PUBLIC REQUEST TO ADDRESS
THE BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES, CALIFORNIA

Correspondence Received

			The following individuals submitted comments on agenda item:	
Agenda #	**Relate To**	**Position**	**Name**	**Comments**
3.		**Favor**	Ana Alanis	
			Andrew C Ellis	
			Andy J Hattala	The extraction and combustion of oil and gas release massive quantities of greenhouse gases and in turn, exacerbate climate change. Action must be taken to effectively combat climate change and its ill effects, including the reduction if not elimination of oil and gas extraction and the transition to renewable energy if and as soon as feasible. As a resident/constituent, advocate, and representative of Climate Reality Los Angeles, I urge the Los Angeles County Board of Supervisors to vote in favor of the amendment and hasten action to meaningfully mitigate climate change.
			Daryl Gale	
			David Guttman	We need to produce more housing and have less pollution in LA county. I support banning any new oil drilling and making oil drilling & production a non-conforming land use in Baldwin Hills. Once this land is removed from oil production it should have environmental restoration work done so that more building can take place near these currently toxic environments.
			Deborah Robbins	It is time to end oil drilling in Los Angeles.
			Dennis Levitt	Environmental justice should not be an after-thought
			Fran Lee	
			Geraldine Maloof Maloof	
			Hannah Yang	
			Joan Zierler	
			John Fleming	Please see the attached comments from 852 people in L.A. County who support amending the Community Standards District to phase out oil drilling in the Inglewood Oil Fields.
			John Fleming	
			Julie S Starrett	
			Karin Kachler	
			Katherine Pease	

As of: 5/14/2024 2:00:07 PM

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3.		**Favor**	Kathy Schaeffer	For too long, the oil and gas industry has been able to poison our air, water and people. The oil and gas lobby has been able to monetize support to continue drilling with no regard to its effect on surrounding communities and the impact of climate change. Please make existing wells and production facilities a non-conforming use and maintain existing regulations for these facilities during the amortization period.
			Kim A Neistadt	
			Nikki Alvarado	
			Pete Marsh	
			Polly Estabrook	
			Rebecca Gundzik	
			Robert Duffey	
			Sam Miyamoto	
			Seth A Weisbord	
			Sharon Ungersma	
			Sherrell Cuneo	
			Tania M Ibanez Virnig	
			Terry Saucier	
			Vivian Deutsch	
			Wendy-Sue Rosen	Please make oil drilling & production a non-conforming land use in Baldwin Hills. This is an important health and safety and environmental justice issue. Thank you for your consideration.
		Oppose	David Budy	
			Liz K Gosnell	
			Matt Wickersham	Please see attached comment letters. (Resubmitting in case prior upload today was ineffective. Please ignore if duplicative.)
			Matt Wickersham	Please see attached letters
			Matthew Wickersham	
			S Rogers	No drilling here, please.
			Scott A Sommer	
			William D Breidenbach	
		Item Total	**39**	

As of: 5/14/2024 2:00:07 PM

Grand Total			**39**	

As of: 5/14/2024 2:00:07 PM

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Scott A. Sommer
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May 13, 2024

ELECTRONIC MAIL

(https://publiccomment.bos.lacounty.gov/; ThirdDistrict@bos.lacounty.gov; FirstDistrict@bos.lacounty.gov; HollyJMitchell@bos.lacounty.gov; FourthDistrict@bos.lacounty.gov; Kathryn@bos.lacounty.gov)

Chair Lindsay P. Horvath
Supervisor Hilda L. Solis
Supervisor Holly J. Mitchell
Supervisor Janice Hahn
Supervisor Kathryn Barger
Los Angeles County Board of Supervisors
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, CA 90012

Re: **Project No. PRJ2023-001628-(2): Advance Planning Project No. RPPL2023002314-(2), Baldwin Hills Community Standards District (CSD); Scheduled for Hearing before the Board of Supervisors on May 14, 2024**

To the Board of Supervisors:

This office represents Cone Fee LLC, a California limited liability company, formerly Cone Fee Trust (hereinafter “Cone”). Cone owns land in the Baldwin Hills Oil Field that has been in productive use for oil and gas since the 1920’s.

The above-referenced Proposed Amendment to Baldwin Hills Community Standards District, Project No. RPPL2023002314-(2) (“Amendment” or “project”) has been on the Board of Supervisors agendas before and was continued without action. Cone submitted written opposition dated August 14, 2023 when the Amendment was pending before the Los Angeles County Regional Planning Commission for a recommendation, and further opposition dated January 24, 2024 when scheduled before the Board of Supervisors.

For some reason, the Cone opposition was not included with the recently-issued agenda for May 14, 2024. We hereby resubmit our January 24, 2024 opposition for consideration at your May 14, 2024 hearing.

The minimal material submitted by staff for your consideration on May 14, 2024 fails to address any of the very significant legal and policy issues raised in our opposition. You have no fact-based or analytical material before you to even address, let alone refute, the CEQA, purported CEQA exemption, federal and state preemption, and other grounds and evidence we have presented showing the Amendment would be void if adopted. To take action on the Amendment based on this record and without confronting these issues would be an abuse of discretion.

Thank you for your attention and consideration.

Very Truly Yours,

Scott A. Sommer

cc: Jeff Levinson, Interim Executive Officer of the Board of Supervisors

Attachment: Copy of correspondence dated January 24, 2024 with supporting materials

Attachment

Copy of Correspondence dated January 24, 2024 with Supporting Materials

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January 24, 2024

ELECTRONIC MAIL

(https://publiccomment.bos.lacounty.gov/; ThirdDistrict@bos.lacounty.gov; FirstDistrict@bos.lacounty.gov; HollyJMitchell@bos.lacounty.gov; FourthDistrict@bos.lacounty.gov; Kathryn@bos.lacounty.gov)

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Los Angeles, CA 90012

Re: **Project No. PRJ2023-001628-(2): Advance Planning Project No. RPPL2023002314-(2), Baldwin Hills Community Standards District (CSD); Scheduled for Hearing before the Board of Supervisors on January 30, 2024**

To the Board of Supervisors:

This office represents Cone Fee LLC, a California limited liability company, formerly Cone Fee Trust (hereinafter "Cone"). Cone owns land in the Baldwin Hills Oil Field[1] that has been in productive use for oil and gas since the 1920's. The oil and gas extraction on the Cone Property is currently operated by Sentinel Peak Resources California LLC.

These comments are submitted in opposition to the above-referenced Proposed Amendment to Baldwin Hills Community Standards District, Project No. RPPL2023002314-(2) ("Amendment" or "project"). Cone submitted written opposition dated August 14, 2023 when the Amendment was pending before the Los Angeles County Regional Planning Commission for consideration of a recommendation. The points raised in Cone's opposition and the opposition of other parties have not been rebutted by the County and remain applicable.
Important factual information not considered by the Regional Planning Commission has been collected and is referenced hereinbelow.

[1] The Baldwin Hills Oil Field is also referred to as the Inglewood Oil Field or IOF. This correspondence will continue to use the Baldwin Hills terminology utilized in the Amendment.

I. PROCEDURAL STATUS

The Regional Planning Commission conducted hearings on the Amendment on August 16, 2023 and October 4, 2023, and adopted a Resolution on Project No. 2023-001628, Plan No. RPPL2023002314 on October 4, 2023 recommending, in pertinent part, that the Board of Supervisors (i) find the Amendment exempt from CEQA and (ii) adopt the Amendment. The Regional Planning Commission also submitted correspondence to the Board of Supervisors dated January 30, 2024. A Department of Regional Planning "Project Summary" summarizing the project and the hearings before the Regional Planning Commission contains a significant admission at p. 2:

> The Amendment may make the County **more reliant on oil from foreign and domestic sources**, which do not have the same regulatory protections that are in Los Angeles County. (emphasis added)

Regarding CEQA, the Regional Planning Commission relied upon an undated Notice of Exemption with attachment that is deeply flawed and has been submitted without change to the Board of Supervisors for this hearing.

The recommendation of the Regional Planning Commission dated October 4, 2023 has no legal status and is not a "final administrative order or decision" for purposes of a challenge by administrative mandamus under Code of Civil Procedure §1094.5 and 1094.6 nor "an act which the law specially enjoins" for traditional mandamus under Code of Civil Procedure §1085. An action subject to judicial review will occur only if and when this Board of Supervisors were to adopt a resolution enacting the Amendment as part of title 22 of the Los Angeles Planning and Zoning Code. (*Campbell v. Regents of the University of California* (2005) 35 Cal.4th 311, 321; *Abelleira v. District Court of Appeal* (1941) 17 Cal.2d 280, 292).

II. EXECUTIVE SUMMARY

The Board of Supervisors should reject the Notice of Exemption and the Amendment on the following grounds:

1. The Amendment constitutes a "Project" under CEQA and requires an EIR due to the significant environmental impacts shown in the administrative record being established on this matter. (Public Resources Code §21080(a) ["types of projects requiring EIR's"]). Under the "fair argument" standard applicable under CEQA to staff's decision not to prepare an EIR, there is uncontroverted substantial evidence that the Amendment will result in increased CO2 and GHG emissions, and "emissions leakage" as defined by the California Air Resources Board under AB 32, due to substitution of foreign petroleum imports by tanker ships to replace the production of the Baldwin Hills Oil Field now efficiently sent by pipeline to Los Angeles area refineries. Refer to the CARB "*2022 Scoping Plan for Achieving Carbon Neutrality*" (pp.101-106), the expert opinion letter of Capital Matrix

Consulting dated January 19, 2024, and conclusions in the 2008 Final Environmental Impact Report for Baldwin Hills Community Standards District at p.4.2-44.[2]

The Amendment proposes to reduce the Cone Property to unproductive land as oil and gas production is phased out. There is no identification of alternatives for future use, contrary to CEQA's requirement that there shall be a meaningful discussion and consideration of project alternatives. The Notice of Exemption also improperly results in no consideration of mitigation measures. (*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 396-403). The "whole of the action" is not being considered contrary to CEQA Guideline 15378(a).

The project does <u>not</u> qualify for exemption under CEQA Guidelines 15301, 15308, or 15061. To the contrary, there is substantial evidence that the "whole of the action" of the Amendment will cause significant impacts including major modifications of operations, "phase out of oil drilling and extraction activities," substitution of petroleum imported by marine tankers, a resulting need for new and additional infrastructure in the Los Angeles basin with major transportation and air quality impacts, effect on disadvantaged communities contrary to Environmental Justice requirements, and increased emissions and "emissions leakage." Accordingly, an EIR or subsequent EIR is required pursuant to CEQA Guideline 15162.

CEQA Guideline Appendix G section XII specifically requires the County to prepare an EIR to evaluate "loss of a known mineral resource that would be of value to the region and the residents of the state."

2. The Amendment is void on California and Federal preemption grounds. A local ordinance conflicting with Public Resources Code §3106 and permits issued by CalGEM was most recently struck down by a unanimous California Supreme Court in *Chevron U.S.A. v. County of Monterey* (2023) 5 Cal.5th 135, 145-146.

   The conflict of the Amendment with State law takes three forms. <u>First</u>, and foremost, CalGEM, and its predecessor DOGGR, issued permits and allows operators in the Baldwin Hills Oil Field to utilize production methods pursuant to Public Resources Code §3106 that CalGEM deems suitable for recovery of underground hydrocarbons; the Amendment prohibits and phases out such methods in conflict with CalGEM permits and approvals in the same flawed manner as the invalid Monterey County ordinance. <u>Second</u>, under SB1137, in 2022 the State of California adopted a 3,200 buffer rule applicable to new oil and gas extraction; the Amendment prohibits new oil and gas extraction even though in compliance with SB1137. <u>Third</u>, as reflected in the CARB *2022 Scoping Plan for Achieving Carbon Neutrality* (p.29) and Government Code §§65040-65040.17, the State is carefully analyzing impacts of oil and gas extraction on disadvantaged communities; the Amendment and its resulting emissions

[2] Copies of these referenced documents are submitted in an Appendix to this letter.

leakage (i) interferes and conflicts with State planning and (ii) is in derogation of Environmental Justice requirements applicable to the County and its General Plan.

3. The "phase out of oil drilling and exaction activities" proposed in the Amendment is not rationally related to a legitimate County objective nor supported by substantial evidence, in violation of Code of Civil Procedure §§1094.5 and 1085. Multiple health risk assessments including the 2020 Inglewood Oil Field Health Risk Assessment Report consistently concluded the health risks of the Baldwin Hills Oil Field are below SCAQMD thresholds. Likewise, the Baldwin Hills Community Standard District Periodic Review Final Report dated September 2021 concluded that applicable CSD provisions have been effective to protect the health, safety, and general welfare of the surrounding community. In contrast, increased health risks caused by 'emission leakage' will be caused by the Amendment through resulting greater imports of foreign oil by marine tankers, with potentially greater impacts on disadvantaged communities and the general public which have not been analyzed by an EIR.

   The resulting health risks caused by the shift to greater imports of foreign oil by marine tankers will disproportionately impact the SB 535 disadvantaged communities in and around the port and related transportation corridors. See the CalEPA "Final Designation of Disadvantaged Communities (May 2022)" and map, and related "Technical Memorandum" dated January 18, 2024 of Catalyst Environmental Solutions, addressed in section III (p.7) below, and included in the appendix to this letter.

4. The Amendment exceeds the County's statutory authority under the Planning and Zoning Law, Government Code ("Gov. Code") §§65000-66499.58, which does not authorize the phasing out of petroleum production regulated and permitted by the State.

5. The Amendment would conflict with the Los Angeles County General Plan in violation of Government Code §65860.

6. The modifications of operations and "phase out of oil drilling and exaction activities" proposed in the Amendment conflict with traditional vested rights of Cone as landowner and the operator as lessee/permittee. The Amendment "goes so far" as to constitute a regulatory taking of longstanding objectively reasonable investment-backed property rights of Cone and the operator, contrary to the Fifth Amendment of the U.S. Constitution and Art. I section 19 of the California Constitution. Further, the amortization methodology contemplated under the Amendment is contrary to the measure of damages under Federal jurisprudence.

III. <u>VIOLATION OF CEQA</u>

A threshold issue of compliance with CEQA must be addressed before the Board of Supervisors could take action on the Amendment. The staff recommendation on exemptions is incorrect and conflicts with the previous adoption of the Baldwin Hills CSD.

<u>Applicable Standard</u>. County staff has erroneously determined that an EIR should not be prepared to provide the necessary information to consider the Amendment in accordance with CEQA. The County's decision not to prepare an EIR is subject to the "fair argument" standard, <u>requiring</u> an EIR if there is <u>any</u> substantial evidence that significant impacts could result.

As stated in *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927, a public agency "**<u>must</u> prepare an EIR whenever substantial evidence supports a fair argument that a proposed project 'may have a significant effect on the environment**." (citing Public Resources Code] §§2100, 21151, 21080, 21082.2 [fair argument standard]; Guidelines, §§15002, subd. (f)(1), (2), 15063; *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75; emphasis added). As *Pocket Protectors* further stated:

> **If there is substantial evidence in the whole record supporting a fair argument that a project may have a significant non-mitigable effect on the environment, the lead agency shall prepare an EIR, even though it may also be presented with other substantial evidence that the project will not have a significant effect**… "May" means a reasonable possibility…The fair argument standard is a "low threshold" test for requiring the preparation of an EIR. (multiple citations) … It is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, ***with a preference for resolving doubts in favor of environmental review***. (124 Cal.App.4th at 927-928, emphasis in original and added)

Refer also to CEQA Guideline 15064(a)(1), (f)(1), and (g). In *No Oil, Inc.,* the Supreme Court stated:

> Evaluation of the environmental impact of the drilling project in the instant case required resolution of a factual dispute…In such cases, an EIR- an impartial, detailed, and factual analysis of the project's effects- can perform an invaluable service in aiding the agency's resolution of the dispute…**an agency should prepare an EIR whenever it perceives '<u>some</u> substantial evidence that a project may have a significant effect environmentally.**' (13 Cal.3d at 85, emphasis added)

<u>Substantial Evidence</u>: Such substantial evidence of emissions leakage and other significant environmental impacts arising from the Amendment is not only present here, it is <u>uncontradicted</u>:

The Final Environmental Impact Report Baldwin Hills Community Standards District dated October 2008 (the "2008 FEIR") was certified before approval of the original Baldwin Hills CSD on October 8, 2008 and the Board of Supervisors adoption of section 22.310 on October 28,

2008. The 2008 FEIR addressed, *inter alia*, the environmental impacts of current and future operations, oil field development, necessary development standards, operating requirements, and mitigation of potential environmental impacts. See 2008 FEIR, p. ES-1 et seq., sections 2.0, 3.0, and 4.0. In particular, the 2008 FEIR stated at p.4.2-44:

> The use of foreign crude oil is associated with substantial emissions associated with transportation as foreign crude oil needs to be transported from between 4,000 miles (Ecuador) and 13,000 miles (Saudi Arabia) one-way to get to California. Alaska North Slope crude travels about 2,500 miles from Alaska. **This causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil.** (2008 FEIR, p. 4.2-44, emphasis added.)

The 2008 FEIR documents over 1,000 tanker trips importing crude oil into California at p.4.2-45. The County is bound by these conclusions in its 2008 FEIR, which remain in effect as the County has not prepared a newer or supplemental EIR.

Note also the expert commentary in the Capital Matrix Consultant report dated January 19, 2024:

> CO2 emissions and other pollution associated with replacement imports.
> The increase in waterbourne imports would require additional tankers, some traveling up to 15,000 miles, and each offloading crude through Southern California's already-crowded ports. As noted above, crude oil production from the Inglewood oil field is collected on-site and sent via pipeline to local refineries in Southern California. This efficient process is partly responsible for the relatively low carbon intensity of oil produced by this oil field. (footnotes) Because of this relatively low intensity**, replacement of oil extracted from the Inglewood field with offshore sources may significantly raise the net level of CO2 emissions attributable to oil refined in California.**
>
> **In addition to CO2 emissions, the offloading of additional foreign crude would result in increases in other pollutants- including particulate matter, nitrogen oxides, carbon monoxide, and sulfur dioxide- in and around Southern California ports. This would have important environmental justice implications**, in that people living in low-income communities near the ports and marine terminals would face more pollution and associated risks of cancer, respiratory diseases, and other health-related ailments. (p. 3, emphasis added)
>
> In a study we conducted for the Western States Petroleum Association in 2019, we found that refiners do not have adequate port-related capacity of accommodate the increased imports that would be required to replace a shutdown of California production. (footnote) **Hence, a significant loss of California crude production would require increased expenditures for additional dock capacity, coastal storage and pipelines, and potentially for reconfiguration of refineries**

> themselves to optimally process foreign slates of crude. (footnote) (p.4, emphasis added)

In addition, the California Air Resources Board's "*2022 Scoping Plan for Achieving Carbon Neutrality*" recites further substantial evidence of 'emissions leakage' and significant environmental impacts if in-state oil and gas production were phased out and replaced with foreign imports:

> AB 32 also requires any actions undertaken to reduce GHGs to "minimize leakage." Increases in imported crude could result in increased activity outside California to extract and transport crude into California…**a full phaseout of in-state extraction could result in GHG emissions leakage and in-state impacts to crude oil imported into the state.** (p.102, emphasis added)
>
> **Any crude oil demand by California refineries not met by California crude oil will be met by marine imports of Alaskan and foreign crude**. (footnote) As shown in Figure 2-8**, approximately 99 percent of crude imports into California are met by marine transportation**…There are no pipelines that bring crude oil into California from out of state. (footnote) (p.103-104, emphasis added)
>
> Importantly, **activity at the ports would increase, and new infrastructure would be needed to store and deliver crude to in-state refineries…emissions related to the production and transport of crude to California might increase elsewhere, resulting in emissions leakage.** (p.105, emphasis added)

The resulting health risks caused by the shift to greater imports of foreign oil by marine tankers will disproportionately impact the SB 535 disadvantaged communities in and around the port and related transportation corridors. See the CalEPA "Final Designation of Disadvantaged Communities (May 2022)" and map, and related "Technical Memorandum" dated January 18, 2024 of Catalyst Environmental Solutions, addressed in section III (p.7). Refer to items 4 and 5 in the appendix to this letter.

This are excerpts from the administrative record being established on the Amendment. There is additional substantial evidence of significant environmental impacts that would be caused by the Amendment. The Board of Supervisors has no contrary evidence before it; even if it did, CEQA Guideline 15064(g) and applicable caselaw requires the County prepare an EIR under CEQA Guideline 15064(g) ["If there is disagreement among expert opinion supported by facts over the significance of an effect on the environment, the Lead Agency **shall treat the effect as significant and shall prepare an EIR**." (emphasis added)].

There is no dispute the Amendment would cause these effects. As reflected in the Board of Supervisors Resolution dated September 15, 2021, the County's purpose is the "phase out of oil drilling and extraction activities in the County" and "transition away from fossil fuels." See also the LA County-City "Los Angeles Just Transition Strategy" at pp. 3-4 for "phase out of oil drilling and extraction activities in the City of Los Angeles and unincorporated areas of L.A.

County" and "closing of oil well sites." The County has also worked closely with Culver City on its adoption of Ordinance No. 2021-016 which likewise prohibits new wells and redrilling and a "phase out [of all oil activities] to end by November 26, 2026." The announced purpose is the substantial modification of operating requirements, restriction of wells and drilling to reduce production, addition of costs and compliance activities that may render operations increasingly uneconomic, and "phase out" oil and gas extraction.

However, the Amendment's substantial revisions to operating requirements and "phase out" purpose were not considered in the 2008 FEIR nor has any other environmental review consistent with CEQA occurred. Further, although the restriction and phase out of oil activities is sought, no alternatives analysis or other land use designation for the affected property is included. The long term effect of the Amendment is to convert the Baldwin Hills Oil Field, including the Cone Property, into unproductive land.

There is other substantial evidence of significant environmental impacts that require review prior to any consideration of the Amendment, including:

<u>Phase Out of Domestic Oil and Gas Production and Replacement by Foreign Sources</u>. The Baldwin Hills Community Standards District Periodic Review dated September 2021 (p.2) recites figures for Baldwin Hills Oil Field 2014-2018 daily production. When averaged over that five-year period and converted to annual figures, the production is approximately 2,229,566 barrels of oil and over 1,000,000,000 standard cubic feet of gas per year. Estimates of remaining oil reserves related to the Cone Property are at least 19 million barrels. As reflected in numerous reports on the CSD and the 2008 FEIR (p. ES-8), the Baldwin Hills oil production goes to local refineries and gas production is processed and supplied within the Los Angeles area. There has been no evaluation of the potentially significant environmental impacts of loss of these substantial domestic energy supplies and replacement with foreign imports, transported by tanker.

Such review is <u>required</u> under CEQA Guideline Appendix G section XII ["Would the project… Result in the loss of a known mineral resource that would be of value to the region and the residents of the state?"].[3]

<u>Operational Constraints on Oil and Gas Operations</u>. The Amendment substantially modifies well drilling and operation and multiple operational requirements from the original CSD ordinance, in ways that are numerous and will probably be the comment of the operator and experts. The potentially significant environmental impacts of these operational changes have not been reviewed. The impacts of construction and restoration resulting from the "phase out" likewise

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[3] As defined in 16 U.S.C. §2462(5), "The term 'mineral resources' means all nonliving natural nonrenewable resources, <u>including fossil fuels</u>, minerals, whether metallic or nonmetallic, but does not include ice, water, or snow." The *Los Angeles County General Plan* (p. 155, "Oil and Natural Gas") states: "<u>Mineral Resources</u> include areas that are appropriate for the <u>drilling for and production of oil and natural gas</u>." (emphasis added)

have not been reviewed as required under CEQA Guideline Appendix G, sections I, III, IV, VII(c), VIII-X, XII-XVII, XIX, XXI(b).

Conversion to Unproductive Land and Failure to Consider Alternatives under CEQA . The Amendment does not address the General Plan Land Use Designation of the Oil Field during and after the "phase out." There has been a complete failure to consider the "reasonable range of potentially feasible alternatives" as required under CEQA Guideline 15126.6 that could attain most of the basic objectives of the project and avoid or substantially lessen any of the significant effects. For example, there is not even a correlation attempted as to whether or when hydrocarbon energy needs of the Los Angeles basin may lessen vs. the "phase out" of this substantial domestic oil and gas production, which might lessen the impacts of foreign importation. None of the alternative land use designations for the Oil Field have been addressed, which could range from commercial, residential, industrial, etc., all with potentially substantial impacts on transportation, infrastructure, construction, air quality, noise, and other areas required by the CEQA Guidelines Appendix G Environmental Checklist.

These multiple potential future impacts, as well as potential future land use of the Cone Property after the Amendment would convert it to unproductive land, have been ignored under the Notice of Exemption. It is well recognized that CEQA requires "that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official." (*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 400, citing *Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 197). As further stated by the Supreme Court in *Laurel Heights*:

> We hold an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects. (47 Cal.3d at 396) …We hold that under CEQA an environmental impact report must include a meaningful discussion of both project alternatives *and* mitigation measures. (47 Cal.3d at 403, emphasis in original).

That there is substantial evidence of multiple significant environmental impacts that would be caused by the "whole of the action" of the Amendment cannot be denied. The County has failed to prepare the requisite EIR or subsequent EIR, violating CEQA.

IV. THE NOTICE OF CEQA EXEMPTION IS ERRONEOUS

Instead of complying with the mandatory requirements under CEQA, staff's "Notice of Exemption" puts forward only the unsupported and conclusory assertion that the Amendment "will not have an individual or cumulative adverse impact on the environment."

Procedurally, the notice of exemption fails to set forth any facts and presents mere unsupported conclusory statements. CEQA requires detailed analysis and expert opinion supported by facts and substantial evidence. Refer to CEQA Guideline 15064(f)(5) [unsubstantiated opinion or narrative does not constitute substantial evidence…substantial evidence "shall include facts, reasonable assumptions predicated on facts, and expert opinion supported by facts."]. The notice of exemption directly conflicts with the 2008 FEIR certified by the Board of Supervisors, which cited CEQA Guideline 15151 and found:

> Los Angeles County has determined that the proposed CSD project needs environmental review in the form of an EIR pursuant to CEQA *instead of a categorical or statutory exemption, or a Negative Declaration.* (p. 1-5, emphasis added)

CEQA Guideline 15151 continues to apply ["An EIR should be prepared with a sufficient degree of analysis to provide decisionmakers with information that enables them to make a decision which intelligently takes account of environmental consequences."].

Specifically, the 'common sense' exemption under CEQA Guideline 15061(b)(3) has no applicability because the Board of Supervisors cannot make a finding of "certainty that there is no possibility that activity in question may have a significant effect on the environment." As shown above, there is substantial evidence from multiple credible sources that there is potential for multiple impacts of shifting substantial energy supply from local to foreign sources, a failure to evaluate turning the Oil Field into unproductive land, future redevelopment of alternative land use designations of the Oil Field and impacts on transportation, infrastructure, construction, air quality, noise, and other areas required by the CEQA Guidelines Appendix G Environmental Checklist.

Likewise, the Board of Supervisors cannot make a finding under CEQA Guideline 151061(b)(2) that the Amendment involves only "minor alteration of [private mechanical equipment] involving negligible or no expansion of existing or former use." A complete "phase out" and removal of all oil and gas infrastructure and facilities, reversion to a restored natural condition with input from "Native Nations" to "initiate remediation and redevelopment" is intended. LA County-City "Los Angeles Just Transition Strategy" (p. 4). Again, such a finding is precluded due to the failure to evaluate turning the Oil Field into a tract of unproductive land, any redevelopment of alternative land use designations of the Oil Field and impacts on transportation, infrastructure, construction, air quality, noise, and other areas required by the CEQA Guidelines Appendix G Environmental Checklist.

Lastly, the exception under CEQA Guideline 15038 is inapplicable. The Amendment is not an authorized action by a "regulatory agency" as the Amendment is a legislative act. Nor is the Amendment authorized under the California Planning and Zoning Law or any other state or local ordinance. To the contrary, the Amendment is preempted by California and Federal law. See section V, *post*. Also, the Amendment would cause certain construction and remediation activities, which "are not included in this exception [15038]."

Instead of a purported exemption, the Amendment would require an EIR or at least review by Subsequent EIR under CEQA Guideline 15162 as substantial changes to the 2008 CFD are proposed which involve "new significant environmental effects" which were not considered in the 2008 FEIR. Due to the contemplated "phase out" the Amendment will have "one or more significant effects not discussed in the previous EIR." Refer to full text of CEQA Guideline 15162(a) and (b).

Use of the 2008 FEIR alone is precluded under CEQA Guideline 15153 because the Amendment and the 2008 CFD are not "essentially the same." The impacts of the Amendment (see above) were not analyzed in the 2008 FEIR and there are "potentially significant off-site impacts and cumulative impacts which were not discussed in the prior EIR." Refer to CEQA Guideline 15183(b)(2) and (3). Also, it is mandatory that the economic and social impacts of the changed operations and "phase out" be considered in an EIR under CEQA Guideline 15131(c).

Accordingly, the Board of Supervisors cannot lawfully make a finding for a CEQA exemption and is precluded from approving the Amendment. An EIR or subsequent review under CEQA Guideline 15162 is required, and CEQA Guideline Appendix G, section XII specifically applies.

V. VOIDNESS DUE TO FEDERAL AND CALIFORNIA PREEMPTION

The Amendment overlaps substantially with the Monterey County Measure Z struck down by a unanimous California Supreme Court in *Chevron U.S.A. v. County of Monterey* (2023) 15 Cal.5th 135, 145-146. Both measures would restrict new oil and gas wells in unincorporated areas, although the Amendment imposes greater restrictions and under the Board of Supervisors Resolution dated September 15, 2021 has the purpose to "phase out of oil drilling and extraction activities in the County" and "transition away from fossil fuels."

The *Chevron* decision is clear that under California Constitution Article XI, section 7, local legislation that conflicts with state law is preempted and "void." The oil and gas extraction in the Baldwin Hills Oil Field complies with all state laws and is permitted by CalGEM. The Supreme Court ruled that Public Resource Code §3000 et seq. and Cal. Code Regs. Title 14 §1712 et seq. control oil and gas exploration and extraction, drilling, reworking, injection, and abandonment operations, well and safety, etc. and are "statewide in application." Under Public Resources Code §3106, it is the State of California that determines "drilling, operation, maintenance, and abandonment of wells… [and regulates] damage to life, health, property, and natural resources…"

In particular, *Chevron* holds that under Public Resources Code §3106(b), the State of California supervises oil production as follows:

> As set forth above, section 3106, subdivision (b) provides that the state oil and gas supervisor "shall … supervise" oil production "so as to permit" well owners and operators to "utilize all methods and practices" that, "in the opinion of the supervisor, are suitable for th[e] purpose" of "increasing the ultimate recovery of underground hydrocarbons … in each proposed case." The subdivision also provides that, in order "[t]o further the elimination of waste by increasing the recovery of underground hydrocarbons," "it is … declared to be the policy of this state that" all oil and gas contracts are deemed to give well operators the authority to use all

> methods and practices the supervisor has approved, including specifically, the… methods that Measure Z bans. (§3106, subd. (b).) (15 Cal.5th at 145).

Like the void Measure Z, the Amendment would have the County of Los Angeles make the decisions reserved to the State of California under Public Resource Code §3000 et seq. and Cal. Code Regs. Title 14 §1712 et seq. Refer to Amendment sections 22.310.010, 22.310.040 ["New oil wells and production facilities are prohibited within the Baldwin Hills CSD Boundary"], 22.310.050 et seq. (with possible exception for required signage and painting).

Further, under SB1137, in 2022 the State of California adopted a 3,200 buffer rule applicable to new oil and gas extraction. The Amendment prohibits new oil and gas extraction even though in compliance with SB1137.

In addition, as reflected in the CARB "*2022 Scoping Plan for Achieving Carbon Neutrality*" (p.29), the State is carefully analyzing impacts of oil and gas extraction on disadvantaged communities. The Amendment and its resulting emissions leakage (i) interferes and conflicts with requisite State planning and adoptions under AB32 and (ii) is in derogation of Environmental Justice requirements to the County and its General Plan under Government Code §§65040-65040.17.

In addition, other Federal and California agencies regulate various aspects of the Baldwin Hills Oil Field production, including U.S. EPA, U.S. Department of Transportation, California Regional Water Quality Control Board, California Department of Toxic Substances Control, and South Coast Air Quality Management District, as reflected on the Summary of Regulatory Agencies, staff materials Exhibit D.

The Amendment is preempted under Federal and California law and would be void if adopted.

VI. <u>THE "PHASE OUT OF OIL DRILLING AND EXACTION ACTIVITIES" PROPOSED IN THE AMENDMENT IS NOT RATIONALLY RELATED TO A LEGITIMATE COUNTY OBJECTIVE NOR SUPPORTED BY SUBSTANTIAL EVIDENCE IN VIOLATION OF CODE OF CIVIL PROCEDURE §§1094.5, 1085</u>

The 'phase out" of oil and gas purpose of the Amendment is an entirely subjective goal which is not rationally related to a legitimate County objective, nor supported by substantial evidence as required under Code of Civil Procedure §§1094.5 and 1085.

As addressed below, neither the Planning and Zoning Law nor the Government Code authorize the County to regulate or "phase out" oil and gas production. The County's authority under Article XI, section 7 of the California Constitution is to make "local, police, sanitary, and other ordinances and regulations not in conflict with general laws." As held in *Chevron U.S.A. v. County of Monterey, supra*, 15 Cal.5th at 145-146, a county cannot conflict with applicable State authority under Public Resource Code §3000 et seq. and Cal. Code Regs. Title 14 §1712 et seq.

In addition, any ordinance enacted by the County must be rationally related to achieving a legitimate governmental objective and supported by substantial evidence; as provided in Code of Civil Procedure §1094.5(b), such an inquiry includes "whether the respondent has proceeded without, or in excess of jurisdiction…Abuse of discretion is established if the respondent has not proceeded in the manner required by law, the order or decision is not supported by the findings, or the findings are not supported by the evidence."

The only conceivable inquiry would be whether the Baldwin Hills Oil Field is a significant air quality health or a safety risk to adjacent communities and, even if it were, the ordinance would have to be narrowly tailored to achieve such an objective. However, the record is manifest that there is no significant air quality/health risk nor safety issue.

Focusing on air quality and safety, the record is as follows:

Air Quality. The LA County Department of Public Health issued a report entitled "Public Health and Safety Risks of Oil and Gas Facilities in Los Angeles County" dated February 2018. Although several case studies in unrelated locations were provided, there is no mention of any identified risks relating to the Baldwin Hills Oil Field. The only mention (p. 15 of 29) is to cite the Oil Field in the context of appropriate setback distances under the CSD.

The County received the "Inglewood Oil Field Health Risk Assessment Report" dated November 2020 ("HRA"), the most recent health risk assessment on the Baldwin Hills Oil Field. This report states:

> During the year 2019, there was no drilling occurring at the oil field and operations were limited to normal production and maintenance operations. The 2019 operating year with no drilling is typical of recent operating years as the last new well drilled at the oil field was in 2014. (p. 1).

As for health risks, the HRA states:

> For the 2019 operations scenario, the estimated peak risks at the facility boundary would be a peak cancer risk of 5.2 cases per million, and an acute and chronic risk of 0.48 and 0.06 HI, which are below the SCAQMD thresholds for AB2588 facilities, defined as below 10 cancer cases per million and below a Hazard Index (HI) of 1.0. The peak cancer risk at the nearest residence would be 1.0 cancer cases per million, which would be below the SCAQMD AB2588 threshold. ((p. 2, emphasis added)

These numbers are only a very small fraction of the thresholds. The HRA further states:

> Based on the worst-case scenario and the 2019 operational scenario, the level of drilling that would result in peak cancer risk levels below the SCAQMD threshold level would correspond to about 25 wells drilled per year average. (p. 2)

That per year average assumption has not occurred in recent years. Even if it had been, the County's concern would be directed to mitigation or safeguards on well drilling in excess of such an average, not a "phase out" of the entire Oil Field.

Safety. This is documented in the "Baldwin Hills Community Standard District Periodic Review Final Report" dated September 2021. The report states:

> As detailed in the following pages of this report, the results of this Periodic Review demonstrate that the provisions of the CSD have been effective and adequate to protect the health, safety, and general welfare of the public. The report also determined that no recommendations to change the language of the CSD are necessary at this time. (p. ES-1).

The report also summarizes an "Annual Well Increase Evaluation" that included review of noise, vibration, air emissions, odors, ground movement, visual and aesthetics, hazards, fire protection and emergency response, and groundwater quality, stating:

> The results of this review concluded that for these areas of review, the CSD has been effective in protecting the health, safety, and general welfare of the public. (p. 14).

The report also evaluated toxic pollutants, concluding that the total Oil Field contribution in the community to excess cancer risk was "less than 2%" of the total and that "the primary cancer risk in the area is attributable to vehicle diesel exhaust (DPM)." Again, like the HRA, the report states that "acute exposure values from oil field operations were both below 1.0, the health reference level where no adverse human health effects would occur." (p. 15).

The report addresses the Community Alert Notification System (CAN) and Emergency Response Plan (ERP), stating that "no issues" or "complaints" by the public have been received. (p. 20-21). It is further stated:

> The report also concluded that all tank secondary containment structures comply with the California Division of Oil, Gas and Geothermal Resources (CalGEM) requirements and that the volume of the available secondary containment can contain volumes in excess of the full volume of each tank. (p. 21).

This is consistent with the results of the 2008 Health Risk Assessment, 2011 DPH Health Study, and 2015 Baldwin Hills Air Quality Study, as detailed in correspondence submitted by Sentinel Peak Resources dated September 27, 2023 and correspondence submitted by Cone. Although the staff report makes vague statements without citations to incidents or data, the actual record on air quality and safety for the Baldwin Hills Oil Field provides no evidence to support any of the changes in the Amendment, rendering it arbitrary and not rationally based on a legitimate County objective. This fails to meet the substantial evidence standard of Code of Civil Procedure §1094.5(b).

VII. THE AMENDMENT EXCEEDS THE COUNTY'S STATUTORY AUTHORITY UNDER THE PLANNING AND ZONING LAW, GOV. CODE §§65000-66499.58

The County's authority to regulate zoning and land use is strictly prescribed under the California Planning and Zoning Law, Government Code §§65000-66499.58. Section 65850 et seq. specifically authorizes a county to regulate the use of buildings, structures, and land, and related matters. Regulation of oil and gas production is not included in any authority delegated to a city or county under the Planning and Zoning Law, and is expressly reserved to the State of California under Public Resource Code §3000 et seq. and Cal. Code Regs. Title 14 §1712 et seq. as held in *Chevron*.

In addition to being barred by Federal and State preemption, the County lacks the jurisdiction to purport to regulate oil and gas production in the first place. This renders the Amendment invalid under Code of Civil Procedure §1094.5(b), as the County will have "proceeded without, or in excess of jurisdiction" and because the Amendment was not adopted "in the manner required by law."

VIII. THE AMENDMENT WOULD CONFLICT WITH THE LOS ANGELES COUNTY GENERAL PLAN IN VIOLATION OF GOV. CODE §65860

The General Plan land use designation for the Baldwin Hills Oil Field and the Cone Property is "MR" Mineral Resources, as depicted on the Ladera Heights/Viewpark-Windsor Hills Land Use Policy, Figure A-16. As noted, the *Los Angeles County General Plan* (p. 155, "Oil and Natural Gas") provides: "Mineral Resources include areas that are appropriate for the drilling for and production of oil and natural gas."

Other than a conclusory statement, the staff report to date is silent on how the Amendment is to be reconciled with the General Plan land use designation. The "phase out" of oil and gas production over the term of the CSD on some or all of the Baldwin Hills Oil Field will conflict with the General Plan. Section 65860(a) requires that "County or city zoning ordinances shall be consistent with the general plan of the county or city," which requires that the "phase out" be compatible with the land use, objectives, and policies specified in the plan. The general plan is the "constitution for all future developments within the city or county…[T]he propriety of virtually any local decision affecting land use and development depends on consistency with the applicable general plan and its elements." *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 570.

Such consistency with the MR Mineral Resources land use designation is absent. The Amendment, both in terms of its purpose, objectives, and policies, and specific provisions on drilling and operations, is in conflict with the General Plan. This renders the Amendment invalid *ab initio*.

IX. THE AMENDMENT CONFLICTS WITH THE VESTED RIGHTS OF CONE AS OWNER AND WOULD CONSTITUTE A REGULATORY TAKING

Both Cone and the operator have vested rights to continued beneficial use of the Cone Property for oil and gas production. These rights are of two types.

First, Cone as owner has the right to objectively reasonable "investment-backed" expectations for the use of the Cone Property, of which it cannot be deprived without payment of just compensation. Fifth Amendment of the U.S. Constitution; Art. I section 19 of the California Constitution; *Penn Central Transportation Co. v. City of New York* (1978) 438 U.S. 104; *Colony Cove Properties, LLC v. City of Carson* (9th Cir. 2018) 888 F.3d 445 and cases cited therein. The U.S. Supreme Court "has long acknowledged that 'if regulation goes too far it will be recognized as a taking.'" *Colony Cove, supra*, 888 F.3d at 450 citing *Penn. Coal Co. v. Mahon* (1922) 260 U.S. 393, 415. The Cove ownership and use dates back decades and was continuous and well established prior to the CSD or LA County General Plan.

Second, Cone as owner and the operator as lessee have vested right to continue their oil and gas use under the permits and approvals of the State of California under DOGGR and CalGEM, and other agencies, and approvals of the County under the CSD. The doctrine is stated in *Avco Community Developers, Inc. v. South Coast Regional Planning* (1976) 17 Cal.3d 785, 791:

> It has long been the rule in this state and in other jurisdictions that if a property owner has performed substantial work and incurred substantial liabilities in good faith reliance upon a permit issued by the government, he acquires a vested right to complete construction in accordance with the terms of the permit. (citations) Once a landowner has secured a vested right the government may not, by virtue of a change in the zoning laws, prohibit construction authorized by the permit upon which he relied.

Refer also to *Trans-Oceanic Oil Corp. v. City of Santa Barbara* (1948) 85 Cal.2d 776, 784:

> If a permittee has acquired a vested property right under a permit, the permit cannot be revoked. …When in reliance thereon, work… is actually commenced and liabilities are incurred for work and material, the owner acquires a vested property right to the protection of which he is entitled.

Cone has the traditional investment-backed property right to continue the oil and gas use; and Cone along with the operator have a vested right to continue the oil and gas production in accordance with the past permits and approvals. The modifications of operations and "phase out of oil drilling and exaction activities" proposed in the Amendment "goes so far" as to conflict with these vested rights, and would constitute a taking for which just compensation is required under the Fifth Amendment of the U.S. Constitution and Art. I section 19 of the California Constitution. *Colony Cove, supra*, 888 F.3d at 450-451. Enactment and enforcement of the Amendment will expose the County to damages to Cone, the operator, and other landowners in the Baldwin Hills Oil Field.

There has been reference to various types of amortization analysis under both the Culver City ordinance and the Amendment. Such discussion has been unsupported by any legal authority and is inapplicable to any taking of the Cone ownership interest. The applicable standard of compensation is stated in *Colony Cove, supra*, 888 F.3dat 450, citing *Keystone Bituminous Coal Assn. v. Debenedictis* (1987) 480 U.S. 470, 497:

> In considering the economic impact of an alleged taking, we "compare the value that has been taken from the property with the value that remains in the property."

This standard has no allowance for reduction of the owner's value based on amortization of the original investment.

It should be added that the "phase out' of oil and gas production that is the purpose and effect of the Amendment results in nothing more than converting the Cone Property into unproductive land. This is analogous to the uncompensated park designation considered but not enacted by the County in 2008. At that time, Cone objected by letter dated September 29, 2008, a copy of which is included in the appendix to this letter. All of the legal points referenced in that letter continue to apply to the Amendment.

X. CONCLUSION

An exemption under CEQA cannot be lawfully found and the Amendment should be rejected for the multiple reasons stated. Thank you for your attention and consideration.

Very Truly Yours,

Scott A. Sommer

cc: Celia Zavala, Executive Officer-Clerk of the Board of Supervisors

Appendix:

1. Excerpts from the California Air Resources Board "*2022 Scoping Plan for Achieving Carbon Neutrality*" (cover page, index, and pp.29-30, 101-106);
2. Expert opinion letter of Capital Matrix Consulting dated January 19, 2024;
3. 2008 Final Environmental Impact Report for Baldwin Hills Community Standards District (cover page, p.4.2-42 to 4.2-45);
4. CalEPA "Final Designation of Disadvantaged Communities (May 2022)" and map;
5. "Technical Memorandum" dated January 18, 2024 of Catalyst Environmental Solutions;
6. Correspondence from Cone to the Regional Planning Commission dated September 29, 2008.

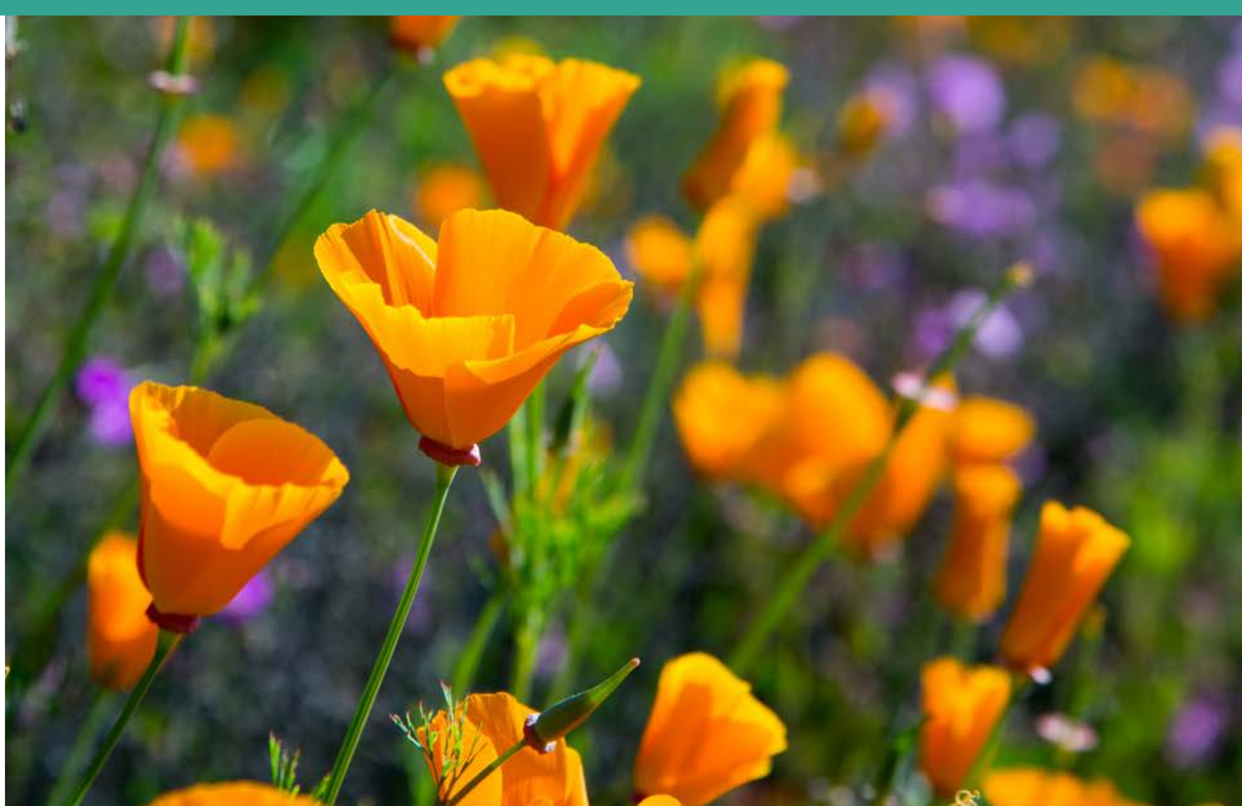
APPENDIX 1

Excerpts from the California Air Resources Board "*2022 Scoping Plan for Achieving Carbon Neutrality*" (cover page, index, and pp.29-30, 101-106)

CALIFORNIA
AIR RESOURCES BOARD

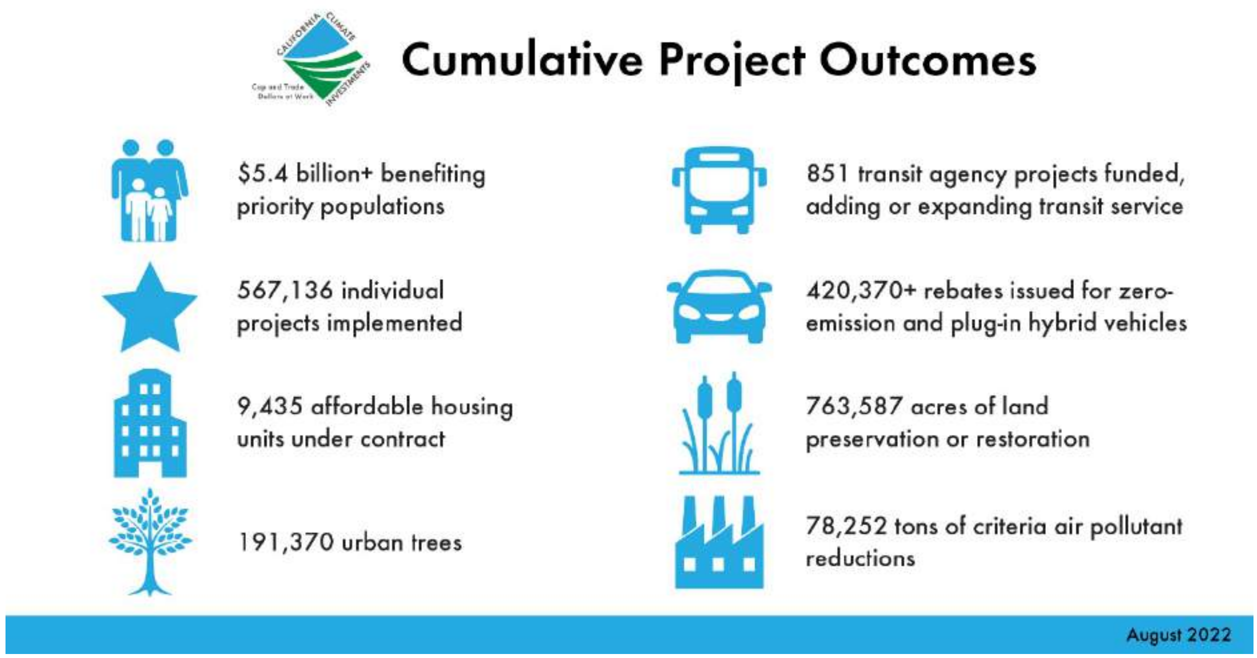
December 2022

2022 Scoping Plan for Achieving Carbon Neutrality



CARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy. CARB is the lead agency for climate change programs and oversees all air pollution control efforts in California to attain and maintain health-based air quality standards.

Figure 1-4: California climate investments cumulative outcomes[68,69]



Role of the Environmental Justice Advisory Committee

To inform the development of the Scoping Plan, AB 32 calls for the convening of an Environmental Justice Advisory Committee (EJ Advisory Committee) to advise CARB in developing the Scoping Plan, and any other pertinent matter in implementing AB 32. It requires that the Committee be comprised of representatives from communities with the most significant exposure to air pollution, including communities with minority populations and/or low-income populations. On January 25, 2007, CARB appointed the first

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[68] CARB. 2022. California Climate Investments program implements $10.5 billion in greenhouse gas-reducing programs, expected to reduce 76 million metric tons of emissions. April 11. https://ww2.arb.ca.gov/news/california-climate-investments-program-implements-105-billion-greenhouse-gas-reducing-projects.

[69] SB 535 and AB 1550 require investments located in and benefiting low-income communities and households, which are termed *priority populations. Disadvantaged communities* are currently defined by CalEPA as the top 25 percent of communities experiencing disproportionate amounts of pollution, environmental degradation, and socioeconomic and public health conditions according to the Office of Environmental Health Hazard Assessment's *CalEnviroScreen tool,* plus certain additional communities including federally recognized Tribal Lands. Low-income communities and households are defined by statute as those with incomes either at or below 80 percent of the statewide median or below a threshold designated as low-income by the Department of Housing and Community Development.

Environmental Justice Advisory Committee to advise it on the Initial Scoping Plan and other climate change programs.

For this Scoping Plan, CARB reconvened the EJ Advisory Committee in May 2021. The committee is currently comprised of 14 environmental justice and disadvantaged community representatives, including the EJ Advisory Committee's first tribal representative, who was appointed in February 2022. In October 2021, the EJ Advisory Committee formally created eight workgroups. These workgroups are a space for EJ Advisory Committee members to better understand specific sectors of the Scoping Plan and to assist the EJ Advisory Committee in the development of recommendations on this Scoping Plan. In December 2021, the EJ Advisory Committee provided scenario input responses to help shape the modeling for this Scoping Plan. In February 2022, San Joaquin Valley EJ Advisory Committee members hosted their first community workshop, with over 100 attendees. In March 2022, the CARB Board held a joint public meeting with the EJ Advisory Committee to discuss their draft preliminary recommendations for this Scoping Plan. In June 2022, over 165 attendees participated in a statewide community workshop held by EJ Advisory Committee members. The full schedule of EJ Advisory Committee Meetings and meeting materials are available on CARB's website.[70] This Scoping Plan includes references where EJ Advisory Committee Final Recommendations[71] are included in the document. The final recommendations were discussed at a joint CARB and EJ Advisory Committee Hearing on September 1, 2022.

The integration of environmental justice is critical to ensure that certain communities are not left behind. The AB 32 EJ Advisory Committee provided recommendations on September 30 in advance of the final Scoping Plan. There are footnotes to indicate where there is alignment between the AB 32 EJ Advisory Committee's recommendations and this Scoping Plan. While the language in the text may not fully incorporate the specific EJ Advisory Committee's recommendation, the footnotes do acknowledge the places in the text where there is general alignment with the spirit of the EJ Advisory Committee's recommendation.

Partnering with Tribes

[70] CARB. Environmental Justice Advisory Committee Meetings and Events. https://ww2.arb.ca.gov/environmental-justice-advisory-committee-meetings-and-events.

[71] Environmental Justice Advisory Committee. September 30, 2022. 2022 Scoping Plan Recommendations. https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/090122/finalejacrecs.pdf.

demand for petroleum fuels and of opportunities to phase down oil and gas extraction and refining will be included in the next Scoping Plan update.

In addition to supplying in-state demand, California is a net exporter of gasoline, diesel, and jet fuel. California pipelines supply the Nevada and Arizona regions[174] with approximately 87 million barrels gasoline equivalent of refined products annually.[175] California pipelines deliver approximately 85% of Nevada's and 40% of Arizona's refined product. Most finished fuels flowing from California to Nevada and Arizona are currently produced by California refineries. To manage the phasedown of oil and gas extraction and petroleum refining in California, exports of finished fuels must be considered and factored into that process, in addition to the declining in-state demand. The authorities and considerations related to supply and demand of petroleum fuels span federal, state, and local agencies. If supply of fossil fuels is to decline along with demand, a multi-agency discussion is needed to systematically evaluate and plan for the transition to ensure that it is equitable.

This inter-agency work should also consider related topics, such as the following:

- Direct and indirect job and economic impacts
- Demand for other liquid fuel types such as renewable fuels, and expected volumes
- Legal considerations
- Public health benefits
- Demand and supply strategies for petroleum fuels, including how to avoid short term supply constraints that may impact low-income consumers

Some of these topics were also discussed as part of two studies[176] supported by the California Environmental Protection Agency, which can serve as a starting point for a working group to analyze these questions and develop policy recommendations.

Oil and Gas Extraction

On April 23, 2021,[177] Governor Newsom directed CARB to evaluate the phaseout of oil and gas extraction no later than 2045 as part of this Scoping Plan. As noted above, this Scoping Plan still has some California demand for finished fossil fuels (gasoline, diesel,

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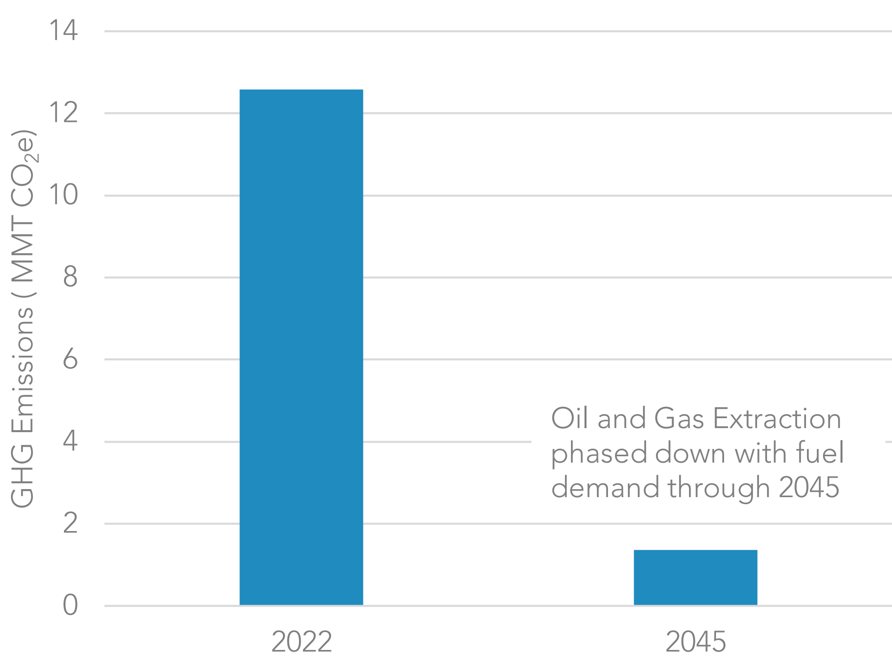
[174] CEC. August 2021. A Primer on California's Pipeline Infrastructure. *Petroleum Watch.* https://www.energy.ca.gov/sites/default/files/2021-08/August_Petroleum_Watch_ADA.pdf.
[175] CEC. March 2020. *Petroleum Watch.* https://www.energy.ca.gov/sites/default/files/2020-03/March_2020_Petroleum_Watch.pdf.
[176] CalEPA. 2021. Carbon Neutrality Studies: https://calepa.ca.gov/climate/carbon-neutrality-studies/.
[177] Governor Newsom. April 23, 2021. Governor Newsom Takes Action to Phase Out Oil Extraction in California. Press Release. https://www.gov.ca.gov/2021/04/23/governor-newsom-takes-action-to-phase-out-oil-extraction-in-california/.

and jet fuel) in 2045. This demand is primarily for transportation, including for sectors that are directly regulated by the state and some that are subject to federal jurisdiction, such as interstate locomotives, marine, and aviation. As discussed more fully below, while significant GHG reductions from oil and gas extraction could be achieved as demand for fossil fuels is reduced due to strategies in this Scoping Plan, it is not feasible to phase out oil and gas production fully by 2045 given this remaining demand.

