. Writ of mandamus issued.
- Assisted several neighborhood associations and cities impacted by quarries, asphalt plants, and cement plants in Alameda, Shasta, Sonoma, and Mendocino counties in obtaining mitigations for dust, air quality, public health, traffic, and noise impacts from facility operations and proposed expansions.
- For over 100 industrial facilities, commercial/campus, and redevelopment projects, developed the record in preparation for CEQA and NEPA lawsuits. Prepared technical comments on hazardous materials, solid wastes, public utilities, noise, worker safety, air quality, public health, water resources, water quality, traffic, and risk of upset sections of EIRs, EISs, FONSIs, initial studies, and negative declarations. Assisted counsel in drafting petitions and briefs and prepared declarations.
- For several large commercial development projects and airports, assisted applicant and counsel prepare defensible CEQA documents, respond to comments, and identify and evaluate "all feasible" mitigation to avoid CEQA challenges. This work included developing mitigation programs to reduce traffic-related air quality impacts based on

energy conservation programs, solar, low-emission vehicles, alternative fuels, exhaust treatments, and transportation management associations.

SITE INVESTIGATION/REMEDIATION/CLOSURE

- Technical manager and principal engineer for characterization, remediation, and closure of waste management units at former Colorado oil shale plant. Constituents of concern included BTEX, As, 1,1,1-TCA, and TPH. Completed groundwater monitoring programs, site assessments, work plans, and closure plans for seven process water holding ponds, a refinery sewer system, and processed shale disposal area. Managed design and construction of groundwater treatment system and removal actions and obtained clean closure.
- Principal engineer for characterization, remediation, and closure of process water ponds at a former lanthanide processing plant in Colorado. Designed and implemented groundwater monitoring program and site assessments and prepared closure plan.
- Advised the city of Sacramento on redevelopment of two former railyards. Reviewed work plans, site investigations, risk assessment, RAPS, RI/FSs, and CEQA documents. Participated in the development of mitigation strategies to protect construction and utility workers and the public during remediation, redevelopment, and use of the site, including buffer zones, subslab venting, rail berm containment structure, and an environmental oversight plan.
- Provided technical support for the investigation of a former sanitary landfill that was redeveloped as single family homes. Reviewed and/or prepared portions of numerous documents, including health risk assessments, preliminary endangerment assessments, site investigation reports, work plans, and RI/FSs. Historical research to identify historic waste disposal practices to prepare a preliminary endangerment assessment. Acquired, reviewed, and analyzed the files of 18 federal, state, and local agencies, three sets of construction field notes, analyzed 21 aerial photographs and interviewed 14 individuals associated with operation of former landfill. Assisted counsel in defending lawsuit brought by residents alleging health impacts and diminution of property value due to residual contamination. Prepared summary reports.
- Technical oversight of characterization and remediation of a nitrate plume at an explosives manufacturing facility in Lincoln, CA. Provided interface between owners and consultants. Reviewed site assessments, work plans, closure plans, and RI/FSs.
- Consultant to owner of large western molybdenum mine proposed for NPL listing. Participated in negotiations to scope out consent order and develop scope of work. Participated in studies to determine premining groundwater background to evaluate

applicability of water quality standards. Served on technical committees to develop alternatives to mitigate impacts and close the facility, including resloping and grading, various thickness and types of covers, and reclamation. This work included developing and evaluating methods to control surface runoff and erosion, mitigate impacts of acid rock drainage on surface and ground waters, and stabilize nine waste rock piles containing 328 million tons of pyrite-rich, mixed volcanic waste rock (andesites, rhyolite, tuff). Evaluated stability of waste rock piles. Represented client in hearings and meetings with state and federal oversight agencies.

REGULATORY (PARTIAL LIST)

- In September and November 2017, prepared comments on revised Negative Declaration for Delicato Winery in San Joaquin County, California.
- In October and November 2017, prepared comments on North City Project Pure Water San Diego Program DEIR/DEIS to reclaim wastewater for municipal use.
- In August 2017, reviewed DEIR on a new residential community in eastern San Diego County and research and wrote 60 pages of comments on air quality, greenhouse gas emissions, and health impacts.
- In August 2017, reviewed responses to comments on Part 70 operating permit and researched and wrote comments on metallic HAP issues.
- In July 2017, reviewed the FEIS for an expansion of the Port of Gulfport and researched and wrote 10 pages of comments on air quality and public health.
- In June 2017, reviewed and prepared technical report on an Application for a synthetic minor source construction permit for a new Refinery in North Dakota.
- In June 2017, reviewed responses to NPCA and other comments on the BP Cherry Point Refinery modifications and assisted counsel in evaluating issues to appeal, including GHG BACT, coker heater SCR cost effectiveness analysis, and SO_2 BACT.
- In June 2017, reviewed Part 70 Operating Permit Renewal/Modification for the Noranda Alumina LC/Gramercy Holdings I, LLC alumina processing plant, St. James, Louisiana, and prepared comments on HAP emissions from bauxite feedstock.
- In May and June 2017, reviewed FEIR on Tesoro Integration Project and prepared responses to comments on the DEIR.