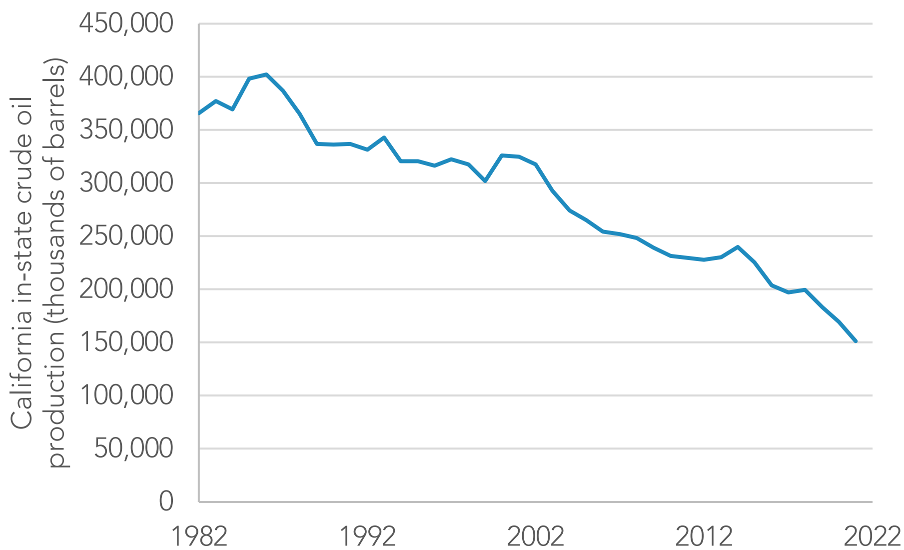
In the Scoping Plan Scenario, with successful deployment of zero carbon fuels and non-combustion technology to phase down petroleum demand, GHG emissions from oil and gas extraction could be reduced by approximately 89 percent in 2045 from 2022 levels if extraction decreases in line with in-state finished fuel demand. If in-state extraction were to be phased out fully, the future petroleum demand by in-state refineries would be met through increased crude imports to the state relative to the Scoping Plan Scenario. AB 32 defines leakage as, “a reduction in emissions in greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state.” AB 32 also requires any actions undertaken to reduce GHGs to “minimize leakage.” Increases in imported crude could result in increased activity outside California to extract and transport crude into California. Therefore, our analysis indicates that a full phaseout of in-state extraction could result in GHG emissions leakage and in-state impacts to crude oil imported into the state. Figure 2-6 compares the 2022 emissions from this sector with the modeled results when the sector is phased down with in-state petroleum demand.

Figure 2-6: Oil and gas extraction sector GHG emissions in 2022 and 2045 when activity is phased down with in-state fuel demand



According to California Energy Commission (CEC) data used in Figure 2-7, the total oil extracted in California peaked at 402 million barrels in 1986. Since then, California crude oil production has decreased by an average of 6 million barrels per year, to about 200 million barrels in 2020. This steadily decreasing production of crude in California is expected to continue as the state's oil fields deplete.

Figure 2-7: California in-state crude oil production[178]



A UC Santa Barbara report estimated that, under business-as-usual conditions, California oil field production would decrease to 97 million barrels in 2045.[179] The business-as-usual model assumed no additional regulations limiting oil extraction in California.

Any crude oil demand by California refineries not met by California crude oil will be met by marine imports of Alaskan and foreign crude.[180] As shown in Figure 2-8, approximately 99 percent of crude imports into California are delivered by marine transportation. The

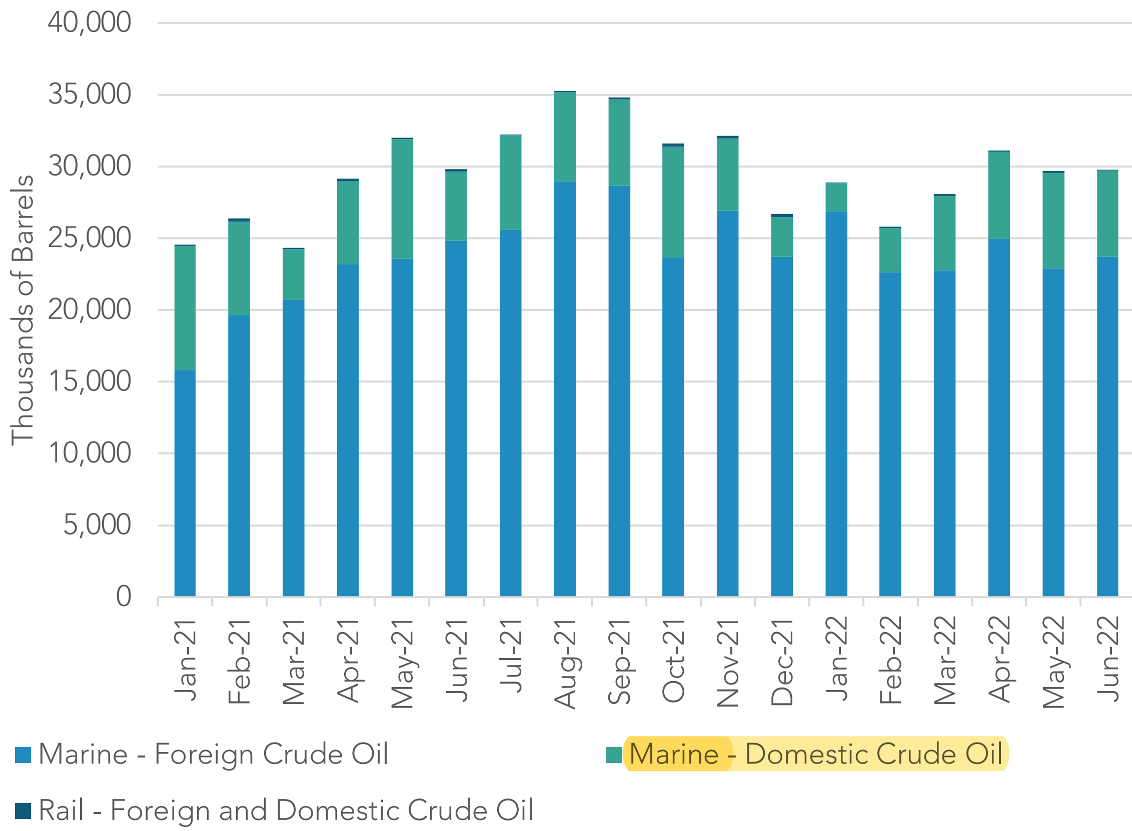
[178] CEC. No date. Oil Supply Sources to California Refineries. Accessed April 21, 2022. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries.

[179] University of California, Santa Barbara. 2021. Enhancing Equity While Eliminating Emissions in California's Supply of Transportation Fuels.

[180] CEC. 2020. *Petroleum Watch: How Petroleum Products Move.* March. https://www.energy.ca.gov/sites/default/files/2020-03/March_2020_Petroleum_Watch.pdf, and CEC. 2020. *Petroleum Watch: What Types of Crude Oil Do California Refineries Process?* February. https://www.energy.ca.gov/sites/default/files/2020-02/2020-02_Petroleum_Watch_ADA_0.pdf.

remaining imports occur by rail.[181] There are no pipelines that bring crude oil into California from out of state.[182]

Figure 2-8: Crude oil imports by transportation type[183]



Crude oil delivered by marine tankers is delivered to onshore storage tanks and subsequently to refineries via pipeline. Most crude oil produced in California is delivered to California refineries by pipeline. Using historical trends, any increases in imported crude above historic levels would result in increased deliveries through the marine ports. This increased activity could require more infrastructure to store and move larger volumes of crude to the refineries in state.

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[181] CEC. June 2021. Crude Oil Imports by Transportation Type. Accessed March 16, 2022. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/crude-oil-imports-source.

[182] CEC. 2020. *Petroleum Watch: How Petroleum Products Move.* March. https://www.energy.ca.gov/sites/default/files/2020-03/March_2020_Petroleum_Watch.pdf.

[183] CEC. June 2021. Crude Oil Imports. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/crude-oil-imports-source.

California refineries import a variety of crude oils to meet refinery needs. California petroleum refineries are generally designed to process relatively heavy crude relative to other U.S. refineries. In 2018, crude inputs to California refineries had an average American Petroleum Institute (API) gravity of 26.18 and an average sulfur content of 1.64 percent. Processing significantly lighter or heavier crude blends would require significant changes to a refinery.[184] Most crude imported from Alaska and the Middle East is relatively light (API gravity > 30) compared to California crude (API gravity < 20).[185] If California crude production is insufficient to meet the demand at California refineries, then California refineries will need access to a similarly heavy source of crude so that the average API gravity of crude remains within their established operating window. South American crude oil imports into California are the heaviest relative to other regions, and therefore they may be the most likely to replace decreased California crude oil supply.[186]

In summary, the modeling indicates that demand for petroleum will persist due to legacy fleets that will not be replaced until end of life. The modeling also shows what the GHG emissions reductions would be if oil and gas extraction activities were phased down in line with the reduction of in-state petroleum demand. Trend data shows that oil and gas extraction already has been on the decline and will continue to decline. It is possible to anticipate the likely regions and types of crude that would be imported to meet in-state petroleum demand if in-state extraction was fully phased out by 2045. Importantly, activity at the ports would increase, and new infrastructure would be needed to store and deliver crude to in-state refineries. And while GHG emissions from this sector would go to zero in our AB 32 GHG Inventory with a full phaseout, emissions related to the production and transport of crude to California might increase elsewhere, resulting in emissions leakage.

As the state continues to reduce demand for petroleum, efforts to protect public health for communities located near oil and gas extraction sites must also continue. In October 2021, Governor Newsom directed action to prevent new oil drilling near communities and

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[184] CEC. 2020. *Petroleum Watch: What Types of Crude?* February. https://www.energy.ca.gov/sites/default/files/2020-02/2020-02_Petroleum_Watch_ADA_0.pdf.
[185] CEC. 2020. *Petroleum Watch: What Types of Crude?* February. https://www.energy.ca.gov/sites/default/files/2020-02/2020-02_Petroleum_Watch_ADA_0.pdf.
[186] CEC. 2020. *Petroleum Watch: What Types of Crude?* February. https://www.energy.ca.gov/sites/default/files/2020-02/2020-02_Petroleum_Watch_ADA_0.pdf.

expand health protections.[187,188] In 2022, the Legislature passed, and the governor signed, SB 1137 to protect communities from existing and any new oil and gas extraction activities through 3,200 foot setbacks.

Petroleum Refining

In the Scoping Plan Scenario CARB modeled a phasedown of refining activity in line with petroleum demand. Meeting petroleum demand means sufficient availability of finished fuel (gasoline, diesel, and jet fuel). Crude is processed at in-state refineries to produce finished fuel. In response to stakeholder requests,[189] this evaluation focuses on the Scoping Plan Scenario, but with an evaluation of a complete phasedown of refinery operations in state.

The Scoping Plan Scenario results in California petroleum refining emissions of 4.5 $MMTCO_2e$ in 2045; a reduction of approximately 85 percent relative to 2022 levels, which is in line with the decline in in-state finished fuel demand.[190] Emissions from refining can be reduced further through the application of CCS technology, as shown in Figure 2-9. If in-state refining is phased down to zero and the demand for the finished fuels produced by that refining persists, imported finished fuels may be needed to meet the remaining in-state demand.[191] The current data shows unmet demand for liquid petroleum transportation fuels would most likely be met by marine imports. A CEC report notes, "The only way for California to receive large amounts of crude and refined products is by marine."[192]

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[187] Office of Governor Gavin Newsom. 2021. California Moves to Prevent New Oil Drilling Near Communities, Expand Health Protections. https://www.gov.ca.gov/2021/10/21/california-moves-to-prevent-new-oil-drilling-near-communities-expand-health-protections-2/?msclkid=6c0da86bc58e11ecb81cf596d4d8a735.

[188] California Department of Conservation Geologic Energy Management Division. October 2021. Draft Rule for Protection of Communities and Workers from Health and Safety Impacts from Oil and Gas Production Operations. https://www.conservation.ca.gov/calgem/Pages/Public-Health.aspx?msclkid=45660232cf2511ecb1c56119097e3b0c.

[189] California Environmental Justice Alliance. October 22, 2021. Comment on 2022 Scoping Plan Update - Scenario Inputs Technical Workshop. https://www.arb.ca.gov/lists/com-attach/68-sp22-inputs-ws-WzhdPlI5AjACW1Qx.pdf.

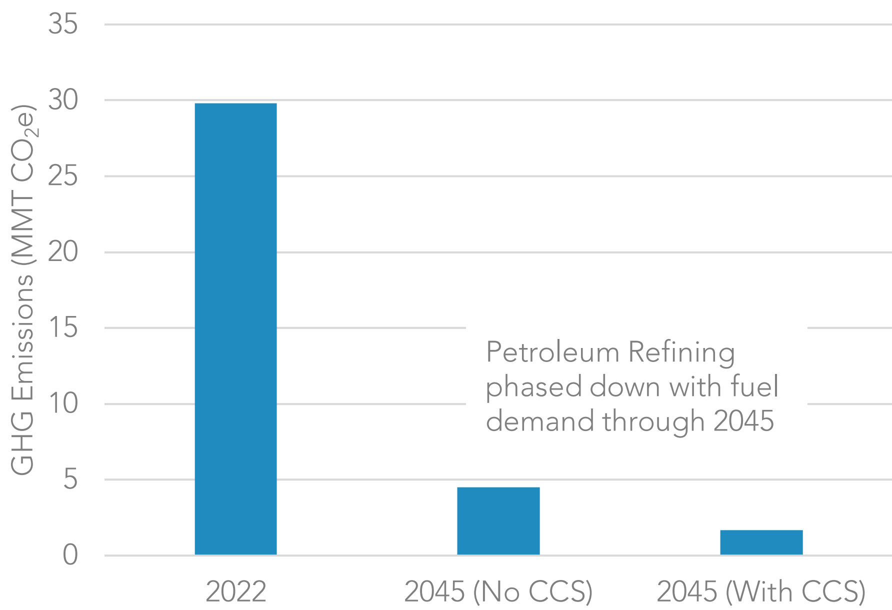
[190] This reduction in demand does not assume any need for ongoing operations to support exports to neighboring states.

[191] If demand assumes an ongoing need to support exports to neighboring states, the residual demand would require a five-fold increase in finished fuel imports.

[192] CEC. 2020. *Petroleum Watch: How Petroleum Products Move.* March. https://www.energy.ca.gov/sites/default/files/2020-03/March_2020_Petroleum_Watch.pdf.

There are currently no pipelines capable of bringing refined products to the state, and rail imports of refined products have historically made up less than 1 percent of all imports.[193] Significant increases in marine imports would likely require significant reconfiguring, retrofitting, or replacement of crude pipelines and storage tanks at current marine terminals, and possible reconfiguring of existing finished fuel infrastructure to account for changes in volumes and locations of supply points.

Figure 2-9: Petroleum refining sector GHG emissions in 2022 and 2045 (with and without CCS) when activity is phased down with fuel demand



If California's finished fuel demand is not met by continued refining activity in California, the state would need to import finished fuels to meet the ongoing demand. This would likely result in a two- to five-fold increase in the number of finished fuel ship deliveries to marine terminals. Marine tankers delivering refined products are often much smaller than crude oil tankers, so changes in fuel use and emissions cannot be easily estimated from the change in both the type and the number of ship deliveries.[194]

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[193] CEC. 2020. *Petroleum Watch: How Petroleum Products Move.* March. https://www.energy.ca.gov/sites/default/files/2020-03/March_2020_Petroleum_Watch.pdf.

[194] Personal communication with CEC staff, March 2022; U.S EIA. 2017. *World Oil Transit Chokepoints*. 3. https://www.eia.gov/beta/international/regions-topics.php?RegionTopicID=WOTC.

If refining ceased in California, the rail and marine deliveries currently needed to support both refining processes and the export of waste products, such as petroleum coke, would cease.

In summary, the modeling indicates that demand for petroleum will persist through 2045. The modeling also shows what the GHG emissions reductions would be if refining activities were phased down in line with the reduction in in-state petroleum demand. CCS can further reduce emissions for this sector. Importantly, activity at the ports would increase, and new infrastructure would be needed to store and deliver finished fuel across the state, if in-state refining were fully phased down by 2045. And while GHG emissions from this sector would go to zero in our AB 32 GHG Inventory with a full phaseout, emissions related to the refining and transport of finished fuel to California might increase elsewhere, resulting in emissions leakage.

Progress Toward Achieving the Accelerated 2030 Target

The 2017 Scoping Plan laid out a path to achieving the SB 32 target of at least a 40 percent reduction of GHG emissions below 1990 levels by 2030 that focused on reducing emissions in the state and was technologically feasible and cost-effective, reflecting statutory direction. Many of the programs to achieve the 2030 target increased in stringency beginning January 1, 2021. However, the 2030 target must be increased to help achieve the deeper reductions needed to meet the state's statutory carbon neutrality target specified in AB 1279 and Executive Order B-55-18.

Starting in 2020 and extending into 2022, the COVID-19 pandemic impacts reverberated across the globe in a multitude of ways, including the devastating loss of millions of lives. The pandemic also had a significant impact on GHG emissions by virtue of its impact on global economies and lifestyle changes for Californians, with extended work and school disruptions. Thus, assessing our progress toward meeting our SB 32 target is confounded by the unprecedented nature of the pandemic. Nevertheless, an assessment of progress toward the 2030 target is critical, in particular the accelerated 2030 target called for in this Scoping Plan, since achieving the accelerated 2030 target would make the state well positioned to achieve its carbon neutrality goals and bring critical near-term air quality benefits to address historical and ongoing disparities in access to healthy air. Because there is only one year of data available for this decade, the analysis takes a prospective look using projected emissions over the remainder of this decade.

Estimating GHG emissions in 2030 requires projecting the effect of policies or measures that are currently deployed and undergoing implementation. Table 2-4 shows three distinct estimates of GHG emissions in 2030 that were created at different times and used different modeling approaches.

APPENDIX 2

Expert opinion letter of Capital Matrix Consulting dated January 19, 2024

Capitol Matrix Consulting
Analysis, Advice, Advocacy

January 19, 2024

Mr. Patrick McGarrigle
McGarrigle Kenney and Zampiello, AAPC
9600 Topanga Canyon, Suite 200
Chatsworth, CA 91311

Dear Mr. McGarrigle,

This responds to your request that I evaluate the environmental and economic impacts of the proposed amendment to the Baldwin Hills Community Standards District (CSD). This amendment would prohibit the location of new oil wells and production facilities in the Baldwin Hills CSD area, and it would make existing oil wells and production facilities a non-conforming land use, thereby triggering a phase-out in existing production within 20 years. The amendment would make CSD regulations consistent with the Los Angeles County Oil and Gas Well Ordinance adopted by the Board of Supervisors in January 2023, which bans the drilling of new oil and gas wells in the unincorporated County and phases out existing wells over a 20-year period.

Specifically, you asked me to address the question of whether the categorical exemption of the proposed amendment from environment impact report (EIR) requirements otherwise mandated under the California Environmental Quality Act's (CEQA) for significant projects or project revisions is appropriate.

As noted in a legal brief prepared by the Larson LLP law firm (dated August 14, 2023) and a Technical Memorandum prepared by Megan Schwartz, Director of Regulatory Compliance and Permitting for Catalyst Environmental Solutions (dated September 25, 2023), such an exemption is inappropriate on legal grounds, given the substantive nature of the proposed revisions to the CSD that were not contemplated in the original EIR that was produced when the CSD was formed in 2008. Among other provisions, CEQA guidelines require an EIR review in cases where a project revision results in the "loss of a known mineral resource that would be of value to the region and residents of the state."

I believe that the phase-out of oil and gas production in Inglewood Field would represent a significant loss of a mineral resource in California, and that the real-world environmental and economic consequences of this loss would be substantial. For these reasons, a full EIR is clearly warranted. My conclusions are based on the following factors:

1. Inglewood Oil Field supplies 2 million barrels of oil per year to Southern California.

Over the past decade, annual production from the Inglewood Oil Field has averaged 2 million barrels of crude oil and 1 million Mcf (or 167 thousand barrels of oil equivalent) of natural gas production. Oil extracted from the field is shipped by pipeline from the field to local refiners, where it is processed and sold to consumers of gasoline, diesel, jet fuel and other petroleum products in the Southern California region. Natural gas is sold to Southern California Gas, which distributes the product to 21.8 million customers in the Southern California region.[1]

2. The field has high production potential for decades to come.

According to a U.S. Geological Survey (USGS) conducted in 2012, the Inglewood Oil Field had known recoverable reserves (equal to total production-to-date plus remaining reserves) of 430 million barrels. The USGS's mean estimate for remaining recoverable reserves was 230 million barrels. Even after taking into account the depletion that occurred due to extraction between 2012 and 2023, the field still has over 200 million in recoverable reserves, or about one-half of its original total. This implies that the field will continue to provide oil (and associated gas) to the Southern California regions for decades to come, assuming that operators are allowed to make investments in replacement wells and other field operations needed to sustain production over time.

3. These supplies will be needed in California for many years.

According to the California Energy Commission (CEC), California refiners purchased 528 million barrels of crude oil in 2022, which were mostly refined into gasoline, diesel, and jet fuel. These fuels accounted for well over 99 percent of energy used in California's transportation sector during the year.[2] California is currently one of the largest consumers of gasoline, diesel nd juet fuel on earth. About 25 percent of crude oil consumption in 2022 was supplied by in-state production and the remaining 75 percent was from waterborne imports from Alaska and foreign countries. As discussed in more detail below, in-state oil production plays a major role in ensuring an adequate amount of refined petroleum products are available for Californians.

The share of total transportation energy supplied by petroleum will likely decline over time as California transitions to a carbon-neutral economy. Even under optimistic assumptions about the speed of the energy transition, however, the state will remain a major consumer of crude oil for many years into the future. The California Energy Commission's most recent Transportation Energy Demand Forecast, released in December 2022, shows that combined demand for gasoline, diesel and jet fuel will decline only modestly over the next 12 years – from 21 million gallons in 2022 to 19 million by 2035.[3] While gasoline and diesel consumption is expected to fall moderately during this period, jet fuel consumption is projected to rise. Consumption of gasoline, diesel, and jet fuel for years beyond 2035 (the final year of CEC's forecast) will depend

[1] Most of my comments in subsequent sections refer to oil production because it is the main resource extracted from Inglewood Oil Field. However, it is important to note that many of the same issues raised with respect to oil also apply to natural gas produced in the field, albeit on a smaller scale.

[2] Source: *Transportation Energy Demand Forecast. 2022 Integrated Energy Policy Report*. Aniss Bahreinian, Ph.D. California Energy Commission, December 7, 2022. https://www.energy.ca.gov/event/workshop/2022-12/iepr-commissioner-workshop-updates-california-energy-demand-2022-2035

[3] Ibid.

on the rate of uptake of zero emission vehicles, growth in the state's population and economy, future changes in per-capita vehicle miles traveled, and numerous other difficult-to-predict factors. However, the slow decline rate over the next decade makes it highly likely that California demand for crude oil will remain in the range of several hundred million barrels per year for decades to come.

The bottom line is that the great majority of oil produced in California is refined locally and consumed within the state, and that this will remain the case for many years to come. The corollary is that any loss in local production will need to be replaced with more imports from Alaska and foreign countries in order to fulfill demand for refined petroleum products in the state. As discussed in the following section, the shift to more imports would come at a significant environmental and economic cost to Californians.

4. Loss of local supplies will have substantial negative environmental and economic impacts.

These impacts would occur in three key areas: (1) increased CO_2 and other emissions related to shipments and offloading of crude from Alaska and foreign sources; (2) loss of jobs, income, and taxes related to local production; and (3) higher retail fuel prices and greater supply risk to California consumers.

CO_2 emissions and other pollution associated with replacement imports.

The increase in waterborne imports would require additional tankers, some traveling up to 15,000 miles, and each offloading crude through Southern California's already-crowded ports. As noted above, crude oil production from the Inglewood oil field is collected on-site and sent via pipeline to local refineries in Southern California. This efficient process is partly responsible for the relatively low carbon intensity of oil produced by this oil field.[4,5] Because of this relatively low intensity, replacement of oil extracted from the Inglewood field with offshore sources may significantly raise the net level of CO_2 emissions attributable to oil refined in California.

In addition to CO_2 emissions, the offloading of additional foreign crude would result in increases in other pollutants – including particulate matter, nitrogen oxides, carbon monoxide, and sulfur oxides – in and around the Southern California ports. This would have important environmental justice implications, in that people living in low-income communities near the ports and marine terminals would face more pollution and associated risks of cancer, respiratory diseases, and other health-related ailments.

More generally, California oil and gas operators are subject to the strictest health, safety, and environmental regulations in the world. They are regulated by more than two-dozen federal and state agencies, including the U.S. Environmental Protection Agency, the Geologic Energy Management

[4] Source: *Calculation of 2022 Crude Average Carbon Intensity Value, Low carbon Fuel Standard Crude Oil Cycle Assessment. August 3, 2023.* https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2022_Crude_Average_CI_Calculation_initial.pdf.

[5] Crude oil carbon intensity measures emissions associated with the production and transport of crude oil supplied to California refiners. Carbon intensity (measured as grams of CO_2 per megajoule of energy) was 10.06 for Inglewood, or 26 percent less than the 12.69 average from all California refinery sources. It is also 37 percent lower than the carbon intensity of Alaska crude and nearly 20 percent lower than crude oil from Iraq, which was the leading non-U.S. source of imports during 2022.

Division of the California Department of Conservation (CalGEM), and numerous state and regional air and water districts. Production in the Inglewood oil field is additionally subject to the CSD, which regulates nearly every aspect of the oil field's daily operations, ranging from drilling and flaring to protocols for handling community complaints. Given these multiple levels of regulation, Inglewood oil field is one of the most highly regulated fields in the world. It is unlikely that replacement oil from non-California sources would be produced under the same rigid environmental, health, and safety standards.

Loss of local jobs, income, and state and government tax revenues.

Direct impacts. According to Sentinel Peak Resources' (the current operator in the Inglewood oil field), about 80 workers are directly employed by the company to work in the oil field, along with an additional 100 to 150 contractors who support Sentinel Peak's operations.[6] According to data from the California Employment Development Department, the oil and gas extraction and support industries in Los Angeles County had a combined average annual wage of $110,000 in 2022.[7] This was 43 percent higher than the $77,000 average wage for all private sector employees during the year. The above average pay rate for oil and gas production is even more impressive given that many field service jobs are available to workers with high-school and technical degrees.

The Inglewood oil field is also the source of millions of dollars in royalty payments, with most royalty owners living in the surrounding local community. It is also a major source of ad-valorem property taxes paid to the county, as well as income taxes, sales taxes, and a variety of other taxes and fees paid to state and local governments.

Total impacts, including multipliers. In addition to the elimination of jobs, wages, royalty income, and taxes directly related to field operations, a production phase-out would have indirect impacts on the Southern California communities surrounding the field, as the lost wages and royalty payments translate into less expenditures on goods and services in the local economy. Taking into account these multiplier effects, *the total impact of a phase-out of the Inglewood oil field would likely be losses of 600 jobs, $100 million in income, and over $20 million in state and local taxes.*

Reduced energy reliability and increased petroleum prices to consumers.

Local crude oil production is particularly important to Californians because unlike most states, which are interconnected to petroleum supplies through networks of pipelines, rail, and short-distance vessel shipments, California is an "energy island." California refiners rely almost exclusively on in-state production and waterborne imports from Alaska and foreign countries to meet petroleum demand. Some of the largest foreign sources, such as Iraq and Saudi Arabia, are up to 15,000 nautical miles away from Southern California ports, meaning that it can take weeks, or even months to access new foreign supplies in the event of unexpected changes in supply or demand in California markets. California receives almost no oil from the other "lower-

[6] Source: *Inglewood Oil Field – Economic Benefits*. https://inglewoodoilfield.com/benefits/economic-benefits/
[7] Source: *Quarterly Census of Employment and Wages.* Labor Market Information Division, California Employment Development Department. https://labormarketinfo.edd.ca.gov/qcew/cew-select.asp

48" states due to the lack of interstate crude oil pipelines from North Dakota and Texas to California, and the high costs, safety concerns, and strong public resistance to rail shipments.[8,9]

Given California's isolation from other U.S. markets, production from the Inglewood oil field and other in-state sources plays a crucial role in ensuring a steady and reliable supply of crude oil to help refiners meet California's energy needs. A loss of in-state oil supplies would have a variety of deleterious effects, including:

- **Higher costs for imported crude.** According to the California Energy Commission's 2022 Integrated Energy Policy Report Update, one key reason for California's higher-than-average gasoline prices is higher dependence on "more expensive foreign and Alaskan crude oil."[10] The implication is that a loss of in-state production and corresponding increased reliance on Alaska and foreign crude will likely result in further retail price increases.

- **Higher refinery costs.** If a phase-out of Inglewood oil production were combined with losses of other sources of California crude oil, refiners would likely face significant capital costs to maintain efficient operations. This is because California refiners currently rely on a steady flow of California crude to optimize fuel inputs and minimize foreign supply disruptions. In a study we conducted for the Western States Petroleum Association in 2019, we found that refiners do not have adequate port-related capacity of accommodate the increased imports that would be required to replace a shutdown of California production.[11] Hence, a significant loss of California crude production would require increased expenditures for additional dock capacity, coastal storage and pipelines, and potentially for reconfiguration of the refineries themselves to optimally process foreign slates of crudes.[12] The costs associated with increased reliance on imports are acknowledged in the California Air Resources Board (CARB) 2022 California Air Resources Board Scoping Plan, which specifically states that if a phase-out of California crude oil were to occur, "activity at the ports would increase, and new infrastructure would be needed to store and deliver crude to in-state refineries."[13] In

[8] Total shipments into California by rail were 862,000 barrels in 2022, representing less than 0.2 percent of total crude oil demand in the state. See "Oil Imports by Rail, 2022," California Energy Commission. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california-0.

[9] Similarly, California imports only small amounts of refined motor vehicle fuel from other states. This reflects (1) the lack of interstate refined petroleum pipelines extending from mid-continent or the Gulf Coast to California, and (2) the lack of out-of-state refineries that produce sufficient quantities of motor vehicle fuels that meet California's special fuel formulation requirements.

[10] Source: *Final 2022 Integrated Energy Policy Report Update.* California Energy Commission, May 10, 2023. See page 9. https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update.

[11] See "Impact of a Statewide Oil Production Ban on Downstream Petroleum Markets," Capitol Matrix Consulting, August 2019. Prepared for the Western States Petroleum Association.

[12] Petroleum refineries are complex industrial facilities that are designed to handle specific slates of crude oil. Replicating the chemical characteristics of California crudes with foreign-sourced oil would pose a significant challenge to refineries, who would need to either find foreign oil matching characteristics of California crude or incur major costs to reconfigure their refining processes.

[13] Source: *2022 Scoping Plan for Achieving Carbon Neutrality*, California Air Resources Board, December 2022, See page 105. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.The 2022 Scoping Plan also acknowledges that a full phase-out of local oil and gas would result in "leakages," stating that "while GHG emissions from this sector would go to zero in our AB 32 GHG inventory with a full phase-out, emissions related to the production and transport of crude to California might increase elsewhere, resulting in emissions leakage."

California's isolated petroleum markets, these additional costs would likely be passed along to consumers.

- **Potential capacity constraints and supply shortages.** This would occur if California refiners were unable to secure the permits from multiple agencies needed to move forward on the infrastructure investments.[14] It would also occur if refiners found such investments to be uneconomic due to their long lead times, the state's plans phase-out of petroleum fuels, and uncertainties about future regulations and taxes affecting refineries. The resulting supply shortfalls would boost retail prices for refined fuels.

- **Greater risk of supply disruptions.** Lastly, higher dependence on imports would put California at greater risk from foreign supply disruptions due to regional skirmishes, oil embargos, and other global factors. Disruptions would quickly translate into supply shortages and price increases for refined fuel products.

Conclusion

The proposed CSD amendment would result in a major change to land use in the Inglewood oil field, which will have far-reaching environmental and economic impacts. The amendment will result in a significant loss of a mineral resource that is highly valued to Californians and will remain so for many years. Reduced local oil production may significantly raise CO_2 emissions related to production and transport of crudes sourced from Alaska and foreign countries. Increased imports will also have negative effects on local air quality in and around California ports, thereby increasing health-related risks in adjacent communities. The phase-out of Inglewood oil field operations would also reduce jobs, income, and tax revenues to the region surrounding Inglewood oil field. And the loss of in-state crude oil production may raise prices and reliability of California petroleum supplies, thereby negatively impacting households and businesses throughout the state. It is important that these potential impacts be thoroughly vetted in an updated EIR.

Sincerely,

Brad Williams
Senior Partner and Chief Economist
Capitol Matrix Consulting

Enclosure: Author Biography

[14] Our 2019 report, referenced in footnote 11, also highlights California's long history of major delays, revisions, and permit denials for oil-related capital projects in and around California ports, which bodes poorly for future expansions.

Author Biography

Brad Williams joined Capitol Matrix Consulting (CMC) in 2011 as its senior partner and chief economist after a nearly 33-year career in state government. During the 12 years at CMC, Mr. Williams has advised clients on development of statewide ballot initiatives; prepared numerous economic studies; and represented clients in public hearings, editorial board meetings, press conferences, and other public and private venues. His work has involved projects in numerous areas, including oil and gas, renewable energy, education, taxation, state and local government finances, pensions, agriculture, and health care.

During this period, Mr. Williams has prepared dozens of statewide and regional studies for the California oil and gas industry. These have included the industry's direct and indirect impacts on statewide and regional economies, as well as evaluation of the impacts of laws, regulations, and general plan updates on oil production, gasoline prices and availability, and jobs in the industry. Mr. Williams has also presented testimony before regional boards and commissions on oil-inbdustry related impacts of proposed regulatory changes.

During his career in state government, Mr. Williams served in the non-partisan California Legislative Analyst's Office as its chief economist and Director of Economic and Fiscal Forecasting, where he was responsible for: the office's economic and budget-related forecasts; financial modeling of budget scenarios for legislative leaders; analyses of ballot and legislative budget proposals; and preparation of studies relating to revenue volatility, the impacts of the state's spending limit, and fiscal challenges facing local governments. He was also a key spokesman for the office, frequently providing testimony to the legislature, presenting at state and national conferences, and appearing on CNBC and other television and radio programs. In his government career, Mr. Williams also served as consultant in the Assembly Appropriations committee; as an advisor to State Treasurer Kathleen Brown and State Controller Kathleen Connell; and as the executive director of the Commission on State Finance – an agency responsible for preparing short- and long- term forecasts of the state's economy and financial situation.

Based on a detailed Wall Street Journal comparison of economic projections made by banks, universities, and other forecasters over the full decade of the 1990s, Mr. Williams was recognized by the Journal as the most accurate forecaster of California's economy for that period. He was also recognized by the Journal as one of the first economists in the U.S. to recognize and measure growing volatility in state government revenues starting in the late 1990s, reflecting shifting income distributions and state governments' rising dependence on income taxes on capital gains.

Mr. Williams received his BA and MA in economics from the University of California, Davis.

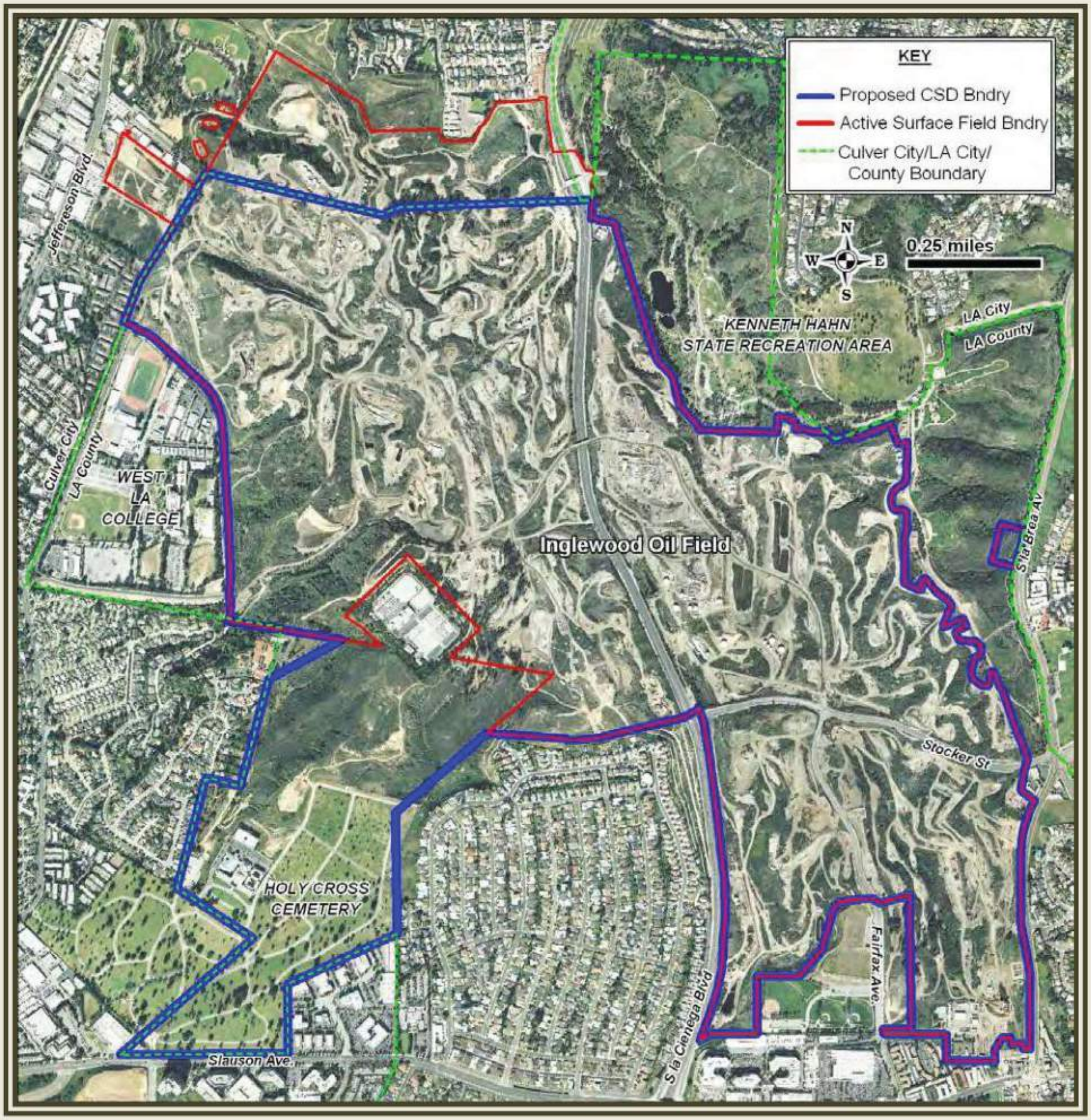
APPENDIX 3

2008 Final Environmental Impact Report for Baldwin Hills Community Standards District

(cover page, p.4.2-44)

Final Environmental Impact Report

Baldwin Hills Community Standards District



October 2008

SCH# 2007061133
County Project # R2007-00570
Environmental Case # RENVT2007-00048

Prepared For:
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Prepared By:
mrs
Marine Research Specialists

Table 4.2.13 Electricity Generation Resource Mix and Greenhouse Gas Emissions

Area	United States	Western States (WECC)	California ISO	So Cal Edison Service Area*
Resource Mix, %				
Coal	50.2	34.2	1.2	1.7
Oil	3.0	0.5	1.2	0.9
Gas	17.4	26.3	51.1	41.9
Nuclear	20.0	9.9	16.8	38.0
Hydro	6.6	24.3	17.3	4.7
Biomass	1.4	1.3	3.2	2.9
Wind	0.3	0.9	2.4	3.8
Solar	0.0	0.1	0.3	0.8
Geo	0.3	2.0	5.5	4.1
Other Fossil	0.5	0.3	0.9	1.2
Other	0.1	0.0	0.0	0.0
Non-renewables	91.3	71.3	71.3	83.7
Renewables	8.7	28.7	28.7	16.3
Non-hydro Renewables	2.1	4.3	11.4	11.6
CO2 Rate, lb/MWh	1363	1107	687	613

Notes: Source is eGRID database with modifications and updates. *SCE Service area includes 75% of San Onofre, Geothermal in Nevada and hydro in Sierra Nevada, San Bernardino & LA. Mojave Coal Fired Power Plant not included in CalISO or So Cal Edison service area as it was shut down in 2005. Resource mix is the percentage of total mega-watt hours. Renewables are defined as hydro, biomass, wind, solar, geo and other.

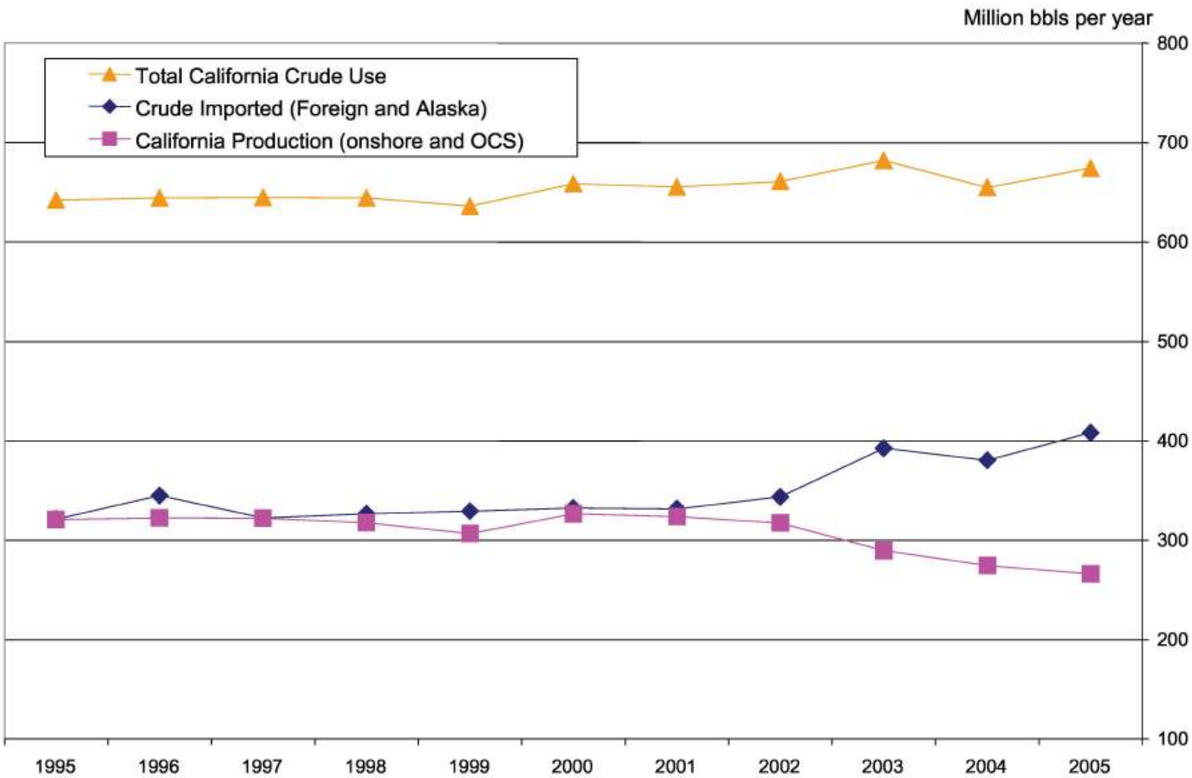
Crude Oil Transportation/Refining Lifecycle and Greenhouse Gas Emissions

One aspect of the "lifecycle" analysis of greenhouse gas emissions associated with the baseline and potential development is the dynamics of the crude oil markets in California. The supply of crude oil is driven by the demand for refined products (gasoline, diesel and jet fuel). Currently, the demand for refined products is met through supply to California refineries of crude oil from California domestic production, foreign imports of crude oil, imports of crude oil from Alaska, and imports of refined products. There are no crude oil pipelines which bring crude oil into California.

This means that the only sources of crude oil to meet refinery crude oil demand are from California production, Alaska production, or from foreign sources brought into ports by tanker ships.

California production of crude oil per year has been in decline since 1986, when production peaked at slightly over 400 million barrels. The decline has averaged about 1.7% per year since 1995. More recently, the decline has averaged over 3% annually since the year 2000. Figure 4.2-6 shows the total California crude oil use, California production, and the associated imports through California ports.

Figure 4.2-6 California Crude Oil Use, Production and Imports



Source: CEC and DOGGR databases online

The production of Alaska North Slope crude oil has experienced decline due to the age of the reservoirs. Alaska North Slope production has declined since its peak in 1989 of about 328 million barrels annually. The average rate of decline since 1995 has been above 4%.

At the same time that there has been declining California production and declining Alaska North Slope production, demand for crude oil in California has remained relatively flat, with an annual average increase since 1995 of only about 0.5%.

The combination of declining California and Alaska North Slope production along with a relatively constant, flat demand for crude oil in California equates to an increase in foreign crude oil imports. Foreign crude oil imports since 1995 have increased by an average of almost 38%. As seen in Figure 4.2-6, the increase in imports closely mirrors the decline in California production since about 2000.

The California Energy Commission (CEC) has produced a number of reports on the state of the California crude oil markets. They conclude the following:

- "Declining California production will be replaced with crude oil delivered by marine vessel" (CEC 2003);

- A "reduction in [gasoline] use with alternative fuels and efficiency improvements will reduce imports of [refined] products, not imports of crude oil" (CEC 2007);
- "Without increasing the fuel supply by importing additional crude oil and transportation fuels, California will not only continue to experience supply disruptions and price spikes, but also supply shortages and prolonged and elevated prices, for gasoline fuels"; (CEC 2003b); and
- "Supplies of crude oil from within California and from Alaska have been declining, requiring California to import an increasing proportion of its crude oil from foreign sources" (CEC 2003b).
- The CEC estimates that increases in imports of crude oil to California translates into "an additional 150 shipments of crude oil [into ports] received per year [by] 2015" (CEC 2005).

A component of the crude oil markets involve Los Angeles area refineries and their associated ability to process a range of different crude types, from the relatively sweet/light Alaska North Slope crude to the heavy San Joaquin Valley crudes. Increased installation of cracking units at refineries, which allow for the refining of heavier crude oils into gasoline and lighter products, in the last 5-10 years has increased the ability of refineries to process heavier crude oils as the supply of ANS crude and San Joaquin Valley light crude has diminished (SCAQMD CEQA Documents).

The three major regions of California crude oil production are Kern County, the Los Angeles Basin, and the Outer Continental Shelf. Oil from Kern County accounts for two-thirds of California's total crude oil production. Approximately 58 percent of the Kern County crude oil has an API of 18 degrees or less (heavy crude). The Los Angeles Basin's largest fields are the Wilmington and the Huntington Beach fields with average APIs of 17 to 19 degrees, respectively (heavy crude). The Outer Continental Shelf accounts for about 10 percent of the total California production. The quality of Outer Continental Shelf crude oil varies by field with API gravities ranging from 14 to 38 degrees (heavy to light crude). (CEC 2006). Alaska North Slope crude oil ranges from an API gravity of 22 to 40 degrees (light crude).

Oil imports delivered to California from foreign sources by ocean going tankers come from Saudi Arabia (35%), Ecuador (25%), Iraq (12%), Mexico (7%) and others. The Saudi crude oil API gravity ranges from 28 to 34 degrees (light crude) (CEC 2006).

The use of foreign crude oil is associated with substantial emissions associated with transportation as foreign crude oil needs to be transported from between 4,000 miles (Ecuador) and 13,000 miles (Saudi Arabia) one-way to get to California. Alaska North Slope crude travels about 2,500 miles from Alaska. This causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil.

Transportation of the majority of California crude oil is via pipeline, which requires energy to pump the crude oil to the refineries. This energy is generally a function of the type of crude oil, if heating is required, and the distance and terrain between the wells and the refinery.

Very little, if any, crude oil is exported from California. Since the beginning of 2001 through the end of November 2007, 1,367,000 barrels of crude has been exported from PADD 5 (California, Arizona, Nevada, Oregon, Washington, Alaska, and Hawaii). The majority of the exports were a shipment to China of 805,000 barrels in April 2004, 401,000 barrels to Canada in January 2006, and 57,000 barrels to Canada in October 2004 (EIA 2008). The remaining exports from PADD 5 (17 shipments) were to Canada and Mexico, and averaged approximately 6,000 barrels per shipment. Given the small size of most of these shipments, it is likely they were via truck and not marine tanker.

Therefore, if one assumes that all of the PADD 5 exports originated from California, which is highly unlikely, but the most conservative assumption, then at best there would have been two to four marine tanker trips for exporting crude over a seven year period. This compares with over 1,000 tanker trips that imported crude oil into California over the same seven year period.

Refining of crude oil into end-use products such as gasoline, diesel and jet fuel requires energy. Refinery energy requirements are a function of the refinery arrangements, the type of crude oil, the type of gasoline being produced (winter or summer blends), the level of sulfur removal required, etc. Efficiencies of refineries have been shown to range from 83 to 87% (GM, 2001), meaning that 13 to 17% of the product energy content is required to refine the product.

4.2.7.2 Affected Environment

National Greenhouse Gas Emissions

Fossil fuel combustion represents the vast majority of the nation's greenhouse gas emissions, with CO_2 being the primary greenhouse gas. The total U.S. greenhouse gas emissions were 7,260 million metric tons of carbon equivalents (MMTCE) in 2005, of which 84% was CO_2 emissions (EPA 2007). Figure 4.2-7 shows the breakdown of U.S. greenhouse gas emissions since 1990. Approximately 33% of greenhouse gas emissions were associated with transportation in 2005 and about 41% was associated with electricity generation.

Statewide Greenhouse Gas Emissions

California's greenhouse gas emissions are large in a world-scale context and growing over time. If California were considered an independent country, its emissions would rank at least 16th largest. In 2004, California produced 492 million metric tons of CO2 equivalent greenhouse gas emissions (CEC 2006). The transportation sector is the single largest category of California's greenhouse gas emissions, producing 41% of the state's total greenhouse gas emissions in 2004. Electrical generation produced 22% of greenhouse gas emissions. Most of California's emissions, 81%, are carbon dioxide produced from fossil fuel combustion (CEC 2006).

APPENDIX 4

CalEPA "Final Designation of Disadvantaged Communities (May 2022)" and map

FINAL DESIGNATION OF DISADVANTAGED COMMUNITIES PURSUANT TO SENATE BILL 535
May 2022

I. INTRODUCTION

With the increasing frequency and severity of wildfires, extreme heat, drought, and other climate impacts, there is no doubt that California must double-down on efforts to address climate change. That is precisely what California is doing through the billions of dollars of investments to reduce greenhouse gas pollution and safeguard our communities from the mounting risks related to that pollution. At the same time, many of our communities struggle with unacceptable levels of pollution and poverty. One of our best opportunities to address these related challenges is to direct climate investments to "disadvantaged communities."

Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012) mandates that California use certain Cap-and-Trade auction proceeds to fund investments in "disadvantaged communities" (DACs). It charges the California Environmental Protection Agency (CalEPA) with the responsibility to designate DACs. CalEPA must base designations on "geographic, socioeconomic, public health, and environmental hazard criteria,"[1] but is given broad discretion for developing specific criteria and methods for applying those criteria.

In issuing previous designations, CalEPA relied upon the California Communities Environmental Health Screening Tool (CalEnviroScreen), a mapping tool developed by the Office of Environmental Health Hazard Assessment (OEHHA). On October 13, 2021, OEHHA released a new final version of CalEnviroScreen, Version 4.0. CalEPA determined that the improvements and updates in Version 4.0 were sufficiently material to warrant new designations of disadvantaged communities, pursuant to SB 535 (DAC designations).

In this designation, CalEPA generally defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes.[2]

II. LEGAL BACKGROUND

California administers a suite of measures intended to reduce greenhouse gas emissions and air pollution. One of these is the California Air Resources Board's (CARB) Cap-and-Trade

[1] Health and Safety Code § 39711(a).
[2] Some of these tracts of land are not visible in the maps in this document due to the limited granularity of the maps. An interactive map showing all designated disadvantaged lands can be found at https://calepa.ca.gov/envjustice/ghginvest/".

Program.

The Cap-and-Trade Program is a market-based system that establishes an annual declining limit – or cap – on about 80 percent of statewide greenhouse gas (GHG) emissions from the largest polluters (“covered entities”) in the state. Covered entities must obtain allowances equal to their emissions. Allowances are purchased at quarterly auctions, which generates proceeds. The state’s share of the auction proceeds is deposited into the Greenhouse Gas Reduction Fund (GGRF), which the Legislature appropriates to state agencies to implement California Climate Investments programs. The Legislature has established a set of requirements for the use of GGRF funds, including that the funds must be used to facilitate greenhouse gas emission reductions, benefit disadvantaged communities and low-income communities and households, and maximize other environmental, public health, and economic benefits, where applicable and to the extent feasible.

Through SB 535 and related legislation, the Legislature has mandated that certain percentages of GGRF funds be invested in DACs. It has charged CalEPA with designating such communities.

A. Funding Allocations

In 2012, the Legislature passed SB 535, which established initial requirements for minimum funding levels to DACs. In 2016, the Legislature passed Assembly Bill (AB) 1550 (Gomez, Chapter 369, Statutes of 2016), which established the currently applicable minimum funding levels. Under it, at least 25 percent of funds must be allocated toward DACs.[3] At least 5 percent must be allocated toward projects within low-income communities or benefiting low-income households.[4] And at least 5 percent must be allocated toward projects within and benefiting low-income communities, or low-income households, that are outside of a CalEPA-defined DAC but within ½ mile of a disadvantaged community.[5,6]

Together, SB 535 and AB 1550 help guide the California Climate Investments program in prioritizing investments to disadvantaged communities and low-income communities and households. CARB assists with the implementation of both bills by, among other things, developing resources and guidance for targeting investments towards DACs, low-income communities, and low-income households. These resources include CARB’s “Funding Guidelines for Agencies Administering California Climate Investments,” a mapping tool, and benefit criteria tables to guide demonstration of direct, meaningful, and assured benefits that

[3] Health and Safety Code § 39713(a).
[4] *Id.*, § 39713(b).
[5] *Id.*, § 39713(c).
[6] The three set-asides for DACs and low-income communities and households are collectively referred to in California Climate Investment programming as “priority population” funding. The map of priority population areas will be updated by CARB upon finalization of the 2022 DAC designations and will be available here: https://webmaps.arb.ca.gov/PriorityPopulations/

meet community needs.[7]

B. Designation Requirement

Neither AB 1550 nor SB 535 provide a definition for "disadvantaged communities."[8] Instead, SB 535 directs CalEPA to "identify disadvantaged communities … based on geographic, socioeconomic, public health, and environmental hazard criteria."[9] It recognizes that these criteria "may include, but are not limited to":

- "Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation."[10]

- "Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, or low levels of educational attainment."[11]

SB 862 (Leno, Chapter 836, Statutes of 2014) requires CalEPA to hold at least one public workshop prior to the identification of disadvantaged communities.[12] It expressly exempts CalEPA's designations of disadvantaged communities from ordinarily applicable Administrative Procedure Act rulemaking requirements.[13]

III. CALENVIROSCREEN

CalEnviroScreen is a mapping tool developed by OEHHA on behalf of CalEPA that analyzes data on environmental, public health and socioeconomic conditions in California's census tracts to provide a clear picture of cumulative pollution burdens and vulnerabilities in communities throughout the state. It has become the national gold standard of geospatial data tools capable of driving more equitable decision-making.[14] CalEPA selected it as a methodology in determining the first DAC designation in 2014, and continues to use it, because it most clearly addresses the requirements in SB 535 that disadvantaged communities be identified based on geographic, socioeconomic, public health, and environmental hazard criteria. Additionally, CalEnviroScreen offers the advantage of having been subject to extensive public review by

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[7] More information on these resources can be found here: https://ww2.arb.ca.gov/our-work/programs/california-climate-investments.

[8] By contrast, AB 1550 defines "low-income communities" to mean "census tracts with median household incomes at or below 80 percent of the statewide median income or with median household incomes at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093." Health and Safety Code § 39713(d)(2).

[9] *Id*., § 39711(a).

[10] *Id*., § 39711(a)(1).

[11] *Id*., § 39711(a)(2).

[12] *Id*., § 39711(b).

[13] *Id*., § 39711(c).

[14] E.g., Sammy Roth, Writing About Calamity and Holding on to Hope, L.A. Times, Nov. 28, 2021 ("Yet California has developed a novel approach for confronting these inequities. A tool called CalEnviro-Screen has been refined and turbocharged to the point where it is now a national model for locating the census tracts most overburdened with pollution.")

community groups, businesses, academic experts, and government agencies across California.

While CalEnviroScreen was developed through a process separate from that of the DAC designation, and while it informs a number of programs besides GGRF, it is integral to the GGRF DAC designation process. The framework for what later became known as CalEnviroScreen existed at the time the Legislature enacted SB 535.[15] CalEPA relied upon versions of the tool in its two previous designation processes, in 2014 and 2017, and continues to take it into account for the present designation.

A. Underlying Scientific Principles

The CalEnviroScreen methodology is based on several scientific principles, including:

- Scientific Literature: Existing research on environmental pollutants has identified socioeconomic and other sensitivity factors as "effect modifiers" that can increase health risk, depending on the combination of pollutants and underlying susceptibilities.

- Risk Assessment Principles: Some people (such as those with underlying health conditions) may be more sensitive to some chemical exposures than others. Risk assessments, using principles first advanced by the National Academy of Sciences, apply numerical factors or multipliers to account for potential human sensitivity (as well as other factors such as data gaps) in deriving acceptable exposure levels.

- Established Risk Scoring Systems: Priority-rankings done by various emergency response organizations to score threats have used scoring systems with the formula: Risk = Threat × Vulnerability.

B. Geographic Scale

CalEnviroScreen originally defined communities at the ZIP code scale but, since Version 2.0, has used census tracts as its units of geographic scale. There are approximately 8,000 census tracts in California. The United States Census Bureau (Bureau) explains that "[t]he primary goal of the census tract is to provide a set of nationally consistent small, statistical geographic units, with stable boundaries, that facilitate analysis of data across time."[16] The Bureau applies several criteria when drawing census tracts. In particular, "[i]n order to ensure a minimal level of reliability in sample data and minimize potential disclosures of sensitive information, a census

[15] The framework for CalEnviroScreen was proposed in 2010 in the "Cumulative Impacts: Building a Scientific Foundation" report prepared by OEHHA. See https://oehha.ca.gov/calenviroscreen/report/cumulative-impacts-building-scientific-foundation-report. The report presented "the first step in developing a screening methodology to evaluate the cumulative impacts of multiple sources of pollution in specific communities or geographic areas." Id. However, the first draft of EnviroScreen was not released to the public until 2012. See "CalEnviroScreen 1.0 Drafts" at https://oehha.ca.gov/calenviroscreen/report-general-info/calenviroscreen-10-drafts.

[16] Bureau, Census Tracts for the 2020 Census—Final Criteria, 83 Fed. Reg. 56277 (Nov. 13, 2018.)

tract should contain at least 1,200 people or at least 480 housing units at minimum, and 8,000 people or 3,200 housing units at maximum."[17] Census tracts may not cross county or state lines, and they must comprise a reasonably compact and contiguous land area.[18] Whenever possible, census boundaries should follow visible and identifiable features.[19]

At the time OEHHA released Version 2.0 in 2014, it identified several advantages to using census tracts over ZIP codes. It stated that census tracts "[r]epresent a finer level of resolution for many parts of the state" and that "a more substantial set of demographic data is associated with each census tract."[20] In addition, "[c]ensus tracts are, on average, more uniform in population than ZIP codes." Census tracts "are made up of multiple census blocks, which are the smallest geographic unit for which population data are available."[21]

OEHHA has explained that another benefit of using census tracts is that they can show community-scale differences. At a larger scale, differences between communities could be lost, where at a smaller geographic scale (e.g., census block group) there could be less confidence in the underlying indicator data or concerns over confidentially of the health data, for example. The geographic scale of census tracts allows for statewide comparisons based on fixed boundaries. Census tracts are less variable regarding the size of the populations included and thus there is greater normalization of the population across the different geographic units.[22]

Both of these reasons for using census tracts remain the case today.

C. Scoring

CalEnviroScreen 4.0, like previous versions of the tool, scores census tracts to identify those that are disproportionately burdened by multiple sources of pollution and vulnerable population characteristics. It begins by assigning percentile scores for 21 statewide indicators, which fall into two categories, reflecting pollution burden and population characteristics. The percentiles are averaged for the set of indicators in each of the four components (Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors). These four components, in turn, are combined to yield an overall CalEnviroScreen score. Figure 1 below shows the ways that the individual indicators relate to each other and the overall CalEnviroScreen score.

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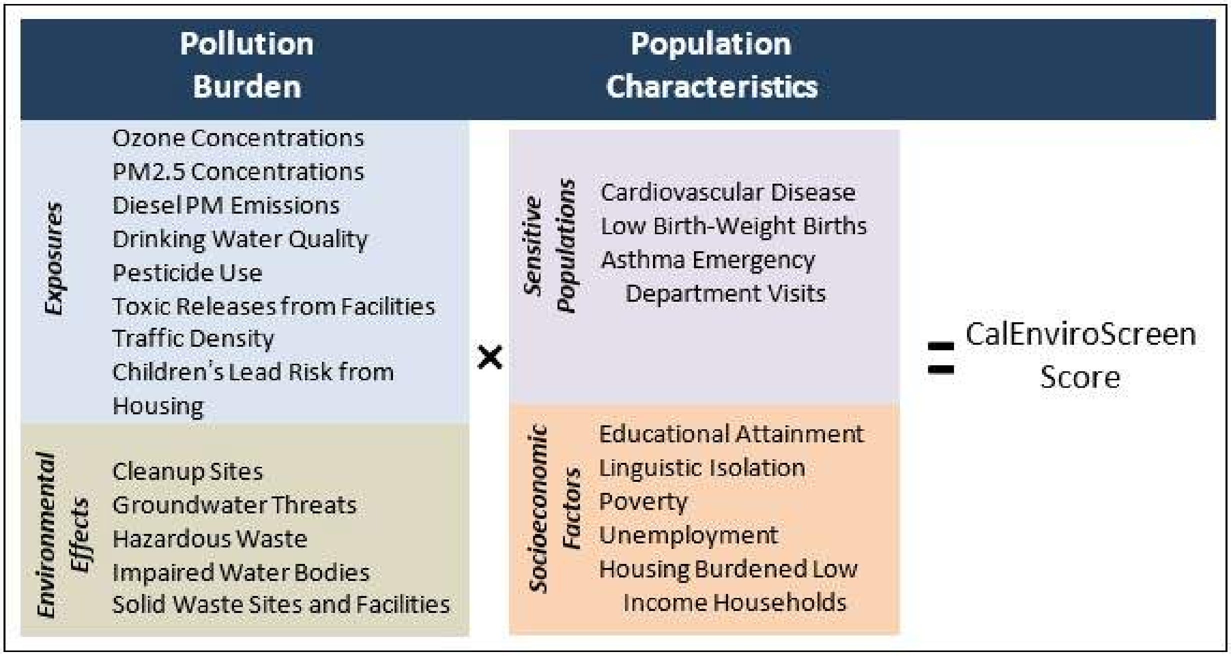
[17] Id., p. 56279.
[18] Id., p. 56280.
[19] Ibid.
[20] *Major Changes in CalEnviroScreen 2.0*, OEHHA, p. 1, available at https://oehha.ca.gov/media/CES20SummaryMajorChanges.pdf.
[21] CalEPA and OEHHA, CalEnviroScreen 4.0 (October 2021), p. 15, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf.
[22] CalEPA and OEHHA, CalEnviroScreen 4.0 (October 2021), p. 15, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf. The current version of CalEnvioScreen, Version 4.0 uses the Census Bureau's 2010 boundaries. New boundaries will be drawn by the Census Bureau as part of the 2020 Census but will not be available until 2022. OEHHA plans to update the census tract geography in CalEnviroScreen after the new boundaries are drawn.

Figure 1. CalEnviroScreen 4.0 Indicator and Component Scoring



D. Iterative Improvements

Prior to the creation of CalEnviroScreen, a methodology did not exist to fully integrate, for a community in a given geographic location, the spectrum of pollutants (such as simultaneous exposure to numerous pollutants from multiple pollution sources), intrinsic factors (health status), and extrinsic factors (socioeconomic status) into risk assessment. Hence, OEHHA developed CalEnviroScreen to conduct statewide evaluations of community-scale impacts through this screening tool.

OEHHA initially created CalEnviroScreen by applying a framework (released to the public in 2010) for assessing cumulative impacts, based in large part on input from a statewide working group on environmental justice that pointed out the unmet need to assess cumulative burdens and vulnerabilities affecting California communities.[23] Subsequent versions updated CalEnviroScreen using the most current available data and incorporating various improvements and recommendations from residents, stakeholders, and government partners. To date, CalEPA has released five final versions of CalEnviroScreen.[24]

OEHHA released the current version – Version 4.0 – on October 13, 2021. Version 4.0 materially improves upon Version 3.0 and reflects the years of iterative improvement across all

[23] *Cumulative Impacts: Building a Scientific Foundation*, OEHHA, December 2010, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/cireport123110.pdf.

[24] Final versions 1.0, 1.1, 2.0, 3.0, 4.0 were released in April 2013, September 2013, August 2014, January 2017, and October 2021, respectively.

versions of the tool.[25] It incorporates the most recent data produced by CalEPA's boards, departments and offices, the California Health and Human Services Agency, and federal entities. It refines the way certain indicators are calculated, to more precisely account for environmental conditions and a population's vulnerability to environmental pollutants. For example, it adds data on dairies and feedlots to the Groundwater Threats indicator, and it adds data on chrome metal plating facilities to the Hazardous Waste indicator. Additionally, Version 4.0 incorporates a new indicator of Children's Lead Risk from Housing to account for potential lead exposure from older housing.[26]

C. Public Process

In developing the current and previous versions of CalEnviroScreen, OEHHA has used multiple approaches to foster a sense of partnership across the state's highly varied communities and stakeholders and solicit input. Early work was guided by a group of external stakeholders, the California Environmental Justice Advisory Committee, which provided a definition for cumulative impacts that guided the development of the CalEnviroScreen framework. The Cumulative Impacts and Precautionary Approaches Work Group was later convened from 2008 to 2013 specifically to advance OEHHA's work in characterizing impacts. Both groups included representatives from community and environmental organizations, agricultural interests, industry groups, academic institutions, and local/regional and federal government.

Beginning with the first version of CalEnviroScreen, OEHHA has had particular success with a public engagement model adapted from the established World Café process. Using this model, OEHHA conducted workshops across the state, to "ground truth" and receive input on the tool using small group discussions. Workshops were held in communities with multiple pollution concerns.[27] This approach places an emphasis on creating a space for conversation in which many voices and perspectives can be heard, interaction is encouraged, and collective input is shared broadly across participants. While adequately representing the interests of all of California's nearly 40 million residents can be daunting, the approach has generated thousands of comments, which have been thoroughly reviewed and considered and that have led to improvements to the tool.

In each iteration of CalEnviroScreen, OEHHA has taken into account public comments. Notably,

[25] See *California Communities Environmental Health Screening Tool, Version 1.0 (CalEnviroScreen 1.0)*, OEHHA, April 2013, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/042313calenviroscreen1.pdf; *California Communities Environmental Health Screen Tool, Version 2.0 (CalEnviroScreen 2.0)*, OEHHA, October 2014, available at https://oehha.ca.gov/media/CES20FinalReportUpdateOct2014.pdf; *Update to the California Communities Environmental Health Screening Tool: CalEnviroScreen 3.0*, OEHHA, January 2017, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/ces3report.pdf; *CalEnviroScreen 4.0*, OEHHA, October 2021, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf.

[26] A full summary of the changes can be viewed here: Summary of Changes in CalEnviroScreen Version 4.0.

[27] In developing CalEnviroScreen 4.0, the public engagement process was further adapted in light of Covid-19. To reduce the spread of the Covid-19, workshops were held virtually.

it has added indicators on drinking water quality, diesel particulate matter emissions, and linguistic isolation, and it developed methods for incorporating data on pollution sources originating in Mexico that impact California communities.[28]

IV. DAC DESIGNATION PROCESS

The present designation marks the third CalEPA has issued under SB 535. This section reviews the previous designations. It then addresses the preliminary designation that formed the foundation for this final designation, and it identifies the communities that CalEPA is designating as DACs in the current process.

A. Previous DAC Designations

CalEPA issued previous DAC designations in 2014 and 2017. In the 2014 designation, CalEPA recognized as disadvantaged the census tracts that received overall scores in the highest 25 percent in what was then the operative version of CalEnviroScreen.[29] In the 2017 designation, CalEPA designated census tracts as disadvantaged on the basis of this same metric. In addition, it designated census tracts that lacked overall CalEnviroScreen scores due to data gaps but scored in the top five percent on the composite Pollution Burden indicator. These thresholds were chosen through a review of related statutes and proxy indicators of disadvantage. They took into account extensive public comments.

B. 2021 Preliminary Designation

On October 19, 2021, CalEPA released a preliminary designation (Preliminary Designation). In it, CalEPA proposed to designate four types of communities as disadvantaged: (1) census tracts with the highest 25 percent of CalEnviroScreen overall scores; (2) census tracts lacking overall scores due to data gaps, but with the highest 5 percent of CalEnviroScreen Pollution Burden scores; (3) census tracts recognized as disadvantaged in CalEPA's most recent SB 535 designation, made in 2017; and (4) areas under the control of federally recognized Tribes. After releasing the Preliminary Designation, CalEPA held two public meetings, on October 26 and October 27, 2021, and it received public comments through November 16, 2021. CalEPA thoroughly reviewed and evaluated all the comments it received. In fact, CalEPA pushed back its release of this final designation to provide CalEPA with additional time to consider the feedback it received. CalEPA has made an effort to respond, at least at a general level, to all relevant comments in the appendix attached to this designation.

C. 2021 Final Designation

After having reviewed and considered all comments submitted on the Preliminary Designation

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[28] For additional background on the evolution of CalEnviroScreen, see John Faust, et al, *California's Environmental Justice Mapping Tool: Lessons and Insights from CalEnviroScreen*, 51 ENVTL. L. REP. 10684 (August 2021).

[29] https://calepa.ca.gov/2014/10/31/press-release-2014-calepa-identifies-communities-targeted-for-cap-and-trade-investments/

(see attached appendix), CalEPA has decided to formally designate as DACs the four categories of tracts proposed for designation in the Preliminary Designation. Below, it explains its reasoning for designating each of the four categories.

1. Census Tracts with Highest 25 Percent Overall Scores

SB 535 provides four categories of criteria that CalEPA must consider in making a determination on how to designate disadvantaged communities, but it does not specify how many communities or what percentage of the population should be included in designations. In selecting the 25 percent threshold for the 2014 and 2017 designations, CalEPA looked toward the circumstances surrounding the enactment of SB 535, other legislation, and studies regarding disadvantaged communities.

For instance, in contrast to SB 535, the Legislature has determined in one other situation that CalEPA should identify the top 20 percent most disadvantaged communities. SB 43 (Wolk, Chapter 413, Statutes of 2013) created the Green Tariff Shared Renewables Program to allow consumers to purchase voluntarily electricity from renewable energy facilities through major utility companies. This program is intended to allow low-income Californians, generally renters, to participate in the market for renewable energy. The pilot program is limited to 600 megawatts statewide, to be shared proportionally by the major utility companies that implement the program. One hundred megawatts of that maximum are reserved for smaller facilities (no larger than one megawatt generating capacity) that are located in areas “identified by the California Environmental Protection Agency as the most impacted and disadvantaged communities.” This provision encourages renewable energy facility development in disadvantaged communities to realize the socioeconomic and environmental benefits of that development and provide those communities access to renewable energy. Similar to SB 535, SB 43 tacitly references CalEnviroScreen by requiring these communities to be identified using a screening methodology designed to identify areas (1) disproportionately affected by pollution and environmental hazards and (2) with socioeconomic vulnerability.[30] Unlike SB 535, however, SB 43 not only asserts that the communities shall be identified by census tract, but also states that the communities shall be the most impacted 20 percent.[31] By setting aside program funds to benefit disadvantaged communities, SB 43 provides CalEPA with general guidance on where to establish a percentage threshold for identifying disadvantaged communities. It is not determinative, however, of the precise threshold for communities identified as disadvantaged for the purposes of SB 535.

In addition to looking at legislative approaches, CalEPA has also considered the portion of the state’s population, families and households that under other standards would be considered disadvantaged.

- In 2019, the California Poverty Measure developed by the Public Policy Institute of California and the Stanford Center on Poverty and Inequality identified about 34 percent

[30] Public Utilities Code §§ 2833(d)(1)(A)(i) and (ii).
[31] Public Utilities Code § 2833(d)(1)(A).

of California residents were poor or near poor, and 16.4 percent were living in or near poverty.[32]

- From 2015 to 2019, 16.7 percent of Californians ages 25 and over lacked a high school degree of equivalent.[33]
- In 2017, 28.4 percent of renters were severely cost-burdened, spending more than half of their income on rent.[34]
- In 2020, the Northwestern University Institute for Policy Research found that the food insecurity rate in California was 23.1 percent from April to July.[35]

While these data points do not represent a complete list of comparative markers, they provide CalEPA some instruction in determining a practical percentage threshold for disadvantaged communities. CalEPA also must balance the value of being inclusive of the many communities that face pollution burdens and vulnerabilities, with the consideration that an overly broad threshold would dilute the impact of SB 535 and AB 1550 by spreading the designated funding too thinly to provide the needed benefits.

The above reasoning applies as readily in 2021 as it did in 2014 and 2017. Moreover, once again using 25 percent as a CalEnviroScreen threshold would provide policy continuity and would ensure that approximately a quarter of California census tracts – which, collectively, are home to 9.6 million residents, or 24.3 percent of the state's population – receive DAC designations.

2. Census Tracts with Highest 5 Percent Pollution Burden Indicator Scores

In certain instances, CalEnviroScreen 4.0, like its predecessors, may not offer overall scores for tracts due to unavailable or unreliable population data. It would be inconsistent with the spirit of SB 535 to exclude tracts that are in fact disadvantaged from a DAC designation solely on account of unreliable data.

Therefore, for the 2017 designation, CalEPA considered proxies to use in place of unavailable overall scores. It settled upon tracts that scored in the highest 5 percent on CalEnviroScreen's Pollution Burden composite score. It determined that these census tracts generally reside in areas that are sparsely populated and located adjacent to census tracts that score in the top 25 percent of CalEnviroScreen scores. In some cases, these 19 census tracts represent some of the most significant pollution point sources in a region. Many of these high pollution census tracts include ports, airports, or heavy industrial areas.

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[32] *Just the Facts: Poverty in California*, Sarah Bohn, Caroline Danielson, and Patricia Malagon, July 2021, available at https://www.ppic.org/wp-content/uploads/JTF_PovertyJTF.pdf.
[33] *Quick Facts*, United States Census, available at https://www.census.gov/quickfacts/fact/table/CA/EDU635219#EDU635219.
[34] *Issue Brief: California's Housing Affordability Crisis Hits Renters and Households With the Lowest Incomes the Hardest*, Sara Kimberlin, California Budget and Policy Center, April 2019, available at https://calbudgetcenter.org/wp-content/uploads/2019/04/Report_California-Housing-Affordability-Crisis-Hits-Renters-and-Households-With-the-Lowest-Incomes-the-Hardest_04.2019.pdf.
[35] https://www.ipr.northwestern.edu/state-food-insecurity.html

3. Census Tracts Designated in 2017

CalEPA is designating as disadvantaged all the communities it designated in 2017. While there is an 85 percent overlap between the census tracts designated as disadvantaged in 2017 and those in the highest scoring census tracts under CalEnviroScreen 4.0, CalEPA sees value in ensuring that the 305 census tracts that were in the highest scoring 25 percent in CalEnviroScreen 3.0 but are not in the top 25 percent in CalEnviroScreen 4.0 continue to be considered disadvantaged and thus eligible for disadvantaged community-related funding opportunities through California Climate Investments. In some instances, these 305 census tracts may have fallen below the disadvantaged community thresholds, in part, because of California Climate Investments programming. Recognizing these communities as disadvantaged will allow for program continuity.

4. Lands Under Federally Recognized Tribes

CalEPA for the first time is designating as disadvantaged lands under the control of federally recognized Tribes,[36] including but not necessarily limited to Federal American Indian Reservations and lands held in trust by the United States for the benefit of American Indian tribes in California (collectively, Tribal Lands).[37] Data gaps related to Tribal nations frequently make it difficult to fully and accurately assess pollution burden and population characteristics of these areas in CalEnviroScreen. Specifically, because of their status as sovereign governments, federally recognized Tribes in California are not required to report or make publicly available to the state the types of data used in CalEnviroScreen. The data used in developing the drinking water quality, pesticide use, solid waste, asthma or cardiovascular disease indicators, for example, are not required to be reported to the state by federally recognized Tribes in California. Therefore, these data are often not available to the state.

CalEPA has accounted for such gaps by looking for information outside of CalEnviroScreen. In stakeholder meetings, Tribal representatives have raised concerns that these data gaps have meant that federally recognized Tribes in California have been effectively excluded from California Climate Investments-related funding despite frequently high levels of poverty, health and environmental burden, and increased suicide rates,[38] oftentimes related to the historical violence and deprivation federally recognized Tribes in California have endured. For example, recent census data show that the poverty rate on Tribal Lands in California is nearly double the

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[36] Federal Recognition refers to acknowledgement by the federal government that a Tribal government and Tribal members constitute a Tribe with a government-to-government relationship with the United States, and eligibility for the programs, services, and other relationships established for the United States for Indians, because of their status as Indians. (Title 25 United States Code § 83.2)

[37] American Indian Areas Related National Geodatabase, available at https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-geodatabase-file.html.

[38] National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC) 2019. Suicide Rates for Females and Males by Race and Ethnicity: United States, 1999 and 2017. https://www.cdc.gov/nchs/data/hestat/suicide/rates_1999_2017.htm

state average.[39] While not specific to members of federally recognized Tribes[40] in California (because of present data gaps), health disparities for Native American communities are present in the following areas:

- **Heart Disease:** Native Americans[41] were 50 percent more likely to be diagnosed with coronary heart disease.[42]

- **Diabetes:** Well documented and recent data show that Native Americans have nearly twice the prevalence of diabetes compared to white populations nationally (14.7 percent compared to 7.5 percent).[43] In California, Native American populations had a diabetes prevalence of 10.4 percent.[44]

- **Asthma:** Native American adults have the highest asthma prevalence of any racial/ethnic groups, 40 percent higher than other groups.[45] Native American children are almost twice as likely to ever have had asthma.[46]

- **Obesity:** Native American adolescents are 30 percent more likely than non-Hispanic white adolescents to be obese. Native American adults are 50 percent more likely to be obese than non-Hispanic whites.[47] Obesity is a risk factor for several diseases including diabetes, heart disease, and stroke.

- **Infant Mortality:** Native Americans have almost twice the infant mortality rate.[48]

CalEPA has therefore concluded that the most reasonable way to approach data gaps for specific CalEnviroScreen indicators for tribal lands is to designate lands under the control of federally recognized Tribes as DACs. As discussed, these lands and the tribal communities that are located on them reflect "geographic, socioeconomic, public health, and environmental

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[39] American Community Survey 2015-2019, showing residents of federally recognized tribal lands in California with a 22 percent poverty rate, with 43 percent of residents at 200 percent of the federal poverty level, versus state averages of 13 percent poverty rate and 30 percent of the state below 200 percent of the federal poverty level.
[40] Identified as American Indians in published reports and available data however identified as Native Americans.
Based on data downloaded from https://data.census.gov/cedsci/
[42] CDC 2021. Summary Health Statistics: National Health Interview Survey: 2018. Table A-1a. http://www.cdc.gov/nchs/nhis/shs/tables.htm
[43] CDC. National Diabetes Statistics Report, 2020: Estimates of Diabetes and Its Burden in the United States. Atlanta, GA: Centers for Disease Control and Prevention; 2020 available at https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf
[44] Bullock A, Sheff K, Hora I, et al. *Prevalence of diagnosed diabetes in American Indian and Alaska Native adults*, 2006–2017. BMJ Open Diabetes Research and Care 2020; 8(1):e001218.. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7199144/.
[45] https://www.trackingcalifornia.org/asthma/who-is-vulnerable-to-asthma.
[46] CDC 2021. Summary Health Statistics: National Health Interview Survey: 2018. Table A-2a. http://www.cdc.gov/nchs/nhis/shs/tables.htm.
[47] CDC 2020. Summary Health Statistics: National Health Interview Survey: 2018. Table A-15a. https://www.cdc.gov/nchs/nhis/shs/tables.htm
[48] CDC 2020. Infant Mortality Statistics from the 2018 Period Linked Birth/Infant Death Data Set. National Vital Statistics Reports. Table 2. https://www.cdc.gov/nchs/data/nvsr/nvsr69/NVSR-69-7-508.pdf

hazard[s]" that would support a DAC designation.[49] CalEPA recognizes the value of accurate and comprehensive data as well as the burden associated with collecting data. It believes that this final 2022 DAC designation is a critical step in enabling Tribes to seek resources that can benefit their communities. Moving forward, CalEPA would like to coordinate with Tribes to explore ways to fill current data gaps.

Recognizing that the lands under the control of federally recognized Tribes may not be accurately reflected in the American Indian Areas Related National Geodatabase maintained by the U.S. Census Bureau, CalEPA will provide for a consultation-based process with any interested federally recognized Tribe to identify lands that are under its control but not accounted for in the American Indian Areas Related National Geodatabase. A Tribe may establish that a particular area of land is under its control, for purposes of this designation, by submitting evidence that would provide a reasonable basis for CalEPA to determine, in its discretion, that the Tribe has control over the land. A Tribe interested in participating in the consultation process should contact the CalEPA Deputy Secretary for Environmental Justice, Tribal Affairs and Border Relations.

V. Conclusion

CalEPA is pleased to publish this updated DAC designation, pursuant to SB 535, which takes into account the latest and best available data and considers factors related to data unavailability. This designation will go into effect on July 1, 2022, at which point programs funded through California Climate Investments will use the designation in making funding decisions.[50] The time between finalization of this designation and July 1, 2022 allows administering agencies to consider how the designation will be implemented in their particular programs. In addition, CARB will use this time to develop guidance materials on implementation of the designation. This designation is an important step in ensuring that California Climate Investments yield significant benefits to California's disadvantaged communities, a goal to which the entire California government is committed.

[49] Health and Safety Code § 39711(a).
[50] Agencies administering California Climate Investments programs are welcome to begin implementing this designation before July 1, 2022.

VI. FIGURES AND MAPS

The following maps use a U.S. Census Bureau GIS layer that includes only Reservations and Off Reservation Trust Lands. Thus, the maps may not include all the lands under the control of federally recognized Tribes. The term "Tribal Areas" in the map key also comes from the U.S. Census Bureau. In addition, while some Tribal Areas are not visible in the maps below due to the granularity of these maps, the following interactive link can be used to zoom into any area of the state and see all lands designated as disadvantaged: https://calepa.ca.gov/envjustice/ghginvest/.

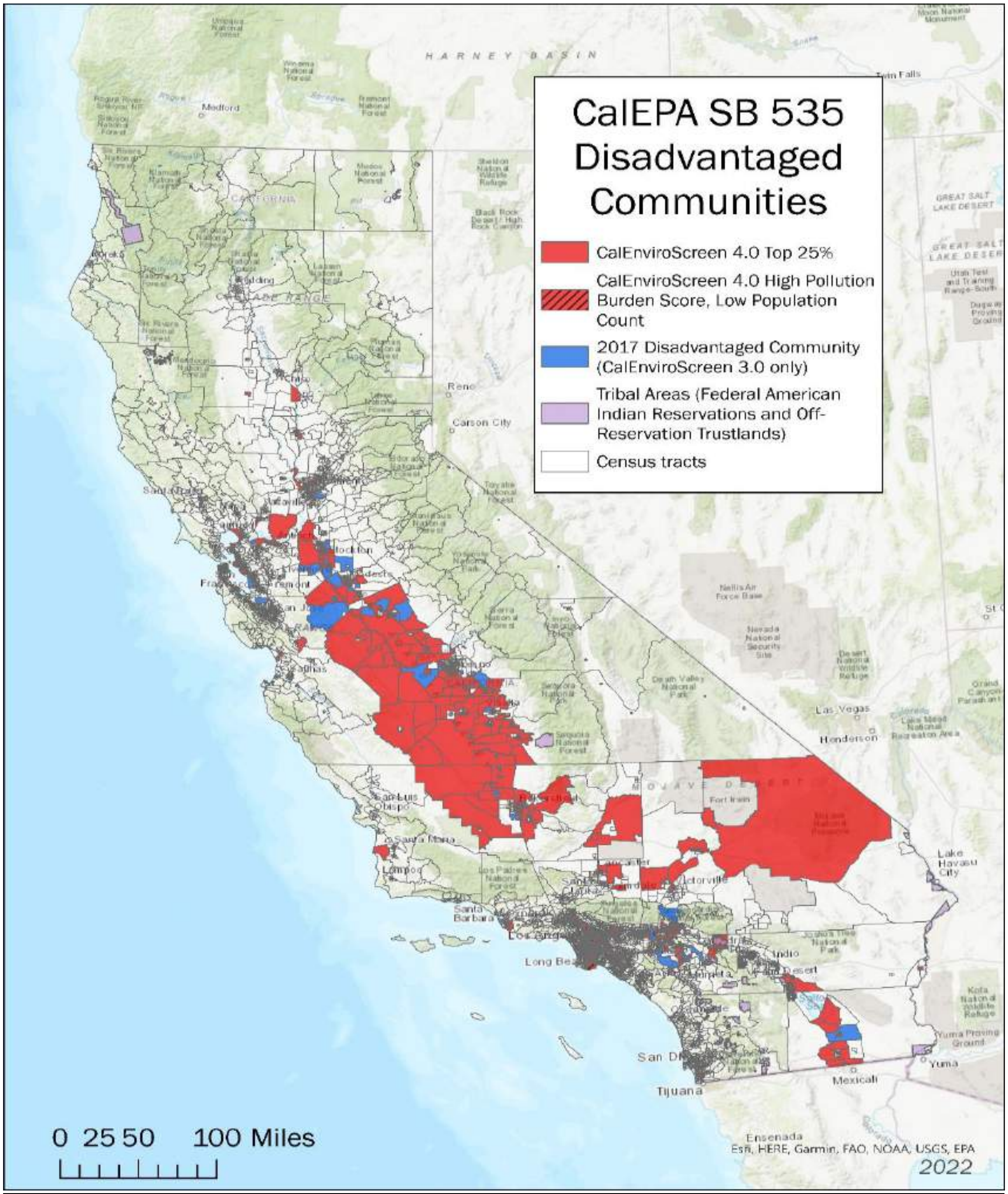

Figure 1: Statewide map of the disadvantaged communities

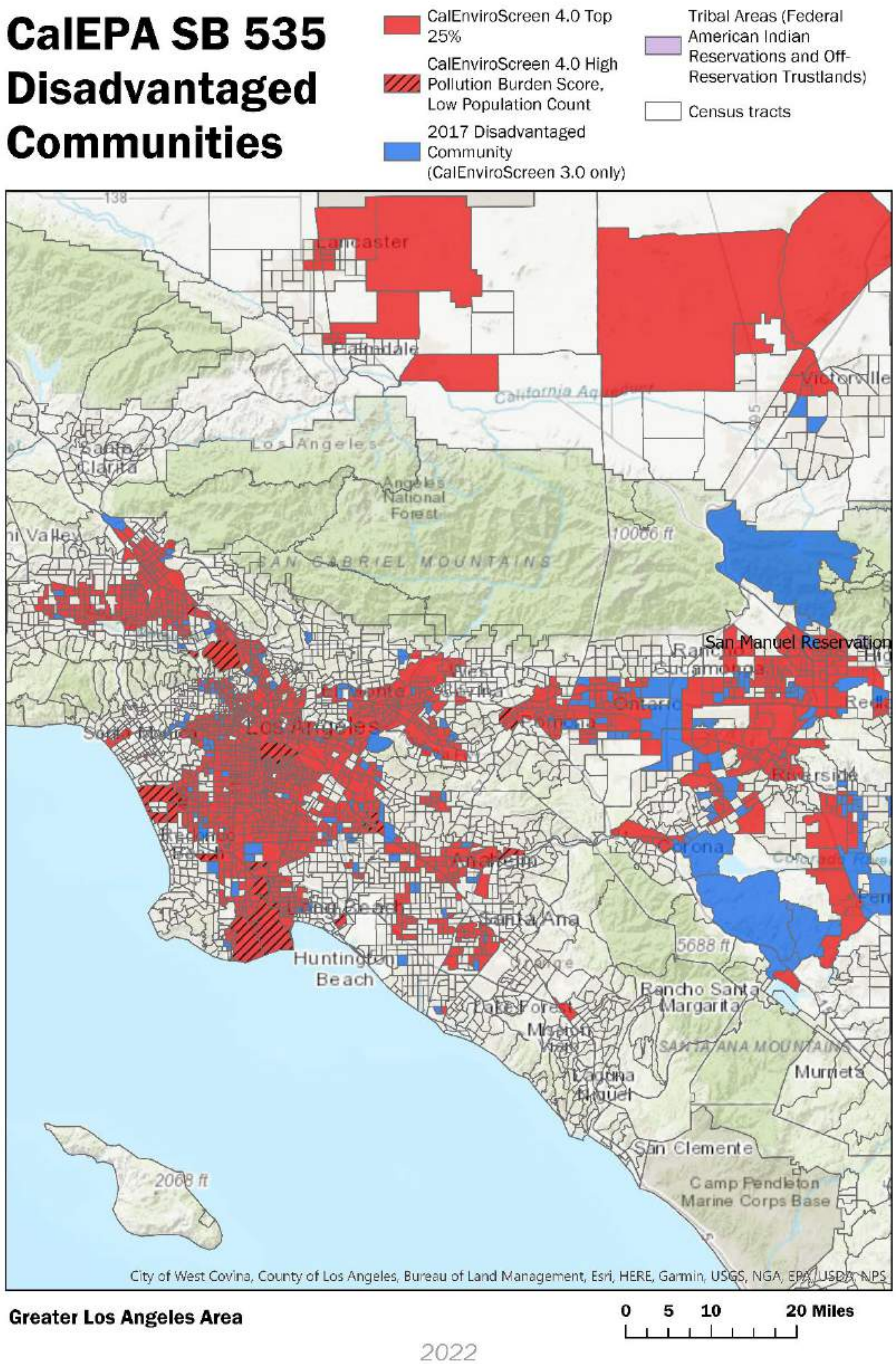

Figure 2: Map of the disadvantaged communities in the Los Angeles region

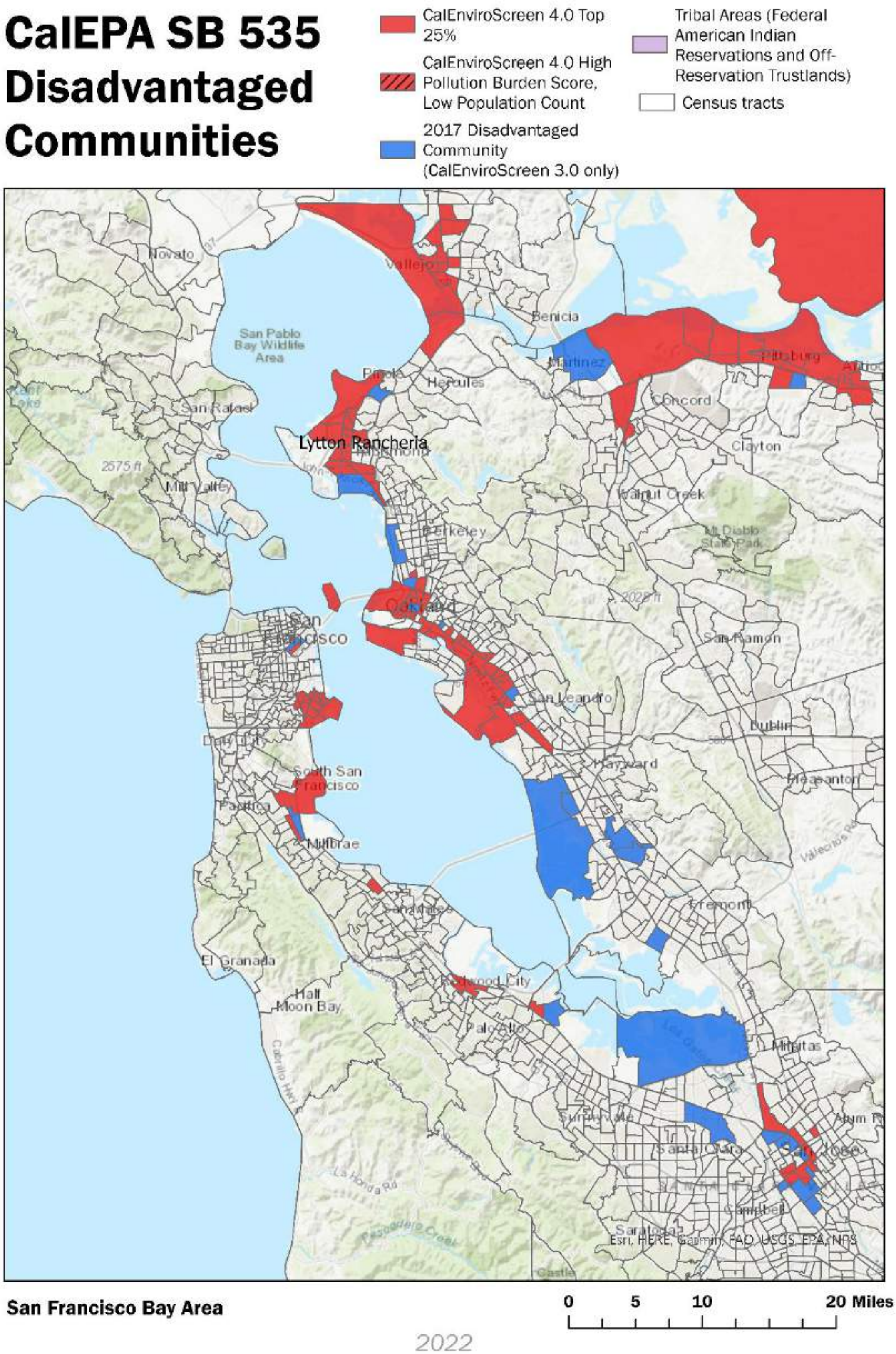

Figure 3. Map of the disadvantaged communities in the San Francisco Bay Area region

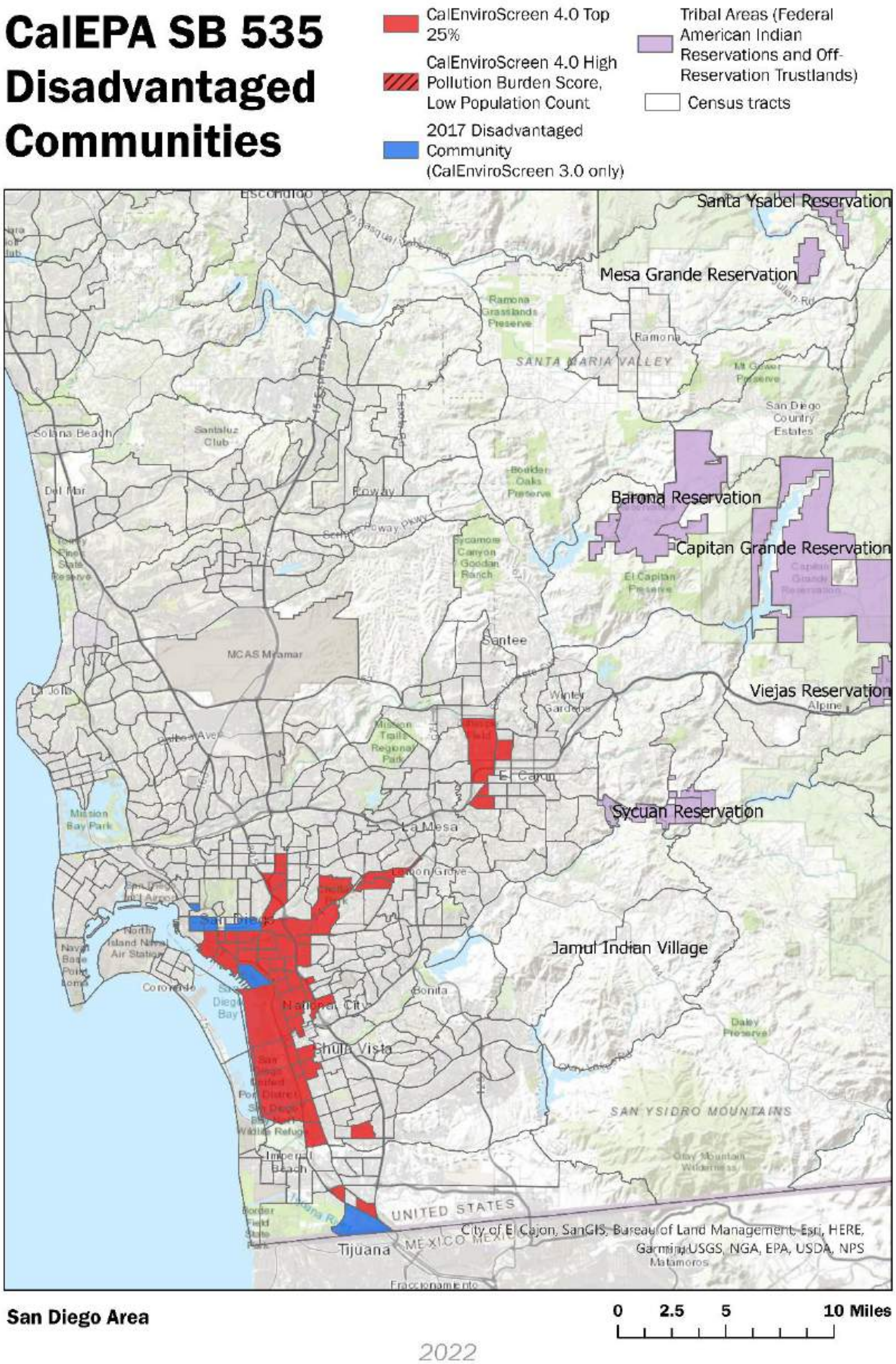

Figure 4. Map of the disadvantaged communities in the San Diego region

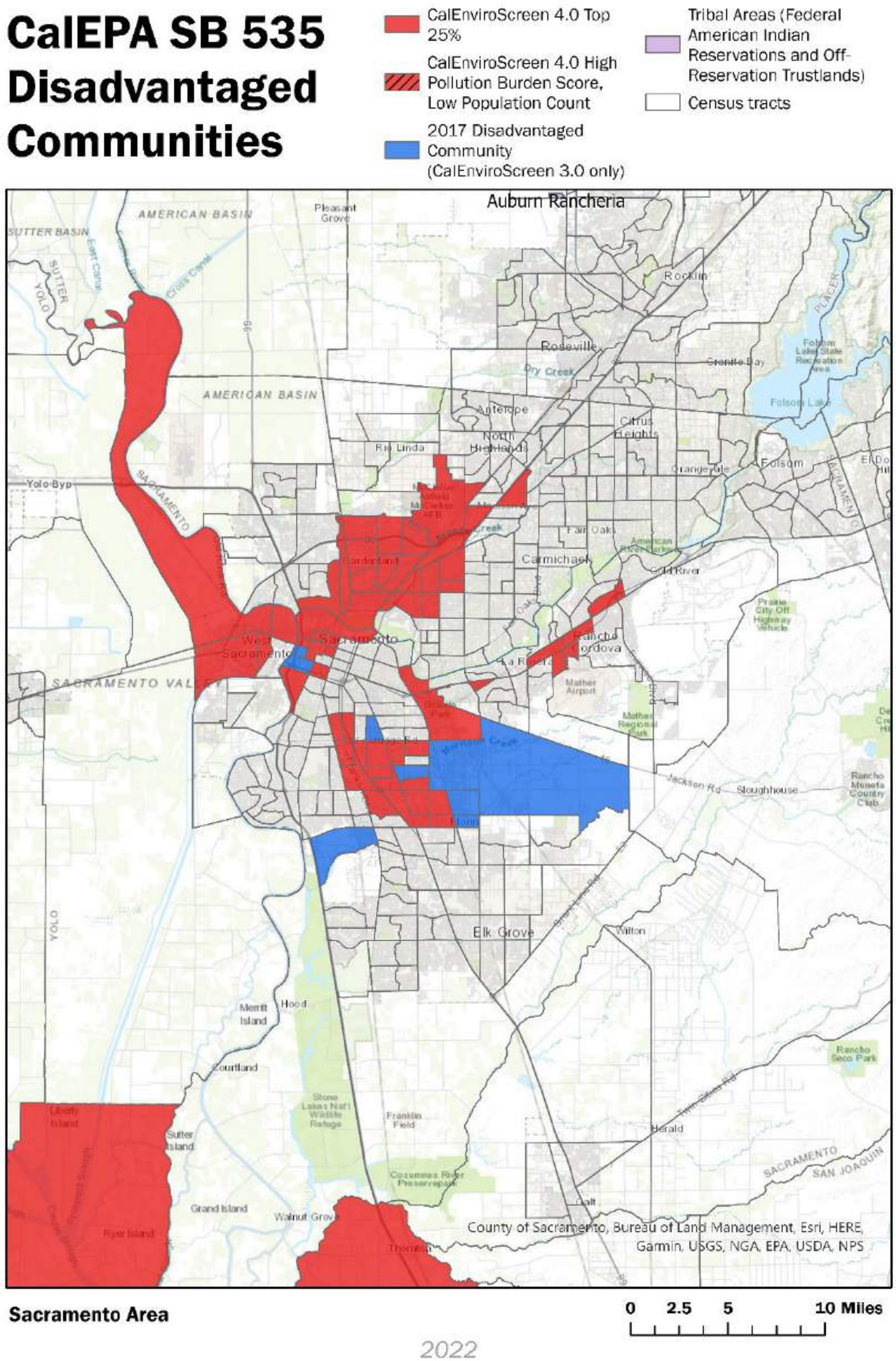

Figure 5. Map of the disadvantaged communities in the Sacramento region

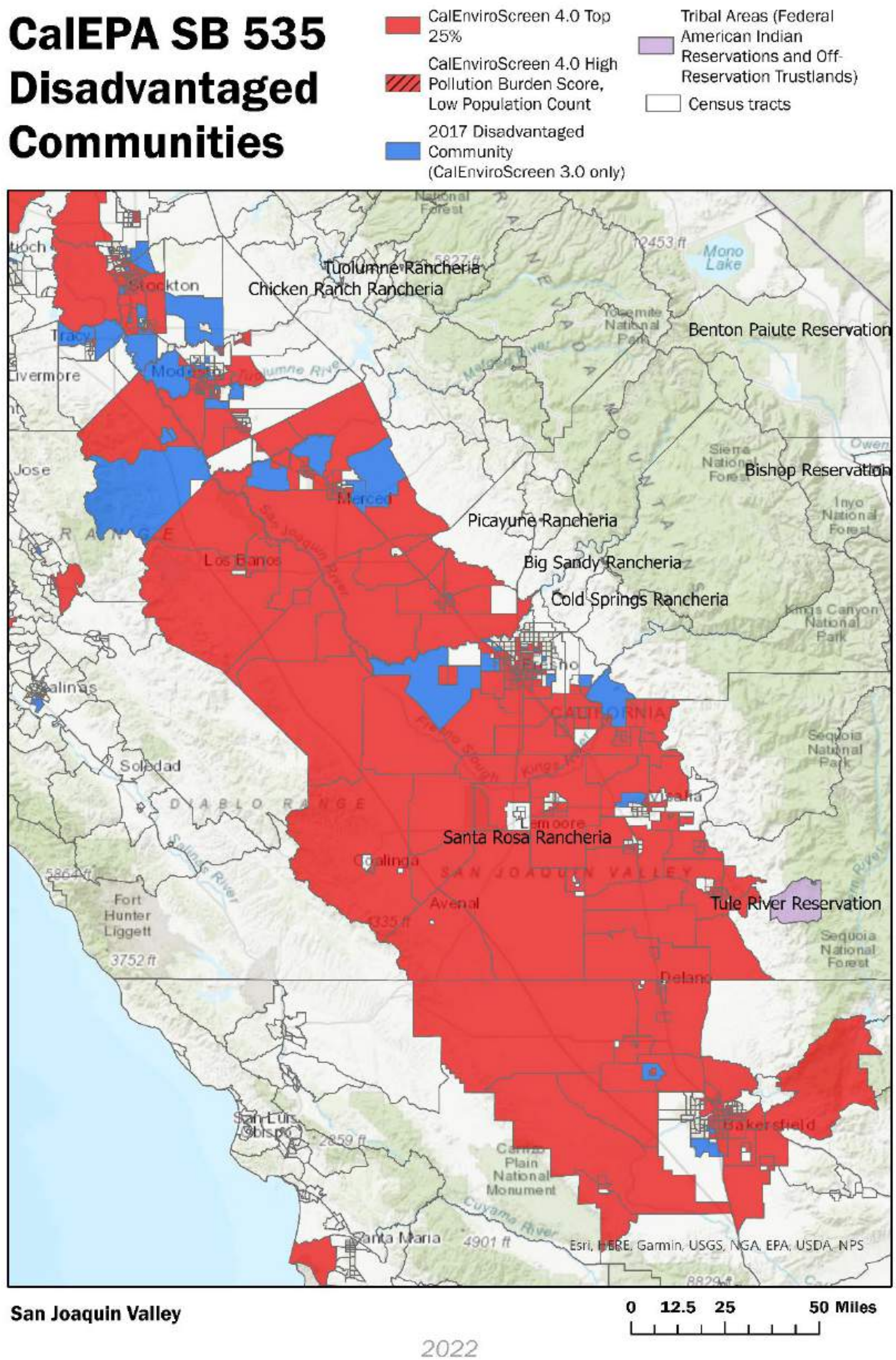

Figure 6. Map of the disadvantaged communities in the San Joaquin Valley

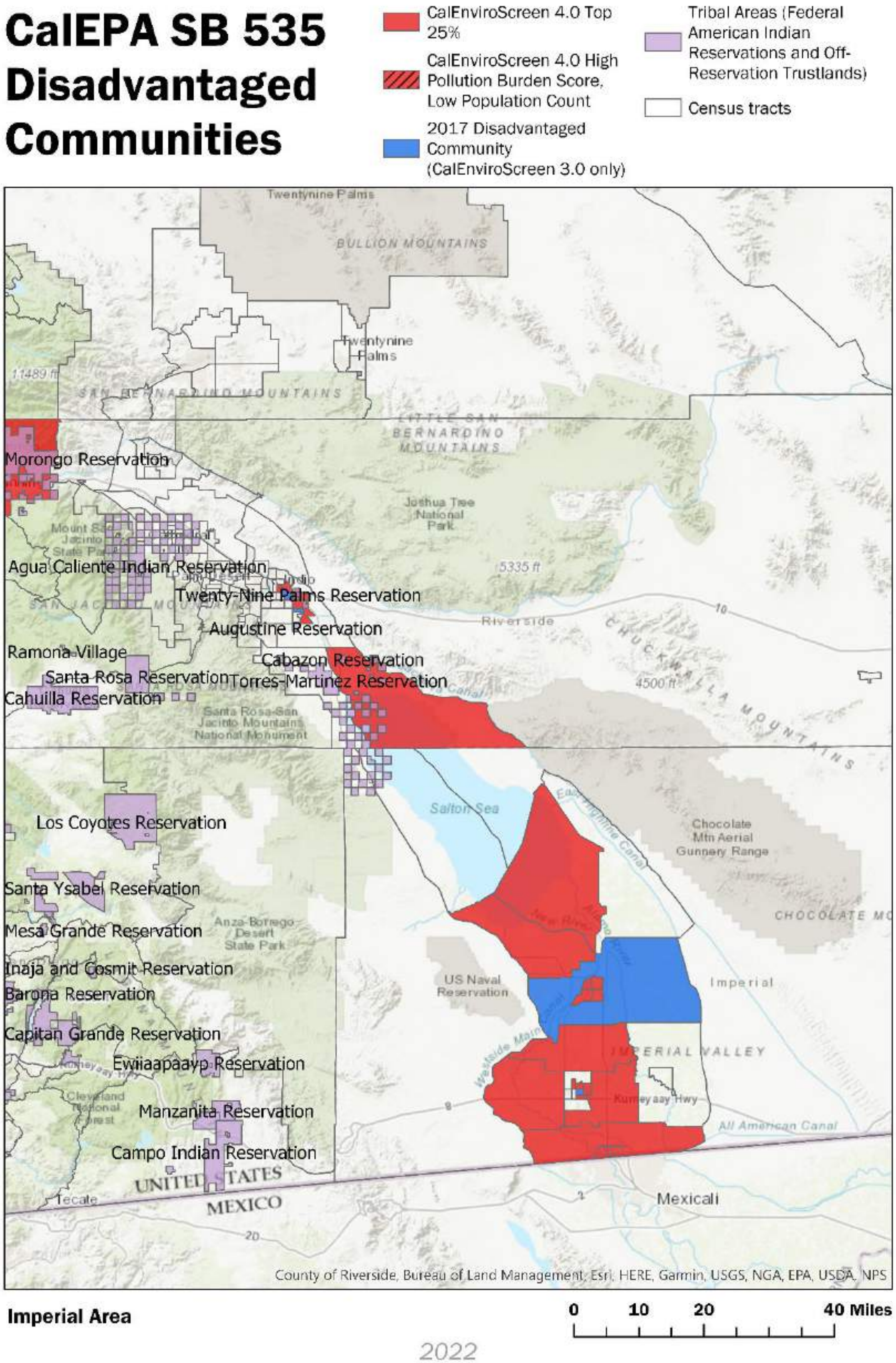

Figure 7. Map of the disadvantaged communities in the Imperial Valley region

Figure 8. Map of the disadvantaged communities in the Northern California region

APPENDIX 1 – RESPONSES TO COMMENTS

CalEPA values stakeholder input and has attempted to develop the DAC designation in a transparent and collaborative manner, noting that the only statutory requirement (through SB 862) related to public participation in the designation process is that CalEPA hold one public hearing on the preliminary designation. Because CalEPA sees value in stakeholder engagement, for the 2022 designation, CalEPA additionally invited public comments from October 19, 2021 to November 16, 2021. During this time, CalEPA received numerous thoughtful and substantive comments. CalEPA addresses many of the issues raised in these comments in the final designation above. To the extent that the final designation above does not address comments received, CalEPA attempts to address them here.

1. **Requests to establish petition process.** Multiple commenters requested that CalEPA establish a petition process where communities could petition CalEPA for a DAC designation.

   CalEPA Response. *CalEPA has decided not to establish a DAC designation petition process at this time. CalEPA has not identified objective criteria it could use to evaluate petitions other than the very criteria used for its Final 2021 Designations. In addition, CalEPA is concerned that such a petition process could favor wealthier or more organized communities that have the capacity to file a petition. The granting or denial of petitions could be viewed by some as being arbitrary and favoring certain communities (e.g., rural areas) or conversely, favoring other communities (e.g., urban areas). Using CalEnviroScreen 4.0 and the other objective criteria underlying the Final 2021 Designations provides CalEPA with a uniform approach across the state. This approach is reasonable and ensures consistency.*

2. **Requests to modify CalEnviroScreen.** Several commenters suggested that OEHHA should modify CalEnviroScreen to account for additional indicators or to weight current indicators differently. For example, certain commenters requested that OEHHA modify CalEnviroScreen to include a climate impacts indicator.

   CalEPA Response: *As discussed in Section III above, OEHHA released Version 4.0 on October 13, 2021. It built upon the improvements of earlier versions, and it underwent an extensive public process. OEHHA uses comments and input received on the previous versions of the tool to inform the updates to the tool. In addition, the draft CalEnviroScreen 4.0 was released for public comment from February 19 to May 14, 2021.[51] OEHHA held a webinar and six workshops on the draft CalEnviroScreen 4.0.[52] This process for developing Version 4.0 is separate from the process for developing the DAC designations. It would be inappropriate to reopen Version 4.0 at this time, in response to comments received in the course of the DAC designation process since the public comment period for draft Version 4.0 closed in May 2021 and Version 4.0 was released in October 2021.[53] Moving forward, CalEPA intends to continue to work with OEHHA to refine CalEnviroScreen to account for updated data and improved modeling*

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[51] CalEnviroScreen 4.0, OEHHA (October 20, 2021), available at https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40.
[52] Id.
[53] OEHHA has thoroughly reviewed and evaluated the comments received during the public comment period for the draft CalEnviroScreen 4.0 and plans to release a response to comments later in 2022.

techniques[54]. It should be noted that CalEPA does not respond in this designation or appendix to comments substantively focused on the CalEnviroScreen tool.

3. **Requests to designate communities as DACs with high scores in a single or handful of indicators.** Multiple commenters recommended including communities with high scores on a single or a handful of indicators. For example, one commenter suggested designating communities as DACs that score in the top 25 percentile for 5 of the 21 indicators. Another commenter suggested that smaller communities with high scores in a few indicators should be designated as DACs.