- In May 2017, prepared comments on tank VOC and HAP emissions from Tesoro Integration Project, based on real time monitoring at the Tesoro and other refineries in the SCAQMD.
- In April 2017, prepared comments on Negative Declaration for Delicato Winery in San Joaquin County, California.
- In March 2017, reviewed Negative Declaration for Ellmore geothermal facility in Imperial County, California and prepared summary of issues.
- In March 2017, prepared response to Phillips 66 Company's Appeal of the San Luis Obispo County Planning Commission's Decision Denying the Rail Spur Extension Project Proposed for the Santa Maria Refinery.
- In February 2017, prepared comments on Kalama draft Title V permit for 10,000 MT/day methanol production and marine export facility in Kalama, Washington.
- In January 2017, researched and wrote 51 pages of comments on proposed Title V and PSD permits for the St. James Methanol Plant, St. James Louisiana, on BACT and enforceability of permit conditions.
- In December 2016, prepared comments on draft Title V Permit for Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana, responding to EPA Order addressing enforceability issues.
- In November 2016, prepared comments on Initial Study/Mitigated Negative Declaration for the AES Battery Energy Storage Facility, Long Beach, CA.
- In November 2016, prepared comments on Campo Verde Battery Energy Storage System Draft Environmental Impact Report.
- In October 2016, prepared comments on Title V Permit for NuStar Terminal Operations Partnership L.P, Stockton, CA.
- In October 2016, prepared expert report, Technical Assessment of Achieving the 40 CFR Part 423 Zero Discharge Standard for Bottom Ash Transport Water at the Belle River Power Plant, East China, Michigan. Reported resulted in a 2 year reduction in compliance date for elimination of bottom ash transport water. 1/30/17 DEQ Letter.
- In September 2016, prepared comments on Proposed Title V Permit and Environmental Assessment Statement, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana.
- In September 2016, prepared response to "Further Rebuttal in Support of Appeal of Planning Commission Resolution No. 16-1, Denying Use Permit Application 12PLN-00063 and Declining to Certify Final Environmental Impact Report for the Valero Benicia Crude-by-Rail Project.

- In August 2016, reviewed and prepared comments on manuscript: Hutton et al., Freshwater Flows to the San Francisco Bay-Delta Estuary over Nine Decades: Trends Evaluation.
- In August/September 2016, prepared comments on Mitigated Negative Declaration for the Chevron Long Wharf Maintenance and Efficiency Project.
- In July 2016, prepared comments on the Ventura County APCD Preliminary Determination of Compliance and the California Energy Commission Revised Preliminary Staff Assessment for the Puente Power Project.
- In June 2016, prepared comments on an Ordinance (1) Amending the Oakland Municipal Code to Prohibit the Storage and Handling of Coal and Coke at Bulk Material Facilities or Terminals Throughout the City of Oakland and (2) Adopting CEQA Exemption Findings and supporting technical reports. Council approved Ordinance on an 8 to 0 vote on June 27, 2016.
- In May 2016, prepared comments on Draft Title V Permit and Draft Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project.
- In March 2016, prepared comments on Valero's Appeal of Planning Commission's Denial of Valero Crude-by-Rail Project
- In February 2016, prepared comments on Final Environmental Impact Report, Santa Maria Rail Spur Project.
- In February 2016, prepared comments on Final Environmental Impact Report, Valero Benicia Crude by Rail Project.
- In January 2016, prepared comments on Draft Programmatic Environmental Impact Report for the Southern California Association of Government's (SCAG) 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy.
- In November 2015, prepared comments on Final Environmental Impact Report for Revisions to the Kern County Zoning Ordinance – 2015(C) (Focused on Oil and Gas Local Permitting), November 2015.
- In October 2015, prepared comments on Revised Draft Environmental Report, Valero Benicia Crude by Rail Project.
- In September 2015, prepared report, "Environmental, Health and Safety Impacts of the Proposed Oakland Bulk and Oversized Terminal, and presented oral testimony on September 21, 2015 before Oakland City Council on behalf of the Sierra Club.
- In September 2015, prepared comments on revisions to two chapters of EPA's Air Pollution Control Cost Manual: Docket ID No. EPA-HQ-OAR-2015-0341.

- In June 2015, prepared comments on DEIR for the CalAm Monterey Peninsula Water Supply Project.
- In April 2015, prepared comments on proposed Title V Operating Permit Revision and Prevention of Significant Deterioration Permit for Arizona Public Service's Ocotillo Power Plant Modernization Project (5 GE LMS100 105-MW simple cycle turbines operated as peakers), in Tempe, Arizona; Final permit appealed to EAB.
- In March 2015, prepared "Comments on Proposed Title V Air Permit, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana". Client filed petition objecting to the permit. EPA granted majority of issues. In the Matter of Yuhuang Chemical Inc. Methanol Plant, St. James Parish, Louisiana, Permit No. 2560-00295-V0, Issued by the Louisiana Department of Environmental Quality, Petition No. VI-2015-03, Order Responding to the Petitioners' Request for Objection to the Issuance of a Title V Operating Permit, September 1, 2016.
- In February 2015, prepared compilation of BACT cost effectiveness values in support of comments on draft PSD Permit for Bonanza Power Project.
- In January 2015, prepared cost effectiveness analysis for SCR for a 500-MW coal fire power plant, to address unpermitted upgrades in 2000.
- In January 2015, prepared comments on Revised Final Environmental Impact Report for the Phillips 66 Propane Recovery Project. *Communities for a Better Environment et al. v. Contra Costa County et al. Contra Costa County (Superior Court, Contra Costa County, Case No. MSN15-0301, December 1, 2016).*
- In December 2014, prepared "Report on Bakersfield Crude Terminal Permits to Operate." In response, the U.S. EPA cited the Terminal for 10 violations of the Clean Air Act. The Fifth Appellate District Court upheld the finding in this report in CBE et al v. San Joaquin Valley Unified Air Pollution Control District and Bakersfield Crude Terminal LLC et al, Super. Ct. No. 284013, June 23, 2017.
- In December 2014, prepared comments on Revised Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project.
- In November 2014, prepared comments on Revised Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project and Crude Unloading Project, Santa Maria, CA to allow the import of tar sands crudes.
- In November 2014, prepared comments on Draft Environmental Impact Report for Phillips 66 Ultra Low Sulfur Diesel Project, responding to the California Supreme Court Decision, *Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310.*