   CalEPA Response. *SB 535 aims to direct funds toward improving public health, quality of life, and economic opportunity in California's "most burdened communities" while reducing pollution that causes climate change. CalEPA believes that it is reasonable to interpret "most burdened communities" as those communities that experience the greatest number of cumulative impacts. OEHHA has configured CalEnviroScreen to account for such cumulative impacts, which it defines to mean exposures and public health or environmental effects from all sources of pollution in a geographic area."[55] OEHHA has described the significance of cumulative impacts:*

   > *[m]any factors, often referred to as stressors, contribute to an individual or a community's pollution burden and vulnerability. Standard risk assessment protocols used by regulatory agencies cannot always account for the full range of factors that may contribute to risk and vulnerability. Risk assessments are often primarily designed to quantify health risks from a single pollutant or single source at a time, often in one specific medium (e.g., air or water). Many community groups and scientists have highlighted the fact that this approach fails to consider the totality of the health risks that communities face.*
   >
   > *In reality, people are simultaneously exposed to multiple contaminants from multiple sources and also have multiple stressors based on their health status as well as living conditions. Thus, the resulting cumulative health risk is influenced by nonchemical factors such as socioeconomic and health status of the people living in a community. In such situations, risk assessment has a limited ability to quantify the resulting cumulative risk. Furthermore, risk assessment requires extensive characterization of the chemicals present, the routes and levels of exposure, and the dose-response relationship for hundreds of chemicals for which data are neither currently available nor likely to be generated in the foreseeable future.[56]*

   Focusing only on select indicators would deemphasize the cumulative nature of impacts. Therefore, CalEPA has decided to continue to focus on cumulative impacts and socioeconomic indicators of disadvantage, as measured by the CalEnviroScreen overall score and, in particular instances, the Pollution Burden composite score, rather than designate communities as disadvantaged because they have high scores on a single or handful of indicators. CalEPA concludes that this focus on cumulative impacts better

[54] CalEPA has shared the comments it received during the public comment period for the preliminary DAC designation related to CalEnviroScreen 4.0 with OEHHA for future consideration.
[55] About CalEnviroScreen, OEHHA, available at https://oehha.ca.gov/calenviroscreen/about-calenviroscreen.
[56] CalEnviroScreen 4.0, OEHHA, CalEPA (October 2021), p. 9-10, available at https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf.

furthers the Legislature's directive that CalEPA develop criteria for identifying and directing GGRF funds to the most disadvantaged communities. This said, CalEPA reiterates that programs administering GGRF funds are not required to focus solely on CalEPA-designated disadvantaged communities. Aside from the targets set out in statute, program administrators have flexibility to focus their initiatives on the communities best served by their particular focus.

4. **Request to designate the tracts with the 30 percent – rather than 25 percent – highest scores in CalEnviroScreen as disadvantaged.**

   CalEPA Response. *In enacting SB 535, the Legislature signaled an intent to direct funding toward the "most impacted and disadvantaged communities." It did not, however, provide a bright line for distinguishing between communities that are impacted and disadvantaged and those that are "most" impacted and disadvantaged.*

   CalEPA recognizes the challenges inherent in selecting a numerical threshold and has considered at length the appropriate threshold for this context. In section IV.C.1 above, CalEPA explains the reasons it identified the census tracts in the top 25 percent of CalEnviroScreen scores as disadvantaged.

   While CalEPA could in theory lower the threshold – to 30 percent, or even further, to 35 or 40 percent – it is not aware of any factors that would render a lower threshold more reasonable than the 25 percent threshold, which has already undergone extensive public review, and which would provide for a measure of policy continuity from previous designations.

   CalEPA must balance the value of being inclusive of the many communities that face pollution burdens and vulnerabilities, with the consideration that an overly broad threshold would dilute the impact of SB 535 by spreading the funding too thinly. That is, CalEPA is mindful of the legislative intent animating SB 535 and of the risk that lowering the threshold could ultimately channel GGRF funds away from the "most impacted and disadvantaged communities."

5. **Request to define DACs to include all "priority populations."** Multiple commenters recommended that CalEPA designate tracts that have significant portions of particular populations.

   CalEPA Response**.** *CalEPA is mindful that SB 535 and AB 1550 conceive of communities as physical areas,*[57] *and it may not designate DACs in a manner that loses that geographical connection. That does not mean that the physical areas must always be contiguous. For example, CalEPA is designating Tribal Lands, which, for certain Tribes, may include lands that are non-contiguous. Such lands, however, would still be physical areas and connected in that they would fall under the control of a single Tribe.*

6. **Request to designate communities at a smaller geographic scale.** Several commenters suggested CalEPA should employ a more granular unit of geographic scale than census tracts. They stated that aggregating or averaging data across census tracts could obscure the burdens of smaller areas within those tracts.

[57] SB 535 twice describes DACs as "areas." Similarly, both SB 535 and AB 1550 refer to "projects located within the boundaries of, and benefiting individuals living in, communities."

CalEPA's Response. *Defining the precise boundaries of communities is a challenging exercise, particularly in a state as vast and populous as California. CalEPA believes there is considerable benefit to defining them, to the extent possible, in a manner that is standard from one community to the next. Standardization promotes equity across communities and eliminates the need to engage in an administratively resource-intensive exercise of drawing boundaries on a community-by-community basis. For the DAC designation process, CalEPA has generally chosen to define communities in terms of census tracts, where data are available, in part because CalEPA is using scores from CalEnviroScreen – which uses tracts as its standard unit of geographic scale – to identify DACs and in part because census tracts offer the independent advantages described in Section II.B above. CalEPA has departed from the use of census tracts only in the designation of lands under the control of federally recognized Tribes, which are generally not coterminous with census tract boundaries. In instances in which Tribal Lands occupy only a portion of a census tract, data unavailability may complicate the assessment of burdens at a tract level. Additionally, as compared to other communities that are smaller than census tracts, Tribal Lands are distinct because they fall under the control of Tribal governments.*

7. **Request to designate communities on a program-by-program basis:** Several commenters suggested that CalEPA designate DACs on a program basis.

   CalEPA Response*. Legally, CalEPA interprets SB 535 as directing it to issue a single designation for the purpose of allocating GGRF funds. CalEPA does not interpret the legislation as authorizing it to issue program-specific designations. DAC minimums apply across California Climate Investments portfolio and individual programs may have additional statutory direction or otherwise focus on the communities most appropriate to each program.*

8. **Request to designate non-federally recognized tribes.** Several commentors suggested CalEPA should designate both federally recognized and non-federally recognized Tribes as disadvantaged communities.

   CalEPA Response. *CalEPA is not designating federally recognized Tribes as disadvantaged. It is designating lands under the control of federally recognized Tribes as disadvantaged. Section IV.C.4 above explains the reason for this designation. CalEPA appreciates that areas associated with non-federally recognized Tribes are often disadvantaged. Because the legal distinctions between federally and non-federally recognized Tribes differ, the same type of data gaps do not exist for communities associated with non-federally recognized Tribes. CalEPA instead is able to rely upon CalEnviroScreen in the same way it generally could for other areas outside the jurisdictions of federally recognized Tribes.*

APPENDIX 5

"Technical Memorandum" dated January 18, 2024 of Catalyst Environmental Solutions

Thursday, January 18, 2024

Technical Memorandum

To:	Liz Gosnell, Cone Fee, LLC
From:	Megan Schwartz, Director of Regulatory Compliance and Permitting
RE:	Baldwin Hills Community Standards District Amendment Proposal

Introduction

At your request, this technical memorandum provides supplemental data and analysis to further support the technical memorandum submitted to you on September 25, 2023, related to CEQA review of the proposed amendment to the Baldwin Hills Community Standards District, as well as potential environmental justice effects of approving or denying the proposed motion.

Analysis of CEQA Review of Modifications to the Baldwin Hills Community Standards District

The Inglewood Oil Field has operated in accordance with the CSD and the adopted EIR and Mitigation Monitoring and Reporting Plan since 2008 without violation or incident. The CSD established a geographic area (the Baldwin Hills) and with site-specific conditions adopted by the County. While Conditional Use Permit approvals are conditional and subject to discretionary review with some established frequency, which allows a local jurisdiction to end a land use or revoke a permit, a CSD is an adopted ordinance and land use regulation.

Five-year reviews were built in a part of the CSD Ordinance and subsequent Settlement Agreements, as well as requirements for additional studies such as the Inglewood Oil Field Hydraulic Fracturing Study and Health Risk Assessment, in order to provide the County an opportunity to determine if any additional environmental protection measures were necessary. These reviews resulted in suggested revisions to CSD Conditions by the County which the operator voluntarily implemented. Because these suggested revisions to the CSD Conditions that have occurred since 2008 to date have been minor and within the scope of the analysis and findings of the Baldwin Hills CSD EIR, no formal Amendment to the CSD was required and additional CEQA review was necessary. The minor modifications were prepared as a result of the reviews that were built into the CSD framework and therefore did not result in any new impacts or more severe impacts than what was analyzed in the certified EIR.

In contrast, the County Department of Regional Planning is now proposing to formally amend the CSD. This change is not being considered as part of the 5-year review cycle, but as a stand-alone action of the Board of Supervisors. For CEQA compliance, the proposed amendment must be compared to the 2008 certified EIR for the CSD to evaluate if the amendment would result in a new or more severe impact compared to what was analyzed in that documents. The proposed change in the amendment that requires analysis is “no new wells, and nonconforming use allowed to continue for 20 years”.

The CSD EIR Energy and Mineral Resources chapter clearly states that “The potential future development would not result in the loss of availability of a known energy or mineral resource as the mineral resource located at the oil field would be developed as part of the potential future development.” In contrast, the proposed amendment to the CSD would not allow new drilling, and would put a sunset on all existing operations of 20 years. Therefore, the proposed amendment would directly result in the loss of availability of a known mineral resource. This is a significant and unmitigable impact.

This new, significant, and unmitigable impact means that the County cannot rely upon the analysis in the 2008 CSD EIR for this action. Rather, a supplemental EIR to the 2008 CSD EIR would be required for this significant impact of the amendment.

In addition, the County could not rely on a Categorical Exemption to CEQA because one exception provision is that a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances (CEQA Guidelines § 15300.2 (c)). The County could not rely on an addendum, because the proposed amendment would result in a new significant impact, or a substantial increase in the severity of previously identified significant impacts (CEQA Guidelines §§ 15162, 15163, 15164).

Consideration of Environmental Justice Impacts

Los Angeles County Board of Supervisors has voted unanimously to establish environmental justice as an official Board priority for Los Angeles County. While the CEQA guidelines do not include a requirement to evaluate for environmental justice impacts as of yet, the such effects are required under the National Environmental Policy Act in accordance with the 1993 Executive Order 12898 signed by President Clinton, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,* which directs federal agencies to: 1)identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law; 2) develop a strategy for implementing environmental justice; 3) promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation.[1]

This approach may be applied to the Inglewood Oil Field. The first step of the approach is to identify the presence of an environmental justice population in the vicinity of the Project site. In California, environmental justice populations are defined according to Senate Bill 535, which designates these populations are "disadvantaged communities." In the final designation description of disadvantaged communities published by CalEPA in May 2022 it is stated "CalEPA generally defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes."[2] Accordingly, Catalyst reviewed the CalEnviroScreen 4.0 to identify the presence or absence of disadvantaged communities in the vicinity of the Inglewood Oil Field. A screenshot of the CalEnviroScreen map is shown in figure 1 below. As depicted, the immediate residential areas surrounding the oil field are not designated at disadvantaged communities, but disadvantaged communities are mapped in the census tracts approximately 1 mile south and east of the field.

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[1] https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

[2] https://calepa.ca.gov/wp-content/uploads/sites/6/2022/05/Updated-Disadvantaged-Communities-Designation-DAC-May-2022-Eng.a.hp_-1.pdf

The next step in environmental justice impact analysis the determination of whether disadvantaged communities are *disproportionately* adversely affected by impacts of the Project (in this case, the continued operation of oil and gas production at the Inglewood Oil Field, and potential future drilling of new wells). As described above and in the September 25, 2023 technical memorandum prepared by Catalyst Environmental Solutions, the Inglewood Oil Field has operated in accordance with the Baldwin Hills Community Standards District since 2008. According to the EIR prepared for the Community Standards District, no significant and unavoidable impacts were identified. Further, in our review of the monitoring reports and data published in accordance with the Community Standards District since 2008, no adverse impacts to any of the resource categories considered under CEQA have occurred. Finally, in our review of both the Los Angeles County Department of Public Health study related to the field published in 2008 and the subsequent Human Health Risk Analysis prepared by MRS on behalf of the County for the Inglewood Oil Field, no adverse health impacts were identified related to operations at the field, up to a limit of 25 new wells drilled per year. Catalyst has also reviewed the data of emissions posted by the California Air Resources Board in accordance with the current ongoing Study of Air Pollution in Neighborhoods Near Petroleum Sources (SNAPS) program. In order review of the real-time emissions data posted, no exceedances of air emissions thresholds have occurred at either the upwind or downwind monitoring locations around the field.

Therefore, based on this data, it is unlikely that the identified disadvantaged communities east of the field would be disproportionately adversely affected by continued operations of the field.

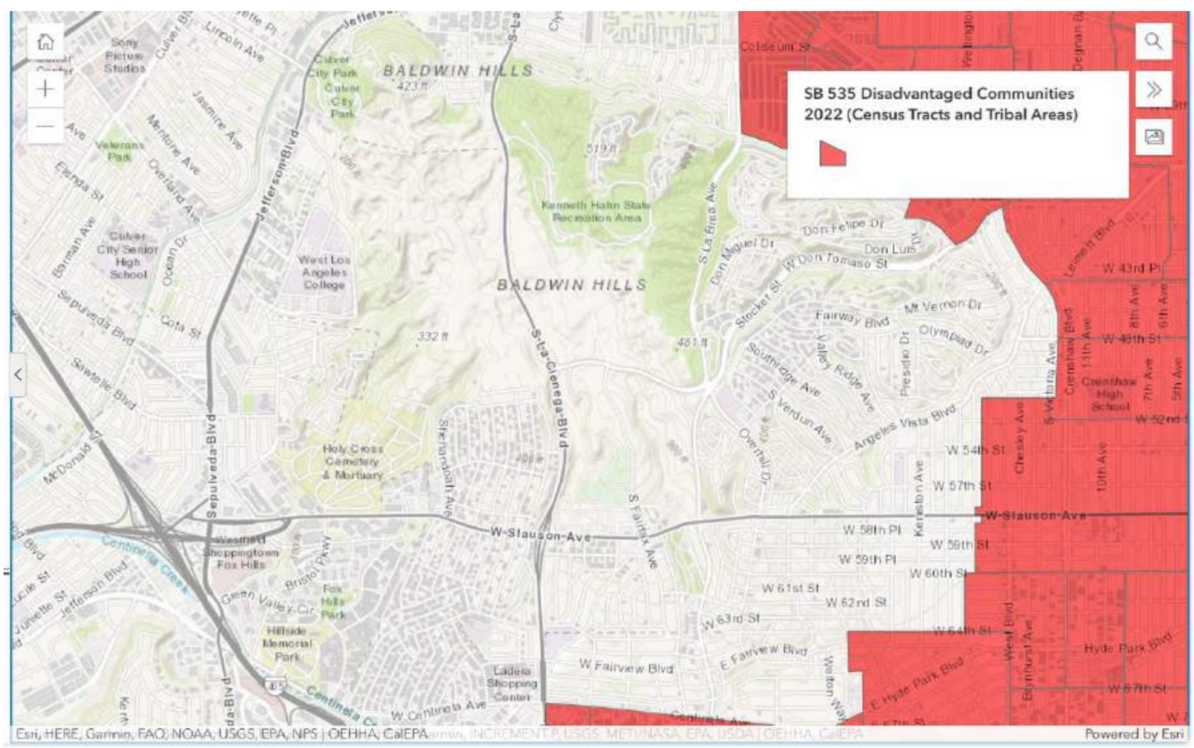

Figure 1. Screenshot of CalEnviroScreen 4.0 Map of Disadvantaged Communities Focused on the Inglewood Oil Field

In contrast, while domestic oil production in California has seen a decline, because of regulatory and legislative efforts, there has been an increase in oil imports. While Gov. Newsom announced that 25.5% of all new cars sold in California second quarter 2023 were zero-emission vehicles (ZEV), and since 2011, 1.6 million ZEVs have been sold in the State. However, even with the increased number of ZEV sales, the total number of ZEVs driving on California roads is miniscule compared to non-ZEV vehicles. In 2022, there were 31% more vehicles registered in California than in 2010 and year over year that increase consisted primarily of non-ZEV vehicles. Even if the current trend in ZEV car sales continues to increase at the same rate as it has since 2010 through to 2035 (when it will no longer be allowed to purchase a non-ZEV vehicle in California), only 6% of vehicles registered in California are expected to be ZEV. Therefore, demand for oil is not likely to decrease significantly in the coming years (Chart 1).

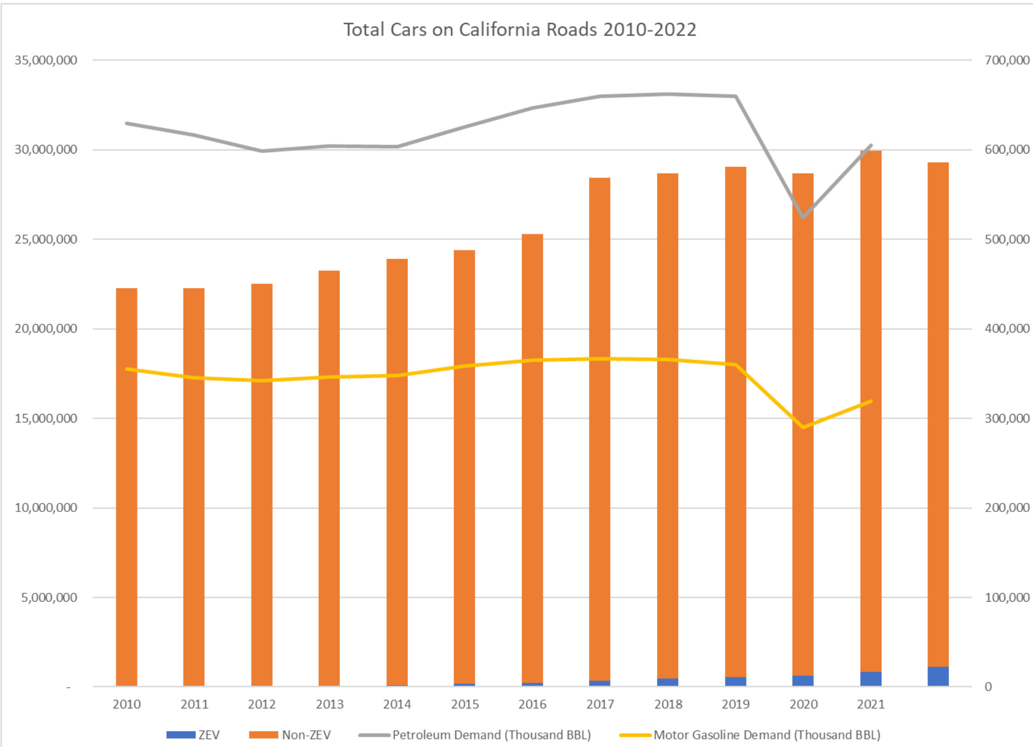

Chart 1. Total Cars on California Roads ZEV vs. Non-ZEV compared to Petroleum Deman 2010-2022

Every barrel of oil not produced in-state must be tankered into California to the Ports of Los Angeles and Long Beach to meet demand. There are no interstate pipelines that carry crude oil and railing and trucking oil is expensive and impractical. As a result, increased tankering of foreign oil is the inevitable result of any curtailment of in-state production. Californians consume over 1.8 million barrels of crude a day. Despite the state's efforts to transition to alternative fuels, oil consumption in California has not decreased[3]. Accordingly, since the data shows that demand is not decreasing, oil produced at the Inglewood Oil Field currently sent to the local refineries will need to be made up for by either production at other California fields, or imported via tanker to the Ports. According to the CalGEM WellSTAR data dashboard, average monthly production of crude oil at the Inglewood Oil Field in 2022 was 134,935 barrels.[4] According to the documentation associated with the Stanford produced OPGEE model which is used by the California Air Resources Board to calculate the carbon intensity of oil produced in California and imported into California from elsewhere, the standard tanker

[3] Energy Information Administration. 2023. State Energy Data System: Table CT3. Total End-Use Sector Energy Consumption Estimates, Selected Years, 1960-2021, California. Available online: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tx/use_tx_CA.html&sid=CA

[4] California Geologic Energy Management Division. 2024. WellSTAR data dashboard. Well Production. Available online at: Microsoft Power BI (powerbigov.us). Accessed January 17, 2024.

which delivers crude to California has a capacity of 22,500 tons.[5] This equates to 153,926 barrels of oil (1 ton equals 6.08 barrels of oil equivalent). Accordingly, if production of oil from Inglewood Oil Field is eliminated, it is reasonably foreseeable that this would result in an additional tanker of crude oil coming into the local ports each month.

The census tracts at the Ports and along the freeways which are used to transport products from the Ports to their ultimate destinations have been identified by CalEnviroscreen 4.0 as Senate Bill 535 Disadvantaged Communities as shown in the figure below. This is in direct contrast to the areas immediately surrounding the Inglewood Oil Field which are not identified as Senate Bill 535 Disadvantaged communities (Figure 2). Thus, it is reasonably foreseeable that an increase in tanker traffic at either Port as a result of decreased local production of oil, would disproportionately adversely affect a known disadvantaged community through increased emissions of criteria pollutants, which would be an environmental justice impact.

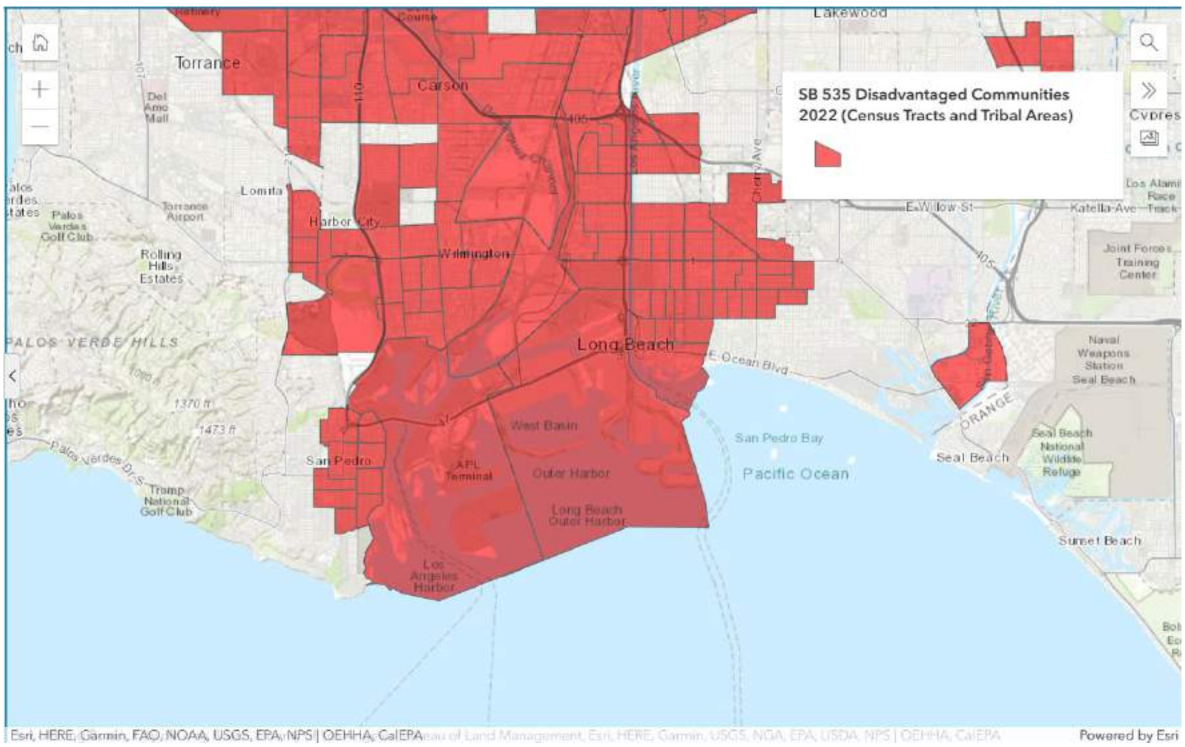

Figure 2. Screenshot of CalEnviroScreen 4.0 Map of Disadvantaged Communities Focused on the Ports of Long Beach and Los Angeles

Health Indicator Data

Note that the three most commonly referred to health issues evaluated with regard to oil and gas operations in California are cancer, low-birth weight, and respiratory ailments (e.g., asthma). For point of reference, Catalyst reviewed the current statistics for each of these issues in Los Angeles County. To determine cancer rates, Catalyst reviewed the Center for Disease Control, National Cancer Institute's State Cancer profiles[6]. As

[5] opgee_v3.0_methodology-3.pdf (stanford.edu)

[6] State Cancer Profiles > Incidence Rates Table (https://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=06&areatype=county&cancer=001&race=00&sex=0&age=001&stage=999&year=0&type=incd&sortVariableName=rate&sortOrder=default&output=0#results)

described on its website, the State Cancer profiles provide a table of incidence statistics for use in assessing the burden and risk for a major cancer site for the US overall and for states with cancer registries whose data have met the criteria required for inclusion in the US Cancer Statistics. The 95% Confidence Intervals for the rates provide a measure of how certain or uncertain the point estimate is and can be used to generally assess how different one rate is from another. The incidence rates tables provide data at a County level, and provide the latest 5-year average. Based on this table, the average cancer incidence rate (all cancers) in Los Angeles County between 2017 and 2022 is 376 people per 100,000 population, or a rate of 0.00376. CalEnviroScreen does not present any data related to cancer incidence at the census tract level, therefore, it is not possible to compare the county rates to the scoring statistics on the CalEnviroScreen database.

For information on birth statistics, Catalyst reviewed the March of Dimes, Peristats, State Summary for California, which provides data at the County level.[7] The data shows that in 2021 (the most recent year with data available), of the 96,216 babies born in Los Angeles County, 9,033 were pre-term (either moderately pre-term or very pre-term). This equates to an incidence rate of pre-term birth of 9.38%. We compared this statistic to the low-birth weight data provided at the census tract level in CalEnviroScreen 4.0 for the census tracts containing and immediately surrounding the Inglewood Oil Field. Note that the CalEnviroScreen data evaluates total live births between 2009 and 2015, so this is a rough comparison between the two data sources. However, the incidence rate of low-birth weight babies for all four census tracts during the period examined was lower than the incidence rate of Los Angeles County as a whole: census tract 6037703001 had an incidence rate of 5.61%, census tract 6037236000 had an incidence rate of 8.57%, census tract 6037702502 had an incidence rate of 4.55% and census tract 6037702600 had an incidence rate of 4.64%.

Finally, for information on respiratory ailments, Catalyst reviewed the California Department of Public Health, Environmental Health Investigations Branch, California Asthma Dashboard to view county-level data on asthma prevalence in Los Angeles County.[8] This provides the percentage of people in Los Angeles County ever diagnosed with asthma, by age group, as of 2020 (the most recent year with data available). Based on this, 12.8% of children (0-17 years of age) and 14.1% of seniors (over 65 years old) in Los Angeles County have been diagnosed with asthma at some point in their life. CalEnviroScreen data presented for asthma provides information at the census tract level for emergency room visits for asthma within the subject years (and does not indicate the number of people within the census tract who have been diagnosed with asthma), therefore it is not possible to directly compare the two data sets and reach a conclusion of relevance.

About Catalyst Environmental Solutions

Catalyst Environmental Solutions Corporation is full-service environmental consulting firm with extensive experience in the oil and gas industry, with staff experience dating back to 1994. We have worked extensively for oil and gas developers and with public agencies regulating oil and gas development, including Ventura County Planning Division.

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[7] Distribution of gestational age categories: Los Angeles county, 2021 | PeriStats | March of Dimes (https://www.marchofdimes.org/peristats/state-summaries/california?top=3&lev=1&stop=55&reg=99&sreg=06&creg=06037&obj=8&slev=6)

[8] California Breathing County Asthma Data Tool(https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHIB/CPE/Pages/CaliforniaBreathingCountyAsthmaProfiles.aspx)

Catalyst's President, Dr. Dan Tormey, advises all levels of government in California on concerns related to oil and gas issues, including the Governor and California Legislature, the Coastal Commission, and local governments. He was on the Steering Committee for the California Council on Science and Technology (CCST) study on hydraulic fracturing in California; he was appointed by the Department of Conservation to the recently formed Underground Injection Control Independent Review Panel (CalEPA SB 83); and he was selected as a peer reviewer for the CCST study on water use in oil and gas operations in California. Catalyst's Director of Regulatory Compliance and Permitting, Ms. Megan Schwartz, works through industry groups to support federal, state, and local government and oil producers as they navigate the evolving regulatory and transparency landscape in the oil and gas industry.

In addition, our staff supported Plains Exploration and Production as the applicant's consultant preparing technical resource studies to support the Baldwin Hills CSD EIR through Los Angeles County. We also supported Plains Exploration and Production in development of technical studies and compliance plans for the Montebello Hills Specific Plan EIR, a plan to restructure the oil field into 6 concentrated oil islands at the edges of the field, and redevelopment the center of the field into mixed use residential and commercial area. Our staff prepared the Remedial Action Plan that is currently being implemented at the field, concurrent with development of a residential community on the former oil field property.

APPENDIX 6

Correspondence from Cone to the Regional Planning Commission dated September 29, 2008

pillsbury

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September 29, 2008

Commissioner Leslie G. Bellamy
Commissioner Harold V. Helsley
Commissioner Pat Modugno
Commissioner Wayne Rew
Commissioner Esther L. Valadez
Regional Planning Commission
County of Los Angeles
170 Hall of Records
320 West Temple Street
Los Angeles, California 90012

Re: Comments to County of Los Angeles' Working Draft Baldwin Hills Community Standards District Version 3

Commissioners:

We represent the Cone Fee Trust ("Trust"), which owns land in the Inglewood Oil Field. The purpose of this letter is to object to the County of Los Angeles' Working Draft Baldwin Hills Community Standards District Version 3 (the "Draft CSD") and to provide comments in advance of the October 1, 2008 Regional Planning Commission Public Hearing. As the representative of a landowner impacted by the proposed CSD, we express our concern that the Draft CSD process is a legally objectionable taking of real property in violation of California law. These comments supplement those previously provided orally and in writing by Plains Exploration and Production Company ("PXP"), Peter Hoss, Liz Goznell, and other landowners at prior hearings on this matter.

Our specific objections and comments are as follows:

1. <u>Provisions of the Draft CSD that the Inglewood Oil Field will be Restored to Park Condition and Become a Park is an Act of Inverse Condemnation</u>. As part of the CSD development process, there have been numerous comments and

statements from interested parties that the land will, following the cessation of oil operations, become a park. In several instances, these comments have been made by individuals, such as Mr. David McNeill, a state employee. Any pronouncements on behalf of the State of California, the County of Los Angeles, or other interested groups that the Inglewood Oil Field will be a park are improper. Activities such as (1) public activities announcing an intention to convert or acquire the land and the Inglewood Oil Field as a park, coupled with (2) specific regulatory actions, as contained in the Draft CSD that actively restrict or provide for restoration of the land to park use without compensation and impose impermissible exactions for that purpose, go beyond planning and constitute a taking.

This approach violates basic principles of constitutional and land use law. In *Nollan v. California Coastal Commission* (1987) 483 U.S. 825, the U.S. Supreme Court declared unconstitutional a policy of the California Coastal Commission of exacting easements for the public to pass over coastal properties as a condition of ordinary land use approvals, in that case remodeling of a beach front bungalow. The Coastal Commission's attempt to justify the exaction on the ground that it was part of the comprehensive program to provide beach access violated the Takings Clause of the Fifth Amendment of the U.S. Constitution. While the state could realize its policy goals by exercising its eminent domain power and paying for the access easements, it could not compel the landowner to contribute to the realization of that policy goal. 483 U.S. at 842. This parallels the process that has lead to the Draft CSD. In parallel with studies and plans for a park, provisions of the Draft CSD compel the landowner to contribute to restoration for uses of park to the exclusion of other land uses consistent with applicable zoning. In *Dolan v. City of Tigard* (1994) 512 U.S. 374, the U.S. Supreme Court declared unconstitutional a city planning commissions attempt to obtain a dedication of land for a public greenway along a creek and pedestrian bicycle pathway as exactions for a commercial use. The court concluded that there had been an uncompensated taking of the property under the Fifth Amendment because these exactions lacked the appropriate nexus to the proposed commercial use. Here, the restoration and other provisions contained in the Draft CSD are clearly preparatory to acquisition of land for a park and exceed any reasonable relationship with any proposed oil and gas extraction or existing activity on the land.

To the extent that representatives of the State and County comment on and advocate for the Draft CSD, those representatives are involved in and are advocating an inverse condemnation. *Klopping v. City of Whittier (1972) 8 Cal.3d 39.* Public announcements that the land will be used as a park are devaluing our client's lands. The Draft CSD will restrict our client's right to use its land as it chooses when the oil and gas is depleted. Announcements by governmental representatives that the

Inglewood Oil Field will be converted from an oil field to a park, prior to the filing of an eminent domain action or offer to purchase the land supported by available funds, will have the effect of devaluing the Trust's Land. Such announcements, discussions or other habitual references reflecting the intention of the Baldwin Hills Conservancy or other governmental agency to "turn the Inglewood Oil Field into a park" will result in damage to our client.

The Draft CSD will require our client's land and the Inglewood Oil Field to be converted to park habitat prior to any payment to the Owners for the land, and the ultimate use will be restricted to a park. The County's pronouncements to date have resulted in numerous persons appearing at public hearings and indicating their assumption that the Inglewood Oil Field will become a park and supporting the Revegetation and Restoration Regulations. To the extent that the fair market value of the land and the Inglewood Oil Field is based upon its use for a park rather than for a more valuable use, the devaluation will be directly attributable to the regulations requiring the conversion of the land to a park. Attempts to incorporate the Baldwin Hills Park Master Plan ("BHPMP") or the substantive provisions of the BHPMP, which contemplate revegetation and biological restoration and other actions to establish a park physically on the Inglewood Oil Field, into the Draft CSD, constitute inverse condemnation.

2. The Baldwin Hills Park Master Plan is Not Law. Despite the fact that the BHPMP is not law, has not been adopted by any governmental or quasi-governmental agency as law, and is merely a vision on the part of an organization to attempt to plan a park for the Baldwin Hills area on private property, it is cited throughout the Draft CSD. As the owner of a portion of the land in the Baldwin Hills, our client has never endorsed the implementation of the BHPMP while the land is being used for oil and gas production, nor has it entered into any agreement or implied agreement with regard to the use of the Trust's land in the Baldwin Hills for a park. The Trust has consistently refused to entertain any proposal to sell the land and the minerals at any price while it is in oil and gas production. No eminent domain action has been filed. It is apparent with the current economic climate that no governmental agency has funds available to purchase the Inglewood Oil Field, including the land and minerals, let alone maintain it as a park.

3. The Draft CSD Exceeds the Regulatory Authority of the County. The Draft CSD is rife with numerous imposed regulations beyond the authority of the County. As a creature of statute, the County is only vested with those responsibilities granted to under the California Government Code. The County itself does not have police power authorities to regulate activities on within the confines of the County. For example, the Draft CSD contains improper regulations relating to Air Quality and

Public Health (Section E.2) and Safety and Risk of Upset (Section E.3). These provisions ostensibly seek to regulate air quality and oil field operations in a manner that is beyond County authority and impedes upon the authority of the South Coast Air Quality Management District. In effect the actions of the County in attempting to regulate air quality at the site is both "preempted" by existing state regulation but is also beyond the County's jurisdiction. Additional examples of these improper extension of County authority also include many other elements of Section E (Oil Field Development Standards) including Subsections E.7 (Biological Resources), E.8 (Cultural/Historic Resources), E.10 (Landscaping, Visual Screening and Irrigation), E.19 (Groundwater Monitoring), E.22 (Oil field Cleanup and Maintenance), E.27 (Drilling, Redrilling and Reworking Operations), E.28 (Processing Operations), E.29 (Well Reworking Operations), E.31 (Well and Production Reporting), E.32-37 (All relating to Idle Well and Well Abandonment Procedures).

4. <u>Encumbering the Land with Revegetation and Biological Restoration Regulations Devalues the Land and Constitutes Inverse Condemnation</u>. The Los Angeles County Department of Regional Planning staff's drafts of the Baldwin Hills Community Services District for the Inglewood Oil Field, Versions 1 and 2, are highly objectionable. Version 1 adopted the BHPMP and Version 2 continues the substantive requirements of the BHPMP despite the deletion of the reference to the BHPMP by name. This same error continues in the Draft CSD. This includes regulations that require the Operator and Owners of the Inglewood Oil Field, currently and at all times in the future, including when the oil and gas is depleted from the Inglewood Oil Field, to comply with the "Biological Resources" provisions in the Draft CSDs. Those regulations include, but are not limited to: requirements to revegetate, biologically restore, monitor, study, survey and protect special species, habitat, wildlife, native plants and endangered species, provide wildlife corridors and links, lizard fencing, training for employees in archeological education, hiring an archeologist and biologist, and extensive, burdensome landscaping requirements throughout the Inglewood Oil Field land ("Revegetation and Restoration Regulations"). The Revegetation and Restoration Regulations appear to be directly from the BHPMP. The CSD Revegetation and Restoration Regulations constitute a present taking of the land in violation of article I, section 19 of the California Constitution (California's takings provision) and the Fifth Amendment of the United States Constitution. To the extent the Revegatation and Restoration Regulations are imposed prior to any payment for the Land, they will devalue the Land, now and in the future. The CSD could have the result of precluding any use of the land other than for park purposes, for various reasons. As a result, the Revegetation and Restoration Regulations constitute an act of condemnation by precluding the Owners from realizing the value of their land at its highest and best use, which can not be assumed to be a park, now or in the future, including when the oil and gas has been

depleted. The actions of the County in requiring conversion of the land to a park as reflected in the Draft CSD, prior to paying any consideration, is an inverse condemnation--a taking without compensation. *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922).

Accordingly, we respectfully urge rejection of the Draft CAO .

Very truly yours,

Scott A. Sommer

cc: Russell Fricano
Elaine Lemke, Esq.

ALSTON & BIRD

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May 13, 2024

County of Los Angeles Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

Re: Comments on Proposed Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2); Board of Supervisors Meeting, Item No. 3, May 14, 2024

Dear Board of Supervisors:

On behalf of Sentinel Peak Resources California LLC, the operator of the Baldwin Hills oil field, we re-submit (1) a letter dated January 29, 2024 submitted in connection with the previously-scheduled hearing before the Board of Supervisors, and (2) a letter dated September 27, 2023, submitted to the Department of Regional Planning, both discussing the legal and factual reasons why the proposed amendment to the Baldwin Hills Community Standards District is improper and unnecessary.[1]

As explained previously in these letters, we urge the Board to reject the proposed amendment to the Baldwin Hills Community Standards District.

Sincerely,

Matt Wickersham

Attorney for Sentinel Peak Resources California LLC

Enclosures

[1] Given the file size constraints on submitting comments electronically, we have attached excerpts of the supporting materials cited in the attached letters. We request that the administrative record include complete versions of the cited references as available on the functioning website links provided in the attached comment letters.

SENTINEL PEAK
RESOURCES

5640 South Fairfax Avenue
Los Angeles, CA 90056

September 27, 2023

Los Angeles County Department of Regional Planning
320 West Temple Street, 13th Floor
Los Angeles, CA 90012
Attn: Edgar de la Torre
Comment@planning.lacounty.gov

RE: 2023 PROPOSED AMENDMENT
BALDWIN HILLS COMMUNITY STANDARDS DISTRICT
REGIONAL PLANNING COMMISSION, OCTOBER 4, 2023 AGENDA ITEM (PRJ2023-001628)

Dear Edgar,

The purpose of this Issue Paper is to address and provide the Los Angeles County Planning Commission with practical information concerning the Inglewood Oil Field (IOF) and its operation that may not have been adequately covered in the previous hearing or informational question and answer session.

The IOF produces and sells crude oil, natural gas, and propane. Produced water is filtered, treated, and reinjected back into the original formations. In general, an oil/water/gas mixture is pumped from oil-bearing formations and processed through a gas plant, various tank systems, and a water plant. These systems along with the oil production wells and water injector wells are all under vapor recovery to prevent emissions from escaping to the atmosphere.

Other supporting operations include the following:

- Use of maintenance and workover rigs to maintain existing injection and production wells. Each rig utilizes a diesel engine equipped with the most advanced Tier IV or V particulate exhaust filters.

- An emergency fire pump powered by diesel, and a heater for crude oil and a backup emergency generator to run pertinent equipment pieces in case of an electrical outage, both which utilize treated, clean natural gas for fuel.

- All other onsite process equipment is electrically powered to minimize onsite emissions.

Sentinel Peak Resources maintains its process equipment to consistently comply with local agency requirements through our air quality permits and onsite safety and risk management. This has been monitored and reported through independent health assessments and air quality studies with repeatedly proven and positive outcomes.

Health Studies

Since 2008, four health studies have been conducted specific to the IOF. As identified below, two were Health Risk Assessments (HRAs); one was an air quality study, which included HRA calculations; and one was a health assessment by LA County Dept of Public Health (DPH). DPH is also in the process of conducting an updated health assessment.

a. **2008 HRA.** This is the original baseline HRA. It is associated with and contained in the EIR and is posted on the Baldwin Hills CSD – LA County Planning website.[1]

b. **2011 DPH Health Study** "Inglewood Oil Field Communities Health Assessment (February 2011)": InglewoodOilField ReportCombinedwAppendix.pdf (lacounty.gov)

c. **2015 "Baldwin Hills Air Quality Study"** (113 pages) includes HRA calculations: Baldwin Hills Final Report (lacounty.gov).

d. **2020 HRA.** Inglewood Oil Field Health Risk Assessment Report: https://planning.lacounty.gov/wp-content/uploads/2022/10/bh health-risk-assessment-report.pdf

The table below provides the overall summary results for each completed HRA.

Criteria Description	Threshold Value	2008 HRA	2015 HRA[2]	2020 HRA
Cancer risk per million	10	8.18	6.7	5.2
Chronic risk, health index	1	0.021	<0.2	0.06
Acute risk, health risk	1	0.96	<1	0.48

All HRAs followed the most updated protocol(s) and guidance documents of the California Office of Health Hazard Assessment (OEHHA). Also, each was reviewed by the South Coast Air Quality Management District (SCAQMD) for comment and accuracy. All results for cancer, chronic, and acute health risks were below thresholds warranting no further assessment or measures to reduce risks. The 2015 and 2020 studies utilized two different methods (the first by direct measurement and the second by collected/reported data). Both had similar outcomes.

No HRA calculations were provided in the DPH 2011 health study; however, the report summary and conclusions indicated no significant differences were identified between the results of the four health parameters studied near the IOF and outside of the IOF. The four health parameters included: mortality, low-birth-weight births, birth defects, and cancer.

[1] Select the "Background" tab on the main website (Baldwin Hills CSD - LA County Planning) and scroll down to "Final EIR Documents". Then click on "Baldwin Hill CSD Final EIR" and the "Baldwin Hill CSD Final EIR – Appendices." These links provide the zip files for download. After downloading, the "Inglewood Oil Field Baseline Health Risk Assessment," the HRA writeup is found in Section 4.3.1.4. Supporting calculations are provided in the second zip file, which are appendices b, c, and d.

[2] HRA calculations were conducted as part of the air study.

For comparative purposes, the results of the SCAQMD's Multiple Air Toxics Exposure Studies (MATES) are provided for the Los Angeles Basin and include total risk from all air pollution sources including mobile sources (i.e., not specific to any single source or industry). Cancer, chronic, and acute risks for each HRA are listed below together with corresponding State threshold levels. Levels above State thresholds are subject to regulatory measures to further minimize health risks; levels below State thresholds are not. For further details, please check the links to each HRA and MATES.

Criteria Description	Threshold Value	2008 MATES III	2015 MATES IV	2021 MATES V
Cancer risk per million	10	853	897	424
Chronic risk, health index	1	12.6	6.25	6.1
Acute risk, health risk	1	N/A	N/A	N/A

The cancer risk outcomes of the MATES study areas are provided on the enclosed exhibit. An outline of the IOF is imposed on the exhibit. Cancer risk outcomes per million range from 459-624 in the areas around the IOF. The contribution by the IOF was estimated to be 5.2 (or, approximately 1%) based on the most recent HRA. Because the IOF is operated nearly 100% by electricity, limited air emissions are produced. The IOF also has full time monitoring to immediately commence repairs to any detected leaks.

SCAQMD Permits and Rule Requirements

Based on the IOF's limited air emissions, it is not part of SCAQMD's or California Air Resources Board's (CARB) listed Air Toxics 'Hot Spots' Program (AB 2588). Also, because the IOF does not exceed the threshold for Green House Gas (GHG) emissions, we must only conduct and submit informal reporting to the SCAQMD and CARB.

The State of California has the strictest oil production-related health and safety standards in the nation. Over 20 government agencies oversee oil and gas operations in California and our company. SPR complies with a myriad of air quality requirements via the SCAQMD and CARB. Primary requirements have been established and enforced by the SCAQMD. The following is a short list of those requirements and a general means on how SPR complies, which further supports why air emissions are controlled and limited:

- **Facility Permit to Operate**. An extensive permit with conditions for operating more than 319 equipment pieces. Conditions include testing of tanks, diagnostic and source testing of process equipment. This includes monthly, quarterly, and annual monitoring reporting of emissions.

- **Leak Detection and Repair (LDAR)**. As required by SCAQMD Rules 1148.1, 1173, and 1176, SPR is required to monitor production wells and process equipment components such as valves, pipe connections, fittings, compressors and so forth, on a quarterly basis (at minimum) and report the findings to SCAQMD. Each rule is intended to control volatile organic compound (VOC) leaks from components. This is completed through a certified third-party contractor who utilizes toxic vapor analyzers (TVAs) as required. This comprises 88,419 different test points for the complete field that are again assessed and reported each quarter. On average, about 0.085% components may have to be addressed/repaired, which are typically corrected in less than one workday.

- **Tank Storage Integrity.** The purpose of SCAQMD Rule 463 is to reduce emissions of VOCs (including methane) from the storage of organic liquids including crude oil.

Gas Plant Process Safety and Risk Management

SPR's history shows that we have exceptional compliance with OSHA Process Safety Management (PSM), Risk Management Plan (RMP) and Cal-OHSA's Cal-AARP requirements as well as required PSM/RMP Process Hazards Analysis (PHAs) of the gas plant system. Audits by third-party Certified Safety Professionals (CSPs) are conducted every three to five years. An audit was conducted in just the past two months, showing that gas plant operations are in substantial compliance. As noted in the PSM/RMP report, "the auditors noted that the facility is at a very mature point in terms of compliance with PSM/RMP. Programs have been in place now for over twenty years.

Complaints

As required by the CSD, a 1-800 number is available for the public to call in complaints concerning odors, dust, noise, property damage, or other categories. Complaints are addressed in a systematic, structured manner for consistency and objectivity. SPR contacts the complainant within minutes, usually less than 10, after a complaint is called in. Quarterly summaries are provided to the Los Angeles County Dept of Regional Planning and reviewed at the monthly Community Advisory Panel (CAP) meetings. Since 2017 when SPR became the operator of the IOF, a total of 189 complaints have been received; of which a total of 14 were attributed to IOF (7 for odor and 7 for noise). All 14 issues were immediately addressed. The remaining complaints (93.7%) could not be related to oil field operations.

Geotechnical Concerns

The Inglewood-Newport fault line runs through midst of the IOF. SPR conducts extensive ground movement surveys and provides an annual report of ground movement and an evaluation of possible causes. The amount of movement observed in the IOF is small and not unique. Also, SPR operates a balanced waterflood meaning produced fluids and injected fluids are approximately equal.

As required by the CSD, the IOF maintains an accelerometer to determine ground accelerations because of any local seismic event and this is monitored on the USGS website anytime a regional seismic event occurs. If a ground acceleration exceeds 13 percent of gravity, and as specified in the CSD, SPR is to temporarily cease operations, inspect pertinent facility integrity, and notify the LA County DRP. Since SPR has been the operator, no ground acceleration exceedances have occurred.

In the event of a substantial earthquake or similar event, please note that the IOF has an updated Spill Prevention, Countermeasures, and Contingency (SPCC) Plan as certified by a third-party professional engineer. The IOF has sufficient secondary containment for tank systems and additionally has retention basins throughout the IOF to contain spills in addition to the secondary containment structures.

Public Outreach

Since the establishment of the CSD, the operator, and now SPR:

- Provides a 1-800 number (our Map Mobile system) to the community to call in complaints or concerns about noise, odors, dust, property damage, etc.

- Attends and participates in monthly CAP meetings. At the meetings, an operator update is provided, and we assist in addressing questions from the CAP members and public concerning periodic submittals or other events that will or may have transpired between CAP meetings.

- Attends and interfaces with the community at annual local community meetings typically held in October.

- Uploads to the IOF and BHCSD websites for all submitted documents including plans and reports and the complaint process for public access, as required by the CSD.

Hopefully, the information contained herein provides a better sense of the operations and the diligence and concern for public safety with which SPR operates the IOF. The proposed CSD amendment is not necessary and should be rejected.

Respectfully,

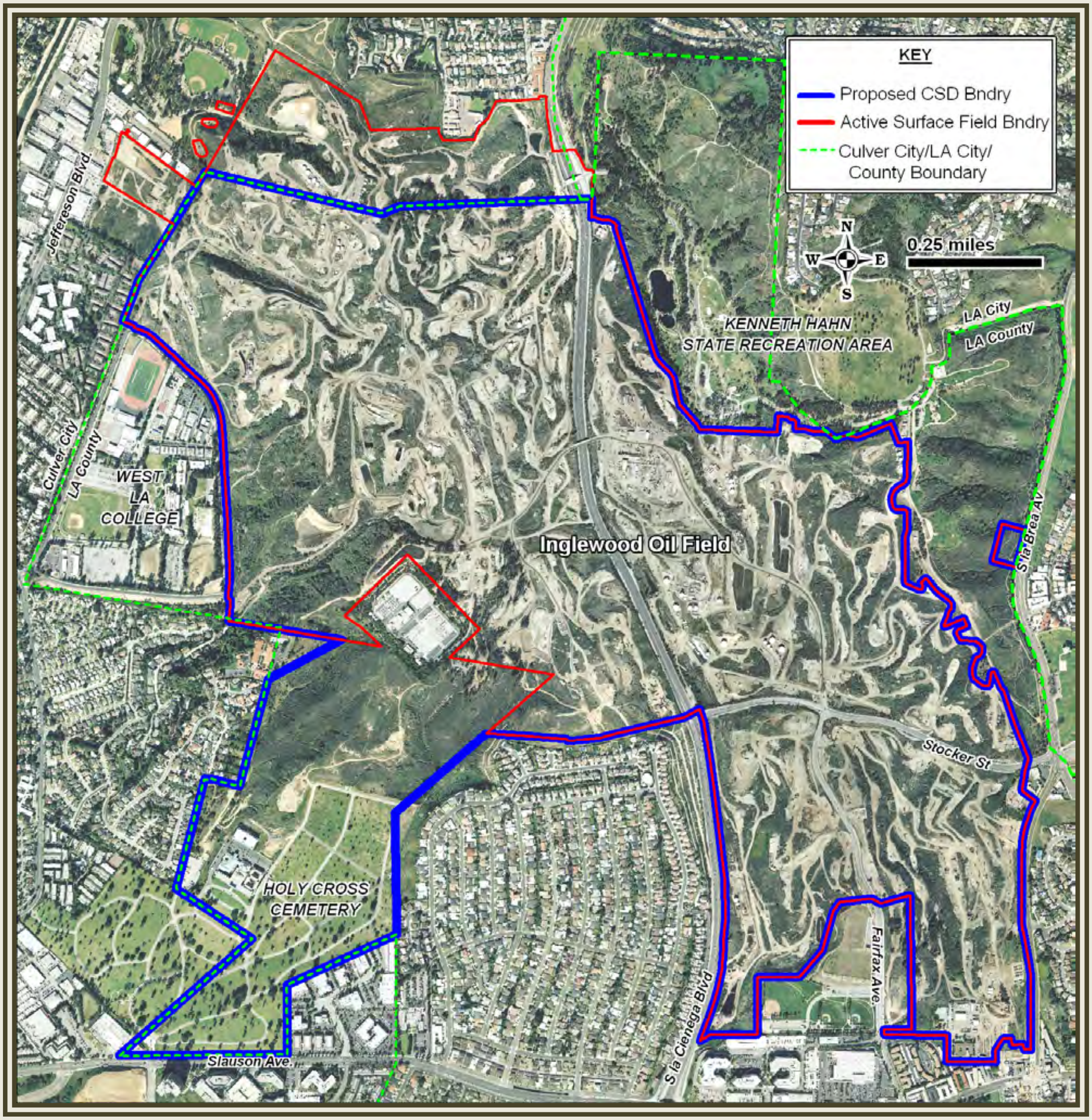
Daniel D. Taimuty
EH&S Manager
Sentinel Peak Resources California, LLC

Excerpt of reference cited at point a. and footnote 1 to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://case.planning.lacounty.gov/baldwinhills/background

Final Environmental Impact Report

Baldwin Hills Community Standards District



October 2008

SCH# 2007061133
County Project # R2007-00570
Environmental Case # RENVT2007-00048

Prepared For:
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Prepared By:
mrs
Marine Research Specialists

4.3 Public Health Risk

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The major sources of toxic emissions from the Inglewood Oil Field are airborne from the sources discussed above. The purpose of this public health analysis is to determine whether a significant health risk would result from public continued exposure to these fugitive emissions and combustion by-products as routinely emitted during project operations.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants, which have been addressed in the Air Quality Section (Section 4.2). This section of the EIR provides information on the baseline air toxic emissions from the Inglewood Oil Field and addresses the potential for increased air toxic emissions associated with the potential future development. Based upon the analysis of the potential future development, recommendations are made to enhance the proposed CSD.

4.3.1 Environmental Setting

The potential development is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which encompasses an area of 10,473 square miles (referred to hereafter as the district), consisting of the four county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin and the Mojave Desert Air Basin. The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air basin is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. Information on regional meteorological conditions is provided in Section 4.2.1.

4.3.1.1 Regional Health Risks from Toxic Air Contaminants

The Multiple Air Toxics Exposure Study III (MATES III) is a monitoring and evaluation study conducted in the South Coast Air Basin by the SCAQMD (2008). The MATES III Study consists of several elements. These include a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize risk across the South Coast Air Basin. The study focuses on the carcinogenic risk from exposure to air toxics. Excerpts from the MATES III study are included below to provide an overview of regional health risk assessment issues.

A network of 10 fixed sites was used to monitor toxic air contaminants once every three days for two years. The location of the sites was the same as in the previous MATES II Study to provide comparisons over time.

The initial scope of the monitoring was for a one-year period from April, 2004 through March, 2005. Due to the heavy rains in the South Coast Air Basin in the fall and winter of this period, there was concern that the measurements may not be reflective of typical meteorology. The study was thus extended for a second year from April, 2005 through March, 2006.

In addition to the fixed sites, five additional locations were monitored for periods of several months using moveable monitoring platforms. These microscale sites were chosen to determine if there were gradients between communities that would not be picked up by the fixed locations.

The study also included an update of the toxics emissions inventories for the South Coast Air Basin and computer modeling to estimate toxics levels throughout the basin. This allows estimates of air toxics risks in all areas of the South Coast Air Basin, as it is not feasible to conduct monitoring in all areas.

The monitored and modeled concentrations of air toxics were then used to estimate the carcinogenic risks from exposure. Annual average concentrations were used to estimate a lifetime risk from exposure to these levels, consistent with guidelines established by the Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency (EPA). The cancer risk is referred to as the excess cancer risk, or the risk associated with exposure to toxic air contaminants, and are generally a small fraction of the overall cancer risk from all contributing factors combined such as dietary exposure or hereditary factors.

The carcinogenic risk from air toxics in the South Coast Air Basin based on the average concentrations at the fixed monitoring sites is about 1,200 excess cancer cases per million. This risk refers to the expected number of additional cancers in a population of one million individuals that is exposed over a 70 year lifetime. The risk at the fixed sites ranged from 870 to 1,400 per million. For comparison purposes, the SCAQMD considers the risk of a project to be significant if the carcinogenic risk exceeds 10 excess cancer cases per million. Thus, the baseline carcinogenic risk resulting from routine exposure to air toxics in the South Coast Air Basin is substantial.

Compared to previous studies of air toxics in the South Coast Air Basin, this study found a decreasing risk for air toxics exposure, with the population weighted risk down by 17% from the analysis in MATES II. While there has been improvement in air quality regarding air toxics, the risks are still unacceptable and are higher near sources of emissions such as ports and transportation corridors.

Diesel particulate continues to dominate the risk from air toxics, and the portion of air toxic risk attributable to diesel exhaust is increased compared to the MATES II Study. The highest risks are found near the port area, an area near central Los Angeles, and near transportation corridors. The results from this study underscore that a continued focus on reduction of toxic emissions, particularly from diesel engines, is needed to reduce air toxics exposure.

The MATES III health risk assessment results are provided in Figure 4.3-1. The location of the Inglewood Oil Field is also shown as a point of reference. This figure indicated that the modeled baseline health risk in the vicinity of the Inglewood Oil Field is in the 600-800 excess cancer cases per million individuals exposed, which is considerably higher than levels that are considered acceptable, which are approximately 10 excess cancer cases per million individuals exposed. The relative risk from the Inglewood Oil Field, or what might be considered the contribution from this facility to the greater regional health risk, are summarized in Section 4.3.1.3.

4.3.1.2 Regional Toxic Air Contaminant Concentrations

A toxic air contaminant is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. Toxic air contaminants are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those toxic air contaminants that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

In 1987, the California legislature adopted the Air Toxics “Hot Spots” Information and Assessment Act (or AB 2588). AB 2588 requires facilities to submit an air-toxics-inventory report from which priority scores are calculated. Facilities with a priority score exceeding specific thresholds must provide health risk analysis. If the risk reported in the health risk analysis exceeds specific thresholds, then the facility is required to provide public notice to the affected community. In 1992, the California legislature added a risk reduction component, the Facility Air Toxic Contaminant Risk Audit and Reduction Plan (or SB 1731), which required the District to specify a significant risk level, above which risk reduction would be required. The District began to implement the AB 2588 program beginning in 1988.

Monitoring for toxic air contaminants is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. California Air Resources Board (CARB) conducts air monitoring for a number of toxic air contaminants various locations throughout California. The closest CARB toxic air contaminant monitoring location is the North Long Beach site. Table 4.3.1 presents the Annual Toxics Summary for North Long Beach, the maximum concentration data for volatile organic compounds, polycyclic aromatic hydrocarbons and inorganic compounds. The data for volatile organic compounds are for the year 2005; for polycyclic aromatic hydrocarbons the year is 2004; and for all inorganic compounds the data are for the year 2003 except for hexavalent chromium, which is from 2005, the most recent data available from CARB on toxic air contaminants.

Figure 4.3-1 SCAQMD MATES III Modeled Health Risk Assessment

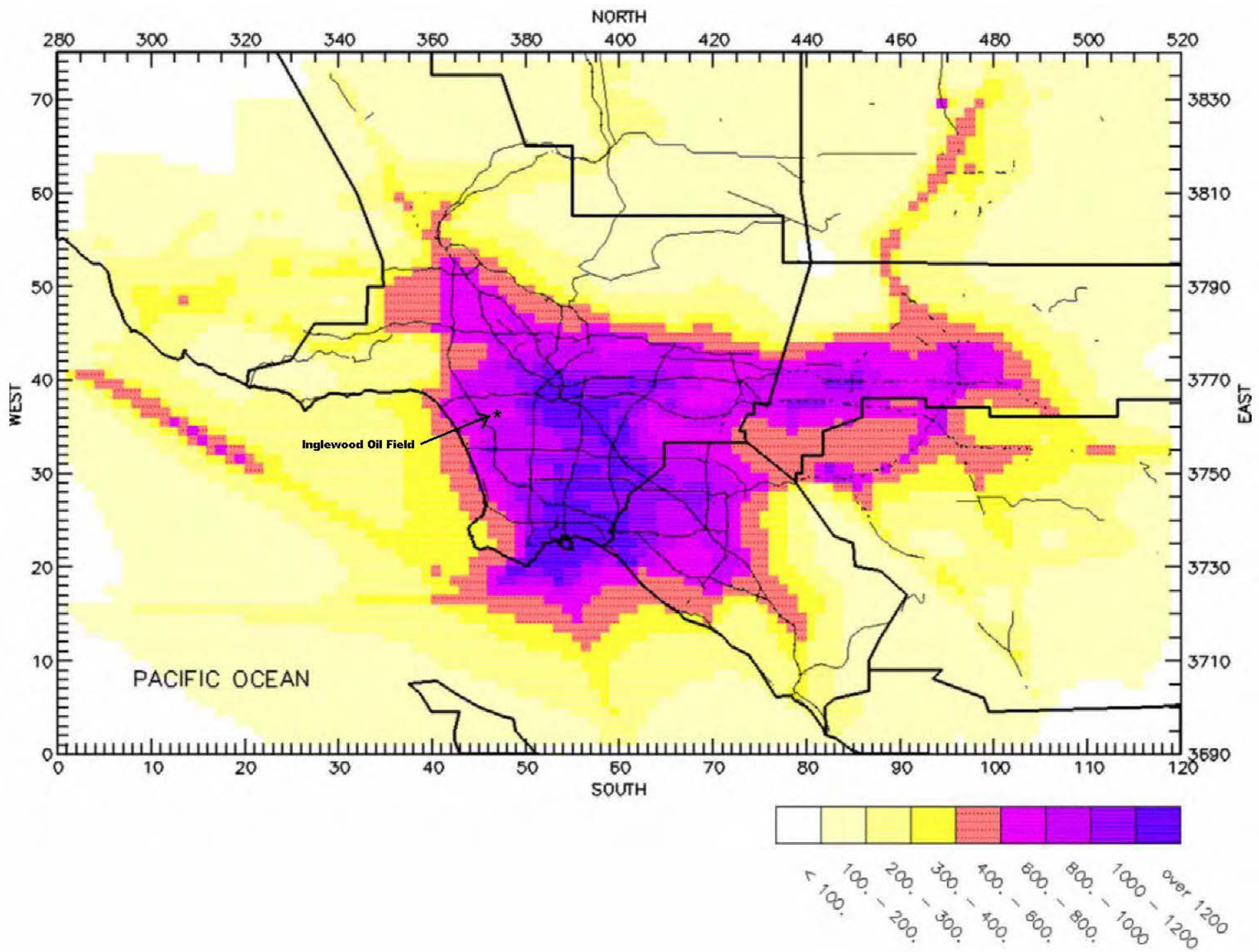


Table 4.3.1 Annual Toxics Summary for North Long Beach

Pollutant	Maximum Concentration	Pollutant	Maximum Concentration
Volatile Organic Compounds [1] (parts per billion by volume)			
Acetaldehyde	2.6	Ethyl Benzene	0.6
Acetone	20	Formaldehyde	6.1
Acetonitrile	2.3	Methyl Bromide	0.12
Acrolein	0.9	Methyl Chloroform	0.05
Acrylonitrile	0.9	Methyl Ethyl Ketone	0.2
Benzene	1.6	Methyl tertiary - Butyl Ether	*
1,3 – Butadiene	0.56	Methylene Chloride	2.4
Carbon Disulfide	1.1	Perchloroethylene	0.18
Carbon Tetrachloride	*	Styrene	0.7
Chloroform	0.06	Toluene	4.7
o – Dichlorobenzene	0.15	Trichloroethylene	0.18
p – Dichlorobenzene	0.15	meta/para – Xylene	2.4
cis – 1,3 – Dichloropropene	0.05	Ortho – Xylene	0.8
trans – 1,3 – Dichloropropene	0.05		
Polycyclic Aromatic Hydrocarbons (2) (nanograms per cubic meter)			
Benzo(a)pyrene	0.61	Benzo(k)fluoranthene	0.19
Benzo(b)fluoranthene	0.51	Dibenz(a,h)anthracene	0.18
Benzo(g,h,i)perylene	1.7	Indeno(1,2,3-cd)pyrene	0.64
Inorganic compounds (3) (nanograms per cubic meter)			
Aluminum	1700	Nickel	9
Antimony	3	Phosphorous	35
Barium	56	Potassium	890
Bromine	9	Rubidium	4
Calcium	2,300	Selenium	1
Chlorine	2,000	Silicon	5,600
Chromium	6	Strontium	24
Cobalt	7.5	Sulfur	1,300
Copper	36	Tin	2.5
Hexavalent Chromium [4]	0.12	Titanium	140
Iron	1,600	Uranium	1.5
Lead	12	Vanadium	23
Manganese	33	Yttrium	2
Mercury	1.5	Zinc	110
Molybdenum	1	Zirconium	7

Source: CARB website: http://www.arb.ca.gov/adam/toxics/sitesubstance.html
[1] Data for VOCs are for the year 2005.
[2] Data for PAHs are for the year 2004.
[3] Data for inorganic compounds are for the year 2003, except for hexavalent chromium.
[4] Data for hexavalent chromium are for the year 2005.
(*) Means there was insufficient or no data available to determine the value.

4.3.1.3 Inglewood Oil Field Toxic Emissions

Operational Emissions

Table 4.3.2 shows the toxic air contaminant emissions from the Inglewood Oil Field as reflected in the Annual Emissions Report (AER) documents submitted to the SCAQMD.

Toxic emissions of benzene are primarily associated with fugitive emissions from the tanks and components. Toxic emissions of the remaining pollutants are associated with combustion (the flare and the internal combustion engines).

The use of drilling and workover diesel engines also contributes to the facility toxic emissions. These emissions are a function of the number of wells drilled per year and the number of well workovers per year. Information of well drilling, pad grading and well workovers from the year 2007 were used in the analysis. Emissions associated with well drilling, pad grading and well workovers are shown in Table 4.3.2 also. The well drilling, grading and well workovers utilize diesel engines which contribute the majority of the toxic air contaminant metal emissions, polycyclic aromatic hydrocarbons, acetaldehydes and the diesel particulate to the field-wide toxic air contaminant emissions.

Soil Vapor Emissions

Between September 24 and October 26, 2007, GeoScience Analytical, Inc. personnel advanced ninety-four (94) soil probes to depths of 4.0’ at various locations throughout the Inglewood Oil Field. Figure E-1 in Appendix E shows the location of the 94 sampling locations. The majority of these sampling locations were in the vicinity of idled or abandoned wells.

Soil gases were extracted from each of the soil probes and transported to the laboratory for analyses of C1-C7 hydrocarbons and hydrogen sulfide. The analytical data for each of the sampling locations is provided in Appendix E, Table E.1.

Methane concentrations ranged from 1.0 ppmv (parts per million volume) to a high of 981,400 ppmv in the case of location #7, which was located near well LAI 1-130, which was an idled well. Given the high value for this location, additional soil gas vapor testing was done at 12 sites located around well LA-1-130. Figure E-2 shows the location of these additional sampling points (location #s 94-105). The results of this additional sampling indicated that the source of the gas was most likely well LA-1-130. After the testing program Plains Exploration & Production tested the well and determined that the casing was leaking gas. The well has since been abandoned to the current Division of Oil, Gas and Geothermal Resources (DOGGR) standards.

Heavier homologes of methane were generally present at low concentrations. The maximum ethane concentration was 1,253 ppmv in the case of location #7, which was the leaking abandoned well. The maximum propane reading was at location #61 with a concentration of 33.7 ppmv. This sample was taken in an area of known historical soil contamination. Hydrogen sulfide concentrations were below detection limits for all locations.

Table 4.3.2 Current Oil Field Operations Toxic Pollutant Emissions (lbs/year)

Pollutant Description	2005 – 2006 Operations	Drilling[1]	Total	Inventory Threshold for Reporting[2]
1,1,2,2-Tetrachloroethane	0.03	0	0.03	1
1,1,2-Trichloroethane {Vinyl trichloride}	0.02	0	0.02	50
1,2,4-Trimethylbenzene	14.0	15.0	29.0	5
1,2-Dichloropropane {Propylene dichloride}	0.02	0	0.02	20
1,3-Dichloropropene	0.02	0	0.02	10
Acetaldehyde	7.8	208.1	215.9	20
Acrolein	4.4	10.31	14.7	0.05
Ammonia	244.3	0	244.3	200
Arsenic and Compounds (inorganic)	0.0007	0.60	0.60	0.01
Benzene	284.3	56.6	341.0	2
Butadiene [1,3]	0.44	5.4	5.8	0.1
Cadmium	0.0007	4.8	4.8	0.01
Carbon tetrachloride	0.03	0	0.025379	1
Chloroform	0.02	0	0.01968	10
Chlorine	0	41.6	41.6	None
Chromium, hexavalent (and compounds)	0.00004	0	0.000044	0.0001
Copper	0.0018	3.02	3.02	0.1
Diesel exhaust particulates	15.2	1311.6	1326.9	10
Ethyl benzene	179.9	8.6	188.6	200
Ethylene dibromide {1,2-Dibromoethane}	0.03	0	0.03	0.5
Ethylene dichloride {1,2-Dichloroethane}	0.02	0	0.02	2
Formaldehyde	131.4	416.5	548.0	5
Hexane	242.9	4.4	247.4	200
Hydrochloric acid	0.08	0	0.08	20
Hydrogen selenide	0.0010	1.2	1.2	0.5
Hydrogen sulfide	0.27	0	0.27	5
Lead compounds (inorganic)	0.0037	5.1	5.1	0.5
Manganese	0.0014	4.8	4.8	0.1
Mercury	0.0009	3.6	3.6	1
Methyl ethyl ketone {2-Butanone}	0	41.8	41.8	None
Methanol	1.04	0.85	1.9	200
Methyl tert-butyl ether	65.7	0	65.7	200
Methylene chloride {Dichloromethane}	0.06	0	0.06	50
Nickel	0	15.3	15.3	0.1
Phosphorus	0.0017	2.30	2.3	None
Polycyclic Aromatic Hydrocarbons	3.5	13.4	16.9	0.2
Styrene	0.02	1.6	1.7	100
Toluene	196.1	41.7	237.8	200
Vinyl chloride	0.01	0	0.01	0.5
Xylene	106.1	29.5	135.5	200

Source: 2005-2006 Operations from SCAQMD AER (based on fiscal year),

1. Drilling emissions are calculated from 2005/2006 drilling activities and includes well drilling, workovers and well pad grading.
2. Thresholds from the SCAQMD Protocol for the development of toxic emission inventories, 2004. Each facility emitting a toxic air contaminant greater than or equal to the annual thresholds listed in this table is assessed an annual emissions fee as specified in SCAQMD Rule 301.

Various governmental agencies have mitigation threshold standards for methane in soil. The City of Los Angeles requires mitigation for all occupied structures within oil fields. Typically, methane concentrations in excess of 12,500 ppmv are considered significantly high requiring mitigation. All but two of the sample values were below this threshold.

The Inglewood Oil Field site was found to be relatively void of appreciable light hydrocarbons in the surficial soils, except for high hydrocarbon concentrations at two locations as discussed above. However, in order to conservatively evaluate potential offsite exposure to fugitive toxic air contaminant emissions from subsurface well casings, worst-case emissions were estimated for all abandoned wells. These emissions were based on the average emission factor for active wells, even though monitoring studies of abandoned wells and subsurface vapors indicated no emissions from almost all wells.

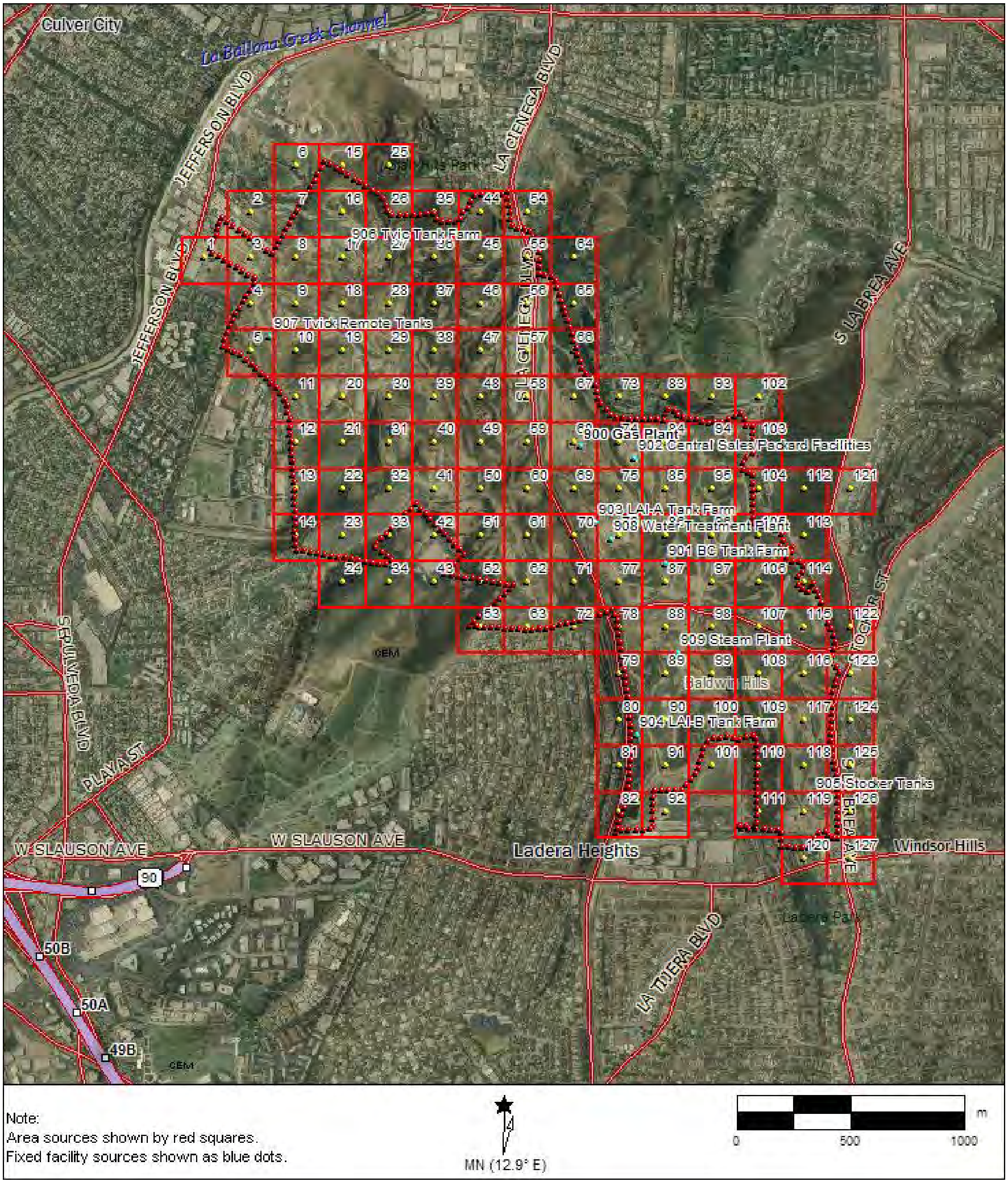
4.3.1.4 Inglewood Oil Field Baseline Health Risk Assessment

As per AB2588, health risk assessments are required for facilities that emit toxic pollutants above a threshold criteria level. Based on the annual emission reporting requirements of the SCAQMD, existing operations at the Inglewood Oil Field exceed the inventory reporting thresholds for a number of air toxic compounds (See Table 4.3.2).

As part of this analysis, a health risk assessment was conducted using the CARB Hotspots Analysis and Reporting Program (HARP) model. HARP is a computer software package that combines the tools of emission inventory database, facility prioritization, air dispersion modeling, and risk assessment analysis. All of these tools are tied to a single database allowing information to be shared and utilized. The HARP model provides the best available modeling methodologies to assess public health impacts associated with emissions of toxic air contaminants. The risk assessment methods and procedures outlined in the Office of Environmental Health Hazard Assessment's document Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2003).The inputs associated with the model are discussed below.

The sources of pollutants at the Inglewood Oil Field were addressed primarily as area sources. The field was divided up into approximately 100 grid cells of 10 acres each. The number of emission sources within each cell, including production wells, injection wells, abandoned wells (for fugitive emissions), fugitive emissions from tanks and components, were generated based on Geographic Information System maps and aerial photographs and component counts produced as part of the field-wide SCAQMD Rule 1173 requirements (The SCAQMD requirements for control of fugitive emissions from valves, flanges and other components). Toxic emissions generated from well workovers diesel engines were assessed based on an assumed well workover frequency of once per year per well. Source locations are shown in Figure 4.3-2.

Figure 4.3-2 Health Risk Assessment Source Locations



Receptor locations were established based on the field boundary, a regional receptor grid and the closest residences. The main receptor grid covered a 4km by 4km grid at 100 meter spacing. Receptors along the property boundary were spaces approximately 20 meters apart. Receptors are points within the modeling domain where concentrations of pollutants and potential health risks are estimated.

People may or may not necessarily reside at the receptor points; however, all receptors could represent at least transient public exposure. For the purposes of the analysis, it is assumed that an individual could reside at the receptor for a continuous 70-year exposure period. The receptor grid that was employed in the health risk assessment is shown in Figure 4.3-3. Sensitive receptors, such as hospitals, care facilities and schools, are shown in Figure 4.3-4.

The health risk assessment utilized two meteorological datasets. SCAQMD meteorological data from the West Los Angeles station for 1981, in conjunction with the HARP model five year (1985-1989) dataset from Los Angeles International Airport, were used in order to obtain worst-case health risk estimates. These meteorological datasets were utilized since they represent the most recent approved data for use in regulatory dispersion modeling. The SCAQMD West Los Angeles station is located at Wilshire and Sawtelle Boulevards, which is approximately six miles northwest of the Inglewood Oil Field. Los Angeles International Airport is located approximately four miles southwest of the Inglewood Oil Field.

Pursuant to SCAQMD Guidelines, terrain elevation heights were included in the modeling analysis. Digital Elevation Mapping data contained in the HARP modeling software were used to input elevation for all sources and receptors. Digital Elevation Mapping data from four US Geological Survey (USGS) quadrangles were required, which included Inglewood, Beverly Hills, Hollywood and Venice.

Since the Inglewood Oil Field has been in operations for over 80 years, it was assumed that all offsite individuals would experience a lifetime exposure (i.e., 70 years under the SCAQMD and OEHHA risk assessment guidelines).

The results of the HARP modeling are shown below in Table 4.3.3 and Figure 4.3-5. Overall, worst-case health risk associated with baseline operations are well below all applicable health risk criteria. The estimated baseline health risk also represents a relatively small fraction of the overall air toxic health risk in the region as identified in the MATES III study. The Inglewood Oil Field baseline cancer risk of 8.18 cancer cases per million represents 1.1 percent of the excess cancer risk of 730 in the vicinity of the project site, 0.58 percent of the excess cancer risk of 1,400 at the Central Los Angeles monitoring site, 0.68 percent of the excess cancer risk of 1,200 at the Compton monitoring site and 1.1 percent of the excess cancer risk of 750 at the North Long Beach monitoring site.

Figure 4.3-3 Health Risk Assessment Receptor Grid

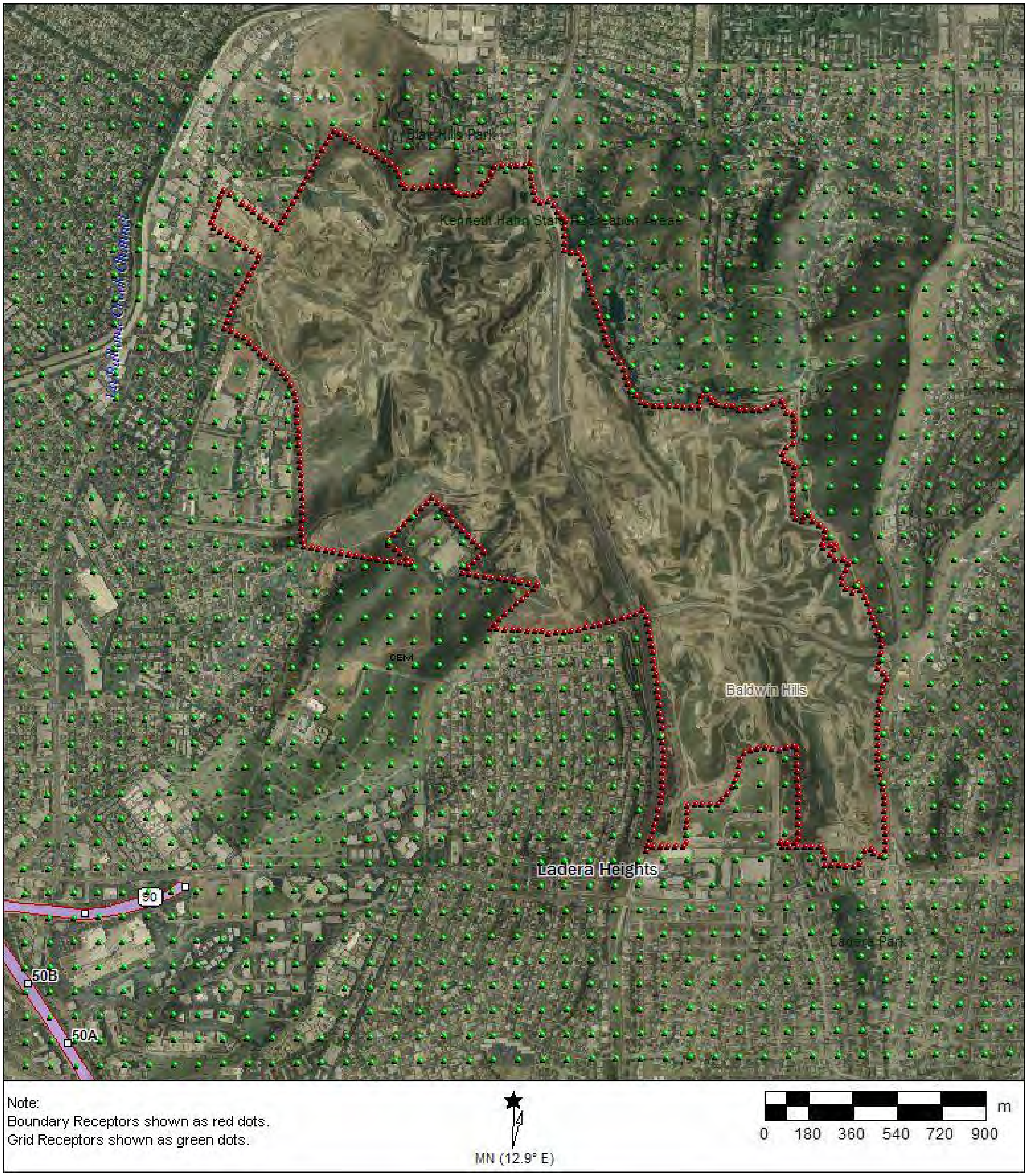


Figure 4.3-4 Sensitive Receptors

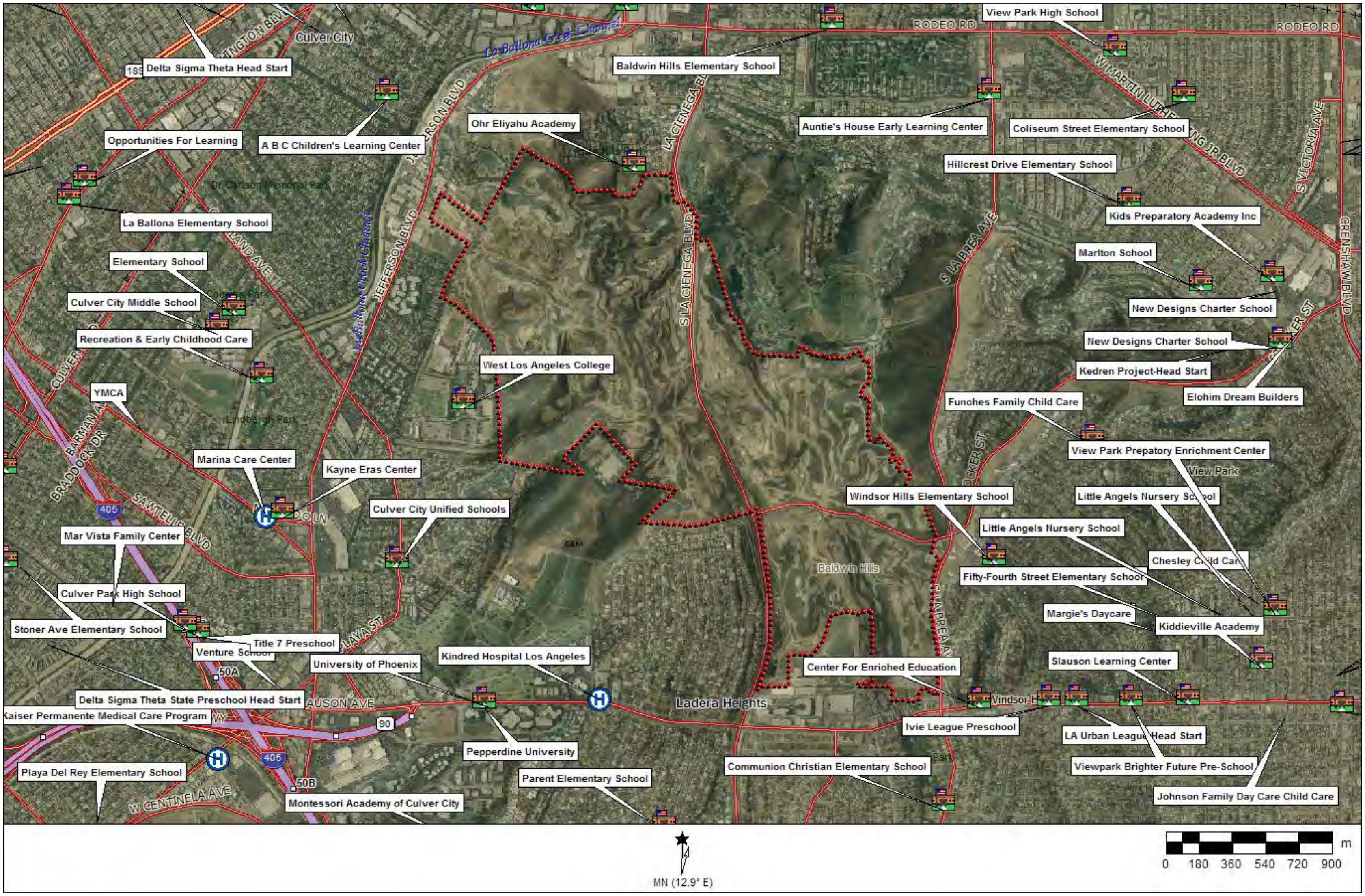


Figure 4.3-5 Inglewood Oil Field Baseline Excess Cancer Risk

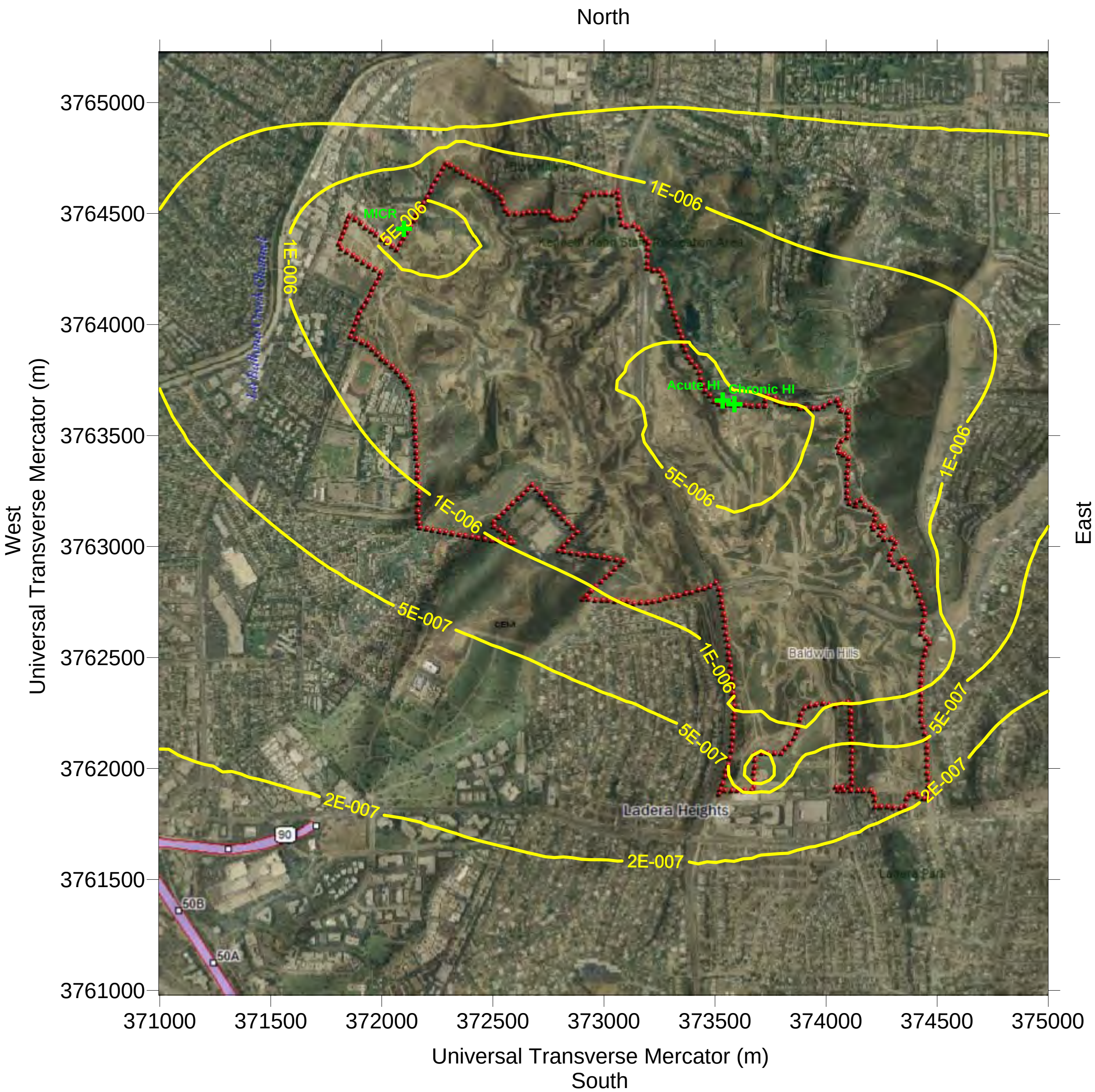


Table 4.3.3 Inglewood Oil Field Baseline Health Risk Assessment Results

Criteria Description	Health Risk Assessment Result	Threshold Value
Cancer risk, per million	8.18	10
Cancer Burden	0.005	0.5
Chronic risk, health index	0.021	1
Acute risk, health index (refined)	0.96	1

4.3.2 Regulatory Setting

Regulatory requirements covering the proposed oil field development project are summarized in Table 4.3.4 and discussed in the following sections.

4.3.2.1 Federal

The Clean Air Act of 1970 (42 U.S.C., § 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States EPA for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 and 2.5 micron or less (PM10 and PM2.5) and lead. The National Emission Standards for Hazardous Air Pollutants (NESHAPs) is a set of national emission standards for listed hazardous pollutants emitted from specific classes or categories of new and existing sources. These standards were implemented in the CAA Amendments of 1977.

4.3.2.2 State

California Health and Safety Code § 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the non-criteria pollutants. The California standards are listed together with the corresponding federal standards in the Air Quality section.

Excerpt of reference cited at point b. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://clkrep.lacity.org/onlinedocs/2017/17-0447_misc_14_07-29-2019.0001.pdf

Inglewood Oil Field Communities Health Assessment

Bureau of Toxicology and Environmental Assessment
Los Angeles County Department of Public Health
February 2011

Report Prepared by:
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EXECUTIVE SUMMARY

Methods

Mortality (Death)

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on mortality rates for the leading causes of death and premature death. The data for the assessment of mortality rates were obtained from information recorded on death certificates for Los Angeles County residents. Death certificates are registered using the Electronic Death Registration System (EDRS), which is maintained by the Los Angeles County Department of Public Health, Data Collection and Analysis Unit. In order to enable meaningful comparisons of mortality rates between residents of the Inglewood Oil Field communities and Los Angeles County as a whole, we present mortality rates adjusted for age and race/ethnicity.

Death certificate data represent an important endpoint in the spectrum of disease and help us to better understand the burden of disease in our communities. State law requires that death certificates be filed on all deaths and include information on age at death and causes of death. Since registration of death certificates is required by law, the reporting of deaths to EDRS is nearly 100 percent complete.

Low-Birth-Weight Births

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on rates of low-birth-weight births. The data for rates of low-birth-weight births were obtained from registered birth certificates entered into the Automated Vital Statistics System (AVSS) at the birth hospital or the office of the local registrar. Since registration of birth certificates is required by law, the data in the AVSS is nearly 100 percent complete. In order to address potential disparities in low birth weight births, we present rates of low birth weights by race/ethnicity and the overall rates adjusted for race/ethnicity.

Birth Defects

The California Birth Defects Monitoring Program (CBDMP) analyzed data on rates of birth defects for the communities near the Inglewood Oil Field compared to rates in Los Angeles County as a whole for all recent available data on birth defects reported in Los Angeles County starting in 1990. Due to budget constraints, not all of the birth defects were collected for all birth years. Vital statistics information on the total number of live births for the rate calculations was determined using the California Center for Health Statistics Office of Health Information and Research Vital Statistics data.

Cancer

The University of Southern California Cancer Surveillance Program (USC-CSP), the population-based cancer registry for Los Angeles County, analyzed data on cancer incidence for the communities near the Inglewood Oil Field compared to Los Angeles County as a whole. Data have been collected on all new cancer patients diagnosed in Los Angeles County since 1972. Since registration of cancer diagnoses is required by law, completeness of the reporting to the registry is over 95%. The expected and observed incidence of five blood-related cancers were examined since the risk of certain types of blood-related cancers has been linked to exposure to petroleum products such as benzene (Linet et al. 2006). The rates of the five blood-related cancers were compared between the census tracts near the Inglewood Oil Field and the general Los Angeles County population for the years 1972-2005. In order to address potential disparities in cancer incidence, rates of cancer are presented stratified by race/ethnicity. The time period was divided into two time periods, 1972-1999 and 2000-2005, in order to capture a better understanding of the most recent trends.

Results

Mortality

From 2000-2007, the mortality rate for all causes of death was 731.9 deaths per 100,000 persons in the Inglewood Oil Field communities and 751.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and the racial/ethnic distribution of the underlying populations. Although the mortality rate appears lower in the Inglewood Oil Field communities, there was no statistically significant difference in the mortality rates for all causes of death, after adjusting for age and race/ethnicity.

African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death compared to African Americans and Hispanics in Los Angeles County. From 2000-2007, mortality rates for all causes of death declined for all ethnic groups in the Inglewood Oil Field communities and in Los Angeles County.

After adjusting for race/ethnicity, there were no statistically significant differences in the mortality rates for any of the leading causes of death or premature death in the Inglewood Oil Field communities compared to Los Angeles County. Although there were no overall statistically significant differences in the mortality rates in the Inglewood Oil Field communities compared to Los Angeles County, the racial/ethnic disparities apparent in Los Angeles County are also reflected in the mortality rates found in these communities.

There were statistically significantly higher mortality rates for some of the leading causes of death and premature death in certain ethnic groups. In the Inglewood Oil Field communities and in Los Angeles County as a whole, African Americans had the highest mortality rates for all causes of death, colorectal cancer, coronary heart disease, diabetes, HIV, homicide, motor vehicle crashes, pancreatic cancer and stroke. Caucasians had the highest mortality rates for emphysema and chronic obstructive pulmonary diseases (COPD), while Hispanics had the highest mortality rates for chronic liver disease in both the Inglewood Oil Field communities and Los Angeles County.

For some of the leading causes of death and premature death, rates were statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for certain ethnic groups. African Americans in the Inglewood Oil Field communities had statistically significantly lower mortality rates for coronary heart disease, diabetes, emphysema/COPD, homicide, chronic liver disease, lung cancer and stroke than African Americans in Los Angeles County. On the other hand, African Americans in the Inglewood Oil Field communities had statistically significantly higher mortality rates for HIV than African Americans in Los Angeles County. Caucasians in the Inglewood Oil Field communities had statistically significantly higher mortality rates for pneumonia/influenza than Caucasians in Los Angeles County.

The differences in mortality rates for the leading causes of death and premature death do not appear to be related to the geographic location of the Inglewood Oil Field communities. Many of the differences observed within these communities are common in Los Angeles County and represent a significant public health challenge throughout the county. The disparities in mortality rates can best be addressed by targeting the underlying causes of these disparities.

Low-Birth-Weight Births

After adjusting race/ethnicity, the rate of low-birth-weight births was 7.2 per 100 live births in the Inglewood Oil Field communities and 7.0 per 100 live births in Los Angeles County. There was no statistical difference in the rates of low-birth-weight births in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for race/ethnicity. There were differences in rates of low-birth-weight births among racial/ethnic groups with African Americans having the highest rates of low-birth-weight births in the Inglewood Oil Field communities as well as in Los Angeles County. These disparities in low-birth-weight births represent another significant public health challenge throughout the county.

Birth Defects

For 28 of the 29 categories of birth defects, there was no statistically significant difference in the Inglewood Oil Field communities compared to Los Angeles County as a whole. Babies born in the Inglewood Oil Field communities between 1990 and 1997 were slightly more likely (1.2 times as likely) to be born with a limb defect compared to babies countywide. Limb defects are not known to be caused by exposure to benzene or other petroleum products. Since multiple comparisons were made, the increase may be explained by statistical chance.

Cancer

The analysis found no evidence of elevated rates of acute myelogenous leukemia (AML), the type of cancer most definitively linked to petroleum products (benzene) or three of the other types of blood-related cancer for any of the race/ethnic groups examined. There was an excess risk of chronic myelogenous leukemia (CML) in non-Hispanic whites based on the occurrence of two (2) cases above the expected number in 2000 to 2005. CML has not been consistently linked with exposure to petroleum products from oil fields or refineries. These two additional cases of CML may be explained by statistical chance, because the analysis examined multiple comparisons. Furthermore, in most of the studies examining this issue, occupational exposure to specific petroleum-based chemicals, such as benzene, was measured, rather than residential proximity to oil wells. Very few, if any, well-conducted published studies exist on health effects in communities due to proximity of oil wells.

Limitations of These Analyses

These analyses cannot confirm whether exposures to chemicals from oil drilling activities at the Inglewood Oil Field may be associated with a small increase in the risk of mortality, low-birth-weight births, birth defects, or cancer among specific individuals living nearby, because these analyses cannot detect small increases in risk. Epidemiological investigations can be relatively conclusive when large, population-based samples are involved. On the other hand, analyses of data from local areas, such as the communities surrounding the Inglewood Oil Field, are limited by small samples sizes. Analyses such as this can detect large differences in risk, but are not able to reliably detect small increases. In addition, these analyses do not take into account other important determinants of health such as behavioral risk factors (such as smoking and physical activity), social factors (such as community resilience, education, income, and access to health care) since these data were not available on the birth certificates, death records, or cancer registry records.

It is important to note that this type of analysis cannot establish causal relationships between emissions from oil drilling activities and specific causes of death because of the lack of information on the individual levels of exposure to emissions that could establish dose-response curves and temporal relationships as well as the multitude of other risk factors that influence these disease outcomes. For example, a high rate of mortality from asthma in the community adjacent to the Inglewood Oil Field would not prove that the oil field operations are causing asthma since there are many other potential causes, such as exposures to traffic-related air pollution, tobacco smoke, or adverse environmental conditions in the home. Alternatively, a normal or low rate of mortality from asthma would not prove that the oil field is safe, again because of the many other factors that influence the rate. Thus, these results should be interpreted with caution. Due to these limitations, the safety of the oil field would be more appropriately assessed by careful monitoring of the oil field operations to ensure compliance with regulations and standards.

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ANALYSIS OF MORTALITY (DEATH) RATES

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on mortality rates for the leading causes of death and premature death. The data for the assessment of mortality rates were obtained from information recorded on death certificates for Los Angeles County residents. Death certificates are registered using the Electronic Death Registration System (EDRS), which is maintained by the Los Angeles County Department of Public Health, Data Collection and Analysis Unit. In order to enable meaningful comparisons of mortality rates between residents of the Inglewood Oil Field communities and Los Angeles County as a whole, we present mortality rates adjusted for age and race/ethnicity.

Death certificate data represent an important endpoint in the spectrum of disease and help us to better understand the burden of disease in our communities. State law requires that death certificates be filed on all deaths and include information on age at death and causes of death. Since registration of death certificates is required by law, the reporting of deaths to EDRS is nearly 100 percent complete.

Methods

The area representing the Inglewood Oil Field communities used in the analyses included the census tracts within 1.5 miles from the perimeter of the Inglewood Oil Field. The census tracts for the year 2000 are: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01, 7025.02, 7026.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, and 7032.00. A map of the included census tracts is provided in Appendix A.

The mortality analysis was performed for overall mortality, the top ten leading causes of death, and premature death (death before age 75 years) during the period 2000-2007 for the communities near the Inglewood Oil Field compared to Los Angeles County as a whole (Fig. 1a). Mortality rates for asthma were also included even though it is not among the leading causes since residents expressed particular concerns about chronic respiratory diseases such as asthma. Information on the causes of death and premature death was obtained from death certificates for all Los Angeles County residents filed with the local registrar. Cause of death was determined by analyzing the underlying cause recorded in the medical portion of each death certificate. "Underlying cause of death" is defined as the disease or injury initiating the sequence of events leading directly to death.

Crude mortality rates are provided in Table 1 of Appendix A. Since crude rates are not suitable for comparisons among populations, the cumulative age-adjusted mortality rates were standardized to the population age distribution of the 2000 U.S. Census to eliminate differences in age as an explanation for differences in rates.

Fig. 1a: Ten leading causes of death and premature death for the Inglewood Oil Field communities in 2007

Leading causes of death		Leading causes of premature** death	
Rank	Cause of death	Rank	Cause of death
1	Coronary heart disease	1	Coronary heart disease
2	Lung cancer	2	Homicide
3	Stroke	3	Motor vehicle crash
4	Pneumonia/influenza	4	Lung cancer
5	Diabetes	5	HIV
6	Emphysema/COPD	6	Diabetes
7	Colorectal cancer	7	Colorectal cancer
8	Alzheimer's disease	8	Breast cancer
9	Breast cancer	9	Liver disease
10	Pancreatic cancer	10	Stroke

*Excludes infants less than 1 year of age and persons of unknown age
** Death before age 75 years

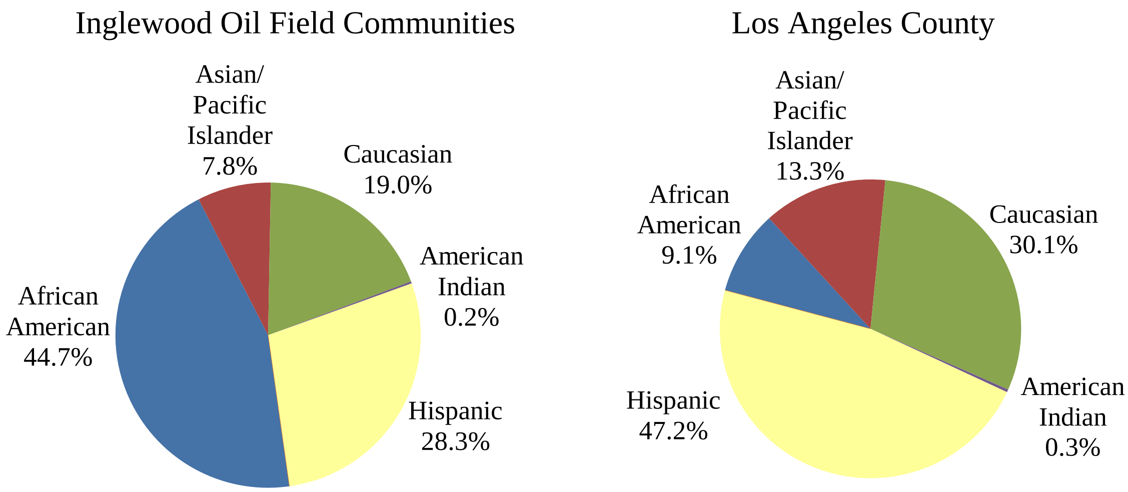
The data were analyzed for an eight year period, from 2000 to 2007, to increase the number of events available for analysis and thus increase the reliability of the findings and to assess trends. Rates based on small numbers of events can fluctuate widely from year to year for reasons other than a true change in the underlying frequency of occurrence of the event. Therefore, mortality rates were not reported when there were fewer than 20 deaths as this is too few to produce reliable rates.

Mortality rates for the Inglewood Oil Field communities and Los Angeles County were compared and a statistical test of the difference was done to determine if the rates were statistically different.[1] A p-value of less than 0.05 indicated that the two rates were statistically significantly different, while a p-value of greater than 0.05 indicated that the two rates were not statistically significantly different.

Since the racial/ethnic distribution of the underlying population in the Inglewood Oil Field communities differs from Los Angeles County, mortality rates were stratified to examine differences by racial/ethnic group for African Americans, Asian/Pacific Islanders, Caucasians and Hispanics (Fig. 1b). Mortality rates for American Indians/Alaska Natives were not reported since the numbers of deaths were too small to provide reliable rates. Age-adjusted mortality rates were additionally adjusted for race/ethnicity to account for the differences in the racial/ethnic distribution in the Inglewood Oil Field communities and Los Angeles County.

[1] Rothman KJ, Greenland S, Lash TL. Modern Epidemiology 3rd Ed. Philadelphia: Lippincott Williams & Wilkins; 2008 p.266-268.

Fig. 1b: Population distribution by race/ethnicity for the Inglewood Oil Field communities and Los Angeles County



Source: U.S. Bureau of the Census, Population Estimates Program (PEP), 2007

Results

Mortality from All Causes of Death:

There was no statistically significant difference in overall mortality rates for all causes of death in the Inglewood Oil Field communities compared to Los Angeles County as a whole, after adjusting for age and the racial/ethnic distributions of the underlying populations.

From 2000-2007, the mortality rate for all causes of death was 731.9 deaths per 100,000 persons in the Inglewood Oil Field communities and 751.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 1a). African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death than African Americans and Hispanics in Los Angeles County (Table 1b and Fig. 2a). From 2000-2007, mortality rates for all causes of death declined in both the Inglewood Oil Field communities and Los Angeles County for all ethnicities (Fig. 2b and 2c).

African Americans had the highest mortality rates for all causes of death in the Inglewood Oil Field communities and in Los Angeles County as a whole (Table 1b). There were proportionately more African Americans in the Inglewood Oil Field communities than in Los Angeles County (Fig. 1b) so there appeared to be a higher age-adjusted mortality rate for all causes of death in the Inglewood Oil Field communities (Table 1a), but after adjusting for race/ethnicity there was no statistically significant difference between the two populations.

Table 1a: Age- and race-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	731.9	476,493	751.7	NS

* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 1b: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	4,697	860.0	66,697	1,033.0	<0.001
Asian/Pacific Islander	427	465.5	43,862	474.2	NS
Caucasian	2,849	746.6	263,057	746.4	NS
Hispanic	709	499.1	101,176	570.5	0.002

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 2a: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

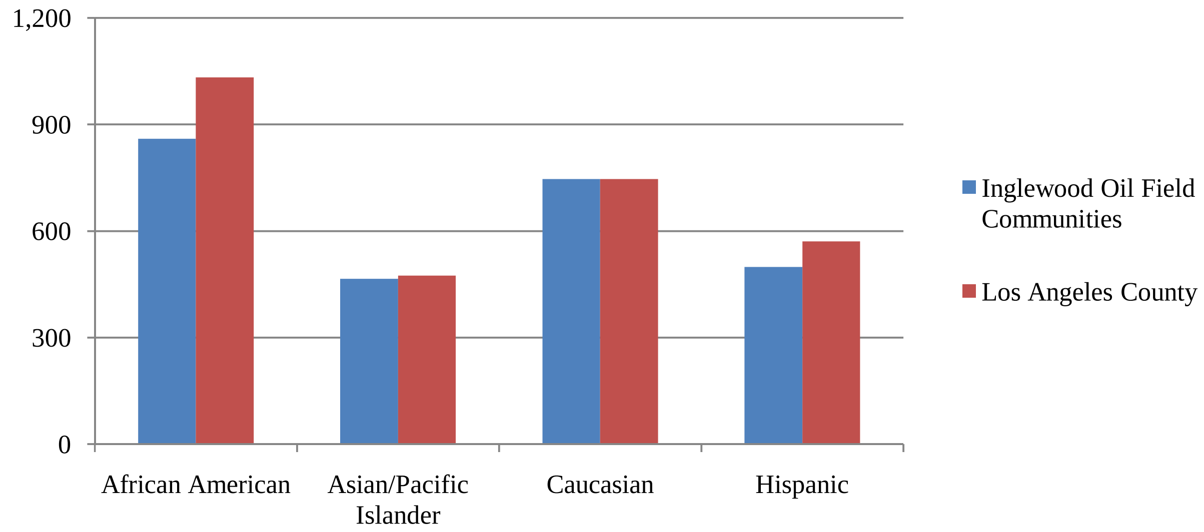
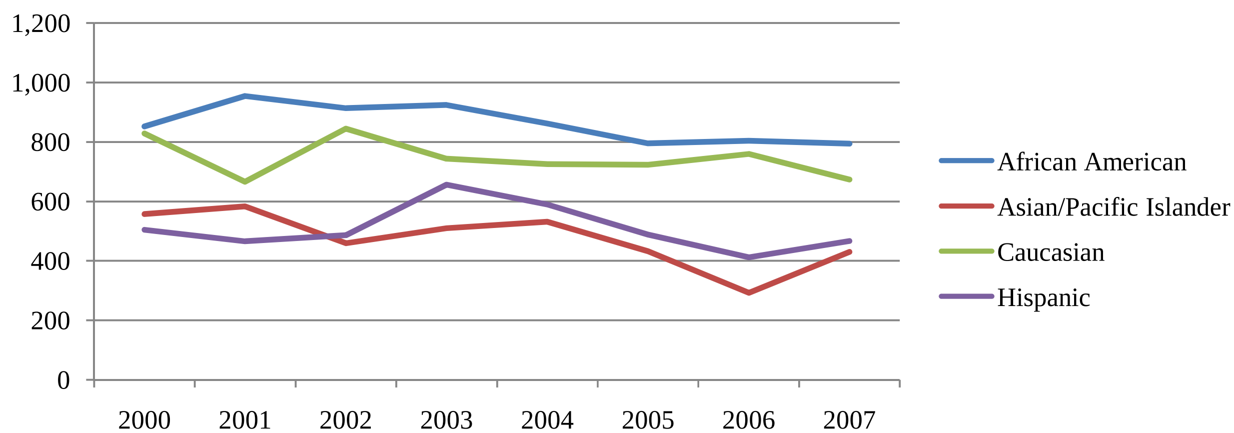
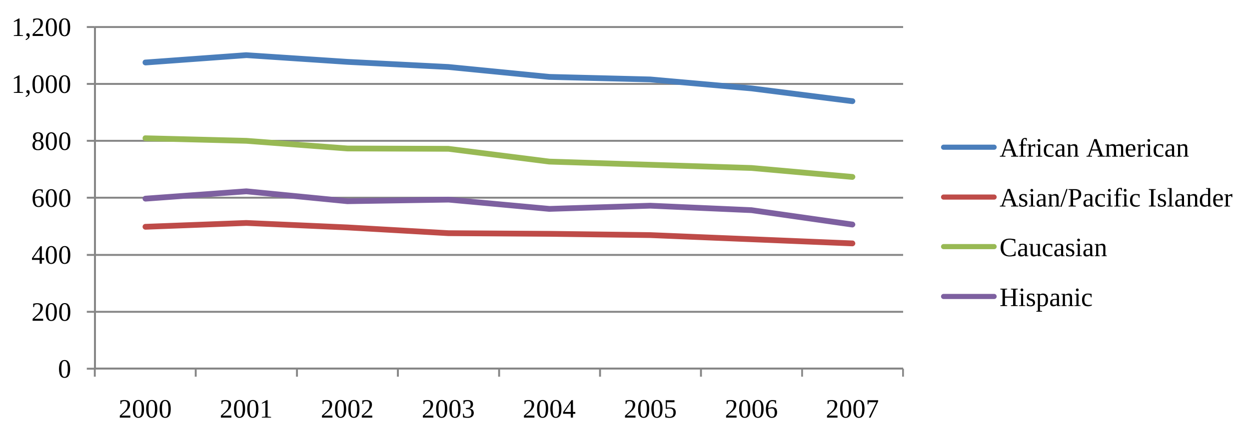


Fig. 2b: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities from 2000-2007, by race/ethnicity



Data Source for Fig. 2b: Table 2 in Appendix A

Fig. 2c: Age-adjusted mortality rates for all causes of death for Los Angeles County from 2000-2007, by race/ethnicity



Data Source for Fig. 2c: Table 2 in Appendix A

Results

Mortality from Specific Causes of Death:

There were no statistically significant differences in mortality rates for asthma or any of the leading causes of death and premature death in the Inglewood Oil Field communities compared to Los Angeles, after adjusting for age and race/ethnicity (Table 2b).

There appeared to be higher age-adjusted mortality rates in the Inglewood Oil Field communities compared to Los Angeles County for some causes of death (asthma, breast cancer, colorectal cancer, coronary heart disease, HIV, homicide, hypertension, cancers of the lung, bronchus and trachea, pneumonia and influenza, prostate cancer and stroke) and lower age-adjusted mortality rates for other causes of death (emphysema/chronic obstructive pulmonary diseases (COPD) and chronic liver disease) (Table 2a), however after adjusting for the differences in the racial/ethnic distributions of the two populations there were no statistically significant differences for any cause of death.

Table 2a: Age-adjusted mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	752.9	476,493	697.9	<0.001
Alzheimer's	160	14.1	10,200	15.3	NS
Asthma	30	2.5	1,028	1.4	0.002
Breast Cancer (females)	186	26.7	8,774	12.7	<0.001
Colorectal Cancer	237	20.3	11,056	16.4	0.001
Coronary Heart Disease	2,251	196.2	125,526	187.6	0.035
Diabetes	310	26.8	16,890	25.2	NS
Emphysema/COPDŧ	322	28.5	21,484	32.8	0.012
HIV	96	7.6	3,804	4.9	<0.001
Homicide	202	17.3	8,352	10.0	<0.001
Liver Disease	103	8.5	8,600	11.9	<0.001
Lung Cancer£	501	43.6	24,654	37.2	<0.001
Motor Vehicle Crash	101	8.5	6,931	8.9	NS
Pancreatic Cancer	134	11.5	6,597	9.9	NS
Pneumonia/Influenza	373	32.8	18,883	28.4	0.006
Stroke	600	52.4	31,928	47.8	0.026

* Per 100,000 persons, age-adjusted and cumulative over years 2000-2007 ‡NS indicates not statistically significant at a p-value of 0.05
ŧ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

Table 2b: Age- and race-adjusted mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	731.9	476,493	751.7	NS
Alzheimer's	160	9.4	10,200	18.0	NS
Asthma	30	1.4	1,028	1.5	NS
Breast Cancer (females)	186	28.6	8,774	26.1	NS
Colorectal Cancer	237	19.5	11,056	17.7	NS
Coronary Heart Disease	2,251	192.0	125,526	205.0	NS
Diabetes	310	22.0	16,890	21.8	NS
Emphysema/COPDŧ	322	36.7	21,484	39.6	NS
HIV	96	3.0	3,804	5.6	NS
Homicide	202	9.3	8,352	9.2	NS
Liver Disease	103	9.1	8,600	10.8	NS
Lung Cancer£	501	46.4	24,654	43.5	NS
Motor Vehicle Crash	101	6.2	6,931	9.5	NS
Pancreatic Cancer	134	9.2	6,597	10.5	NS
Pneumonia/Influenza	373	33.7	18,883	29.3	NS
Stroke	600	48.4	31,928	48.3	NS

* Per 100,000 persons, age/race-adjusted and cumulative over years 2000-2007 ‡NS indicates not statistically significant at a p-value of 0.05
ŧ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

For each of the top ten causes of death and premature death, mortality rates stratified by race/ethnicity are presented for the Inglewood Oil Field communities and Los Angeles County.