- In November 2014, prepared comments on Draft Environmental Impact Report for the Tesoro Avon Marine Oil Terminal Lease Consideration.
- In October 2014, prepared: "Report on Hydrogen Cyanide Emissions from Fluid Catalytic Cracking Units", pursuant to the Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 79 FR 36880.
- In October 2014, prepared technical comments on Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.
- In October 2014, prepared technical comments on the Title V Permit Renewal and three De Minimus Significant Revisions for the Tesoro Logistics Marine Terminal in the SCAQMD.
- In September 2014, prepared technical comments on the Draft Environmental Impact Report for the Valero Crude by Rail Project.
- In August 2014, for EPA Region 6, prepared technical report on costing methods for upgrades to existing scrubbers at coal-fired power plants.
- In July 2014, prepared technical comments on Draft Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.
- In June 2014, prepared technical report on Initial Study and Draft Negative Declaration for the Tesoro Logistics Storage Tank Replacement and Modification Project.
- In May 2014, prepared technical comments on Intent to Approve a new refinery and petroleum transloading operation in Utah.
- In March and April 2014, prepared declarations on air permits issued for two crude-by-rail terminals in California, modified to switch from importing ethanol to importing Bakken crude oils by rail and transferring to tanker cars. Permits were issued without undergoing CEQA review. One permit was upheld by the San Francisco Superior Court as statute of limitations had run. The Sacramento Air Quality Management District withdrew the second one due to failure to require BACT and conduct CEQA review.
- In March 2014, prepared technical report on Negative Declaration for a proposed modification of the air permit for a bulk petroleum and storage terminal to the allow the import of tar sands and Bakken crude oil by rail and its export by barge, under the New York State Environmental Quality Review Act (SEQRA).
- In February 2014, prepared technical report on proposed modification of air permit for midwest refinery upgrade/expansion to process tar sands crudes.

- In January 2014, prepared cost estimates to capture, transport, and use CO2 in enhanced oil recovery, from the Freeport LNG project based on both Selexol and Amine systems.
- In January 2014, prepared technical report on Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project, Santa Maria, CA. Comments addressed project description (piecemealing, crude slate), risk of upset analyses, mitigation measures, alternative analyses and cumulative impacts.
- In November 2013, prepared technical report on the Phillips 66 Propane Recovery Project, Rodeo, CA. Comments addressed project description (piecemealing, crude slate) and air quality impacts.
- In September 2013, prepared technical report on the Draft Authority to Construct Permit for the Casa Diablo IV Geothermal Development Project Environmental Impact Report and Declaration in Support of Appeal and Petition for Stay, U.S. Department of the Interior, Board of Land Appeals, Appeal of Decision Record for the Casa Diablo IV Geothermal Development Project.
- In September 2013, prepared technical report on Effluent Limitation Guidelines for Best Available Technology Economically Available (BAT) for Bottom Ash Transport Waters from Coal-Fired Power Plants in the Steam Electric Power Generating Point Source Category.
- In July 2013, prepared technical report on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063.
- In July 2013, prepared technical report on fugitive particulate matter emissions from coal train staging at the proposed Coyote Island Terminal, Oregon, for draft Permit No. 25-0015-ST-01.
- In July 2013, prepared technical comments on air quality impacts of the Finger Lakes LPG Storage Facility as reported in various Environmental Impact Statements.
- In July 2013, prepared technical comments on proposed Greenhouse Gas PSD Permit for the Celanese Clear Lake Plant, including cost analysis of CO2 capture, transport, and sequestration.
- In June/July 2013, prepared technical comments on proposed Draft PSD Preconstruction Permit for Greenhouse Gas Emission for the ExxonMobil Chemical Company Baytown Olefins Plant, including cost analysis of CO2 capture, transport, and sequestration.
- In June 2013, prepared technical report on a Mitigated Negative Declaration for a new rail terminal at the Valero Benicia Refinery to import increased amounts of "North American" crudes. Comments addressed air quality impacts of refining increased amounts of tar sands crudes.

- In June 2013, prepared technical report on Draft Environmental Impact Report for the California Ethanol and Power Imperial Valley 1 Project.
- In May 2013, prepared comments on draft PSD permit for major expansion of midwest refinery to process 100% tar sands crudes, including a complex netting analysis involving debottlenecking, piecemealing, and BACT analyses.
- In April 2013, prepared technical report on the Draft Supplemental Environmental Impact Statement (DSEIS) for the Keystone XL Pipeline on air quality impacts from refining increased amount of tar sands crudes at Refineries in PADD 3.
- In October 2012, prepared technical report on the Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow on fugitive particulate matter emissions.
- In October 2012-October 2014, review and evaluate Flint Hills West Application for an expansion/modification for increased (Texas, Eagle Ford Shale) crude processing and related modification, including netting and BACT analysis. Assist in settlement discussions.
- In February 2012, prepared comments on BART analysis in PA Regional Haze SIP, 77 FR 3984 (Jan. 26, 2012). On Sept. 29, 2015, a federal appeals court overturned the U.S. EPA's approval of this plan, based in part on my comments, concluding "..we will vacate the 2014 Final Rule to the extent it approved Pennsylvania's source-specific BART analysis and remand to the EPA for further proceedings consistent with this Opinion." Nat'l Parks Conservation Assoc. v. EPA, 3d Cir., No. 14-3147, 9/19/15.
- Prepared cost analyses and comments on New York's proposed BART determinations for NOx, SO2, and PM and EPA's proposed approval of BART determinations for Danskammer Generating Station under New York Regional Haze State Implementation Plan and Federal Implementation Plan, 77 FR 51915 (August 28, 2012).
- Prepared cost analyses and comments on NOx BART determinations for Regional Haze State Implementation Plan for State of Nevada, 77 FR 23191 (April 18, 2012) and 77 FR 25660 (May 1, 2012).
- Prepared analyses of and comments on New Source Performance Standards for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012).
- Prepared comments on CASPR-BART emission equivalency and NOx and PM BART determinations in EPA proposed approval of State Implementation Plan for Pennsylvania Regional Haze Implementation Plan, 77 FR 3984 (January 26, 2012).
- Prepared comments and statistical analyses on hazardous air pollutants (HAPs) emission controls, monitoring, compliance methods, and the use of surrogates for acid gases, organic HAPs, and metallic HAPs for proposed National Emission Standards for

Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 76 FR 24976 (May 3, 2011).

- Prepared cost analyses and comments on NOx BART determinations and emission reductions for proposed Federal Implementation Plan for Four Corners Power Plant, 75 FR 64221 (October 19, 2010).
- Prepared cost analyses and comments on NOx BART determinations for Colstrip Units 1- 4 for Montana State Implementation Plan and Regional Haze Federal Implementation Plan, 77 FR 23988 (April 20, 2010).
- For EPA Region 8, prepared report: Revised BART Cost Effectiveness Analysis for Tail-End Selective Catalytic Reduction at the Basin Electric Power Cooperative Leland Olds Station Unit 2 Final Report, March 2011, in support of 76 FR 58570 (Sept. 21, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station, November 2010, in support of 76 FR 52388 (Aug. 22, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 & 2, Muskogee Units 4 & 5, Northeastern Units 3 &4, October 2010, in support of 76 FR 16168 (March 26, 2011). My work was upheld in: *State of Oklahoma v. EPA*, App. Case 12-9526 (10th Cri. July 19, 2013).
- Identified errors in N_2O emission factors in the Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, and prepared technical analysis to support Petition for Rulemaking to Correct Emissions Factors in the Mandatory Greenhouse Gas Reporting Rule, filed with EPA on 10/28/10.
- Assisted interested parties develop input for and prepare comments on the Information Collection Request for Petroleum Refinery Sector NSPS and NESHAP Residual Risk and Technology Review, 75 FR 60107 (9/29/10).
- Technical reviewer of EPA's "Emission Estimation Protocol for Petroleum Refineries," posted for public comments on CHIEF on 12/23/09, prepared in response to the City of Houston's petition under the Data Quality Act (March 2010).
- Prepared comments on SCR cost effectiveness for EPA's Advanced Notice of Proposed Rulemaking, Assessment of Anticipated Visibility Improvements at Surrounding Class I Areas and Cost Effectiveness of Best Available Retrofit Technology for Four Corners Power Plant and Navajo Generating Station, 74 FR 44313 (August 28, 2009).
- Prepared comments on Proposed Rule for Standards of Performance for Coal Preparation and Processing Plants, 74 FR 25304 (May 27, 2009).

- Prepared comments on draft PSD permit for major expansion of midwest refinery to process up to 100% tar sands crudes. Participated in development of monitoring and controls to mitigate impacts and in negotiating a Consent Decree to settle claims in 2008.
- Reviewed and assisted interested parties prepare comments on proposed Kentucky air toxic regulations at 401 KAR 64:005, 64:010, 64:020, and 64:030 (June 2007).
- Prepared comments on proposed Standards of Performance for Electric Utility Steam Generating Units and Small Industrial-Commercial-Industrial Steam Generating Units, 70 FR 9706 (February 28, 2005).
- Prepared comments on Louisville Air Pollution Control District proposed Strategic Toxic Air Reduction regulations.
- Prepared comments and analysis of BAAQMD Regulation, Rule 11, Flare Monitoring at Petroleum Refineries.
- Prepared comments on Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electricity Utility Steam Generating Units (MACT standards for coal-fired power plants).
- Prepared Authority to Construct Permit for remediation of a large petroleum-contaminated site on the California Central Coast. Negotiated conditions with agencies and secured permits.
- Prepared Authority to Construct Permit for remediation of a former oil field on the California Central Coast. Participated in negotiations with agencies and secured permits.
- Prepared and/or reviewed hundreds of environmental permits, including NPDES, UIC, Stormwater, Authority to Construct, Prevention of Significant Deterioration, Nonattainment New Source Review, Title V, and RCRA, among others.
- Participated in the development of the CARB document, *Guidance for Power Plant Siting and Best Available Control Technology*, including attending public workshops and filing technical comments.
- Performed data analyses in support of adoption of emergency power restoration standards by the California Public Utilities Commission for "major" power outages, where major is an outage that simultaneously affects 10% of the customer base.
- Drafted portions of the Good Neighbor Ordinance to grant Contra Costa County greater authority over safety of local industry, particularly chemical plants and refineries.
- Participated in drafting BAAQMD Regulation 8, Rule 28, Pressure Relief Devices, including participation in public workshops, review of staff reports, draft rules and other

technical materials, preparation of technical comments on staff proposals, research on availability and costs of methods to control PRV releases, and negotiations with staff.

- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and cost of low-leak technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pumps and Compressors, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak and seal-less technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 5, Storage of Organic Liquids, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of controlling tank emissions, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors at Petroleum Refinery Complexes, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 22, Valves and Flanges at Chemical Plants, etc, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pump and Compressor Seals, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability of low-leak technology, and presentation of testimony before the Board.
- Participated in the development of the BAAQMD Regulation 2, Rule 5, Toxics, including participation in public workshops, review of staff proposals, and preparation of technical comments.
- Participated in the development of SCAQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, and proposed amendments to Rule 1401, New Source

Review of Toxic Air Contaminants, in 1993, including review of staff proposals and preparation of technical comments on same.

- Participated in the development of the Sunnyvale Ordinance to Regulate the Storage, Use and Handling of Toxic Gas, which was designed to provide engineering controls for gases that are not otherwise regulated by the Uniform Fire Code.
- Participated in the drafting of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries, including participation in workshops, review of draft plans, preparation of technical comments on draft plans, and presentation of testimony before the SWRCB.
- Participated in developing Se permit effluent limitations for the five Bay Area refineries, including review of staff proposals, statistical analyses of Se effluent data, review of literature on aquatic toxicity of Se, preparation of technical comments on several staff proposals, and presentation of testimony before the Bay Area RWQCB.
- Represented the California Department of Water Resources in the 1991 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on a striped bass model developed by the California Department of Fish and Game.
- Represented the State Water Contractors in the 1987 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on natural flows, historical salinity trends in San Francisco Bay, Delta outflow, and hydrodynamics of the South Bay.
- Represented interveners in the licensing of over 20 natural-gas-fired power plants and one coal gasification plant at the California Energy Commission and elsewhere. Reviewed and prepared technical comments on applications for certification, preliminary staff assessments, final staff assessments, preliminary determinations of compliance, final determinations of compliance, and prevention of significant deterioration permits in the areas of air quality, water supply, water quality, biology, public health, worker safety, transportation, site contamination, cooling systems, and hazardous materials. Presented written and oral testimony in evidentiary hearings with cross examination and rebuttal. Participated in technical workshops.
- Represented several parties in the proposed merger of San Diego Gas & Electric and Southern California Edison. Prepared independent technical analyses on health risks, air quality, and water quality. Presented written and oral testimony before the Public Utilities Commission administrative law judge with cross examination and rebuttal.
- Represented a PRP in negotiations with local health and other agencies to establish impact of subsurface contamination on overlying residential properties. Reviewed health studies

prepared by agency consultants and worked with agencies and their consultants to evaluate health risks.

WATER QUALITY/RESOURCES

- Directed and participated in research on environmental impacts of energy development in the Colorado River Basin, including contamination of surface and subsurface waters and modeling of flow and chemical transport through fractured aquifers.
- Played a major role in Northern California water resource planning studies since the early 1970s. Prepared portions of the Basin Plans for the Sacramento, San Joaquin, and Delta basins including sections on water supply, water quality, beneficial uses, waste load allocation, and agricultural drainage. Developed water quality models for the Sacramento and San Joaquin Rivers.
- Conducted hundreds of studies over the past 40 years on Delta water supplies and the impacts of exports from the Delta on water quality and biological resources of the Central Valley, Sacramento-San Joaquin Delta, and San Francisco Bay. Typical examples include:
    1. Evaluate historical trends in salinity, temperature, and flow in San Francisco Bay and upstream rivers to determine impacts of water exports on the estuary;
    2. Evaluate the role of exports and natural factors on the food web by exploring the relationship between salinity and primary productivity in San Francisco Bay, upstream rivers, and ocean;
    3. Evaluate the effects of exports, other in-Delta, and upstream factors on the abundance of salmon and striped bass;
    4. Review and critique agency fishery models that link water exports with the abundance of striped bass and salmon;
    5. Develop a model based on GLMs to estimate the relative impact of exports, water facility operating variables, tidal phase, salinity, temperature, and other variables on the survival of salmon smolts as they migrate through the Delta;
    6. Reconstruct the natural hydrology of the Central Valley using water balances, vegetation mapping, reservoir operation models to simulate flood basins, precipitation records, tree ring research, and historical research;
    7. Evaluate the relationship between biological indicators of estuary health and down-estuary position of a salinity surrogate (X2);
    8. Use real-time fisheries monitoring data to quantify impact of exports on fish migration;

9. Refine/develop statistical theory of autocorrelation and use to assess strength of relationships between biological and flow variables;
10. Collect, compile, and analyze water quality and toxicity data for surface waters in the Central Valley to assess the role of water quality in fishery declines;
11. Assess mitigation measures, including habitat restoration and changes in water project operation, to minimize fishery impacts;
12. Evaluate the impact of unscreened agricultural water diversions on abundance of larval fish;
13. Prepare and present testimony on the impacts of water resources development on Bay hydrodynamics, salinity, and temperature in water rights hearings;
14. Evaluate the impact of boat wakes on shallow water habitat, including interpretation of historical aerial photographs;
15. Evaluate the hydrodynamic and water quality impacts of converting Delta islands into reservoirs;
16. Use a hydrodynamic model to simulate the distribution of larval fish in a tidally influenced estuary;
17. Identify and evaluate non-export factors that may have contributed to fishery declines, including predation, shifts in oceanic conditions, aquatic toxicity from pesticides and mining wastes, salinity intrusion from channel dredging, loss of riparian and marsh habitat, sedimentation from upstream land alternations, and changes in dissolved oxygen, flow, and temperature below dams.