Alzheimer's Disease

There was no statistically significant difference in overall mortality rates for Alzheimer's disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Alzheimer's disease is the eighth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for Alzheimer's was 9.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 18.0 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 3a). The mortality rates for Alzheimer's were not statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for any ethnicity (Table 3b and Fig. 3). Caucasians had the highest mortality rates for Alzheimer's in the Inglewood Oil Field communities as well as in Los Angeles County as a whole.

Table 3a: Age- and race-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Alzheimer's	160	9.4	10,200	18.0	NS

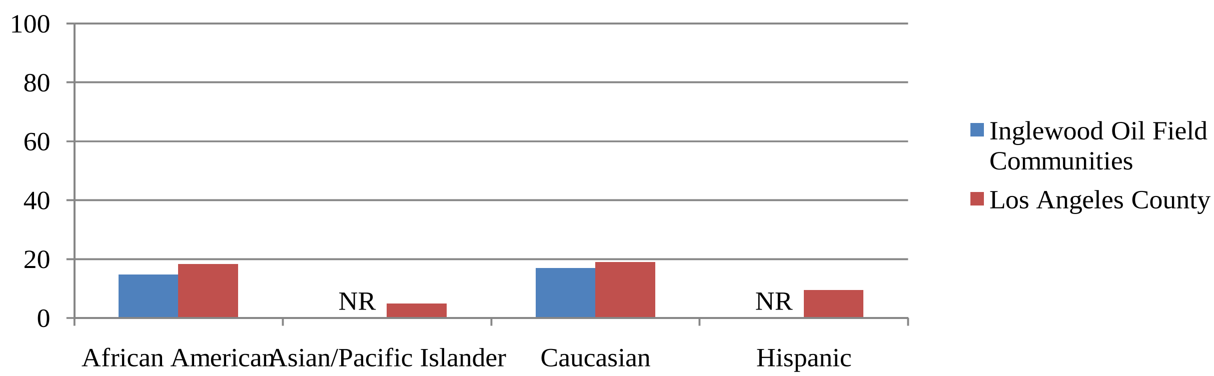
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 3b: Age-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	73	14.6	1,036	18.2	NS
Asian/Pacific Islander	<20	NR	407	4.9	-----
Caucasian	75	16.8	7,558	19.0	NS
Hispanic	<20	NR	1,178	9.5	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 3: Age-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Alzheimer's Disease:

Risk factors for Alzheimer's disease include age and family history of the disease. Scientists are exploring possible connections between Alzheimer's disease and high cholesterol, high blood pressure, physical inactivity and serious head injury.

Individual opportunities for prevention:

- Maintain good overall health by staying physically active, and controlling high blood pressure and cholesterol
- Keep the brain active by playing puzzle games, reading and other mentally stimulating activities
- Slow the progression of symptoms through early diagnosis and treatment of Alzheimer's disease symptoms

Community opportunities for intervention:

- Develop community support networks for caregivers
- Assist persons with early Alzheimer's disease to plan for their future needs

Breast Cancer (Females)

There was no statistical difference in overall mortality rates for breast cancer among women in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Breast cancer is the ninth leading cause of death and eight leading cause of premature death among women in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for breast cancer was 28.6 deaths per 100,000 women in the Inglewood Oil Field communities and 26.1 deaths per 100,000 women in Los Angeles County, after adjusting for age and race/ethnicity (Table 4a). The mortality rates for breast cancer were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 4b and Fig. 4). African Americans had the highest mortality rates for breast cancer in the Inglewood Oil Field communities as well as in Los Angeles County.

Table 4a: Age- and race-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Breast Cancer	186	28.6	8,774	26.1	NS

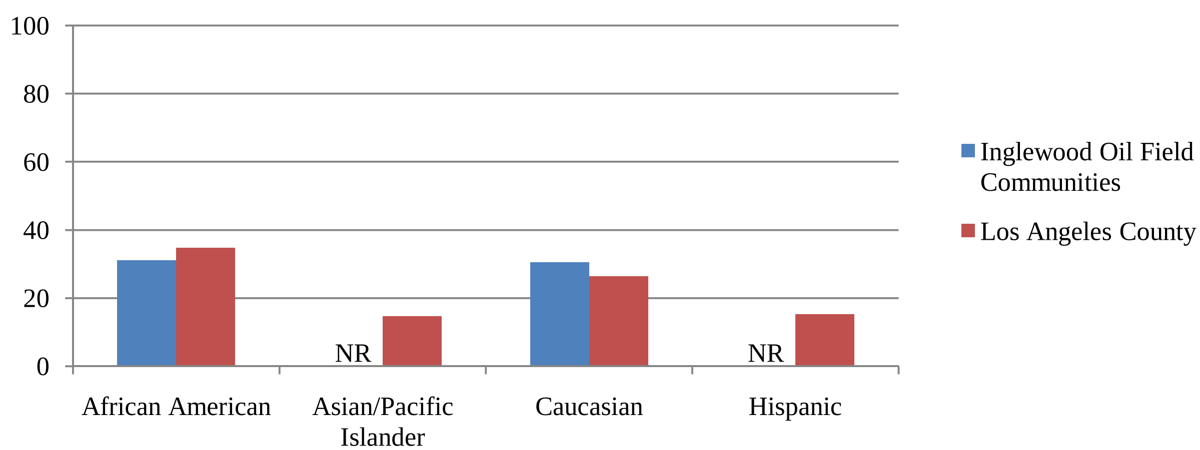
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 4b: Age-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	111	31.0	1,375	34.8	NS
Asian/Pacific Islander	<20	NR	867	14.7	-----
Caucasian	59	30.5	4,781	26.4	NS
Hispanic	<20	NR	1,731	15.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 4: Age-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Breast Cancer:

Risk factors for breast cancer include age, family history of breast cancer, previous breast cancer, race, early radiation treatment to the chest area, menstruation before age 12 or menopause after age 55, genetic mutation linked to breast cancer, treatment with the drug diethylstilbestrol, not having children, excessive alcohol consumption, being overweight, physical inactivity and prolonged postmenopausal hormone therapy.

Individual opportunities for prevention:

- Follow recommended breast cancer screening and follow-up guidelines
- Limit alcohol consumption
- Maintain a healthy weight
- Stay physically active

Community opportunities for intervention:

- Promote the availability of low-cost breast cancer screening and follow-up
- Provide education on the importance of receiving on-schedule breast cancer screening
- Promote physical activity by providing access to safe places like parks to walk, play and exercise

Colorectal Cancer

There was no statistically significant difference in overall mortality rates for colorectal cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Colorectal cancer is the seventh leading cause of death and premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for colorectal cancer was 19.5 deaths per 100,000 persons in the Inglewood Oil Field communities and 17.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 5a). The mortality rates for colorectal cancer were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 5b and Fig. 5). African Americans had the highest mortality rates for colorectal cancer in the Inglewood Oil Field communities as well as Los Angeles County.

Table 5a: Age- and race-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Colorectal Cancer	237	19.5	11,056	17.7	NS

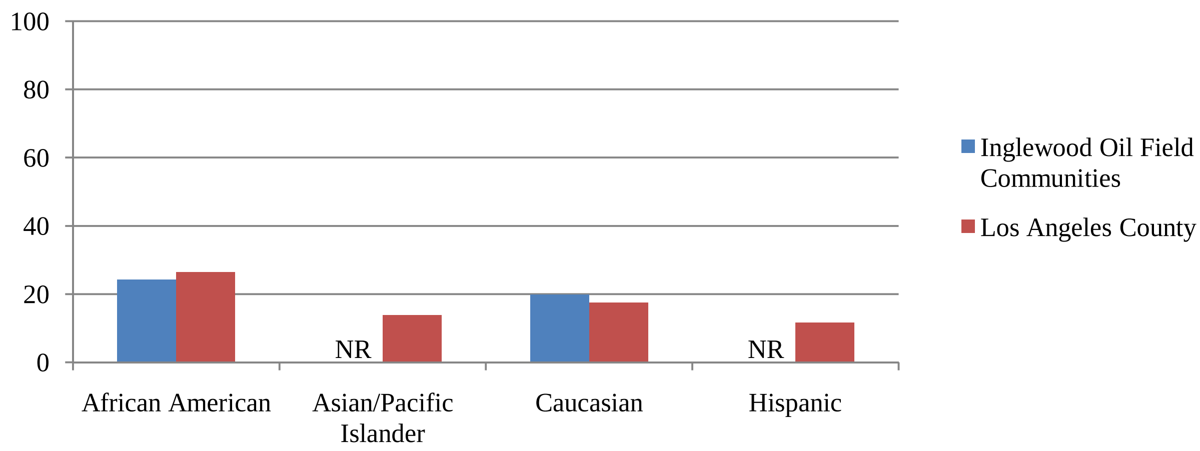
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 5b: Age-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	137	24.2	1,688	26.4	NS
Asian/Pacific Islander	<20	NR	1,340	13.9	-----
Caucasian	73	19.9	6,068	17.5	NS
Hispanic	<20	NR	1,924	11.6	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 5: Age-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Colorectal Cancer:

Risk factors for colorectal cancer include age, previous colorectal cancer or polyps, family history of colorectal cancer, inflammatory bowl disease, physical inactivity, being overweight, alcohol abuse, diets high in red and processed meats, cooking meats at very high temperature, tobacco smoking and type 2 diabetes.

Individual opportunities for prevention:

- Obtain routine medical care to detect and remove precancerous colorectal polyps
- Follow recommended screening guidelines for stool tests and special medical exams to detect colon cancer
- Eat plenty of fruits, vegetables and whole grain foods
- Stay physically active

Community opportunities for intervention:

- Promote the availability of low-cost colorectal cancer screening and follow-up
- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Increase the availability of affordable, nutritious foods

Coronary Heart Disease

There was no statistically significant difference in overall mortality rates for coronary heart disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Coronary heart disease is the number one cause of death and premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for coronary heart disease was 192 deaths per 100,000 persons in the Inglewood Oil Field communities and 205 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 6a). African Americans had the highest mortality rates for coronary heart disease in the Inglewood Oil Field communities and Los Angeles County (Table 6b and Fig. 6). African Americans in the Inglewood Oil Field communities however, had a statistically significant lower mortality rate for coronary heart disease than African Americans in Los Angeles County.

Table 6a: Age- and race-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Coronary Heart Disease	2,251	192.0	125,526	205.0	NS

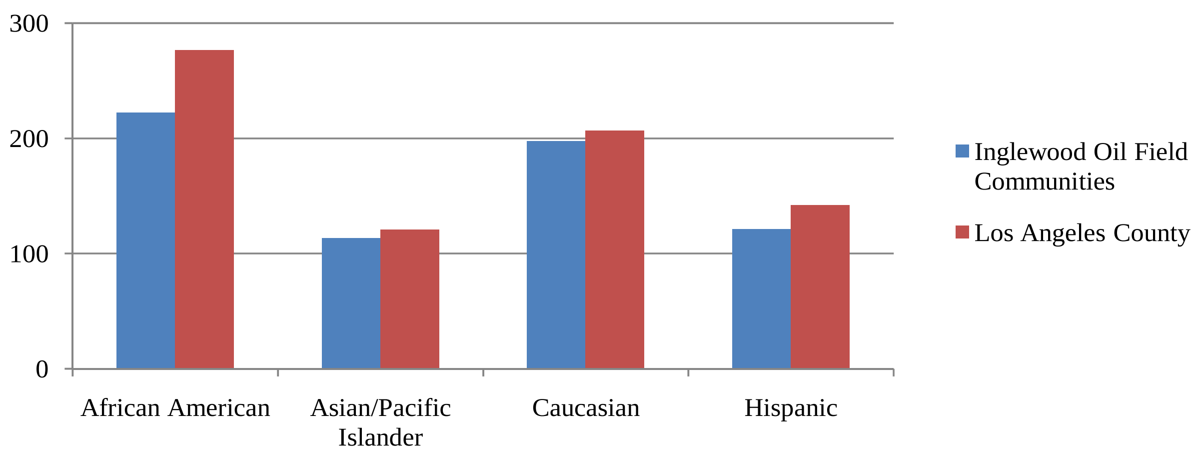
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 6b: Age-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	1,201	222.3	17,219	276.3	<0.001
Asian/Pacific Islander	105	113.3	10,788	120.9	NS
Caucasian	805	197.6	76,414	206.4	NS
Hispanic	134	121.5	20,721	142.3	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 6: Age-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Coronary Heart Disease:

Risk factors for coronary heart disease include age, male gender, race, tobacco smoking, high cholesterol, high blood pressure, being overweight, excessive alcohol consumption, previous heart attack or angina and family history of early heart disease.

Individual opportunities for prevention:

- Eat a heart-healthy diet
- Consult with your physician about increasing physical activity
- Stop smoking
- Control blood pressure, cholesterol, and diabetes
- Reduce stress
- Get regular medical check-ups

Community opportunities for intervention:

- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Restrict smoking in public places and worksites
- Provide access to smoking cessation programs
- Encourage people to quit smoking through media campaigns
- Increase the availability of nutrient-rich foods which have vitamins, minerals, fiber and other nutrients but are lower in calories

Diabetes

There was no statistically significant difference in overall mortality rates for diabetes in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Diabetes is the fifth leading cause of death and sixth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for diabetes was 22 deaths per 100,000 persons in the Inglewood Oil Field communities and 21.8 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 7a). African Americans had the highest mortality rates for diabetes in the Inglewood Oil Field communities as well as in Los Angeles County (Table 7b and Fig. 7). African Americans in the Inglewood Oil Field communities however, had statistically significant lower mortality rates for diabetes than African Americans in Los Angeles County.

Table 7a: Age- and race-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Diabetes	310	22.0	16,890	21.8	NS

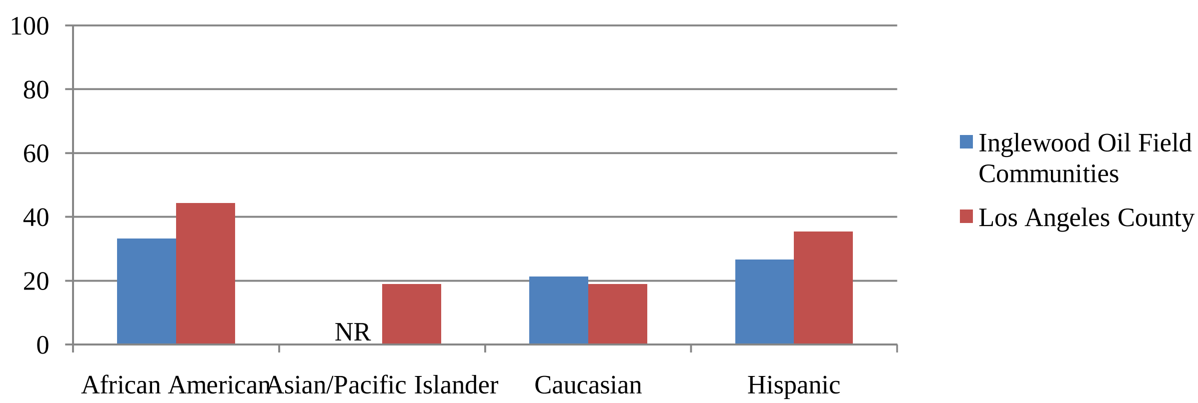
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 7b: Age-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	185	33.2	2,837	44.3	<0.001
Asian/Pacific Islander	<20	NR	1,745	19.0	-----
Caucasian	77	21.2	6,564	19.0	NS
Hispanic	34	26.6	5,657	35.4	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 7: Age-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Diabetes:

Risk factors for diabetes include being overweight, physical inactivity, age, pre-diabetes, family history of diabetes or history of gestational diabetes mellitus.

Individual opportunities for prevention:

- Maintain a healthy weight
- Stay physically active
- Eat plenty of fruits, vegetables and whole grain foods, while limiting consumption of high-fat foods
- Follow recommended screening and treatment guidelines
- Control blood pressure and high cholesterol
- Limit the intake of salt and sugar

Community opportunities for intervention:

- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Promote medical screening for diabetes for individuals with high blood pressure
- Increase the availability of affordable, nutritious foods
- Enforce state physical education requirements and nutrition education as part of a comprehensive school health curriculum

Emphysema and Chronic Obstructive Pulmonary Diseases (COPD)

There was no statistically significant difference in overall mortality rates for emphysema/COPD in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Emphysema/COPD is the sixth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for emphysema/COPD was 36.7 deaths per 100,000 persons in the Inglewood Oil Field communities and 39.6 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 8a). Caucasians had the highest mortality rates for emphysema/COPD in the Inglewood Oil Field communities and Los Angeles County (Table 8b and Fig. 8). African Americans had statistically significant lower mortality rates for emphysema/COPD than African Americans in Los Angeles County.

Table 8a: Age- and race-adjusted mortality rates for emphysema/COPDŧ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Emphysema/COPDŧ	322	36.7	21,484	39.6	NS

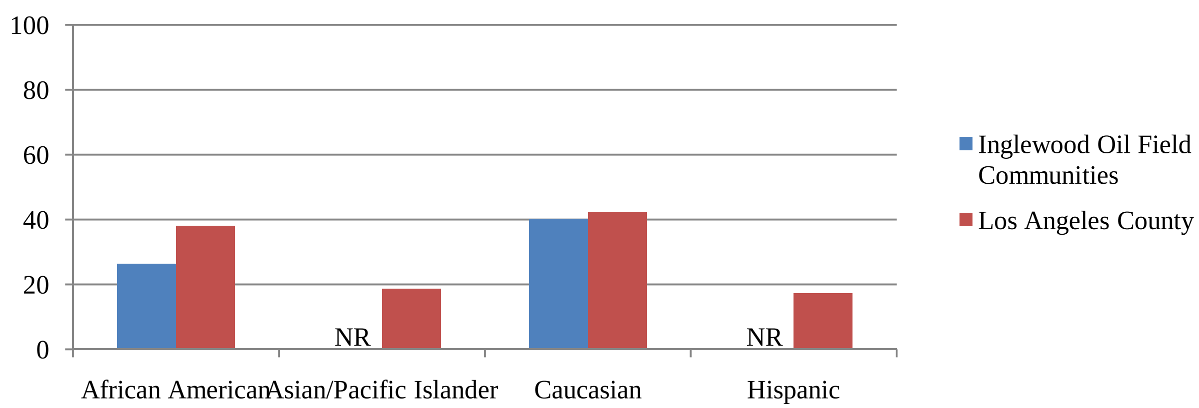
ŧ COPD includes chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 8b: Age-adjusted mortality rates for emphysema/COPDŧ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	141	26.4	2,346	38.1	<0.001
Asian/Pacific Islander	<20	NR	1,614	18.7	-----
Caucasian	156	40.3	15,094	42.2	NS
Hispanic	<20	NR	2,346	17.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 8: Age-adjusted mortality rates for emphysema/COPD for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Emphysema/COPD:

Risk factors for emphysema/COPD include tobacco smoking and breathing the smoke of others, occupational exposure to certain industrial pollutants.

Individual opportunities for prevention:

- Stop smoking
- Avoid being near people who are smoking
- If you don't smoke, don't start

Community opportunities for intervention:

- Increase the availability of effective smoking cessation services
- Limit smoking, and decrease exposure to indoor and outdoor secondhand smoke through effective anti-smoking policies and enforcement
- Support an increase in the tobacco tax

Human Immunodeficiency Virus (HIV)

There was no statistically significant difference in overall mortality rates for HIV in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. HIV is the fifth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for HIV was 3 deaths per 100,000 persons in the Inglewood Oil Field communities and 5.6 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 9a). African Americans had higher mortality rates for HIV in the Inglewood Oil Field communities and in Los Angeles County (Table 9b and Fig. 9). African Americans in the Inglewood Oil Field communities had statistically significant higher mortality rates for HIV than males and African Americans in Los Angeles County.

Table 9a: Age- and race-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
HIV	96	3.0	3,804	5.6	NS

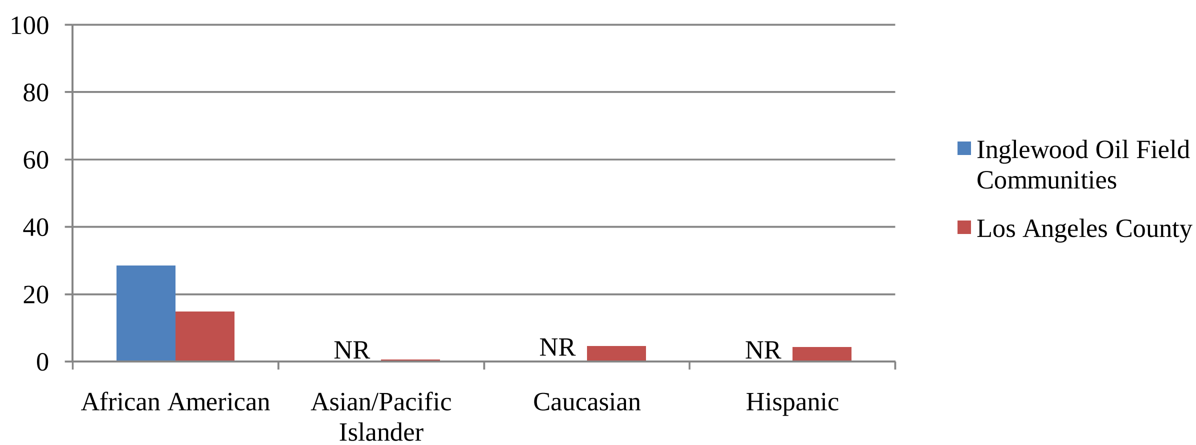
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 9b: Age-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	78	28.5	1,113	14.9	<0.001
Asian/Pacific Islander	<20	NR	73	0.6	-----
Caucasian	<20	NR	1,287	4.6	-----
Hispanic	<20	NR	1,300	4.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 9: Age-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for HIV:

Risk factors for HIV include having unprotected sex with an HIV-infected person or a person whose HIV status is unknown, sharing drug needles and syringes.

Individual opportunities for prevention:

- Use latex condoms consistently and correctly with HIV-infected sexual partners or those whose HIV status is unknown
- Do not share drug needles and syringes
- Learn your HIV status by getting tested for antibodies to HIV. An estimated 60,000 persons are living with HIV/AIDS in Los Angeles County, many of whom may be unaware of their infection.

Community opportunities for intervention:

- Educate the community about how HIV is transmitted and how to avoid getting infected
- Provide HIV counseling and testing
- Provide access to drug treatment programs and sexually transmitted disease testing and treatment
- Screen pregnant women for HIV infection and use drug therapies to reduce the transmission of HIV from mother to baby

Homicide

There was no statistically significant difference in overall mortality rates for homicide in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Homicide is the second leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for homicide was 9.3 deaths per 100,000 persons in the Inglewood Oil Field communities and 9.2 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 10a). African Americans had the highest mortality rates for homicide in the Inglewood Oil Field communities and Los Angeles County (Table 10b and Fig. 10). African Americans in the Inglewood Oil Field communities had a statistically significant lower mortality rate for homicide than African Americans in Los Angeles County.

Table 10a: Age- and race-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Homicide	202	9.3	8,352	9.2	NS

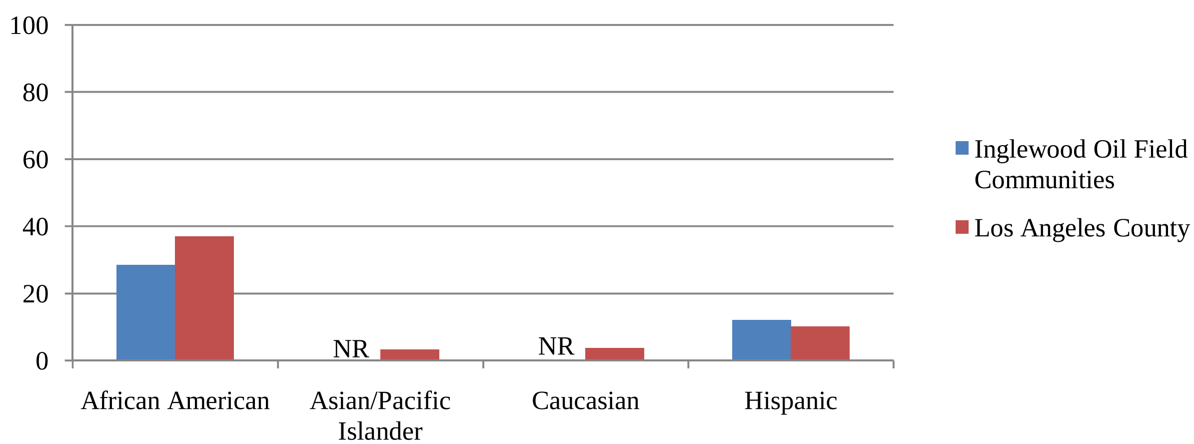
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 10b: Age-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	146	28.5	2,832	37.0	0.003
Asian/Pacific Islander	<20	NR	345	3.2	-----
Caucasian	<20	NR	916	3.7	-----
Hispanic	46	12.1	4,220	10.1	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 10: Age-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Homicide:

Risk factors for homicide include intimate partner violence, poor access to quality education, lack of employment opportunities, youths with excessive unstructured free time, gang affiliation, alcohol and substance abuse, witnessing and experiencing violence and access to firearms.

Individual opportunities for prevention:

- Maintain respectful relationships with family and friends
- Pursue a good education
- Seek help for substance abuse
- Recognize that easy access to firearms is a risk for homicide
- If firearms are kept in the home, store them unloaded and locked with the ammunition locked separately.

Community opportunities for intervention:

- Create social norms that promote healthy relationships
- Develop after-school programs for children and adolescents
- Support nurse home-visitation programs for teenage parents
- Support community policing
- Make substance abuse treatment services widely available
- Build communities that discourage street violence with well-lit streets and plenty of pedestrian traffic

Liver Disease

There was no statistically significant difference in overall mortality rates for chronic liver disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Chronic liver disease is the ninth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for chronic liver disease was 9.1 deaths per 100,000 persons in the Inglewood Oil Field communities and 10.8 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 11a). Hispanics had the highest mortality rates for chronic liver disease in the Inglewood Oil Field communities and in Los Angeles County (Table 11b and Fig. 11). African Americans in the Inglewood Oil Field communities had statistically significant lower morality rates for chronic liver disease than African Americans in Los Angeles County.

Table 11a: Age- and race-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Liver Disease	103	9.1	8,600	10.8	NS

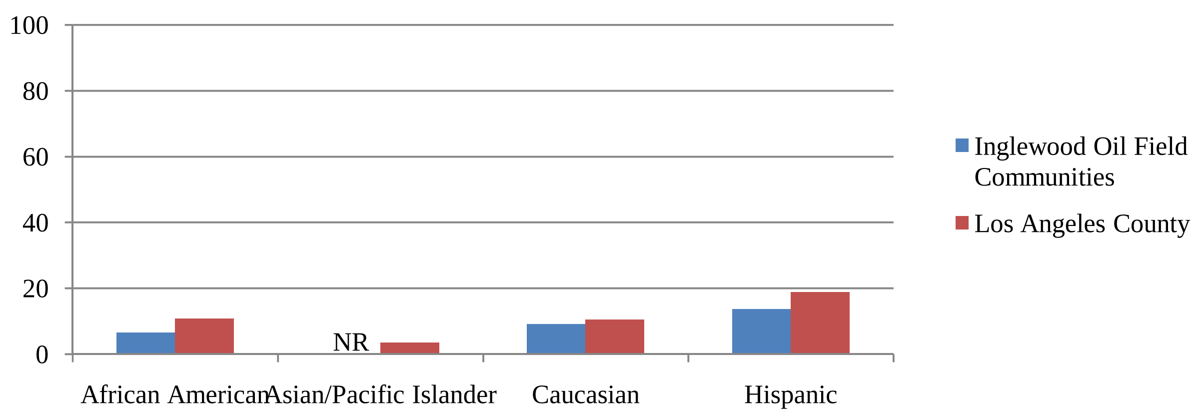
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 11b: Age-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	38	6.6	775	10.9	0.003
Asian/Pacific Islander	<20	NR	357	3.5	-----
Caucasian	28	9.1	3,319	10.6	NS
Hispanic	27	13.7	4,058	18.8	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 11: Age-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Chronic Liver Disease:

Risk factors for chronic liver disease include excessive alcohol consumption, viral hepatitis infection and prolonged exposure to certain chemicals and medications.

Individual opportunities for prevention:

- Limit alcohol intake
- Follow manufacturer's instructions when using household and industrial chemicals
- Follow doctor's instructions when taking prescription and over-the-counter drugs
- Avoid behaviors that promote transmission of hepatitis B and hepatitis C, such as injection drug use and unprotected sex

Community opportunities for intervention:

- Provide access to alcohol treatment programs
- Promote hepatitis B vaccination for groups at high risk
- Promote screening for hepatitis C for groups at high risk including users of injection drugs, hemodialysis patients and recipients of transfusions or organs

Lung Cancer

There was no statistically significant difference in overall mortality rates for lung cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Lung cancer is the second leading cause of death and fourth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for lung cancer was 46.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 43.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 12a). African Americans had the highest mortality rates for lung cancer in the Inglewood Oil Field communities and in Los Angeles County (Table 12b and Fig. 12). African Americans in the Inglewood Oil Field communities had a statistically significant lower mortality rate for lung cancer than African Americans in Los Angeles County.

Table 12a: Age- and race-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Lung Cancer£	501	46.4	24,654	43.5	NS

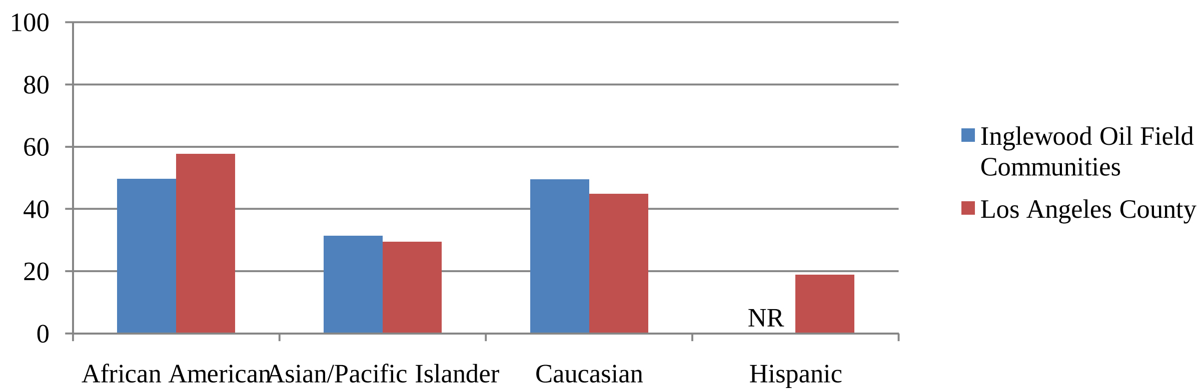
£Lung cancer includes cancers of the lung, bronchus and trachea
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 12b: Age-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	280	49.6	3,717	57.6	0.018
Asian/Pacific Islander	30	31.3	2,821	29.4	NS
Caucasian	174	49.5	15,092	44.7	NS
Hispanic	<20	NR	2,951	18.8	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 12: Age-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Lung Cancer:

Risk factors for cancers of the lung, bronchus and trachea include tobacco smoking and breathing the smoke of others, prior lung cancer and exposure to cancer-causing substances including radon, asbestos, uranium and arsenic.

Individual opportunities for prevention:

- Stop smoking
- Avoid being near people who are smoking
- Reduce exposure to cancer-causing substances
- If you don't smoke, don't start

Community opportunities for intervention:

- Increase the availability of effective smoking cessation services
- Limit smoking, and decrease exposure to indoor and outdoor secondhand smoke through effective anti-smoking policies and enforcement
- Support an increase in the tobacco tax

Motor Vehicle Crashes

There was no statistically significant difference in overall mortality rates for motor vehicle crashes in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Motor vehicle crashes are the third leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for motor vehicle crashes was 6.2 deaths per 100,000 persons in the Inglewood Oil Field communities and 9.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 13a). The mortality rates for motor vehicle crashes were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for African Americans (Table 13b and Fig. 13). The numbers of deaths were too few to compare rates for the other ethnicities. African Americans had the highest morality rates for motor vehicle crashes in the Inglewood Oil Field communities and in Los Angeles County.

Table 13a: Age- and race-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Motor Vehicle Crash	101	6.2	6,931	9.5	NS

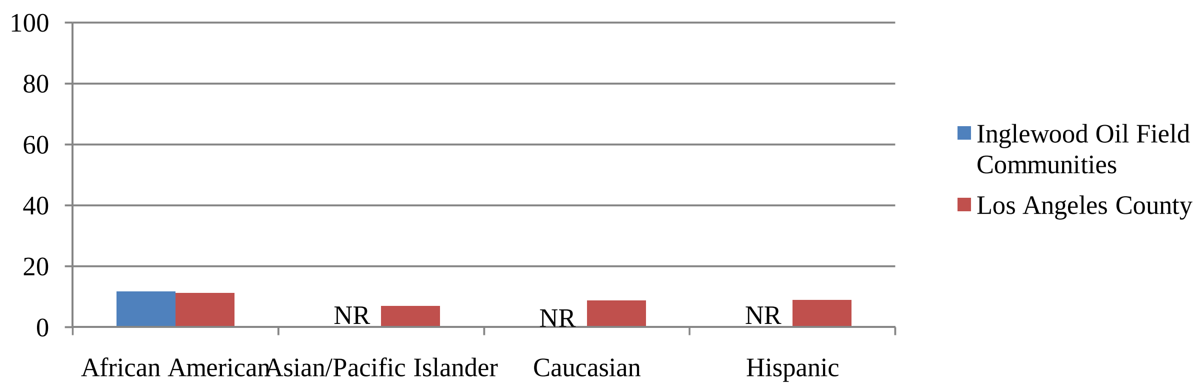
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 13b: Age-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	63	11.7	840	11.3	NS
Asian/Pacific Islander	<20	NR	722	7.0	-----
Caucasian	<20	NR	2,342	8.9	-----
Hispanic	<20	NR	2,993	9.0	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 13: Age-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Motor Vehicle Crashes:

Risk factors for motor vehicle crashes include driving under the influence of alcohol or drugs (illicit, prescription, or over-the-counter), driving recklessly, driving while distracted, disobeying traffic laws, lack of driving experience, younger or older age, hazardous road conditions, neglecting routine car maintenance. Risk factors for injury after a crash include not using seat belts or other passenger safety restraints such as child safety seats, unsafe car design.

Individual opportunities for prevention:

- Do not drive while impaired by alcohol or drugs
- Always wear seat belts, even for short trips
- Place young children in an age-appropriate, properly installed child safety or booster seat
- Have children younger than 12 years of age ride in the back seat
- Do not drive while distracted

Community opportunities for intervention:

- Actively enforce all traffic laws, including laws addressing seat belt use and child passenger safety
- Use media campaigns to reduce alcohol-impaired driving
- Comply with the graduated licensing system for teenage drivers
- Support national efforts for safe car design with safety features such as antilock brakes or electronic stability control systems

Pancreatic Cancer

There was no statistically significant difference in overall mortality rates for pancreatic cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Pancreatic cancer is the tenth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for pancreatic cancer was 9.2 deaths per 100,000 persons in the Inglewood Oil Field communities and 10.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 14a). There was no statistically significant difference in mortality rates for pancreatic cancer in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 14b and Fig. 14). African Americans had the highest mortality rates for pancreatic cancer in the Inglewood Oil Field communities as well as in Los Angeles County as a whole.

Table 14a: Age- and race-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Pancreatic Cancer	134	9.2	6,597	10.5	NS

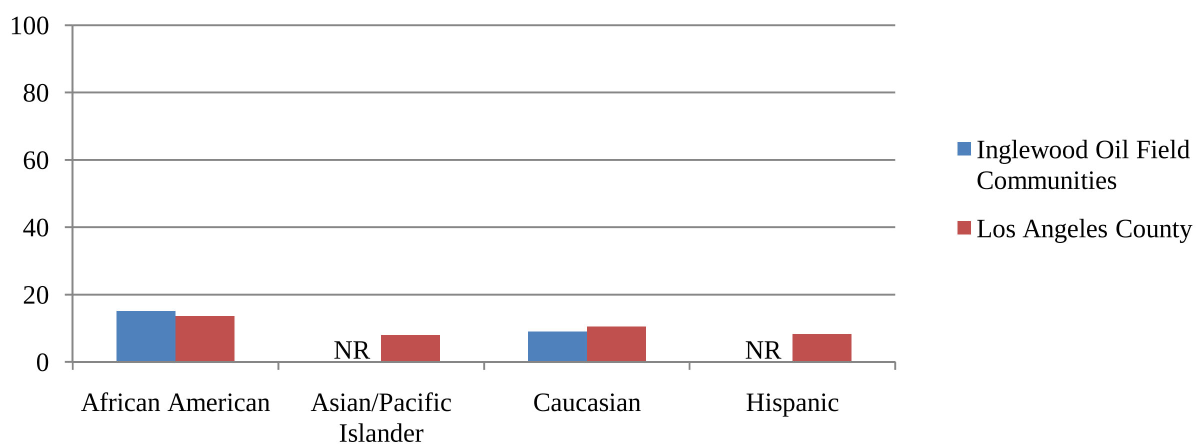
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 14b: Age-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	84	15.0	864	13.6	NS
Asian/Pacific Islander	<20	NR	767	8.0	-----
Caucasian	31	9.0	3,617	10.5	NS
Hispanic	<20	NR	1,331	8.3 (7.9-8.8)	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 14: Age-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Pancreatic Cancer:

Risk factors for pancreatic cancer include age, tobacco smoking, family history of pancreatic cancer, being overweight or obese, H.pylori bacterial infection, pancreatitis and diabetes.

Individual opportunities for prevention:

- Stop smoking
- Maintain a healthy weight

Community opportunities for intervention:

- Restrict smoking in public places and worksites
- Increase the availability of effective smoking cessation services
- Support an increase in the tobacco tax

Pneumonia and Influenza

There was no statistically significant difference in overall mortality rates for pneumonia/influenza in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Pneumonia and influenza are the fourth leading causes of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for pneumonia/influenza was 33.7 deaths per 100,000 persons in the Inglewood Oil Field communities and 29.3 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 15a). Caucasians had the highest mortality rates for pneumonia/influenza in the Inglewood Oil Field communities (Table 15b and Fig. 15). Caucasians in the Inglewood Oil Field communities had a statistically significant higher mortality rate for pneumonia/influenza than Caucasians in Los Angeles County as a whole.

Table 15a: Age- and race-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Pneumonia/Influenza	373	33.7	18,883	29.3	NS

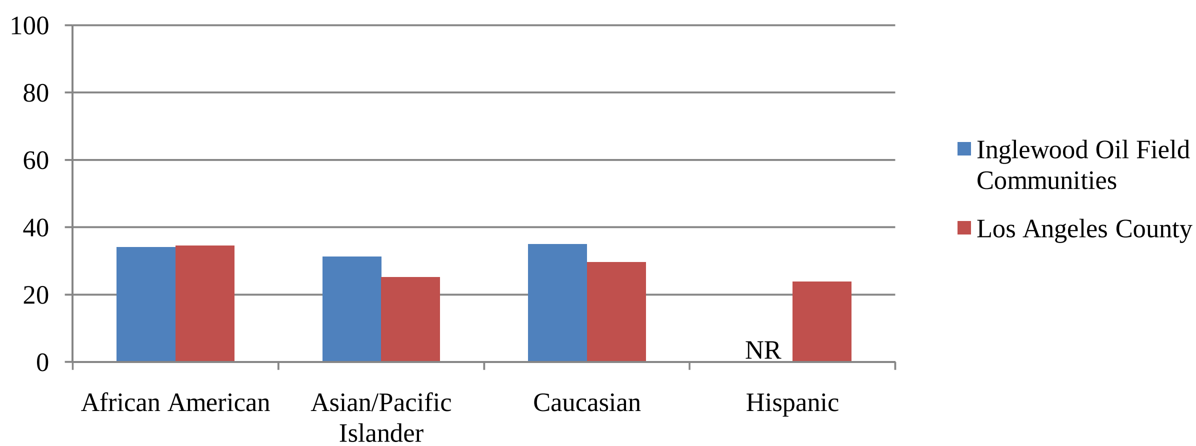
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 15b: Age-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	179	34.0	2,065	34.6	NS
Asian/Pacific Islander	28	31.3	2,138	25.2	NS
Caucasian	148	35.0	11,346	29.6	0.049
Hispanic	<20	NR	3,261	23.9	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 15: Age-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Pneumonia/Influenza:

Risk factors for pneumonia/influenza include age (young and old), smoking, and underlying chronic medical conditions such as diabetes and asthma.

Individual opportunities for prevention:

- Follow recommended guidelines for influenza and pneumococcal pneumonia vaccination
- Wash your hands frequently with soap and water
- Stop smoking
- Stay away from people who are sick
- Avoid touching your eyes, nose or mouth

Community opportunities for intervention:

- Education the community about the recommendations for influenza and pneumococcal pneumonia vaccination
- Provide information about the availability of low-cost or no-cost vaccinations for certain individuals
- Encourage everyone with respiratory illness (fever, cough, runny nose) to stay home to avoid spreading the illness to others

Stroke

There was no statistically significant difference in overall mortality rates for stroke in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Stroke is the third leading cause of death and tenth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for stroke was 48.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 48.3 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 16a). African Americans had the highest mortality rates for stroke in the Inglewood Oil Field communities as well as Los Angeles County (Table 16b and Fig. 16). African Americans in the Inglewood Oil Field communities however, had a statistically significant lower mortality rate for stroke than African Americans in Los Angeles County as a whole.

Table 16a: Age- and race-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Stroke	600	48.4	31,928	48.3	NS

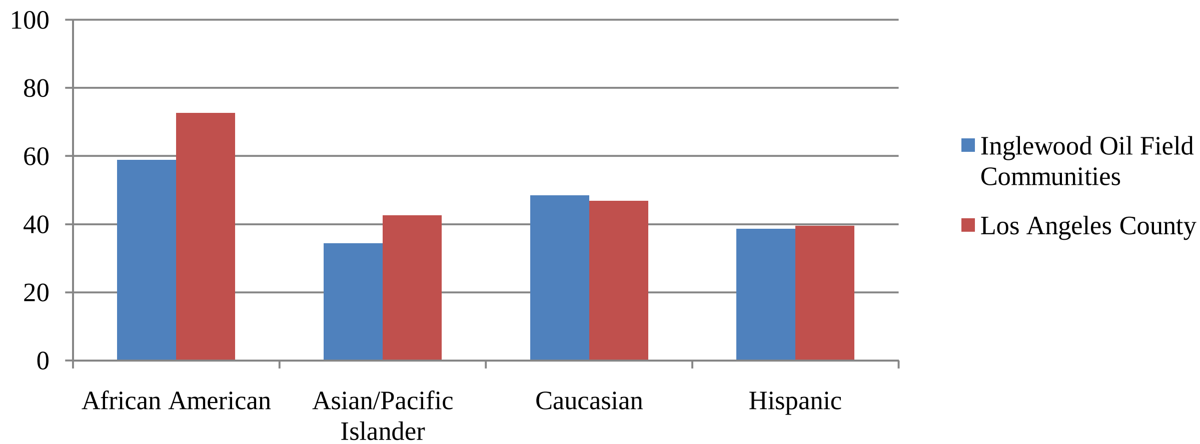
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 16b: Age-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	316	58.9	4,495	72.6	<0.001
Asian/Pacific Islander	31	34.3	3,865	42.6	NS
Caucasian	201	48.5	17,505	46.8	NS
Hispanic	46	38.6	5,979	39.5	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 16: Age-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Stroke:

Risk factors for stroke include high blood pressure, tobacco smoking, diabetes, high cholesterol, being overweight, physical inactivity, excessive alcohol consumption, age, family history of stroke, and prior stroke or heart attack.

Individual opportunities for prevention:

- Control high blood pressure
- Stop smoking
- Manage diabetes
- Maintain a healthy weight
- Consult with your physician about increasing physical activity
- Eat a diet low in fat and salt
- Learn the stroke warning signs

Community opportunities for intervention:

- Promote access to blood pressure screening and treatment for high blood pressure
- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Restrict smoking in public places and worksites
- Provide access to smoking cessation programs
- Encourage people to quit smoking through media campaigns

Conclusion

There were no statistically significant difference in overall mortality rates for all causes of death in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death compared to African Americans and Hispanics in Los Angeles County.

There were no statistically significant differences in the mortality rates for any of the leading causes of death or premature death in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Although there were no statistically significant differences in the overall mortality rates, the racial/ethnic disparities existing in Los Angeles County are also reflected in the mortality rates found in the Inglewood Oil Field communities.

There were statistically significantly higher mortality rates for some of the leading causes of death and premature death in certain ethnic groups. In the Inglewood Oil Field communities and in Los Angeles County as a whole, African Americans had the highest mortality rates for all causes of death, colorectal cancer, coronary heart disease, diabetes, HIV, homicide, motor vehicle crashes, pancreatic cancer and stroke. Caucasians had the highest mortality rates for emphysema and chronic obstructive pulmonary diseases, while Hispanics had the highest mortality rates for chronic liver disease in both the Inglewood Oil Field communities and Los Angeles County. African Americans and Caucasians had higher rates of Alzheimer's disease, breast cancer (among females), lung cancer and pneumonia/influenza than other ethnicities in both the Inglewood Oil Field communities and Los Angeles County.

For some of the leading causes of death and premature death, rates were statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for certain ethnic groups. African Americans in the Inglewood Oil Field communities had statistically significantly lower mortality rates for coronary heart disease, diabetes, emphysema/COPD, homicide, chronic liver disease, lung cancer and stroke than African Americans in Los Angeles County. On the other hand, African Americans in the Inglewood Oil Field communities had statistically significantly higher mortality rates for HIV than African Americans in Los Angeles County. Caucasians in the Inglewood Oil Field communities had statistically significantly higher mortality rates for pneumonia/influenza than Caucasians in Los Angeles County.

The differences in mortality rates for the leading causes of death and premature death do not appear to be related to the geographic location of the Inglewood Oil Field communities. Many of the differences observed within these communities are common in Los Angeles County and represent a significant public health challenge throughout the county. The disparities in mortality rates can best be addressed by targeting the underlying causes of these disparities.

ANALYSIS OF RATES OF LOW-BIRTH-WEIGHT BIRTHS

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on rates of low-birth-weight births in response to community concerns regarding potential adverse health effects for residents living near the Inglewood Oil Field. The data for rates of low-birth-weight births were obtained from registered birth certificates entered into the Automated Vital Statistics System (AVSS) at the birth hospital or the office of the local registrar. Since registration of birth certificates is required by law, the data in the AVSS is nearly 100 percent complete.

Methods

The low-birth-weight births analysis was performed with data on live births during the period 2000-2007. The analysis included births among women living in the area identified in the Inglewood Oil Field communities and Los Angeles County as a whole. Low birth weight was defined as a birth weight less than 2500 grams (5.5 pounds). The area representing the Inglewood Oil Field communities used in the analyses for low-birth-weight births included the census tracts within 1.5 miles from the perimeter of the Inglewood Oil Field. The census tracts for the year 2000 are: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01, 7025.02, 7026.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, and 7032.00. A map of the included census tracts is provided in Appendix A.

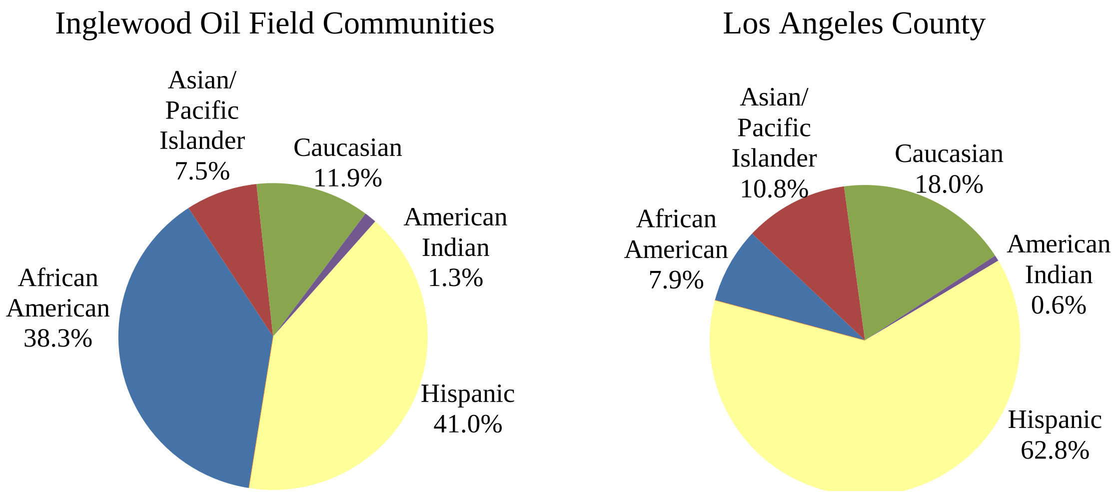
The data were analyzed for an eight year period to increase the reliability of the findings and to assess trends. Rates based on small numbers of events can fluctuate widely from year to year for reasons other than a true change in the underlying frequency of occurrence of the event. Therefore, when the number of low-birth-weight births was less than 20 in any single year, the rates of low-birth-weight births are not reported.

Rates of low-birth-weight births for the Inglewood Oil Field communities and Los Angeles County were compared and a statistical test of the difference was done to determine if the rates were statistically different.[2] A p-value of less than 0.05 indicated that the two rates were statistically significantly different, while a p-value of greater than 0.05 indicated that the two rates were not statistically significantly different.

Since the racial/ethnic distribution of the underlying population in the Inglewood Oil Field communities differs from Los Angeles County, rates were stratified to examine differences by racial/ethnic group for African Americans, Asian/Pacific Islanders, Caucasians and Hispanics (Fig. 1). Rates of low-birth-weight births were not reported for American Indians/Alaska Natives since the numbers of low-birth-weight births were too small to provide reliable rates. Overall rates of low-birth-weight births were adjusted for race/ethnicity to account for the differences in the racial/ethnic distribution in the Inglewood Oil Field communities and Los Angeles County. Cumulative race-adjusted rates were standardized to the racial/ethnic distribution of the Los Angeles County population for the year 2000.

[2] Rothman KJ, Greenland S, Lash TL. Modern Epidemiology 3rd Ed. Philadelphia: Lippincott Williams & Wilkins; 2008 p.266-268.

Fig. 1: Number of live births in the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Source: California Department of Public Health, Center for Health Statistics, 2000-2007

Results

The rate of low-birth-weight births was 7.2 per 100 live births in the Inglewood Oil Field communities and 7.0 per 100 live births in Los Angeles County, after adjusting for the differences in racial/ethnic distribution of births (Table 2). The rates of low-birth-weight births were not statistically significantly different between the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 1).

In both the Inglewood Oil Field communities and Los Angeles County, African Americans had the highest rates of low-birth-weight births. Since there were proportionately more African American births in the Inglewood Oil Field communities than in Los Angeles County (Fig. 1), when rates were adjusted for the differences in racial/ethnic distribution, there were no statistically significant differences in rates of low-birth-weight births (Table 2).

From 2000-2007, the rates of low-birth-weight births were consistently higher in African Americans than in other ethnicities in Los Angeles County (Fig. 2). There appears to be a slight increasing trend in rates of low-birth-weight births in the Inglewood Oil Field communities as well as in Los Angeles County for all ethnicities.

Table 1: Number of low birth weight births and rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of LBW	LBW Rate*	No. of LBW	LBW Rate*	p-value‡
All Races	1,246	8.7	85,370	7.0	<0.001
African American	651	11.9	11,957	12.5	NS
Asian/Pacific Islander	86	8.1	9,496	7.2	NS
Caucasian	101	5.9	14,924	6.8	NS
Hispanic	399	6.8	48,245	6.3	NS

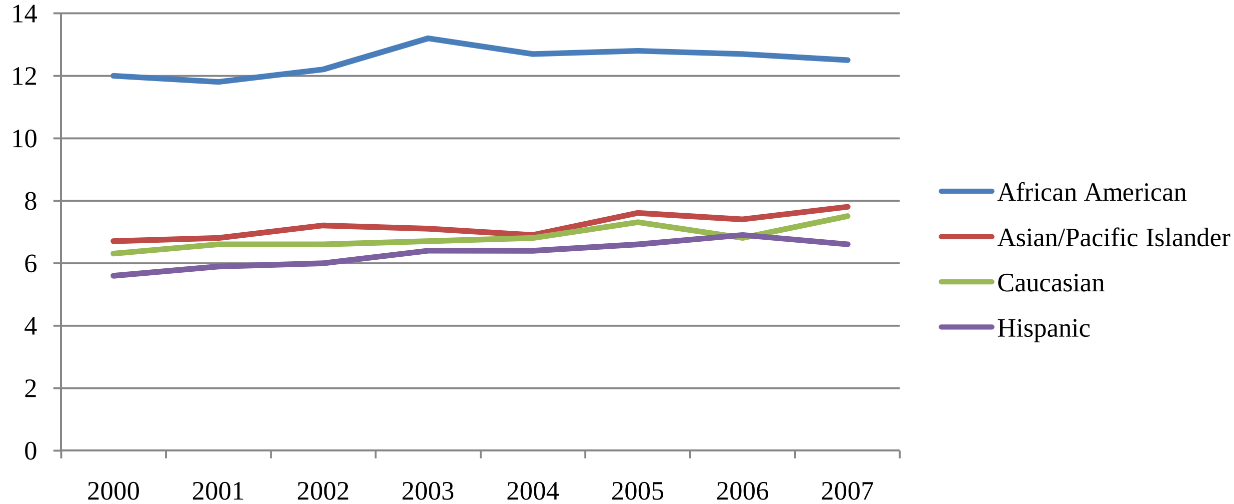
* LBW rate is the number of low birth weight live births per 100 live births, cumulative over years 2000-2007
‡NS indicates not statistically significant at a p-value of 0.05
Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007

Table 2: Number of low birth weight births and rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, adjusted for race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
	No. of LBW	LBW Rate*	No. of LBW	LBW Rate*	p-value‡
Low Birth Weight Births	1,246	7.2	85,370	7.0	NS

* LBW rate is the number of low birth weight live births per 100 live births, race-adjusted and cumulative over years 2000-2007
‡NS indicates not statistically significant at a p-value of 0.05
Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007

Fig. 2: Low-birth-weight birth rates for Los Angeles County from 2000-2007 by race/ethnicity



Data Source for Fig. 2: Table 3 in Appendix A

Conclusion

There was no statistically significant difference in the rates of low-birth-weight births in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for race/ethnicity. These results should be interpreted with caution given the lack of information on other factors (such as smoking) that could influence birth weights.

The differences in rates of low-birth-weight births among racial and ethnic groups that exist countywide are reflected in the rates observed in the Inglewood Oil Field communities. These disparities in low-birth-weight births represent a significant public health challenge throughout the county.

Request Title:

Baldwin Hills Community Standards and Los Angeles County

REQUEST NUMBER: ID 1150

DATE: DECEMBER 22, 2010

DATA SOURCE:

THE CALIFORNIA BIRTH DEFECTS MONITORING PROGRAM
Maternal, Child and Adolescent Health Division
Center for Family Health
California Department of Public Health
1615 Capitol Avenue, MS 8304
Sacramento, CA 95814

PREPARED FOR:

CARRIE TAYOUR

(EPIDEMIOLOGIST, LA COUNTY DEPT OF PUBLIC HEALTH)

DEFINITIONS AND ABBREVIATIONS

Term	Meaning
CBDMP	California Birth Defects Monitoring Program
CDPH	California Department of Public Health
DCS	Data Collection Specialist
MCAH	Maternal, Child and Adolescent Health Division
CFH	Center for Family Health
Registry	CBDMP's database of clinical data related to birth defect cases identified in CBDMP surveillance regions
Precision	Code used to allow for the assessment of the accuracy of the diagnosis
BPA	British Pediatric Association; diagnostic coding system used by CBDMP to classify birth defects
IUFD	Intrauterine fetal death
TAB	Therapeutic abortion

1. CBDMP Program Information

In 1982, California established a groundbreaking program for birth defects monitoring. Recognizing that birth defects are a public health problem about which too little is known, the State Legislature created the California Birth Defects Monitoring Program (CBDMP). From 1982-1990, seven pieces of legislation were passed and enacted, mandating the CBDMP to: 1) Maintain an ongoing program of birth defects monitoring statewide; 2) Track birth defects rates and trends; 3) Evaluate whether environmental hazards are associated with birth defects; 4) Investigate other possible birth defects causes; 5) Develop birth defects prevention strategies; 6) Conduct interview studies about causes; and 7) May operate by contract with a qualified entity.

CBDMP monitors birth defects in California as a means to ensure the safety of the public. Through active medical chart review and data collection, the CBDMP maintains a Registry of birth defects. CBDMP uses information in the Registry to perform surveillance, to monitor trends in occurrence of birth defects, and to help in planning intervention and prevention strategies. In addition, CBDMP provides data to scientific researchers.

1.1 Program Mission and Goals

Program Mission: The California Birth Defects Monitoring Program (CBDMP) collects and analyzes data to identify opportunities for preventing birth defects and improving the health of babies.

Program Goals:

- Increase the quality and quantity of California-based birth defect data available for purposes of public health monitoring and investigator-led research
- Increase communication of birth defects information
- Monitor public health and safety concerns relating to birth defects

1.2 Data Collection Methods

CBDMP uses a systematic approach to collect data that are used for the purposes of surveillance, epidemiologic research, and cluster investigations. To identify cases (live births, fetal deaths, and terminations) with birth defects, highly trained data collection staff visit health facilities in select Registry counties. Data collection is limited to in-patient facilities, genetic offices and cytogenetic laboratories. Data collection staff visit health facilities and review all relevant logs, such as obstetrics, nursery, and newborn intensive care unit, as well as discharge diagnoses indices. All potential cases are identified and the medical records are reviewed. Detailed identifying information and diagnostic information are abstracted into a standard format. For each diagnosis a confirmation code signifies how the diagnosis was made; a sub-specialist code signifies what type of physician or clinician made the diagnosis; and a precision code allows for the assessment of the accuracy of the diagnosis. A CBDMP data expert or geneticist reviews abstracts of children who have multiple diagnoses to determine if the children also have previously unrecognized syndromes.

2. REQUEST

In response to health concerns voiced by residents in communities near the Baldwin Hills Community Standards District (CSD), the Los Angeles County Department of Public Health is conducting a community health assessment. The assessment will provide a profile of the health of the population near the CSD. They are requesting an analysis examining the rates of birth defects for a selected group of zip codes--90008, 90016, 90043, 90056, 90230, 90232, 90302--compared to all recent available data on birth defects reported in Los Angeles County starting in 1990. The results of the analysis will be used to examine the rates of birth defects in this geographical area compared to rates in LA County as a whole as part of a snapshot of health in this area.

3. METHODS

The analysis performed identified birth defect cases in the registry collected over a span of eight years or more (DOB: 7/1/1990-12/31/2002, excluding DOB 1998) for Los Angeles County and zip codes that contain the Baldwin Hills Community (90008, 90016, 90043, 90056, 90230, 90232, and 90302). Rates were calculated per 1,000 live births and fetal deaths with 95% confidence intervals for each defect or defect group. Not all defects requested were collected by CBDMP for all years.

Vital statistics information on the total number of live births and fetal deaths (denominator value) for rate calculations was determined using the California Center for Health Statistics Office of Health Information and Research Vital Statistics data.

3.1 Data Selection Criteria

Congenital anomalies were identified using British Pediatric Association (BPA). Criteria used for inclusion is listed in Table 4 of Appendix A. Births in military hospitals were excluded. Birth year 1998 excluded due to incomplete data collection.

3.2 Statistical Methods

Birth defect rates and confidence intervals (Baldwin Hills and Los Angeles County) are displayed in this report. Rates represent cases per 1,000 live births and fetal deaths. 95% confidence intervals were calculated using Poisson distribution. The Relative risk (RR) was also calculated between groups for each deformity and reported, with respective 95% confidence intervals.

The confidence intervals indicate that there is a 95% probability that the actual statistic falls somewhere between the lower and the upper limit. When looking at the relative risk, if the 95% confidence interval includes 1, it is determined that there is not a statistical difference between the two rates.

4. RESULTS

4.1 Birth defect rates with 95% confidence intervals for Los Angeles County & Baldwin Hills

Zip codes containing and surrounding the Baldwin Hills Community (90008, 90016, 90043, 90056, 90230, 90232, and 90302) and Los Angeles County from July 1, 1990-December 31, 2002 (excluding births occurring in 1998) per 1,000 live births and fetal deaths.

Type of Birth Defect	Baldwin Hills Community Zip Codes*	Los Angeles County	Relative Risk
Anencephaly	0.20 (0.09-0.40)	0.34 (0.32-0.37)	0.59 (0.30 – 1.18)
Spina Bifida	0.38 (0.21-0.62)	0.38 (0.35-0.41)	0.99 (0.6 – 1.66)
EncephaloceleŦ	0.03 (0.00-0.16)	0.11 (0.10-0.13)	0.26 (0.04 – 1.86)
MicrocephalusŦ	0.97 (0.67-1.37)	0.91 0.86-0.95)	1.08 (0.76 – 1.52)
HydrocephalusŦ	0.71 (0.45-1.05)	0.52 (0.48-0.55)	1.37 (0.91 – 2.06)
Other Nervous System AnomaliesŦ	1.86 (1.43-2.38)	1.55 (1.49-1.61)	1.20 (0.93 – 1.54)
Eye Anomalies§	3.29 (2.65-4.04)	3.15 (3.06-3.25)	1.05 (0.85 – 1.29)
Ear Anomalies§	5.21 (4.40-6.13)	5.09 (4.97-5.21)	1.02 (0.87 – 1.21)
Cardiac Septal Closure AnomaliesŦ	3.19 (2.61-3.85)	3.45 (3.36-3.54)	0.92 (0.76 – 1.12)
Transposition of Great Vessels	0.28 (0.14-0.49)	0.46 (0.43-0.49)	0.71 (0.39 – 1.29)
Tetralogy of Fallot	0.40 (0.23-0.65)	0.35 (0.33-0.38)	1.13 (0.69 – 1.86)
Other Heart AnomaliesŦ	2.33 (1.85-2.90)	2.53 (2.45-2.60)	0.92 (0.74 – 1.15)

Type of Birth Defect	Baldwin Hills Community Zip Codes*	Los Angeles County	Relative Risk
Other Circulatory System AnomaliesŦ	1.56 (1.17-2.05)	1.85 (1.79-1.91)	0.85 (0.64 – 1.11)
Respiratory System Anomalies§	3.76 (3.08-4.56)	3.42 (3.32-3.52)	1.1 (0.91 – 1.34)
Cleft palate and/or cleft lip	1.20 (0.89-1.60)	1.52 (1.47-1.58)	.79 (0.59 – 1.05)
TE/Fistula§	0.22 (0.08-0.47)	0.25 (0.22-0.27)	0.88 (0.39 – 1.98)
Pyloric Stenosis§	1.12 (0.76-1.59)	1.55 (1.48-1.62)	0.72 (0.51 – 1.03)
Small Intestinal Atresia§	0.65 (0.39-1.03)	0.41 (0.38-0.45)	1.57 (0.98 – 2.52)
Large Intestinal Atresia§	0.47 (0.25-0.80)	0.44 (0.41-0.48)	1.07 (0.62 – 1.84)
Hirschsprung	0.18 (0.06-0.39)	0.13 (0.11-0.14)	1.40 (0.63 – 3.15)
Genital Anomalies§	2.89 (2.30-3.60)	2.95 (2.86-3.04)	0.98 (0.79 – 1.22)
Urinary System Anomalies§	2.32 (1.78-2.96)	2.29 (2.21-2.37)	1.01 (0.79 – 1.30)
Musculo-skeletal§	3.47 (2.81-4.24)	3.26 (3.16-3.35)	1.07 (0.87 – 1.31)
Limbs§	5.72 (4.86-6.68)	4.80 (4.68-4.91)	1.19₤ (1.02 – 1.39)
Other Musculoskeletal Anomalies§	4.70 (3.93-5.58)	4.11 (4.00-4.22)	1.14 (0.96 – 1.36)
Anomalies of the Integument§	4.85 (4.06-5.74)	4.24 (4.14-4.35)	1.13 (0.95 – 1.34)
Down SyndromeŦ	1.68 (1.27-2.18)	1.67 (1.61-1.73)	1.01 (0.78 – 1.31)
Other Chromosomal Anomalies§	1.23 (0.85-1.72)	1.22 (1.16-1.28)	1.01 (0.72 – 1.42)
Other Congenital Disorders§	0.98 (0.64-1.42)	1.20 (1.14-1.26)	0.82 (0.56 – 1.19)

* Baldwin Hills Community zip codes include 90008, 90016, 90043, 90056, 90230, 90232, and 90302

Ŧ California Birth Defect Monitoring Program reported data from the years 1990-2000, excluding 1998 because of incomplete data collected for that year

§ California Birth Defect Monitoring Program reported data from the years 1990-1997

₤ $p < .05$

5. Discussion

The table included in Section 5.1 of this report shows the rates of birth defects with corresponding 95% confidence intervals for the zip codes that contain and surround the Baldwin Hills Community and for all of Los Angeles County. The Relative risk associated with each rate comparison is also calculated along with the corresponding 95% confidence intervals. In calculating rates for the zip codes that contain and surround Baldwin Hills Community, wide confidence intervals mean that the estimates of the rates are very imprecise due to the small sample sizes of pregnant women and the small numbers of children born with birth defects.

The only rate estimates for birth defects in the zip codes that contain and surround Baldwin Hills that were statistically significantly different when compared to Los Angeles County as a whole was for limb defects, with RR 1.19 (95% CI 1.02 – 1.39). Babies born in the Baldwin Hills area were 1.2 times more likely to be born with a limb defect than those in the remaining Los Angeles area for the birth years 1990 thru 1997.

Epidemiological investigations are relatively conclusive when large, population-based samples are involved. Conversely, analyses of data from local areas, such as the communities surrounding the Baldwin Hills Community, are limited by small sample sizes. In addition, these analyses cannot take into account the multitude of factors associated with the development of birth defects. Thus, these results should be interpreted with caution.

5.1 Limitations

Due to budget constraints, not all of the defects were collected for all birth years. Data collection for the 1998 birth year was incomplete and, therefore, not included in this analysis.

This investigation cannot rule out that living in close proximity to Baldwin Hills may be associated with a small increase in the risk of developing birth defects in some individuals. Scientific detection of such small increases in risk is beyond the scope of this investigation, due to small sample sizes in the Baldwin Hills area and other methodological limitations.

6. Terms of Use

The table and data in this report and results pertaining to the request are confidential. The data will not be used for purposes other than those stated in the agreement. Requester must adhere to strict guidance of HIPAA rules in regards to storing and providing privacy protections for health-related data. The data may be used for epidemiologic and public health monitoring and planning purposes only. Data may be presented in aggregate form only. No personal level data may be released. The requester will not sell or distribute the data or permit others to do so. The requester will not link or match, or let others link or match, the data to any other unaggregated dataset and/or other individual information unless such link or match was identified in the research proposal and the proposal was approved by the State of California Health and Human Services Agency (CHHSA) and Committee for the Protection of Human Subjects (CPHS). No subject contact is permitted without written approval. The requester will not use or permit others to use the data to learn about the identity of a program client or a survey participant.

USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

Keck School of Medicine
University of Southern California

Cancer Surveillance Program

Department of
Preventive Medicine

Assessment of Cancer Incidence in Baldwin Hills, Baldwin Hills Adjacent and Ladera Heights

Report prepared by
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The University of Southern California Cancer Surveillance Program (USC-CSP) is the population-based cancer registry for Los Angeles County that was begun in 1972. By law, all cancers diagnosed in California since January 1, 1988 are reported to one of the regional registries that form the California Cancer Registry (CCR), the legally mandated cancer reporting system of California. The USC-CSP serves as Region 9 of the CCR, and is also one of the registries participating in the National Cancer Institute's Surveillance, Epidemiology, and End-Results Program (SEER). The California Department of Public Health, the Centers for Disease Control and Prevention, and the National Cancer Institute fund cancer surveillance conducted by USC-CSP. Data is collected on all new cancer patients diagnosed in Los Angeles County since 1972 and includes information on age, race/ethnicity, patient's address at diagnosis, gender and specific type of cancer. All invasive cancers, excluding non-melanoma skin cancers, are reported, along with in situ breast and bladder cancer, and benign brain tumors. Completeness of the reporting to the registry is estimated at over 95%.

This report is in response to a request from the Los Angeles County Board of Supervisors as communicated to Dr. Cozen by Carrie Nagy, Epidemiologist, Los Angeles County Department of Health Services, for the risk of cancer types related to exposure to oil wells located at the La Cienega oil field. Because risk of certain types of hematopoietic cancers has been linked to exposure to petroleum products such as benzene1, we examined the expected and observed incidence of these cancers in the area of concern. We divided the time period into 1972-1999 and 2000-2005 in order to capture a better understanding of the most recent trends. The aggregated census tracts examined were: 220100, 235100, 236000, 236202, 236400, 269901, 276100, 600911, 601301, 601303, 702400, 702501, 702502, 702600, 702700, 703001, 703002, 703100, and 703200.

Results:

The type of cancer that has been most definitively linked to benzene (petroleum product) is acute myelogenous leukemia. There was no excess occurrence of this type of leukemia in the census tracts examined (Table 1). All other hematopoietic cancer incidence was similarly within the range of that expected except for chronic myelogenous leukemia among non-Hispanic whites in the most recent time period examined; there were two additional cases over that expected (Table 1.) We could not examine the risk of acute lymphocytic leukemia which occurs mainly in children under 5 years old, because there were too few cases in the area. We did not examine Hodgkin lymphoma because it has not been associated with benzene or petroleum exposures 1.

Table 1. Observed and expected numbers of selected hematopoietic cancers in census tracts 220100, 235100, 236000, 236202, 236400, 269901, 276100, 600911, 601301, 601303, 702400, 702501, 702502, 702600, 702700, 703001, 703002, 703100, 703200 from 1972-2005, based on the USC SEER Cancer Surveillance Program.

	1972-1999		2000-2005	
	Cases Observed[1]	Cases Expected[2]	Cases Observed[1]	Cases Expected[2]
Acute myelogenous leukemia[3]				
African-American	17	14-34	7	3-16
Non-Hispanic White	47	32-59	4	2-13
Hispanic White	-	-	-	-
Asian/Other	4	0-8	-	-
Chronic myelogenous leukemia[4]				
African-American	11	9-27	4	0-9
Non-Hispanic White	11	12-32	9*	0-7
Hispanic White	-	-	-	-
Asian/Other	-	-	-	-
Chronic lymphocytic leukemia[5]				
African-American	28	17-39	13	3-17
Non-Hispanic White	54	39-69	14	4-18
Hispanic White	-	-	-	-
Asian/Other	-	-	-	-
Non-Hodgkin lymphoma[6]				
African-American	106	80-120	41	32-59
Non-Hispanic White	198	175-232	50	30-56
Hispanic White	13	7-24	9	2-14
Asian/Other	15	6-21	12	2-14
Multiple myeloma[7]				
African-American	97	68-105	37	22-46
Non-Hispanic White	52	43-74	11	4-18
Hispanic White	5	0-10	-	-
Asian/Other	4	0-7	-	-

[1]Number of cases observed in census tracts
[2]Expected range of 95% confidence interval based on population of named census tracts
[3]Acute myelogenous leukemia, SEER Site 35021
[4]Chronic myelogenous leukemia, SEER Site 35022
[5]Chronic lymphocytic leukemia, SEER Site 35012
[6]Non-Hodgkin lymphoma, SEER Sites 33041-33042
[7]Multiple myeloma, SEER Site 34000

Discussion:

There was an excess risk of chronic myelogenous leukemia (CML) in non-Hispanic whites based on two cases, in the census tracts examined. The link between this type leukemia and petroleum products is not as consistently found as that with acute myelogenous leukemia, but there are some reports of an association1. Because we examined 27 comparisons (by race/ethnicity and cancer type), chance is still a possible explanation for the occurrence of 2 additional cases. Furthermore, in most of the studies examining this issue, occupational exposure to specific petroleum-based chemicals, such as benzene, was measured, rather than residential proximity to oil wells. Very few, if any, well-conducted published studies exist on health effects in communities due to proximity of oil wells.

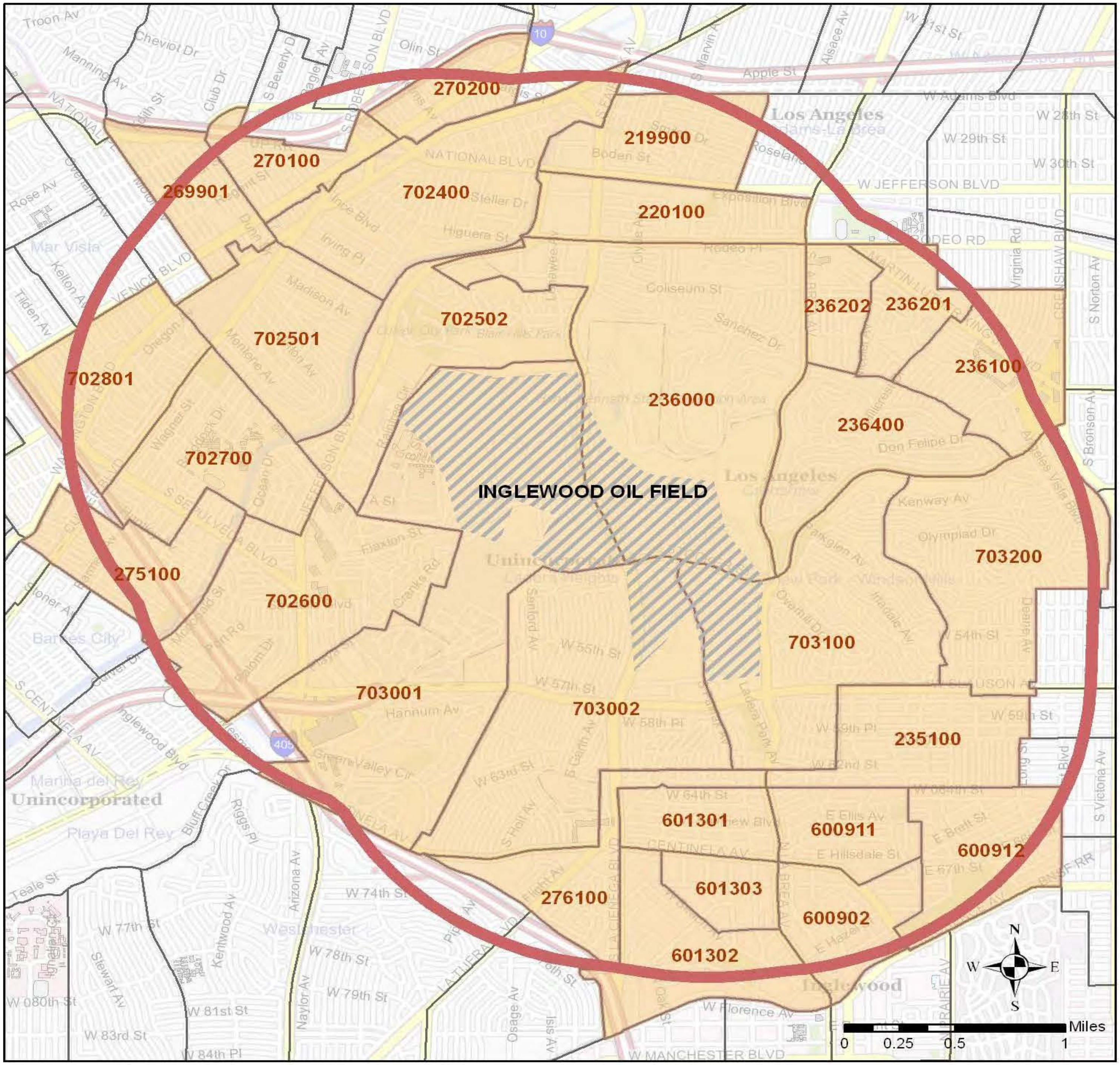
The additional two cases of CML may or may not be related to the proximity of the oil wells and prediction about future leukemia risk related to an expansion of oil wells should not be made on this basis. Rather, risk assessment should be based on estimated exposure of the community to carcinogenic substances associated with oil wells.

References

1. Linet MS, Devesa SS, Morgan GJ. The Leukemias. In Schottenfeld D and Fraumeni JF, Jr. Cancer Epidemiology and Prevention. Third Edition. Oxford University Press, New York, New York, 2006.

Cc: Dennis Deapen, Dr. PH., Thomas M. Mack, M.D., M.P.H., Jonathan Samet M.D., M.S., Kurt Snipes, Ph.D., Janet Bates, M.D., M.P.H. and Margaret McCusker, M.D., M.S.

APPENDIX A



Census tracts within proximity of Inglewood Oil Field perimeter

Legend

study area

1.5 mile buffer

selected census tracts

Estimated population:

PEPS 2007 = 152,035
Census 2000 = 146,461

Prepared by LA County Department of Public Health, Office of Health Assessment and Epidemiology, 12/2010

Table 1: Crude mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County	
Cause of Death	No. of deaths	Rate*	deaths	Rate*
All Causes	8,708	724	476,493	594.3
Alzheimer's	160	13.3	10,200	12.7
Asthma	30	2.5	1,028	1.3
Breast Cancer (females)	186	28.9	8,774	21.6
Colorectal Cancer	237	19.7	11,056	13.8
Coronary Heart Disease	2,251	187.2	125,526	156.6
Diabetes	310	25.8	16,890	21.1
Emphysema/COPDɫ	322	26.8	21,484	26.8
HIV	96	6.4	3,804	4.7
Homicide	202	16.8	8,352	10.4
Liver Disease	103	8.6	8,600	10.7
Lung Cancer£	501	41.7	24,654	30.7
Motor Vehicle Crash	101	8.4	6,931	8.6
Pancreatic Cancer	134	11.1	6,597	8.2
Pneumonia/Influenza	373	31	18,883	23.6
Stroke	600	49.9	31,928	39.8

* Per 100,000 persons, cumulative over years 2000-2007
ɫ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

Table 2: Numbers of deaths from all causes of death and age-adjusted rates of mortality for the Inglewood Oil Field communites§ and Los Angeles County, by race/ethnicity for the years 2000-2007

	2000		2001		2002		2003		2004		2005		2006		2007	
	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*
Inglewood Oil Field Communities	1,071	787.9	1,056	779.9	1,145	824.5	1,136	795.8	1,120	754.9	1,062	708.6	1,060	699.3	1,058	685.1
African American	547	851.4	603	954.6	593	914	631	924.6	607	861.6	570	794.1	577	802.8	569	793.4
Asian / Pacific Islander	52	557.1	59	583	50	459.5	55	509.5	58	531.6	53	432.8	38	292.5	62	430.7
Caucasian	395	828.1	312	666.2	416	844.6	350	743.6	345	724.8	354	723.6	357	759.2	320	673.3
Hispanic	77	504.1	79	465.1	84	486.1	97	656.6	104	589.2	81	488.7	85	411.5	102	446.9
Los Angeles County	59,032	753.7	59,774	756.0	59,586	726.1	61,026	721.3	59,153	682.2	60,145	678.6	59,461	660.6	58,316	624.3
African American	8,256	1,074.8	8,447	1,100.9	8,481	1,077	8,517	1,059	8,372	1,025	8,410	1,016	8,185	984.8	8,023	939.8
Asian / Pacific Islander	4,787	498.2	5,084	511.3	5,255	495.8	5,352	475.7	5,591	472.8	5,820	468.4	5,884	454.2	6,087	439.6
Caucasian	34,688	809.3	34,182	800.7	33,668	772.9	34,100	772	32,320	726.7	32,097	716.3	31,375	704.8	30,590	673.3
Hispanic	11,102	597	11,874	622.4	11,966	587.9	12,801	593.9	12,631	560.9	13,567	572.6	13,783	556.4	13,429	506.2

§2000 Census Tracts: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01,7025.02, 7060.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, 7032.00

* Age-adjusted rate per 100,000 person-years; 'NR' rate not reported due to small numbers

Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit

Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008.

Table 3: Numbers of low-birth-weight live births and rates of low-birth-weight births for the Inglewood Oil Field communites§ and Los Angeles County, by race/ethnicity for the years 2000-2007

	2000		2001		2002		2003		2004		2005		2006		2007	
	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*
Inglewood Oil Field Communities	187	10.3	129	7.5	139	8.2	129	7.5	138	8.0	182	9.9	176	9.3	166	9.0
African American	120	15.7	60	8.8	69	10.1	67	10.4	66	10.7	89	12.9	98	13.7	82	12.5
Asian / Pacific Islander	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR
Caucasian	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR
Hispanic	46	6.2	50	7.2	50	7.4	40	5.4	52	7.4	57	7.7	51	6.8	53	6.7
Los Angeles County	10,080	6.4	10,213	6.7	10,222	6.8	10,794	7.1	10,717	7.1	10,984	7.3	11,196	7.4	11,186	7.4
African American	1,616	12.0	1,489	11.8	1,456	12.2	1,559	13.2	1,478	12.7	1,456	12.8	1,456	12.7	1,429	12.5
Asian / Pacific Islander	1,095	6.7	1,061	6.8	1,151	7.2	1,165	7.1	1,151	6.9	1,244	7.6	1,239	7.4	1,390	7.8
Caucasian	1,827	6.3	1,860	6.6	1,832	6.6	1,883	6.7	1,878	6.8	1,932	7.3	1,775	6.8	1,939	7.5
Hispanic	5,478	5.6	5,714	5.9	5,700	6.0	6,084	6.4	6,111	6.4	6,232	6.6	6,628	6.9	6,298	6.6

§2000 Census Tracts: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01,7025.02, 7060.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, 7032.00

Note: Low birth weight is defined as weight less than 2,500 grams at birth. Numbers in the male and female categories may not add up to the total due to live births designated as unknown gender.

* LBW Rate is defined as the number of low birth weight live births per 100 live births; 'NR' rate not reported due to small numbers

Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007.

Table 4: California Birth Defects Monitoring Program's criteria used for inclusion of birth defect data

Type of Birth Defect	British Pediatric Association (BPA) Code	Continued & Specific Instrucitons
Anencephaly	740.000-740.199	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Spina Bifida Excludes spina bifida if anencephaly (704.000-741.000) present	741.000-741.999	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
EncephaloceleŦ	742.000-742.090	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
MicrocephalusŦ	742.100	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
HydrocephalusŦ Excludes hydrocephaly if spina bifida (741.000-741.999) present	742.300-742.390	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Nervous System AnomaliesŦ Excludes encephalocele (742.000-742.090), microcephalus (742.100), hydrocephaly (742.300-742.390)	742.200-742.299; 742.400-742.999	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Eye Anomalies§	743.000-743.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Ear Anomalies§ Includes anomalies of ear, face & neck	744.000-744.910	DOB 7/1/1990-1997: Continued=any, Specific=any
Cardiac Septal Closure AnomaliesŦ	745.400-745.900	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Transposition of Great Vessels Includes DORV (745.150); only d-TGA; collected for DOB 2001-2003	745.100-745.190	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Tetralogy of Fallot	745.200, 745.210, 747.310	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Other Heart AnomaliesŦ Excludes tetraology of fallot (745.200, 747.310), septal closure defects (745.400-745.900), transposition of great vessels (745.100-745.190)	745.000-745.020; 745.300-745.305; 746.000-746.990	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Circulatory System AnomaliesŦ	747.100-747.900	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Respiratory System Anomalies§	748.000-748.904	DOB 7/1/1990-1997: Continued=any, Specific=any

Cleft palate and/or cleft lip	749.000-749.294	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Tracheoesophageal (TEF)/Fistula§ Includes esophageal atresia +/- TEF; excludes esophageal stenosis	750.300-750.320	DOB 7/1/1990-1997: Continued=any, Specific=any
Pyloric Stenosis§	750.510	DOB 7/1/1990-1997: Continued=any, Specific=any
Small Intestinal Atresia§ Excludes stenosis of duodenum (751.130), jejunum (751.140), ilieum (751.150), stenosis small intestine NOS with fistula (751.185), stenosis small intestine NOS without fistula (751.180) and duodenal web (751.160)	751.100-751.120; 751.190-751.195	DOB 7/1/1990-1997: Continued=any, Specific=any
Large Intestinal Atresia§ Excludes stenosis of large intestine (751.206), stenosis rectum with fistula (751.215) , stenosis rectum without fistula (751.225), stenosis anus with fistula (751.236), stenosis anus without fistula (751.246)	751.200, 751.210, 751.220, 751.235 751.237, 751.239, 751.245, 751.247, 751.249	DOB 7/1/1990-1997: Continued=any, Specific=any
Hirschsprung	751.300-751.340	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Genital Anomalies§	752.000-752.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Urinary System Anomalies§	753.000-753.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Musculo-skeletal§	754.000-754.884	DOB 7/1/1990-1997: Continued=any, Specific=any
Limbs§	755.000-755.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Other Musculoskeletal Anomalies§	756.000-756.994	DOB 7/1/1990-1997: Continued=any, Specific=any
Anomalies of the Integument§	757.000-757.990	DOB 7/1/1990-1997: Continued=any, Specific=any
Down SyndromeŦ	758.000-758.099	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Chromosomal Anomalies§	758.100-758.999	DOB 7/1/1990-1997: Continued=any, Specific=any
Other Congenital Disorders§	759.000-759.999	DOB 7/1/1990-1997: Continued=any, Specific=any

Ŧ CBDMP reported data for DOB 1990-2000, excludes 1998 incomplete data collected for that year

§ CBDMP reported data for DOB 1990-1997

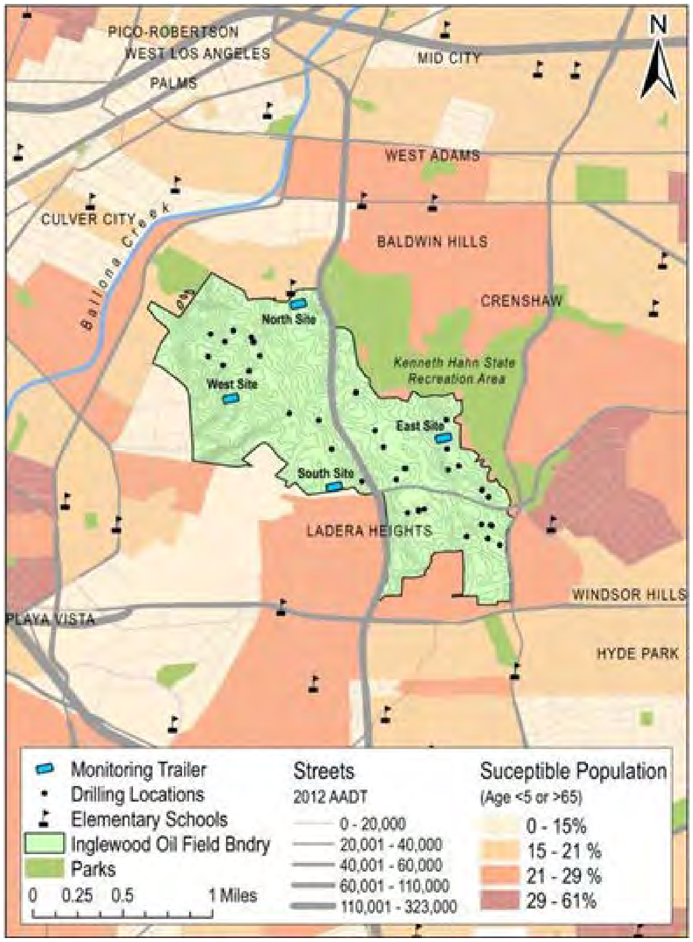
* Data for chromosome defects & birth defects with abnormal chromosomes differs over time

Excerpt of reference cited at point c. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://case.planning.lacounty.gov/assets/upl/project/bh_air-quality-study.pdf

Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

Baldwin Hills Air Quality Study



Final Report prepared for

Los Angeles County
Los Angeles, California

February 2015

Baldwin Hills Air Quality Study

Final Report

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Executive Summary

Overview

The Inglewood Oil Field operates within the Baldwin Hills Community Standards District (CSD) of Los Angeles County. The County commissioned the Baldwin Hills Air Quality Study as part of an agreement settling legal challenges to an Environmental Impact Report (EIR; Marine Research Specialists, 2008) concerning development at the Oil Field. Multiple community groups around the Oil Field were concerned with potential pollutant impacts due to Oil Field activities. Sonoma Technology, Inc. (STI) developed and conducted the Baldwin Hills Air Quality Study.

The Baldwin Hills Air Quality Study focused on two primary and two secondary objectives set forth by the settlement agreement.

- Primary project objectives
  - Quantify the air toxics emissions from the Inglewood Oil Field (referred to as Oil Field throughout this document) operations, including drilling and well workovers.
  - Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.
- Secondary project objectives
  - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.
  - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

The Inglewood Oil Field is one of many sources of air pollution within the South Coast Air Basin (Basin). The Basin is a highly urbanized area of over 17 million people. Emissions sources in the Basin include about 11 million motor vehicles and many industrial and commercial operations. The Inglewood Oil Field is located in the western, urbanized portion of the Basin surrounded by major freeways and bisected by La Cienega Boulevard, a busy arterial road. Major industrial emissions sources mostly lie to the south and southeast, and Los Angeles International Airport is about 4 miles to the south-southwest.

Methods

STI considered the 37 air toxics emitted from the Oil Field and performed a hazard identification to prioritize the air toxics of greatest concern. STI used emissions values from the EIR to compare the pollutants' relative toxicities by weighting these emissions in relation to acute and chronic health benchmark levels from the California Office of Environmental Health Hazard Assessment (OEHHA). Chronic cancer potency risk factors and chronic and acute Reference Exposure Levels (RELs) were obtained from the OEHHA (California Environmental Protection Agency, 2011, 2014) http://www.oehha.ca.gov/air/allrels.html. Acute RELs can be either 1-hr, 8-hr, or 24-hr values; the lowest REL was chosen to provide a conservative estimate of acute toxicities. From this weighting of emissions rates, the pollutants were rank-ordered to prioritize the list. Key pollutants identified for characterization included diesel particulate matter

(DPM), cadmium, benzene, nickel, formaldehyde, mercury, manganese, acrolein, arsenic, and lead.

Four types of monitoring were used: (1) Aethalometers to measure black carbon (as a proxy for DPM); (2) X-ray fluorescence spectrometer (XRF) for metals; (3) Proton Transfer Reaction Time of Flight Mass Spectrometry (PTR-TOFMS) for VOCs; and (4) meteorological sensors to help assess the wind patterns, temperature, and humidity that might influence pollutant concentrations.

The field study began in November 2012 and ended in November 2013. **Table ES-1** shows the sampling durations and windows of operation for black carbon (BC), metals, and VOCs. A map of the monitoring locations is shown in **Figure ES-1**.

Table ES-1. The four monitoring sites at the Inglewood Oil Field, with corresponding windows of operations and sampling durations for BC (as a surrogate for DPM), metals, and VOCs.

Site Name	Window of Operation and Duration		
	BC	Metals	VOCs
North (N)	11/15/12–11/15/13 1 year	–	–
South (S)	11/15/12–11/15/13 1 year	–	–
East (E)	11/15/12–11/15/13 1 year	11/15/12 – 2/1/13 2.5 months	7/3/13–7/17/13 2 weeks
West (W)	11/15/12–11/15/13 1 year	–	–

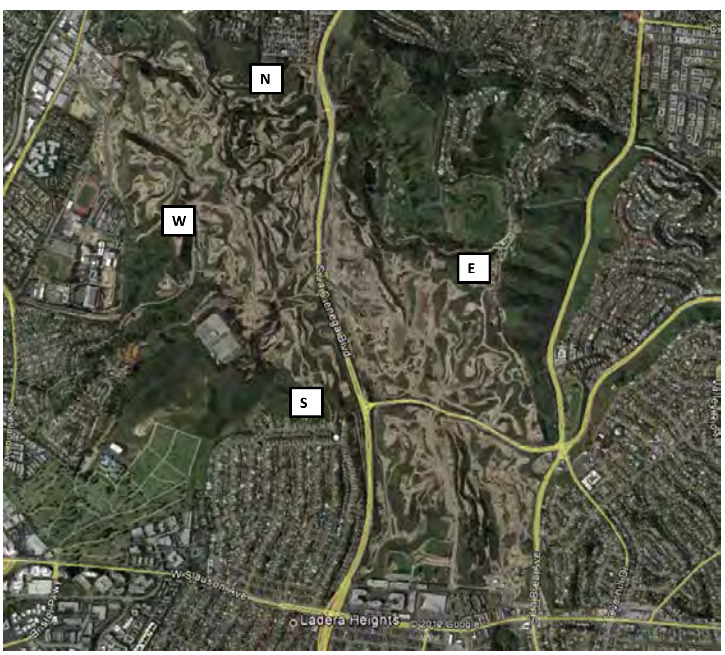


Figure ES-1. Aerial view of the Inglewood Oil Field, showing the locations of the four monitoring sites: North (N), East (E), South (S), and West (W).

Results

Primary Objective 1 – Quantify the air toxics emissions from the Inglewood Oil Field operations, including drilling and well workovers.

STI determined that there were statistically significant increases in concentrations of DPM that are associated with Oil Field operations when winds are from the west-southwest. Black carbon (BC) concentrations increased by 0.036 to 0.056 µg/m^3 on average when winds originated from the west-southwest, compared to annual mean BC concentrations of approximately 0.67 µg/m^3. West-southwest winds occurred 53% of the time during the study, primarily during daytime hours. BC concentrations across the Oil Field were higher during daytime and weekdays, which correlates with the timing of well workover and maintenance activities, and traffic patterns. BC concentrations declined across the Oil Field when winds were from the east-northeast, which occurred 25% of the time, primarily during nighttime hours. Winds from the north-northwest occurred only 7.8% of the time and were not associated with statistically significant changes in downwind concentrations. Winds from the south-southeast occurred 13.1% of the time and were associated with downwind increases of 0.01 to 0.03 µg/m^3. In summary, the largest potential for increased exposures from Oil Field operations is found east-northeast of the Oil Field. Diesel emissions from the Oil Field represent a relatively small fraction of the overall health risk from air toxics (both for pollutants measured in this study and for those identified in the LA Basin MATES IV study). Diesel emissions from all sources translate into approximately 250 excess cancer risk per million, of which 6.7 per million are from the Oil Field operations.

Regarding excess cancer risk, the OEHHA states, “For chemicals that are listed as causing cancer, the "no significant risk level” is defined as the level of exposure that would result in not more than one excess case of cancer in 100,000 individuals exposed to the chemical over a 70-year lifetime. In other words, a person exposed to the chemical at the “no significant risk level” for 70 years would not have more than a “one in 100,000” chance of developing cancer as a result of that exposure.”[1] Therefore, 6.7 excess cancer risk per million is less than the OEHHA’s “no significant risk level.”

STI determined that Oil Field operations were associated with potential increases in nickel and manganese concentrations. Case study analysis showed that both of these pollutants were potentially associated with Oil Field operations. Contributions of the Oil Field were not quantified for nickel and manganese because the concentrations were well below dose-response levels of concern.

STI determined that Oil Field operations were associated with transient increases in concentrations of toluene, benzene, and acetaldehyde. These transient concentration increases were not large enough to be statistically quantifiable because of the infrequent occurrences during the course of the two-week deployment of the PTR-TOFMS.

[1] See “Proposition 65 in Plain Language” at http://www.oehha.ca.gov/prop65/background/p65plain.html.

Primary Objective 2 – Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.

Figure ES-2 shows that estimated diesel particulate matter concentrations in the area constitute the dominant contribution to excess cancer risk from ambient air. The relative contribution from the Oil Field is a small fraction of the total risk. Total risk estimates for each of the air toxics are in reasonable agreement with SCAQMD MATES IV draft estimates of excess cancer risk across the Los Angeles Basin, with the notable exception of cadmium. However, cadmium concentrations are over 50 times higher than the averages reported in MATES IV.

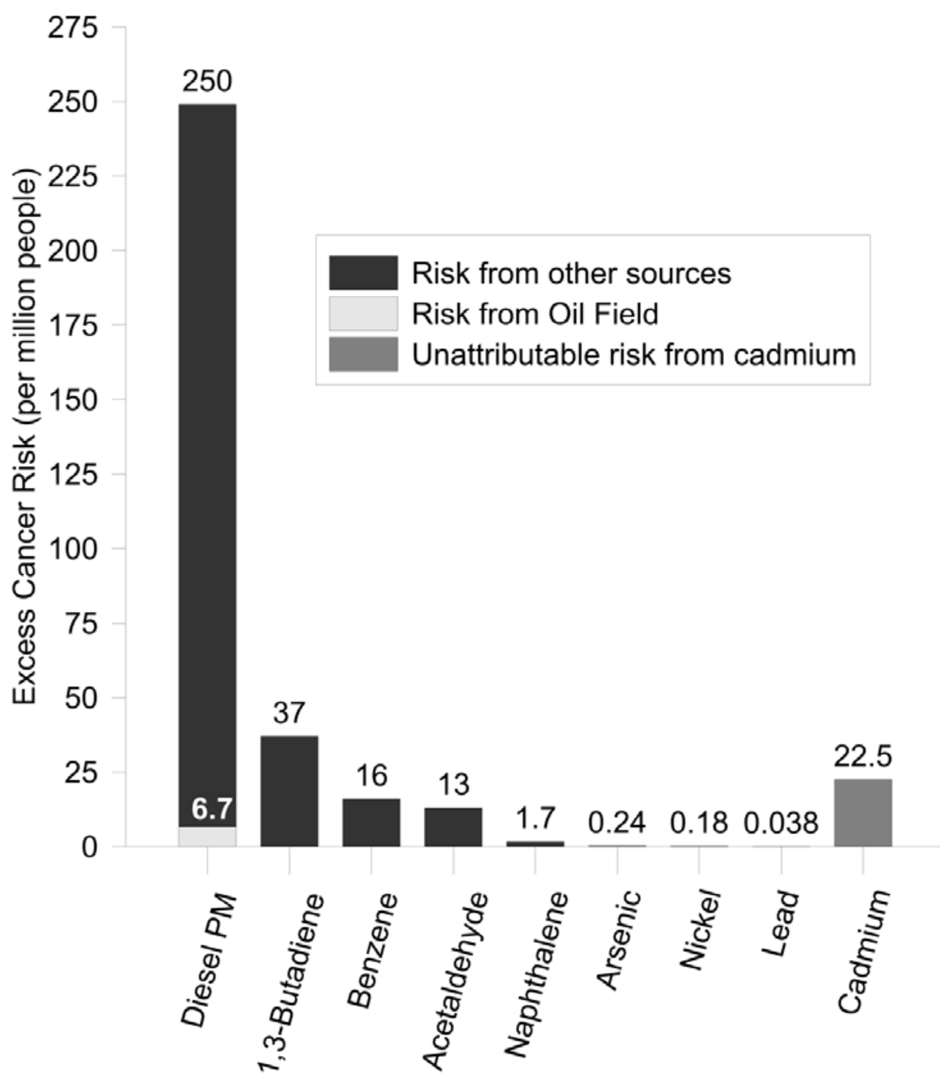


Figure ES-2. Individual pollutant contributions to total excess cancer risk (per million people) at the Baldwin Hills Air Quality Study. The graph shows total risk from ambient air and the incremental contribution of the Oil Field. Cadmium risk could not be attributed and should be verified by measurement intercomparisons.

For DPM, STI used black carbon (BC) as a proxy for DPM concentrations. We converted BC concentrations to DPM concentrations using a BC:EC conversion ratio of 1.5 and the EC:DPM conversion ratio of 0.82 from MATES IV. Cancer risk from DPM on the east side of the Oil Field was estimated to be 6.7 to 11.3 excess cancer cases per million as a result of Oil Field operations and roadway traffic. The lower estimate that does not include the possible influence of La Cienega Blvd. is 6.7-per-million excess cancer cases as a result of Oil Field operations. The Oil Field operations had no measurable impact for DPM on residents living west and south of the Oil Field, and an impact of less than 1-per-million excess cancer risk to residents living north of the Oil Field.

No other pollutants had strong statistical evidence of chronic or acute risk resulting from Oil Field operations. We found no evidence of contributions to other key species such as benzene, acetaldehyde, acrolein, or 1,3-butadiene. It is possible that the Oil Field operations could contribute significantly to some of these species, but we have no compelling evidence to suggest it does, based on the two weeks of VOC monitoring. Additionally, the concentrations observed at the Oil Field are generally consistent with concentrations observed in other parts of the Los Angeles Basin, suggesting that any possible contributions of the Oil Field are incremental or marginal, rather than a dominant local source. However, there is indirect and case-study evidence of potential chronic risk from Oil Field operations for other pollutants. These are quantified below.

- Cadmium – Cadmium concentrations were not attributable to the Oil Field or other sources. First, the average concentration of cadmium was below the analytical method's method detection limit (MDL) of ~5.7 ng/m^3, which indicates that the concentration is relatively uncertain for the 2.5-month monitoring period; 64% of all hourly values were below the MDL. Second, cadmium concentrations were not statistically associated with Oil Field operations (wind direction, time-of-day, or day-of-week). However, concentrations of cadmium were much higher than those measured in the SCAQMD's Multiple Air Toxics Exposure Study (MATES) III and draft MATES IV results,[2] which may indicate a local Oil Field contribution. If we assume the entire excess compared to the Los Angeles Basin background found in MATES IV is attributable to the Oil Field, about 5 ng/m^3 would be from the Oil Field. It is also possible that methodological issues with the analytical technique may be yielding spuriously high concentrations. We note that internal calibrations of cadmium against a cadmium standard did not reveal any problems. Additional comparison of the XACT 625 XRF cadmium concentrations with concentrations using the methods from MATES IV should be performed to verify the reported concentrations.
- As mentioned above, cadmium concentrations measured at the Oil Field were higher than those reported in MATES III and IV. Given that the cadmium concentrations are about 50 times higher than those measured throughout the Los Angeles Basin in MATES IV's preliminary results, we suspect that the analytical methods employed in the two studies may not be comparable. The potential additional cancer risk from cadmium exposures is as much as an additional 22-per-million cancer risk. Note that this is a very conservative upper estimate that does not make any adjustments for seasonality or potential measurement uncertainty.

[2] http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv.

- Nickel – Oil Field operations may contribute to higher average nickel concentrations. However, average nickel concentrations were below the dose-response screening level for chronic cancer risk (1-in-a-million) and noncancer hazard (0.1 hazard index). Thus, total concentrations were not high enough to warrant further analysis. We also note that a single 1-hr average concentration of nickel exceeded the acute REL. Case study analysis showed that the winds associated with this hourly value were from the northeast and did not originate from the Oil Field.
- Manganese - Oil Field operations may contribute to higher average manganese concentrations. However, average manganese concentrations were below the dose-response screening level for noncancer hazard (0.1 hazard index). Thus, total concentrations were not high enough to warrant further analysis.

Figure ES-3 shows chronic noncancer hazard quotients for pollutants measured at the Oil Field. A hazard quotient less than a value of one indicates that no adverse health effects are expected as a result of exposure. Only acrolein is near a value of one, and its contributions were not deemed to be originating from Oil Field sources. All other pollutants had hazard quotient values well below the threshold of adverse health effects.

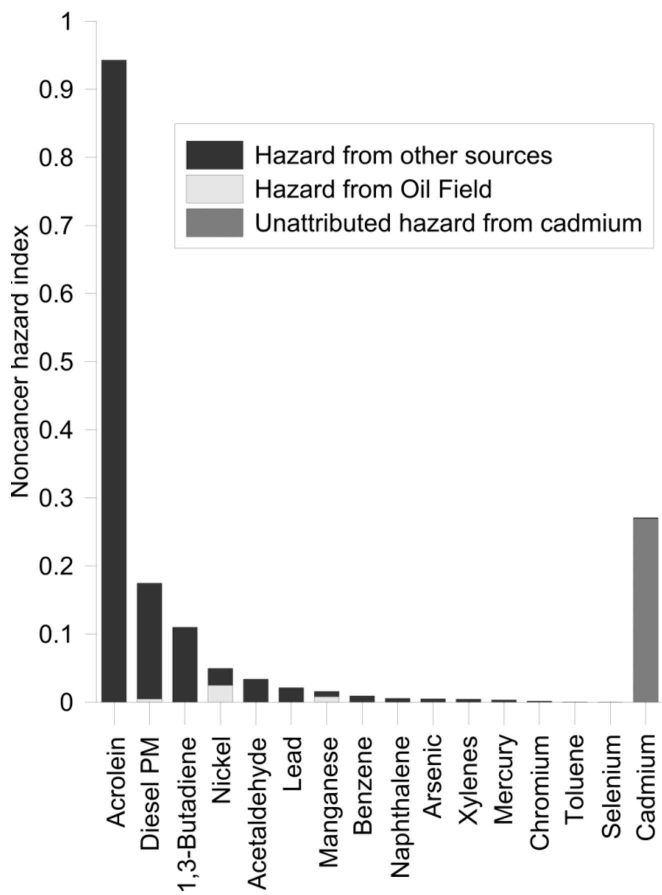


Figure ES-3. Relative contributions to the chronic noncancer hazard index for the Baldwin Hills Air Quality Study. This graph shows total chronic noncancer hazard from ambient air and the incremental contribution of the Oil Field. If the noncancer hazard index is below a value of one, then no adverse effects are expected.

Secondary Objective 1 - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.

The major sources of air toxics emissions within the areas including the Oil Field were expected to be Oil Field operations and traffic on La Cienega Blvd. Differential analysis of BC concentrations when winds were from the west-southwest showed that concentrations across the Oil Field and La Cienega Blvd. were higher, on average (East minus South pair), than those at the site pair that crossed the Oil Field and not La Cienega Blvd. (North minus West pair). The average difference between the two was 0.02 $\mu g/m^3$ of BC, which is equivalent to a 4.7-per-million cancer risk increase from the traffic on La Cienega. The total BC contribution from the Oil Field was 0.036 $\mu g/m^3$ when winds were from the west-southwest. When averaged across the yearly wind pattern climatology, this equates to a 6.7-per-million cancer risk increase (because winds were from west-southwest only 53% of the time). Oil Field BC contributions were higher on weekdays than weekends, and higher during the daytime hours than at night. This temporal pattern of higher daytime and weekday BC concentration differentials is consistent with the timing of the operation of Oil Field maintenance and workover rigs. Up to eight rigs were available, and they only operate Monday through Friday from 7:00 a.m. to 5:00 p.m. LST. This diurnal and weekday-weekend pattern is also consistent with heavy-duty truck traffic on surface streets on La Cienega Blvd. and Stocker St. Thus, the East minus South site comparison has an additional increment of diesel PM attributable to onroad vehicle emissions.

In addition to the quantifiable contributions of the Oil Field operations and traffic on La Cienega, case study analysis and receptor model source apportionment studies identified a few cases of transient high concentrations associated with individual operations of the Oil Field. For example, high concentrations of BC, acetaldehyde, acrolein, benzene, and toluene were associated with drilling operations near the East site on July 10 and 11, 2013. High manganese and nickel concentrations were sometimes associated with winds from the Oil Field, although no drilling operations were pinpointed that could be associated with them.

It was not feasible to distinguish other major sources of toxic air emissions in the areas surrounding the Oil Field with the available monitoring resources.

Secondary Objective 2 - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

The total chronic health risk of all major pollutants targeted and quantified in the study is shown in Figures ES-2 and ES-3 for cancer risk and noncancer hazard, respectively.

Total cancer risk from the measured pollutants summed to 340-per-million people. 74% of the cancer risk was attributable to measured DPM concentrations. An estimate of the Oil Field operations is a contribution of about 6.7-per-million of the total additional cancer risk for residents on the east side of the Oil Field. Note that this incremental risk is likely an upper estimate of the risk for residents, since the DPM will be further diluted and dispersed as it is transported toward the communities east of the Oil Field.

The total chronic noncancer hazard for all major pollutants is shown in Figure ES-3. A noncancer hazard of 1.0 is considered the "health reference level" and is expected to be below the level at which adverse human health effects would occur. Thus, acrolein, which has the highest noncancer hazard index at 0.94, is expected to have no adverse health impacts. However, we note that for most of the toxics shown in Figure ES-3, there is some additional uncertainty associated with the shorter sampling periods (2.5 months for metals, 2 weeks for VOCs); these values do not necessarily represent true annual mean concentrations. Additionally, we are considering each pollutant's effect individually; these pollutants may have additive or synergistic effects that would lead to higher estimated cumulative risks than the estimates shown below.

The sum of noncancer hazard effects summed across all pollutants is 1.65. The noncancer hazard potentially attributable to Oil Field operations is 0.0047 from DPM, less than 0.05 from nickel, and less than 0.016 from manganese. The total across all pollutants potentially associated with Oil Field operations is less than 0.2, which is below the expected level at which adverse chronic health effects would occur. Cadmium contributes an additional 0.27 noncancer hazard, but its source was not attributed. Nonetheless, it is also below the levels at which adverse chronic health effects would occur.

Finally, we found no evidence of acute concentrations exceeding the REL that were associated with Oil Field operations. The single 1-hr concentration of nickel that was above the 1-hr REL was associated with winds originating from outside of the Oil Field.

1. Introduction

The Inglewood Oil Field operates within the Baldwin Hills Community Standards District (CSD) of Los Angeles County. The County commissioned the Baldwin Hills Air Quality Study as part of an agreement settling legal challenges to an Environmental Impact Report (Marine Research Specialists, 2008) concerning development at the Oil Field. Multiple community groups around the Oil Field were concerned with potential pollutant impacts due to Oil Field activities. Sonoma Technology, Inc. (STI) developed and conducted the Baldwin Hills Air Quality Study.

1.1 Objectives

The Baldwin Hills Air Quality Study focused on two primary and two secondary objectives.

- Primary project objectives
  - Quantify the air toxics emissions from the Inglewood Oil Field (referred to as Oil Field throughout this document) operations, including drilling and well workovers.
  - Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.
- Secondary project objectives
  - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.
  - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

As summarized in the Baldwin Hills Community Standard's District Environmental Impact Report (EIR) (Marine Research Specialists, 2008), there are a number of air toxics of concern, including diesel particulate matter (DPM), trace metals, and gaseous volatile organic compounds (VOCs). These different pollutants cannot be measured with a single device, so multiple monitoring and analytical methods were needed. To quantify air toxics emissions from the Oil Field and to assess acute risk from the air toxics of concern, short duration samples were needed. To assess chronic risk, long-term averages that are representative of annual concentrations were needed. Characterizing both short- and long-term concentrations across the large number of air toxics emitted from the Oil Field required that we prioritize the air toxics of greatest concern. We also had to account for hourly and seasonal variations in meteorological patterns, which influence the dispersion and transport of Oil Field emissions to the surrounding community. The challenge of requiring multiple measurement methodologies and short sampling durations, while accounting for variable meteorology, is a common but difficult one.

1.2 Hazard Identification

STI considered 37 of the most important air toxics emitted from the Oil Field and performed a hazard identification to prioritize the air toxics of greatest concern. STI used emissions values from the EIR to compare the pollutants' relative toxicities by weighting these emissions in relation to acute and chronic health benchmark levels from the California Office of Environmental Health Hazard Assessment (OEHHA). Chronic cancer potency risk factors and chronic and acute Reference Exposure Levels (RELs) were obtained from the OEHHA (California Environmental Protection Agency, 2011, 2014) www.oehha.ca.gov/air/allrels.html. Acute RELs can be either 1-hr, 8-hr, or 24-hr values; the lowest REL was chosen to provide a conservative estimate of acute toxicities. From this weighting of emissions rates, the pollutants were rank-ordered to prioritize the list. **Table 1-1** shows the final result from this weighting scheme, with the top 13 pollutants listed. Note that this weighting was performed in early 2012, and RELs and cancer potency factors for some of the pollutants have changed since that time. See Section 2, Table 2-4 for the 2014 dose-response factors that are used in the final risk assessment.

For chronic cancer risk, DPM from the diesel generators is the most significant pollutant. This is consistent with the findings from the Multiple Air Toxics Exposure Study (MATES) III and IV, conducted by South Coast Air Quality Management District (SCAQMD), which found DPM (based on proxy measurements of elemental carbon) to be the most important toxic pollutant contributing to risk in the Los Angeles Basin (South Coast Air Quality Management District, 2008). In our analysis, the only other pollutants with cancer risks of 1% or more of the risk from DPM were cadmium (5%), benzene (2%), nickel (1%), and formaldehyde (1%). The cumulative risk from emissions of all other (non-DPM) pollutants was approximately 10% of the estimated risk from emissions of DPM.

For chronic noncancer risks, many pollutants were of similar importance. Nickel presented the highest risk, followed by DPM (86% of nickel), cadmium (78%), chlorine (67%), mercury (39%), formaldehyde (20%), manganese (17%), acrolein (14%), arsenic (13%), and lead (11%). These noncancer risks can be reproductive, respiratory, or neurological, or they may involve a host of other effects. The similar ranking across pollutants indicates that there is no single driver of chronic health impacts based on the emissions and that a number of pollutants may be important to monitor.

For acute noncancer risks, formaldehyde was the most important pollutant, followed by manganese (46% of formaldehyde). Mercury (10%), acrolein (10%), arsenic (5%), and nickel (4%) were also on the list but are of less importance. Acute effects occur on time scales shorter than one day.

The comparison of emissions from the 2005-2006 inventory shows that the key pollutant to measure from a toxicity standpoint is DPM. Unfortunately, no direct measurement method of DPM is possible (as discussed by MATES III), so a proxy was used to estimate DPM concentrations. After DPM, the key pollutants to measure included nickel, cadmium, benzene, formaldehyde, manganese, arsenic, acrolein, and mercury. However, the chemical and physical characteristics of these different pollutants required multiple measurement methodologies. Key pollutants other than DPM can be categorized as metals (nickel, arsenic, lead, manganese, and cadmium), hydrocarbons (benzene), and carbonyls (formaldehyde, acrolein). The results of the hazard identification and dose-response assessment drove our study methodology choices to focus on the key pollutants of concern from a health standpoint.

Table 1-1. List of key pollutants and their relative risk-weighted emissions toxicities based on the 2005-2006 EIR emissions and OEHHA dose-response factors from 2011.