- Developed, directed, and participated in a broad-based research program on environmental issues and control technology for energy industries including petroleum, oil shale, coal mining, and coal slurry transport. Research included evaluation of air and water pollution, development of novel, low-cost technology to treat and dispose of wastes, and development and application of geohydrologic models to evaluate subsurface contamination from in-situ retorting. The program consisted of government and industry contracts and employed 45 technical and administrative personnel.
- Coordinated an industry task force established to investigate the occurrence, causes, and solutions for corrosion/erosion and mechanical/engineering failures in the waterside systems (e.g., condensers, steam generation equipment) of power plants. Corrosion/erosion failures caused by water and steam contamination that were investigated included waterside corrosion caused by poor microbiological treatment of cooling water, steam-side corrosion caused by ammonia-oxygen attack of copper alloys, stress-corrosion

cracking of copper alloys in the air cooling sections of condensers, tube sheet leaks, oxygen in-leakage through condensers, volatilization of silica in boilers and carry over and deposition on turbine blades, and iron corrosion on boiler tube walls. Mechanical/engineering failures investigated included: steam impingement attack on the steam side of condenser tubes, tube-to-tube-sheet joint leakage, flow-induced vibration, structural design problems, and mechanical failures due to stresses induced by shutdown, startup and cycling duty, among others. Worked with electric utility plant owners/operators, condenser and boiler vendors, and architect/engineers to collect data to document the occurrence of and causes for these problems, prepared reports summarizing the investigations, and presented the results and participated on a committee of industry experts tasked with identifying solutions to prevent condenser failures.

- Evaluated the cost effectiveness and technical feasibility of using dry cooling and parallel dry-wet cooling to reduce water demands of several large natural-gas fired power plants in California and Arizona.
- Designed and prepared cost estimates for several dry cooling systems (e.g., fin fan heat exchangers) used in chemical plants and refineries.
- Designed, evaluated, and costed several zero liquid discharge systems for power plants.
- Evaluated the impact of agricultural and mining practices on surface water quality of Central Valley steams. Represented municipal water agencies on several federal and state advisory committees tasked with gathering and assessing relevant technical information, developing work plans, and providing oversight of technical work to investigate toxicity issues in the watershed.

AIR QUALITY/PUBLIC HEALTH

- Prepared or reviewed the air quality and public health sections of hundreds of EIRs and EISs on a wide range of industrial, commercial and residential projects.
- Prepared or reviewed hundreds of NSR and PSD permits for a wide range of industrial facilities.
- Designed, implemented, and directed a 2-year-long community air quality monitoring program to assure that residents downwind of a petroleum-contaminated site were not impacted during remediation of petroleum-contaminated soils. The program included real-time monitoring of particulates, diesel exhaust, and BTEX and time integrated monitoring for over 100 chemicals.
- Designed, implemented, and directed a 5-year long source, industrial hygiene, and ambient monitoring program to characterize air emissions, employee exposure, and downwind environmental impacts of a first-generation shale oil plant. The program included stack monitoring of heaters, boilers, incinerators, sulfur recovery units, rock crushers, API

separator vents, and wastewater pond fugitives for arsenic, cadmium, chlorine, chromium, mercury, 15 organic indicators (e.g., quinoline, pyrrole, benzo(a)pyrene, thiophene, benzene), sulfur gases, hydrogen cyanide, and ammonia. In many cases, new methods had to be developed or existing methods modified to accommodate the complex matrices of shale plant gases.

- Conducted investigations on the impact of diesel exhaust from truck traffic from a wide range of facilities including mines, large retail centers, light industrial uses, and sports facilities. Conducted traffic surveys, continuously monitored diesel exhaust using an aethalometer, and prepared health risk assessments using resulting data.
- Conducted indoor air quality investigations to assess exposure to natural gas leaks, pesticides, molds and fungi, soil gas from subsurface contamination, and outgasing of carpets, drapes, furniture and construction materials. Prepared health risk assessments using collected data.
- Prepared health risk assessments, emission inventories, air quality analyses, and assisted in the permitting of over 70 1 to 2 MW emergency diesel generators.
- Prepare over 100 health risk assessments, endangerment assessments, and other health-based studies for a wide range of industrial facilities.
- Developed methods to monitor trace elements in gas streams, including a continuous real-time monitor based on the Zeeman atomic absorption spectrometer, to continuously measure mercury and other elements.
- Performed nuisance investigations (odor, noise, dust, smoke, indoor air quality, soil contamination) for businesses, industrial facilities, and residences located proximate to and downwind of pollution sources.

PUBLICATIONS AND PRESENTATIONS (Partial List - Representative Publications)

J.P. Fox, P.H. Hutton, D.J. Howes, A.J. Draper, and L. Sears, Reconstructing the Natural Hydrology of the San Francisco Bay-Delta Watershed, Hydrology and Earth System Sciences, Special Issue: Predictions under Change: Water, Earth, and Biota in the Anthropocene, v. 19, pp. 4257-4274, 2015. http://www.hydrol-earth-syst-sci.net/19/4257/2015/hess-19-4257-2015.pdf. See also: Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014 at: https://msb.water.ca.gov/documents/86728/a702a57f-ae7a-41a3-8bff-722e144059d6.

D. Howes, P. Fox, and P. Hutton, Evapotranspiration from Natural Vegetation in the Central Valley of California: Monthly Grass Reference Based Vegetation Coefficients and the Dual Crop Coefficient Approach, *Journal of Hydrologic Engineering*, v.20, no. 10, October 2015.

Phyllis Fox and Lindsey Sears, *Natural Vegetation in the Central Valley of California*, June 2014, Prepared for State Water Contractors and San Luis & Delta-Mendota Water Authority, 311 pg.

J.P. Fox, T.P. Rose, and T.L. Sawyer, Isotope Hydrology of a Spring-fed Waterfall in Fractured Volcanic Rock, 2007.

C.E. Lambert, E.D. Winegar, and Phyllis Fox, Ambient and Human Sources of Hydrogen Sulfide: An Explosive Topic, Air & Waste Management Association, June 2000, Salt Lake City, UT.

San Luis Obispo County Air Pollution Control District and San Luis Obispo County Public Health Department, *Community Monitoring Program*, February 8, 1999.

The Bay Institute, *From the Sierra to the Sea. The Ecological History of the San Francisco Bay-Delta Watershed*, 1998.

J. Phyllis Fox, *Well Interference Effects of HDPP's Proposed Wellfield in the Victor Valley Water District*, Prepared for the California Unions for Reliable Energy (CURE), October 12, 1998.

J. Phyllis Fox, *Air Quality Impacts of Using CPVC Pipe in Indoor Residential Potable Water Systems*, Report Prepared for California Pipe Trades Council, California Firefighters Association, and other trade associations, August 29, 1998.

J. Phyllis Fox and others, *Authority to Construct Avila Beach Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, June 1998.

J. Phyllis Fox and others, *Authority to Construct Former Guadalupe Oil Field Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, May 1998.

J. Phyllis Fox and Robert Sears, *Health Risk Assessment for the Metropolitan Oakland International Airport Proposed Airport Development Program*, Prepared for Plumbers & Steamfitters U.A. Local 342, December 15, 1997.

Levine-Fricke-Recon (Phyllis Fox and others), *Preliminary Endangerment Assessment Work Plan for the Study Area Operable Unit, Former Solano County Sanitary Landfill, Benicia, California*, Prepared for Granite Management Co. for submittal to DTSC, September 26, 1997.

Phyllis Fox and Jeff Miller, "Fathead Minnow Mortality in the Sacramento River," *IEP Newsletter*, v. 9, n. 3, 1996.

Jud Monroe, Phyllis Fox, Karen Levy, Robert Nuzum, Randy Bailey, Rod Fujita, and Charles Hanson, *Habitat Restoration in Aquatic Ecosystems. A Review of the Scientific Literature*

Related to the Principles of Habitat Restoration, Part Two, Metropolitan Water District of Southern California (MWD) Report, 1996.

Phyllis Fox and Elaine Archibald, *Aquatic Toxicity and Pesticides in Surface Waters of the Central Valley*, California Urban Water Agencies (CUWA) Report, September 1997.

Phyllis Fox and Alison Britton, *Evaluation of the Relationship Between Biological Indicators and the Position of X2*, CUWA Report, 1994.

Phyllis Fox and Alison Britton, *Predictive Ability of the Striped Bass Model*, WRINT DWR-206, 1992.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the North Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

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J. P. Fox and others, "Long-Term Annual and Seasonal Trends in Surface Salinity of San Francisco Bay," *Journal of Hydrology*, v. 122, p. 93-117, 1991.

J. P. Fox and others, "Reply to Discussion by D.R. Helsel and E.D. Andrews on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.

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J. P. Fox, "The Distribution of Mercury During Simulated In-Situ Oil Shale Retorting," *Environmental Science and Technology*, v. 19, no. 4, pp. 316-322, 1985.

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Ambiente," ONERN-CONCYTEC, Lima, Peru, April 25-27, 1984. (Also presented at Instituto Tecnologico Pesquero and Instituto del Mar del Peru.)

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M. Goldstein et al., *High Level Nuclear Waste Standards Analysis, Regulatory Framework Comparison*, Battelle Memorial Institute Report No. BPMD/82/E515-06600/3, Sept. 1982.

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Sulfate Minerals: Geochemistry, Crystallography, and Environmental Significance, Mineralogical Society of America/Geochemical Society, 11/00.
Design of Gas Turbine Combined Cycle and Cogeneration Systems, Thermoflow, 12/00
Air-Cooled Steam Condensers and Dry- and Hybrid-Cooling Towers, Power-Gen, 12/01
Combustion Turbine Power Augmentation with Inlet Cooling and Wet Compression, Power-Gen, 12/01
CEQA Update, UC Berkeley Extension, 3/02
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Noise Exposure Assessment: Sampling Strategy and Data Acquisition, AIHA PDC 205, 6/02
Noise Exposure Measurement Instruments and Techniques, AIHA PDC 302, 6/02
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McIlvaine Hot Topic Hour, Carbon Management Strategies and Technologies, 6/24/10
McIlvaine Hot Topic Hour, Gas Turbine O&M, 7/22/10

McIlvaine Hot Topic Hour, Industrial Boiler MACT – Impact and Control Options, March 10, 2011
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Attachment 2

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April 18, 2018

Via Email and Hand Delivery ITEM8.F.

ATTN: Architectural Committee
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Re: 2305 Mission College Boulevard Data Center Project – Mitigated Negative Declaration and Architectural Approval (PLN2017-12535 and CEQ2017-01034)

Dear Architectural Committee Members:

We are writing on behalf of California Unions for Reliable Energy ("CURE") to urge the Committee to deny the proposed Mitigated Negative Declaration ("MND") and Architectural Approval for the 2305 Mission College Boulevard Data Center Project ("Project"). The Project, which is proposed by PR III 2305 Mission College Boulevard, LLC, involves the construction of a 495,610 square-foot data center facility that would include 60 megawatts ("MW") of informational technology power, a generator yard, an equipment yard for battery and electrical equipment, and parking. The Project would include 120 diesel-fueled engine generators to provide 75 MW of backup power generation capacity. The Project also proposes to construct a new 90 megavolt amps Silicon Valley Power electrical substation. The 15.7-acre Project site is located at 2305 Mission College Boulevard in the City of Santa Clara.

CURE is a coalition labor organizations whose members construct, operate, and maintain powerplants and other industrial facilities throughout California. CURE advocates for sustainable development of California's energy and natural resources. Environmental degradation consumes limited natural resources and jeopardizes future jobs by making it more difficult and expensive for industry to expand, including in Santa Clara County. Because CURE's participating organizations and their members live, recreate, work, and raise families in the City of Santa Clara and Santa Clara County, CURE's participating organizations and their members stand to be directly affected by the Project's adverse environmental and health impacts.

Our firm previously submitted comments on behalf of CURE on the Initial Study and MND prepared for the Project. Our comments were prepared with the assistance of technical expert Dr. Phyllis Fox, Ph.D, CEQ, PE, DEE. As detailed therein, we identified potentially significant and unmitigated impacts due to operational noise, nitrogen oxide (NOx) emissions from the Project's backup diesel generators, and greenhouse gas (GHG) emissions resulting in part from the Project's substantial energy demand. Dr. Fox's comments further demonstrated that fugitive dust emissions generated during the Project's construction phase may also cause significant air quality impacts. Based on these potentially significant and unmitigated impacts, as well as other deficiencies in the Initial Study, our comments concluded that the MND in its current form and substance violates CEQA and that an Environmental Impact Report is required for the Project. Our previous comments on the Initial Study and MND are incorporated in this letter by reference.

We write to you today not to repeat the points made in our MND comment letter relating to CEQA compliance, but to comment that the Project fails to comply with the Santa Clara City Code. As a result, the Committee cannot make the required findings of consistency.

Santa Clara City Code Section 18.76.020, subsection (c), provides that the Committee must find that the Project is based on the following standards of architectural design, among others:

> (2) That the design and location of the proposed development and its relation to neighboring developments and traffic is such that it will not impair the desirability of investment or occupation in the neighborhood, will not unreasonably interfere with the use and enjoyment of neighboring developments, and will not create traffic congestion or hazard.
> …
> (4) That the granting of such approval will not, under the circumstances of the particular case, materially affect adversely the health, comfort or general welfare of persons residing or working in the neighborhood of said development, and will not be materially detrimental to the public welfare or injurious to property or improvements in said neighborhood.[1]

As our comments on the MND explain, substantial evidence shows that the Project may have several significant impacts on the environment notwithstanding the proposed mitigation measures. These impacts, which directly relate to the Project's potential impacts on public health and the use and enjoyment of neighboring properties, are also such that the Committee cannot properly make the above findings based on the current Project proposal.

First, the Project's potentially significant and unmitigated noise impacts resulting from emergency equipment operations would impair the desirability of occupation in the neighborhood and unreasonably interfere with the use and enjoyment of neighboring residents. The Project's noise impacts may also materially affect the comfort and general welfare of persons residing or working in areas near the Project site. As our MND comments explained, the MND fails to incorporate the mitigation measures that the City's own noise consultant determined are necessary for the Project to comply with the City's residential noise limits during the testing of emergency equipment. The Initial Study also fails to disclose and evaluate the noise impacts resulting from simultaneous operation of the Project's backup generators, as will occur in the event of a power disruption. It is reasonably foreseeable that the Project's backup generators will be required to operate simultaneously, which is why the emergency equipment is included in the Project. And it follows from the City's noise analysis that noise impacts will be greatest during emergency

[1] S.C.C.C. § 18.76.020(c) (Underline added).

operations. For this reason, further environmental review and mitigation is necessary before the Committee can conclude that generator operations would not unreasonably interfere with the use and enjoyment of neighboring properties, or adversely impact public welfare.

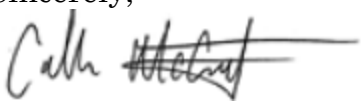
Furthermore, simultaneous operation of the Project's backup generators may cause significant air quality impacts due to NOx emissions. The City's air quality assessment demonstrates that NOx emissions from simultaneous operation of the 120 backup diesel generators may exceed the Bay Area Air Quality Management District threshold of significance in the case of a power outage. However, Mitigation Measure MM AIR-2 only mitigates impacts resulting from generator operations during routine testing and maintenance. NOx emissions are a precursor to ozone, and ground-level ozone is known to contribute to a number of adverse public health impacts, including: causing difficulty breathing; aggravating lung diseases such as asthma, emphysema, and chronic bronchitis; and making the lungs more susceptible to infection, among others harmful effects.

Finally, as our comments on the Initial Study and MND further explain, GHG emissions resulting from the Project's operations may exceed the BAAQMD's numeric threshold of significance for land use projects, particularly when the Project's substantial electricity demand is accounted for. The Project's overall GHG emissions are not quantified in the Initial Study, but the City concludes that the Project's impacts would be less than significant because the Project is consistent with the Climate Action Plan ("CAP"), the General Plan, and other state and regional GHG reduction programs. However, few of the applicable measures discussed in the Initial Study will meaningfully reduce GHG emissions resulting from operation of the data center. Climate change is an impact that not only adversely affects those in the immediate vicinity of the Project, but all Californians in the form of increased drought, wildfires, and rising sea levels. Thus, approval of the Project in its current form may also adversely affect public welfare in this regard.

For each of the reasons above, we urge the Committee not to adopt the MND or approve the Project at this time. The City's analysis in the Initial Study and MND does not support a finding that the Project will not unreasonably interfere with the use and enjoyment of neighboring developments, or that approval will not materially affect adversely the welfare of persons residing or working in the neighborhood of the Project. We request that the Committee deny architectural

approval and direct that further environmental review be performed in order to adequately disclose, analyze, and mitigate the Project's environmental and public health impacts.

Sincerely,



Collin S. McCarthy

CSM:ljl