Pollutant	Total Lbs/Year	Fraction from Drilling and Well Workovers	Cancer 1-in-a-Million Level[1] (μg/m^3)	Acute REL (μg/m^3)	Chronic REL (μg/m^3)	Cancer Risk Relative to DPM	Chronic REL Relative to Nickel	Acute REL Relative to Formaldehyde	Cancer Rank	Chronic REL Rank	Acute REL Rank
Diesel Exhaust PM	1326.8	0.99	$3.3x10^{-3}$	–	5	1.00	0.86	–	1	2	–
Cadmium	4.8	1.00	$2.4x10^{-4}$	–	0.02	0.05	0.78	–	2	3	–
Formaldehyde	547.9	0.76	$1.7x10^{-1}$	9	9	0.01	0.20	1.00	5	6	1
Nickel	15.3	1.00	$3.8x10^{-3}$	6	0.05	0.01	1.00	0.04	4	1	6
Chlorine	41.6	1.00	–	210	0.2	–	0.67	0.00	–	4	9
Manganese	4.8	1.00	–	0.17	0.09	–	0.17	0.46	–	7	2
Mercury	3.6	1.00	–	0.6	0.03	–	0.39	0.10	–	5	3
Acrolein	14.7	0.70	–	2.5	0.35	–	0.14	0.10	–	8	4
Lead	5.1	1.00	$8.3x10^{-2}$	–	0.15	0.00	0.11	–	–	10	–
Arsenic	0.6	1.00	$3.0x10^{-4}$	0.2	0.015	0.00	0.13	0.05	6	9	5
Benzene	340.9	0.17	$3.4x10^{-2}$	1300	60	0.02	0.02	0.00	3	11	8
PAHs	16.9	0.79	$9.1x10^{-5}$	–	–	0.00	–	–	7	–	–
Acetaldehyde	215.9	0.96	$3.7x10^{-1}$	470	140	0.00	0.01	0.01	8	12	7

PM: Particulate matter

PAHs: Polycyclic aromatic hydrocarbons

Cancer 1-in-a-million level: Concentration in μg/m^3 at which a 70-year exposure would result in one excess cancer case among 1 million people

1.3 Report Overview

- Section 2 of this report describes the study methodology, monitoring, timeline, and analysis methods used to address these complex issues.
- Section 3 describes the results of the study. The results are separated into sections based on the monitoring technology used to measure them; a final section describes the Oil Field's quantitative contribution to health risk.
- Section 4 discusses the study results and compares them to the project objectives.
- Section 5 lists the references used for the study.
- Appendix A provides additional well data, and Appendix B provides additional traffic data. Appendix C provides plots for all measured metals species, and Appendix D shows additional results from comparing VOC measurement methods.

2. Methods

2.1 Overview

In designing a monitoring plan that would yield high-quality data useful for evaluating the Oil Field's contribution to air toxics concentrations in surrounding communities, STI considered the influences of meteorology, topography, land area, and background concentrations from other sources. In addition, we considered the types and timing of Oil Field activities that generate different pollutants and the most appropriate monitoring methods for each pollutant. All these factors affected the frequency of sampling, the duration of sampling, and the placement of the monitors.

STI used a combination of monitoring methods to cover the primary pollutants that are likely to be emitted from the Inglewood Oil Field and have an adverse impact on human health.

1. Choose the best available monitoring methods applicable to the selected species for cost, reliability, detection limits, and overall data quality.
2. Select the monitoring locations, and determine the frequency, duration, and type of sampling to occur at each location. This includes evaluation of diurnal and seasonal meteorological patterns (primarily wind speed and wind direction), local topography, and the spatial distribution of wells, storage tanks, drilling locations, and other potential sources within the Oil Field.
3. Plan the sampling logistics (e.g., power availability, accessibility, and communications) and implement the monitoring.
4. Establish routine protocols with the Oil Field operators and Los Angeles County to maintain an up-to-date log of Oil Field activities that will be used, in conjunction with collected data, to assess Oil Field contributions.

This section describes the monitoring locations (Section 2.2), timeline (Section 2.3), analytical methods (Section 2.4), the health risk assessment approach (Section 2.5), and the data analysis approach (Section 2.6) used to complete the project.

2.2 Locations

In determining the best locations for monitoring sites, STI considered the impact of meteorological patterns on the dispersion and transport of air toxics, as well as potential emissions from nearby roadways and other regional sources. Available meteorological data from the existing meteorological tower within the Oil Field, as well as data from the SCAQMD stations at LAX and at West Los Angeles, were evaluated for diurnal and seasonal wind patterns, and the placement of the monitors was based upon these documented wind flows. Local topography and existing obstructions that might influence wind patterns were also considered so that measurements would be made upwind and downwind of the Oil Field, whether the winds were from the west-southwest (onshore) or from the east-northeast (offshore).

Onsite inspections within the Oil Field were made to identify potential areas for monitoring that considered wind patterns, were accessible, and had or could have electrical power available. The decision on the number and placement of the monitors was based upon all the above factors, as well as official siting criteria for air quality monitoring established by the U.S. EPA (U.S. Environmental Protection Agency, 2006).

Four sites were chosen to conduct the continuous monitoring. **Figure 2-1** is an aerial view of the Inglewood Oil Field and neighboring communities. The four sites are shown in this figure, labeled North (N), East (E), South (S), and West (W). Each of these sites was equipped with cellular modems allowing sub-hourly data retrieval and remote access to instrumentation for diagnostics and troubleshooting.

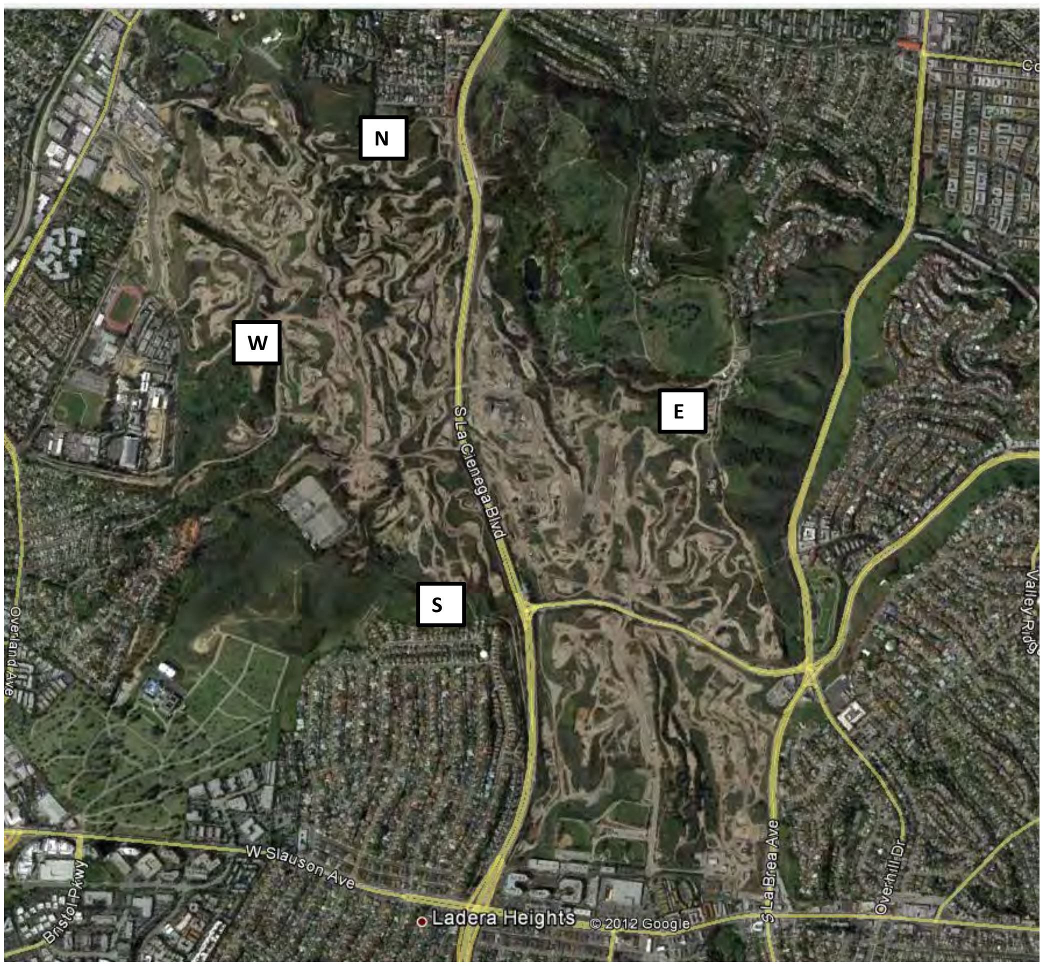


Figure 2-1. Aerial view of the Inglewood Oil Field, showing the locations of the four monitoring sites: North (N), East (E), South (S), and West (W).

The primary monitoring site (Site E) was a small trailer that housed a Teledyne-API Model 633 Aethalometer for BC, the XACT 625 semi-continuous XRF spectrometer for metals during its deployment, and the PTR-TOFMS for VOCs during its deployment; the site also hosted a tower with a full complement of meteorological instrumentation. This main monitoring station's site was chosen to reflect concentrations during both onshore and offshore wind flow conditions.

Besides the main site, three additional sites (N, S, and W) were established to support the semi-continuous Aethalometer measurements of BC. Their placement made it possible to obtain data from both upwind and downwind locations during both onshore and offshore wind flow conditions. **Table 2-1** lists the locations of all monitoring sites and measurements for the study.

Table 2-1. Names, locations, and elevations of the four monitoring sites at the Inglewood Oil Field.

Site Name	Location[a] (Lat/Lon)	Elevation (ft)	Pollutants Monitored
North (N)	34° 00' 48" N 118° 22' 37" W	271	BC for 1 year
South (S)	33° 59' 55" N 118° 22' 23" W	375	BC for 1 year
East (E)	34° 00' 18" N 118° 21' 51" W	503	BC for 1 year Metals[b] for 2.5 months VOCs for 2 weeks
West (W)	34° 00' 20" N 118° 22' 53" W	402	BC for 1 year

[a] Latitude and longitude are given to the nearest minute
[b] The plan was to operate a minimum of one month during active drilling operations at each of Sites S and E; however, it was apparent that the South site was rarely downwind of the Oil Field, so the metals monitor was left at the East site where it was frequently downwind of the Oil Field.

2.3 Timeline

The field study began in November 2012 and ended in November 2013. **Table 2-2** shows the sampling durations and windows of operation for BC, metals, and VOCs. Details of the analytical methods are provided in Section 2.4.

2.4 Analytical Methods

Four types of monitoring were used: (1) Aethalometers to measure black carbon (as a proxy for DPM); (2) X-ray fluorescence spectrometer (XRF) for metals; (3) Proton Transfer Reaction Time of Flight Mass Spectrometry (PTR-TOFMS) for VOCs; and (4) meteorological sensors.

Table 2-2. The four monitoring sites at the Inglewood Oil Field, with corresponding windows of operations and sampling durations for BC (as a surrogate for DPM), metals, and VOCs.

Site Name	Window of Operation and Duration		
	BC	Metals	VOCs
North (N)	11/15/12–11/15/13 1 year	–	–
South (S)	11/15/12–11/15/13 1 year	–	–
East (E)	11/15/12–11/15/13 1 year	11/15/12 – 2/1/13 2.5 months	7/3/13–7/16/13 2 weeks
West (W)	11/15/12–11/15/13 1 year	–	–

2.4.1 Aethalometer (Black Carbon)

DPM emissions ranked highest among the air toxics of concern associated with activities at the Oil Field. We studied DPM by measuring its surrogate, black carbon (BC) at the four monitoring sites for one year. This amount of continuous (hourly) BC data is enough to represent seasonal variability in DPM concentrations, differences between workdays and non-workdays, and upwind/downwind differences under various meteorological conditions.

Teledyne-API Model 633 dual wavelength Aethalometers were deployed in enclosures at the monitoring sites. These instruments measure the light transmittance through a collection spot on a reel-to-reel filter tape and report data at 5-minute intervals. The aerosol is collected on an area of quartz fiber filter at a moderate face velocity. The sample air stream is drawn through the filter by a continuously operating pump. The optical attenuation of the aerosol deposit on the filter is measured by detecting the intensity of light transmitted through the spot on the filter. Measurements are corrected for optical saturation by using two collection spots where data are collected at different flow rates. Quality control protocols for the Aethalometer BC measurements rely on review of raw data, remotely, on a daily or more frequent basis, as well as routine field maintenance procedures and associated record-keeping.

An integral part of the monitoring study was a web-based data retrieval system to allow routine viewing of real-time BC (and meteorological) data. Data were retrieved from each BC monitoring site frequently (typically, every 10 minutes) by cell phone modem and transferred to STI's web server; the data then underwent auto-screening quality assurance procedures and were posted in graphical format to a password-protected web page for viewing by authorized personnel.

Regularly scheduled site visits were made for routine maintenance, including tape changes (the filter tape that collects BC samples), inlet cleaning, flow checks with a certified reference flow meter, and troubleshooting.

The hourly BC data was further quality-assured by a visual inspection of minimum and maximum data values, stuck values, and baseline shift, as well as by direct comparison with other concurrently measured air quality and meteorological data. The validated BC data were compared to activity logs of the Oil Field for qualitative evaluation of potential sources.

2.4.2 X-Ray Fluorescence Spectrometer (Metals)

To determine the impact of metal emissions from the Oil Field on the surrounding community, we used a specialized instrument, the XACT 625 semi-continuous X-ray fluorescence spectrometer (XRF). The instrument quantified a suite of 24 metals on an hourly basis for a period of about 2.5 months.

The XACT 625 automated multi-metals monitor is based on reel-to-reel filter tape sampling followed by nondestructive XRF analysis of metals in the resulting particulate matter (PM) deposit (Yadav et al., 2009; Caudill, 2012). The XACT can simultaneously measure up to 24 elements with an atomic number between potassium and uranium. Ambient air is sampled through a PM size-selective inlet and drawn through a filter tape. The resulting PM deposit is then automatically advanced and analyzed by XRF for selected metals while the next sample is being collected. Sampling and analysis is performed continuously and simultaneously, except for the time required to advance the tape (about 20 seconds) and the time required for daily automated quality assurance checks, which were typically performed around midnight each day.

The monitoring plan for metals focused on a 2.5-month period instead of an entire year because the XACT 625 is costly to operate. However, it offered a viable alternative to longer-term 24-hr filter-based sampling and revealed detailed information on the contribution of the Oil Field to this group of elements.

Dr. Rick Peltier of the University of Massachusetts at Amherst was primarily responsible for setting up the XACT 625 spectrometer, overseeing operations, and ensuring daily quality control . He had remote access to the XACT data and most instrument functions on a daily basis. Field support, when needed, was available from STI staff.

The instrument followed a regular protocol of quality assurance by checking energy levels (based on a measurement of pure palladium) during each hourly sample run. Once per day, a more comprehensive QA protocol ran by sequentially quantifying four pure standardized reference materials (Pd, Cr, Cd, Pb) for approximately 7 minutes each (“Upscale Calibration”). These data were reported and reviewed each day to ensure that data were reported accurately and there were no short-term instrument malfunctions or long-term instrument degradation. Sample flow rates were measured by an independent set of flow monitors, each of which has been calibrated against a NIST-traceable primary standard.

2.4.3 PTR-TOFMS (Volatile Organic Compounds)

VOCs are on the list of air toxics of concern (see Section 1.2), with benzene, formaldehyde, acetaldehyde, and acrolein. Additional species, including 1,3-butadiene, gas-phase naphthalene, toluene, and xylenes were targeted because, although they are lower priority, they potentially represent specific sources among the pollutants ranking fairly high on the list. A Proton Transfer Reaction Time of Flight Mass Spectrometer (PTR-TOFMS), which offers low detection limits and high time resolution, was deployed to measure these key species.

The Ionicon PTR-TOFMS 8000 is based on whole air sampling through a standard Teflon inlet tube followed by ionization of analytes by proton transfer from H_3O^+ to all compounds with a higher proton affinity than water (Jordan et al., 2009). This includes aromatics, most alkenes, aldehydes, ketones, and some longer chain alkanes. Molecular ionization is “soft,” causing minimal fragmentation of molecules. After ionization, molecular ions are pulsed into a time-of-flight mass spectrometer capable of measuring the mass of the parent ion at a resolution of 5000 m/Δm (0.02 mass units at a mass of 100 atomic mass units).

The PTR-TOFMS can simultaneously measure dozens of compounds. Sampling and analysis were performed continuously except for the time required for intermittent background checks and calibrations. Background checks were conducted by passing ambient air through a catalytic converter removing all VOCs, and calibrations were done by sending a commercial calibration mixture of aromatic compounds to the instrument at various dilution ratios.

Dr. Shane Murphy of the University of Wyoming deployed and operated the PTR-TOFMS to measure VOC pollutants at 10-second intervals for two weeks. The deployment was brief because the PTR-TOFMS instrument is costly to operate. However, the PTR-TOFMS measurement methodology has the advantages of very high time resolution, more sensitive measurement capabilities, more data (approximately 4,000 measurements over two weeks), and a larger set of compounds (25 target species) compared to other methods. **Table 2-3** lists the pollutants that were measured and some typical sources. This list includes many of the VOCs that we expected to find in the study location, as well as other VOCs that can be used to identify emissions signatures of other sources that might impact the monitoring site. Uncertainties were set as 20% of the measured value. Values for each species are provided in arbitrary units unique to the PTR-TOFMS. In addition, seven species had calibrations performed to provide data in ppb: butadiene, acrolein, benzene, toluene, xylenes, naphthalene, and acetaldehyde.

Table 2-3. List of pollutants targeted during this study and their typical sources.

Compound	Sources
Formaldehyde	Photo-oxidation, vehicle emissions, diesel generators
Acetaldehyde	Photo-oxidation, vehicle emissions, diesel generators
Acrolein	Butadiene photo-oxidation, vehicle emissions, diesel generators
Benzene	Vehicle emissions, oil and gas extraction, gas stations, industrial
Toluene	Vehicle emissions, oil and gas extraction, gas stations, industrial
Xylenes and ethylbenzene (isomers)	Vehicle emissions, oil and gas extraction, gas stations, industrial
1,3-Butadiene	Vehicle emissions, industrial, diesel generators
Methyl ethyl ketone	Photo-oxidation
Naphthalene	Vehicle emissions

Five pairs of 24-hr air samples were collected during the two-week monitoring period and were analyzed by GC-FID (TO-14; University of Wyoming) and GC-MS (TO-15; SCAQMD). For the PTR-TOFMS, although some isomeric compounds such as ethylbenzene and the xylenes are indistinguishable, they can be measured as a sum of species. The PTR-TOFMS data for these five days were averaged to match the 24-hr samples and the results were compared. The PTR-TOFMS average concentrations were similar to both the University of Wyoming and SCAQMD results for most species. Overall, these results suggest that the PTR-TOFMS measurements are similar to more regulatory methods, but yield higher-time-resolution data. Appendix D shows the results for these comparisons.

2.4.4 Meteorological Variables

A 10-meter meteorological tower was erected next to the trailer at the East site. The tower was equipped with the following RM Young sensors:

- 05305V Wind monitor (wind speed/wind direction)
- 41382VC Temperature and RH sensor
- 41342VC Platinum temperature probes at 2 heights (for Delta-T, a measure of atmospheric mixing)
- 61302V Barometric pressure sensor
- 70201 Solar radiation sensor

All of these sensors collected at 1-minute average duration.

2.5 Health Risk Assessment

Health risk assessment comprises four steps, as described by the National Research Council and adopted by the California Office of Health Hazard Assessment (OEHHA) (National Research Council, 1983; California Environmental Protection Agency, 2001):

1. **Hazard identification.** Identify pollutants of potential concern and their associated health impacts.
2. **Dose-response assessment.** Use quantitative benchmark levels to assess risk.
3. **Exposure assessment.** Assess how people are exposed to a pollutant, at what levels, and for how long.
4. **Risk characterization.** Synthesizing the three previous steps, quantitatively evaluate a pollutant's potential to cause illness or disease in the population.

STI followed the health risk assessment protocol to characterize the risk from the ambient air around the Oil Field. Concentration contributions of the Oil Field were determined through the data analyses described in Section 3. These contributions are compared to background Los Angeles Basin levels to assess the relative level of cancer risk and noncancer hazard from the Oil Field compared to other sources in the area.

2.5.1 Hazard Identification

For the hazard identification, STI used the 2005-2006 Oil Field emissions used in the Baldwin Hills Community Standards District Environmental Impact Report (Marine Research Specialists, 2008). The EIR lists all toxic air contaminant emissions in pounds per year reported to the SCAQMD.

2.5.2 Dose-Response Assessment

STI used dose-response factors recommended by California OEHHA. Measured pollutant dose-response factors are listed in **Table 2-4**. Chronic risk factors and RELs consider a person's lifetime exposure to the pollutant, while acute RELs consider average exposures for 1 hour or 8 hours.

Table 2-4. Dose-response factors for target pollutants measured in this study from OEHHA (March 2014).

Pollutant	Cancer (µg/m^3 for 1-in-a-million risk)	Acute REL (µg/m^3)	Chronic REL (µg/m^3)
1,3-butadiene	$5.88x10^{-3}$	9	2
Acetaldehyde	$3.70x10^{-1}$	470	140
Acrolein		2.5	0.35
Arsenic	$3.03x10^{-4}$	0.015	0.015
Benzene	$3.45x10^{-2}$	1300	60
Cadmium	$2.38x10^{-4}$		0.02
Diesel exhaust PM	$3.33x10^{-3}$		5
Formaldehyde	$1.67x10^{-1}$	9	9
Lead	$8.33x10^{-2}$		0.15
Manganese		0.17	0.09
Mercury		0.06	0.03
Naphthalene	$2.94x10^{-2}$		9
Nickel	$3.85x10^{-3}$	0.2	0.06
Toluene		37000	300
Xylenes		22000	700

2.5.3 Exposure Assessment

In this step of the health risk assessment, STI assessed pathways of exposure, such as inhalation, soil contamination, groundwater, sediment, or contamination of the food chain, to residents of the Baldwin Hills area. Most of the pollutants of interest are transported primarily through the air, and the exposure route of concern is outdoor and indoor inhalation. However, for a subset of the toxic air pollutants, it is plausible that other pathways of exposure may contribute significantly to total risk; we did not evaluate these other pathways.

For the inhalation exposure, we calculated the mean concentrations and maximum 1-hr concentrations for each pollutant with chronic or acute dose-response factors. In addition, average and maximum contributions from the Oil Field were calculated for each target pollutant. These were used to estimate the average and maximum Oil Field contribution to total risk for each pollutant.

2.5.4 Risk Characterization

Risk characterization is a synthesis of the hazard identification, dose-response assessment, and exposure assessment tasks. For the primary risk assessment, we multiplied the observed mean concentrations and maximum observed concentrations calculated per Section 2.5.3 against dose-response factors from Table 2-4. We then used the estimated contributions by pollutant to quantify the absolute and percentage contribution of the Oil Field.

2.6 Data Analysis

Analysis methods for ascertaining the Oil Field's contribution to overall ambient concentrations include (1) diurnal pattern analysis (2) EPA Positive Matrix Factorization (PMF), (3) pollution roses, (4) differential comparisons, and (5) case studies. These methods are briefly described below.

2.6.1 Diurnal Pattern Analysis

Diurnal patterns are characterized using box plots to determine whether concentrations are higher during certain hours of the day. Some pollutants associated with Oil Field activities, such as drilling or well workovers, are associated with daytime hours. Diurnal patterns of each pollutant will be compared to the diurnal patterns listed in McCarthy et al. (2007) and used to categorize possible activities that may be associated with Oil Field operations.

2.6.2 Positive Matrix Factorization

EPA PMF is a freely available multivariate factor analysis tool developed by STI and the EPA (Norris et al., 2008). The tool assigns observed pollutant concentrations to the most likely source types and quantifies the relative contributions of the air pollution sources to ambient air quality. The tool decomposes a matrix of speciated sample data into two matrices—factor contributions and factor profiles—and an analyst then examines the results while considering source-specific tracer species, wind direction, and proximity and direction of local sources to interpret what source types are represented.

PMF uses the variation of each species (by wind direction or by season, for example) and the relative uncertainty across species to determine "factors," or groups of species, that might be analogous to sources such as vehicle exhaust. These factors are mathematically determined from the variation of individual species over time and with each other. For example, if several species vary together since they are all components of dust emitted from soil disturbances, they are likely to be grouped together as a factor.

Factor profiles are unique ratios of the pollutants. The factor contributions indicate the relative amount of that factor that was apportioned for a given sample.

2.6.3 Pollution Roses

Pollution roses illustrate the correlation of pollutant concentrations with wind direction, thus helping analysts identify the wind directions from which concentrations are highest and the direction of likely sources. Petals of the pollution rose point toward the direction from which the wind originates, and their length shows how often the wind comes from that direction.

2.6.4 Differential Comparisons

Black carbon concentrations are measured at four sites across the Oil Field. When segregated by wind direction, concentrations at sites upwind as air enters the Oil Field and downwind along the direction of the wind can be treated as a differential. Concentrations at the upwind site are subtracted from the concentrations at the downwind site to assess the contribution of the Oil Field. Since there are four sites, two comparisons are available for each of the two predominant wind directions (winds from west-southwest and from east-northeast).

2.6.5 Case Study Analysis

The case study analysis looks at specific cases where a given pollutant was high. Analysts examine wind direction and Oil Field activity to see if there is a correlation between the high concentrations and activity.

2.7 Supplementary Emissions Activity Analysis

The Oil Field contribution to DPM is complicated by diesel traffic on La Cienega Boulevard and Stocker Street and by traffic and emissions from diesel engines on drill and workover rigs within the Oil Field itself. Marine Research Specialists provided improved emissions activity data to help STI better identify whether emissions were originating from the Oil Field or other sources (see **Appendices A and B**). Emission inventory activity information included:

- A week of daily and diurnal traffic activity data with vehicle classification by axle length. Vehicles were classified into heavy-duty and light-duty vehicles. Data for three street links were provided:
  - La Cienega Blvd. south of Stocker St.
  - La Cienega Blvd. north of Stocker St.
  - Stocker St.
- A week of gate activity for vehicles entering the Oil Field, classified by heavy-duty and light-duty vehicles. The onfield speed limit is 15 MPH, but no additional activity (e.g., mileage, idling) was available. Gate activity was provided at two gates:
  - Stocker
  - Fairfax

- Onfield operational emissions activity information for drill rigs, workover rigs, and maintenance rigs classified by their distance from the East and North monitoring sites.
  - *One drill rig* – operated 24 hours a day, 7 days of week when drilling, with a diesel particulate filter achieving 90% reduction in PM emissions.
  - *Up to eight (average of six) workover and maintenance rigs* – operated 7:00 a.m. to 5:00 p.m. Monday through Friday. Diesel particulate filters (DPF) were not routinely available on these rigs, but most had Tier 3 or Tier 4 standard on-road diesel engines. **Table 2-5** provides a complete list of rigs, but individual rig activities or locations on the Oil Field are not available.

Table 2-5. Workover and maintenance rigs operated on weekdays from 7:00 a.m. to 5:00 p.m.

Rig No.	Standard	DPF/Catalyst
Rig 1011	Tier 3	
Rig 1061	Tier 3	
Rig 0358	Tier 3	
Rig 1068	Tier 3	With DPF and Catalyst
Rig 1069	Tier 3	With DPF and Catalyst
Rig 30	Tier 3	
Rig 36	Tier 3	
Rig 83	Tier 3	With DPF and Catalyst
Rig 94	Tier 4	
Rig 95	Tier 4	
Rig 96	Tier 4	
Rig 1	Tier 3	
Rig 2	Tier 3	
Rig 4	Tier 3	
Rig 5	Tier 3	
Rig 6	Tier 3	
Rig 7	Tier 4	
Rig 8	Tier 2	
Rig 9	Tier 4	

STI used this emissions activity information by time-of-day and day-of-week to clarify refined calculations of the relative contribution of Oil Field sources to DPM air concentrations. STI also refined calculations of the cancer risk from DPM and revised the Study final report to describe this additional data and the resulting calculations and results.

3. Results

Analysis results are segregated by monitoring method and then by the risk characterization. First, we discuss Aethalometer BC measurements (proxy for DPM), then XRF trace metals, and then PTR-TOFMS VOCs. Lastly, we discuss the risks and hazards associated with each of our target pollutants and the contribution of the Oil Field operations to those risks.

3.1 Aethalometer Black Carbon (Proxy for DPM)

3.1.1 BC Diurnal Patterns by Season

Measurements of BC were examined for diurnal and seasonal patterns that can be associated with emissions activities. **Figure 3-1** shows the notched box whisker plots for the months of December, March, June, and September at the East site. These four months were used to represent the four seasons – data for other months during each season were similar. Box whisker plots show the average concentration (red dot), the median concentration (center of the notch), the interquartile range (end of the boxes), 1.5 times the interquartile range (error bars), and outliers (asterisks and circles).

In all months, mean concentrations have a peak in the morning hours (0800 to 1000 LST; local standard time), which is likely associated with rush hour emissions in the Los Angeles Basin and weak morning wind speeds. In December and other winter months, there is also a peak in overnight concentrations. In the other seasons, the concentrations overnight are not as high as the rush hour peak. In all seasons, concentrations drop off after the rush hour peak through an early evening minimum concentration at about 1800 LST. On average, wintertime concentrations are highest and summer concentrations are lowest. All other sites (North, West, and South) had very similar diurnal and seasonal profiles.

Statistics for all hours across all sites are summarized in **Table 3-1**. Average concentrations at each site were between 0.64 and 0.724 µg/m^3, with narrow confidence intervals. Median, 10th, and 90th percentile concentrations were also quite similar at all sites, although the West site did have somewhat higher average, median, and 90th percentile BC concentration values than the others.

3.1.2 Pollution Roses

Pollution roses display the directions from which the wind originates and the distribution of concentrations associated with that direction. These plots can be used to identify directions associated with higher concentrations of a given pollutant; further analysis can be used to assess if a particular emissions source is associated with that direction.

Figure 3-2 shows pollution roses for BC at the East site for the months of December, March, June, and September. Wind petals indicate the direction from which winds originate. Winds in the winter months are almost evenly distributed between west-southwest and east-northeast. In other months, winds come predominantly from the west-southwest as a result of

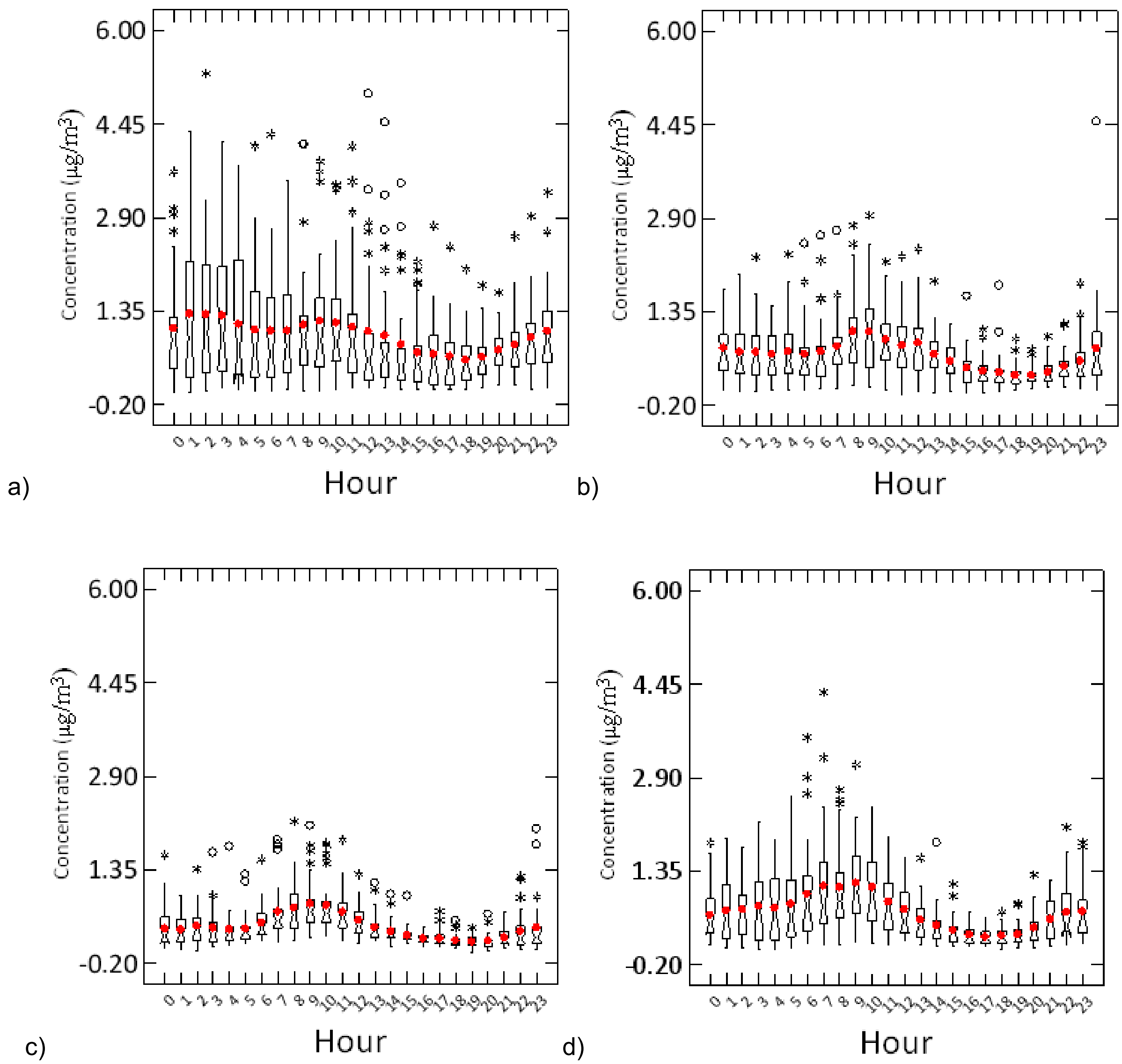


Figure 3-1. Box-notch whisker plots of the diurnal profile of BC concentrations (µg/m^3) at the East site in (a) December, (b) March, (c) June, and (d) September.

Table 3-1. Summary of statistics for BC concentrations (µg/m^3) at each site for the entire monitoring period.

Site	Count of Valid Hours	Average (µg/m^3)	Median (µg/m^3)	10th Percentile (µg/m^3)	90th Percentile (µg/m^3)	Maximum (µg/m^3)	95% Confidence Interval (µg/m^3)
East	8748	0.676	0.474	0.144	1.467	6.328	0.013
South	7945	0.641	0.423	0.128	1.434	7.761	0.015
West	8405	0.724	0.491	0.143	1.611	8.355	0.015
North	8588	0.672	0.455	0.132	1.474	9.286	0.015

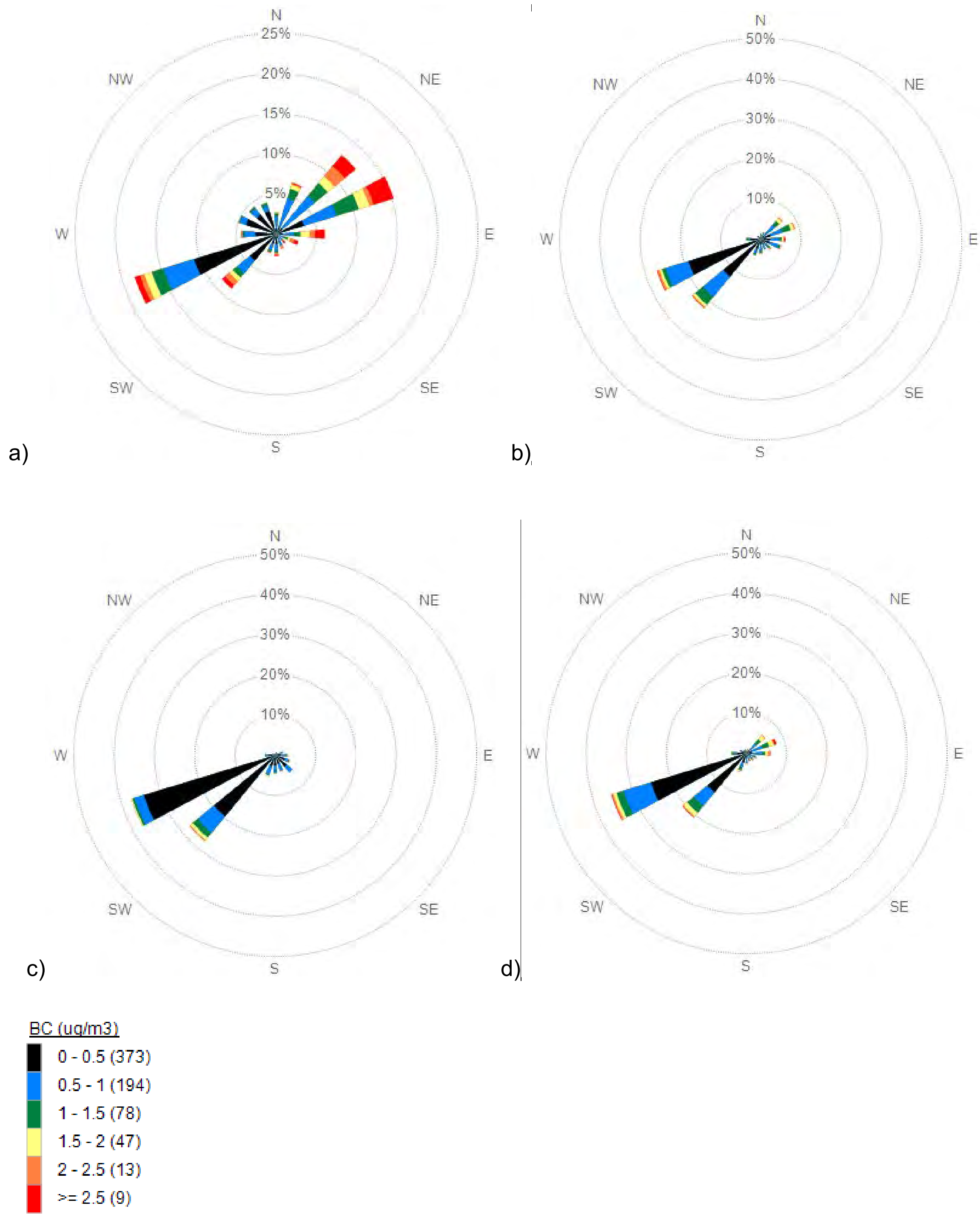


Figure 3-2. Pollution roses for BC (μg/m^3) at the East site for the months of (a) December, (b) March, (c) June, and (d) September. The legend shows the concentration bins of BC, which are the same across all months; the numbers in parentheses indicate the number of hourly observations in each bin for the month of September.

onshore flow. Of most interest, the offshore flows from the east-northeast include higher BC concentrations on average than the west-southwest winds coming from the coast. This is not unexpected, as winds originating inland represent emissions for the majority of the Los Angeles area.

Additionally, the offshore flow during the winter months typically occurs overnight, when concentrations at the East site are highest (as shown in Figure 3-1). Concentrations are also slightly higher when the wind is from the southwest rather than the west-southwest; however, southwesterly winds occur about half as often as winds occur from the west-southwest.

3.1.3 Differential Comparisons

Concentration gradients segregated by wind directions were used to assess the potential contribution of the Oil Field to BC concentrations on a seasonal and diurnal basis. Based on the pollution roses analysis, winds were segregated into two categories. In both cases, winds at the two pairs of sites were used to represent upwind and downwind BC concentrations. The upwind site concentration was subtracted from the downwind site concentration as listed below for both wind bins and site pairs.

- West-southwest – winds originating between 210° and 300°
  - Pair 1: East minus South
  - Pair 2: North minus West
- East-northeast – winds originating between 30° and 120°
  - Pair 1: South minus East
  - Pair 2: West minus North

Results are shown for the seasonal averages (DJF, MAM, JJA, SON) and with diurnal patterns to assess contributions as a function of season and time of day. **Figure 3-3** shows the seasonal patterns for the East minus South pair. In each plot, the average concentration differential during the overnight hours is typically centered on a value of 0 $\mu g/m^3$, indicating no difference between the upwind and downwind sites. During the daytime hours, the average concentration differential is above 0.1 $\mu g/m^3$ for a significant portion of the hours from 0800 to 1200, with declining values thereafter. This differential indicates that daytime concentrations across the Oil Field are higher, likely as a result of Oil Field operations and traffic on La Cienega Blvd.

Figure 3-4 shows the same set of figures for the North minus West pair differentials. The overall pattern for the concentrations is similar, with higher concentrations across the Oil Field during the daytime hours and small or no concentration gradients overnight. Overall, the differential is slightly smaller for the North minus West pair than the East minus South pair. One plausible explanation is that traffic on La Cienega Blvd. is contributing to the differential at the East minus South pair; this road does not influence the North minus West pair differentials because it is not between those two sites.

Figure 3-5 shows the concentration differential for east-northeast winds in the winter and spring at the South minus East pair and in the winter and autumn at the West minus North pair. First, it is important to note that the frequency of east-northeast winds is much lower than the frequency of west-southwest winds, leading to wider confidence intervals around the mean concentration differential (i.e., less certainty). Secondly, some daytime hours in the spring and fall had no east-northeast winds, leaving gaps in the diurnal patterns. Third, the summer months had very few east-northeast winds and are thus not shown. Overall, the overnight concentration differentials for both site pairs are centered on a value slightly below zero (-0.03 µg/m^3), indicating that the upwind sites were similar, but slightly higher in concentration than the downwind sites under easterly flow. Daytime concentrations are more uncertain because of less frequent easterly winds. At the South minus East pair, daytime concentrations were significantly more negative than overnight concentrations, indicating lower downwind concentrations during the day. At the West minus North pair, daytime concentrations were about the same at both sites in the winter, and were insignificantly negative during the fall.

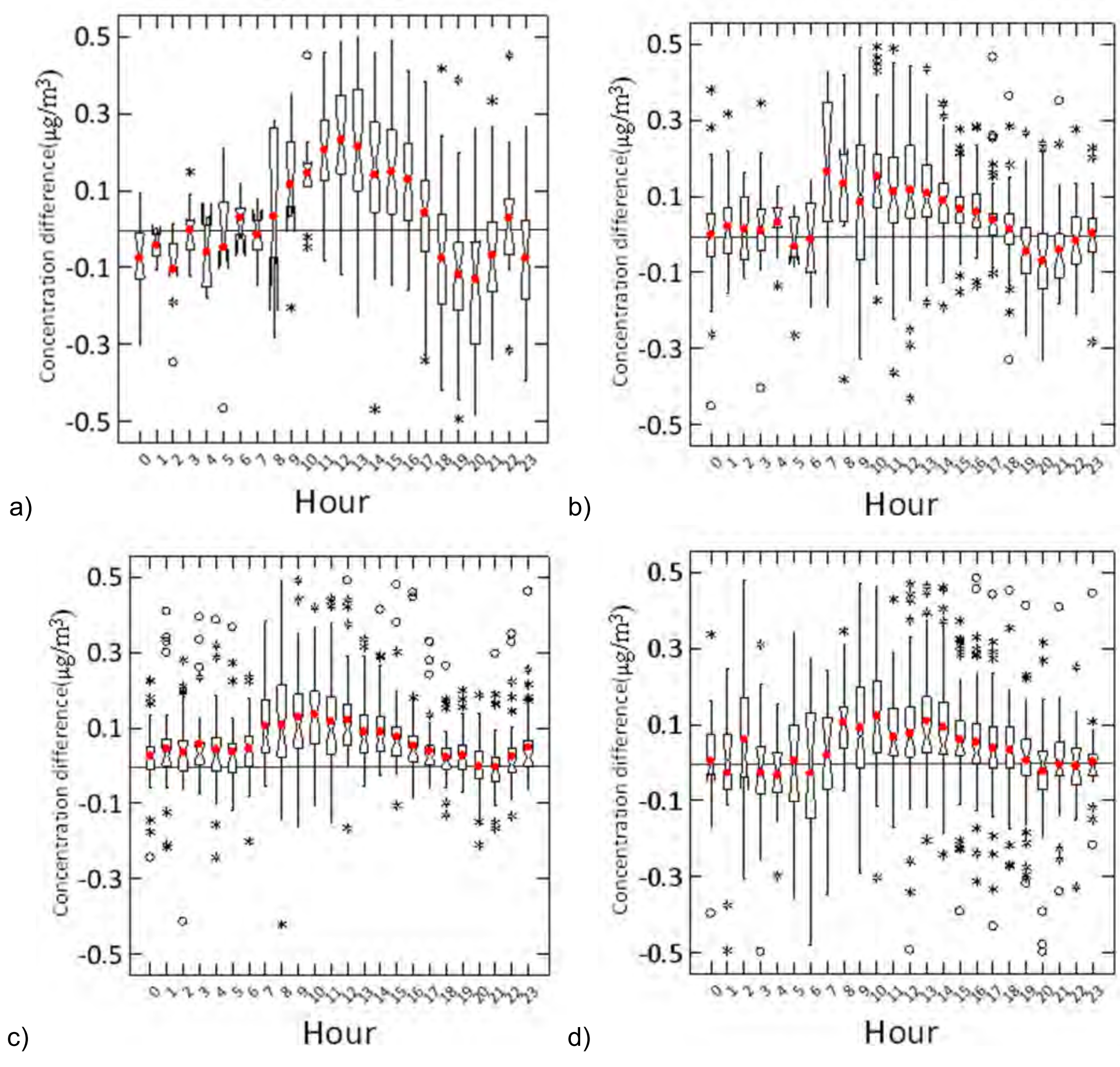


Figure 3-3. Diurnal differential analysis plots showing relative BC concentrations (µg/m^3) at the East minus South pair under west-southwest conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb.; (b) March, April, May; (c) June, July, Aug.; and (d) Sept., Oct., Nov. Positive concentrations indicate higher concentrations at the downwind site across the Oil Field.

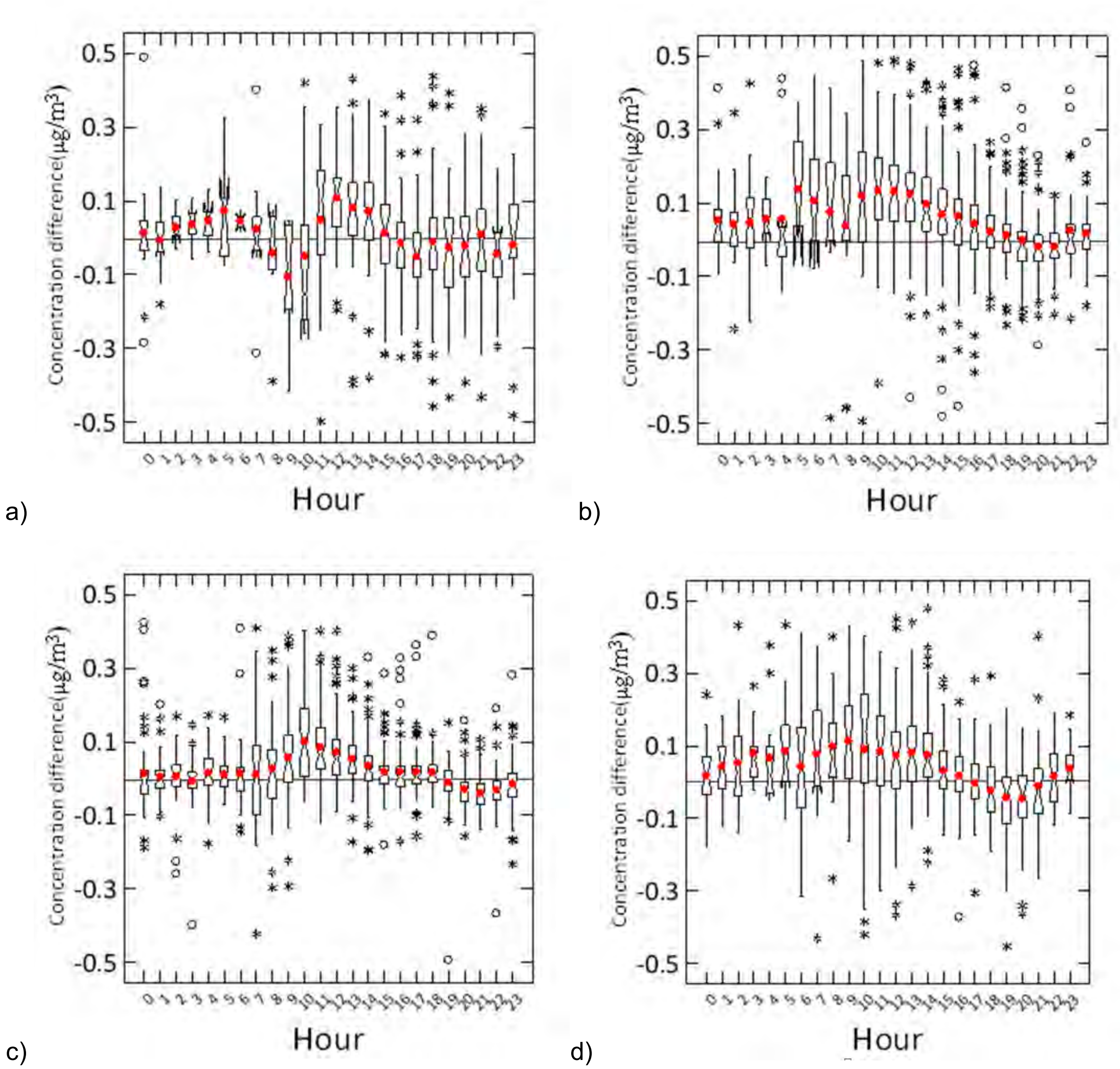


Figure 3-4. Diurnal differential analysis plots showing relative BC concentrations (μg/m^3) at the West minus North pair under west-southwest conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb.; (b) March, April, May; (c) June, July, Aug.; and (d) Sept., Oct., Nov. Positive concentrations indicate higher concentrations at the downwind site across the Oil Field.

The differential analysis plots provide evidence that is consistent with the hypothesis that Oil Field operations are contributing to overall BC concentrations during daytime hours when the winds are from the west-southwest. Overnight concentration differentials show no evidence of Oil Field contributions regardless of wind directions. Winds from the east-northeast do not consistently indicate Oil Field impacts downwind during the daytime hours.

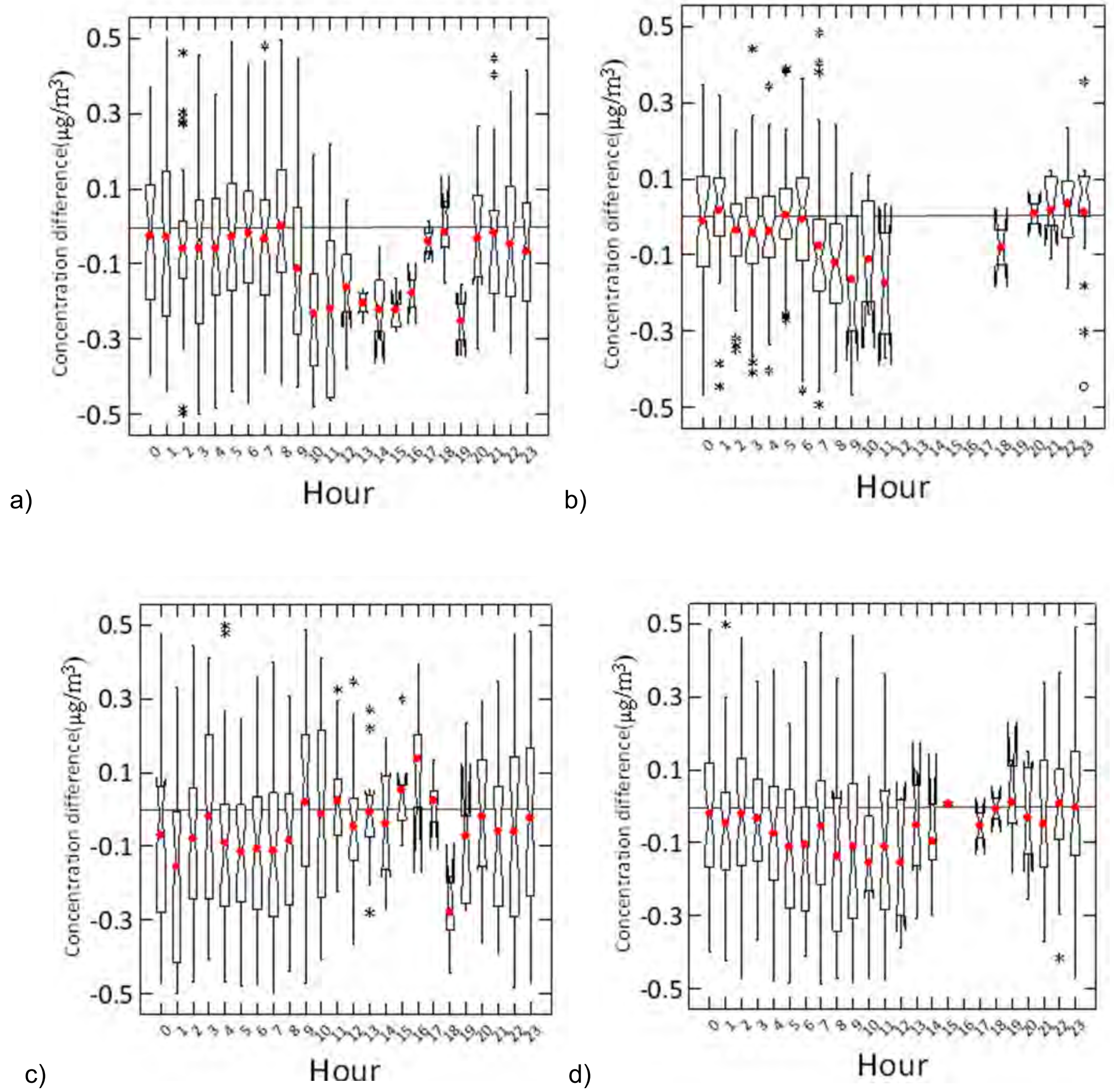


Figure 3-5. Diurnal differential analysis plots showing relative BC concentrations (μg/m^3) at the South minus East pair under east-northeast conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb. and (b) March, April, May; and at the West minus North pair for the seasons of (c) Dec., Jan., Feb. and (d) Sept., Oct., Nov. Negative concentrations indicate lower concentrations at the downwind site across the Oil Field.

Winds from the south-southeast (13.1%) and north-northwest (7.8%) were far less frequent than winds from the west-southwest (53%) and east-northeast (25%). As a result, the ability to assess diurnal and seasonal patterns in gradients is reduced. For these two wind directions, we aggregated all winds from all seasons and calculated the differential BC concentrations for the entire monitoring period. Site pairs and wind bins for these less common directions are:

- South-southeast – winds originating between 120° and 210°
  - Pair 1: West minus South
  - Pair 2: North minus East
- North-northwest – winds originating between 300° and 30°
  - Pair 1: South minus West
  - Pair 2: East minus North

The resulting differential comparisons are shown in **Figure 3-6.** When winds are from the north-northwest, the east-north site pair has a negative contribution, while the south-west pair has a slightly positive contribution from the Oil Field. The confidence interval across the south-west site pair (the notch in the box) encompasses the zero line, indicating that the contribution is not statistically significantly different from zero at the 95% level of confidence. In contrast, the more frequent south-southeast winds have tighter confidence intervals, are both statistically significantly greater than zero, and both site pairs show a positive contribution from the Oil Field. This contribution is 0.01 to 0.03 µg/m^3. This total contribution of BC is lower than that estimated when the winds are from the west-southwest.

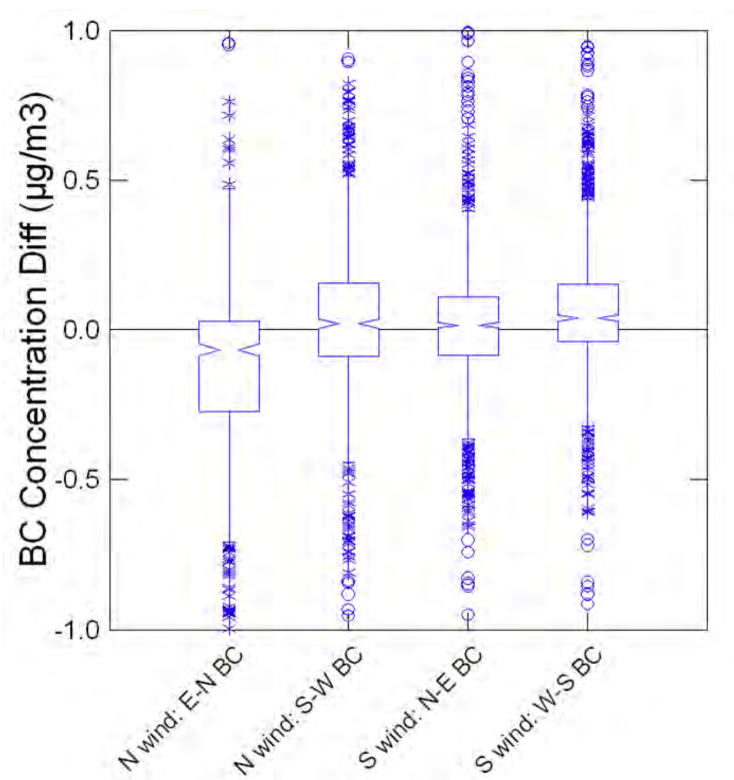


Figure 3-6. Differential analysis results for the entire monitoring period for winds from the north-northwest (N wind) and winds from the south-southeast (S wind) directions.

In a supplemental analysis, we also looked at weekday-weekend differences in concentrations of BC across the Oil Field. Some Oil Field operations are consistent regardless of the day of the week, such as drilling operations and gate traffic. Other operations are constrained to business hours, such as operating maintenance and workover rigs, which occurs during weekdays from 7:00 a.m. to 5:00 p.m. **Figure 3-7** shows the differential analysis for weekday and weekend for the North minus West pair during daytime hours when winds are from the west-southwest. Weekday concentration gradients are higher than weekend concentration gradients, which is consistent with Oil Field rig activity.

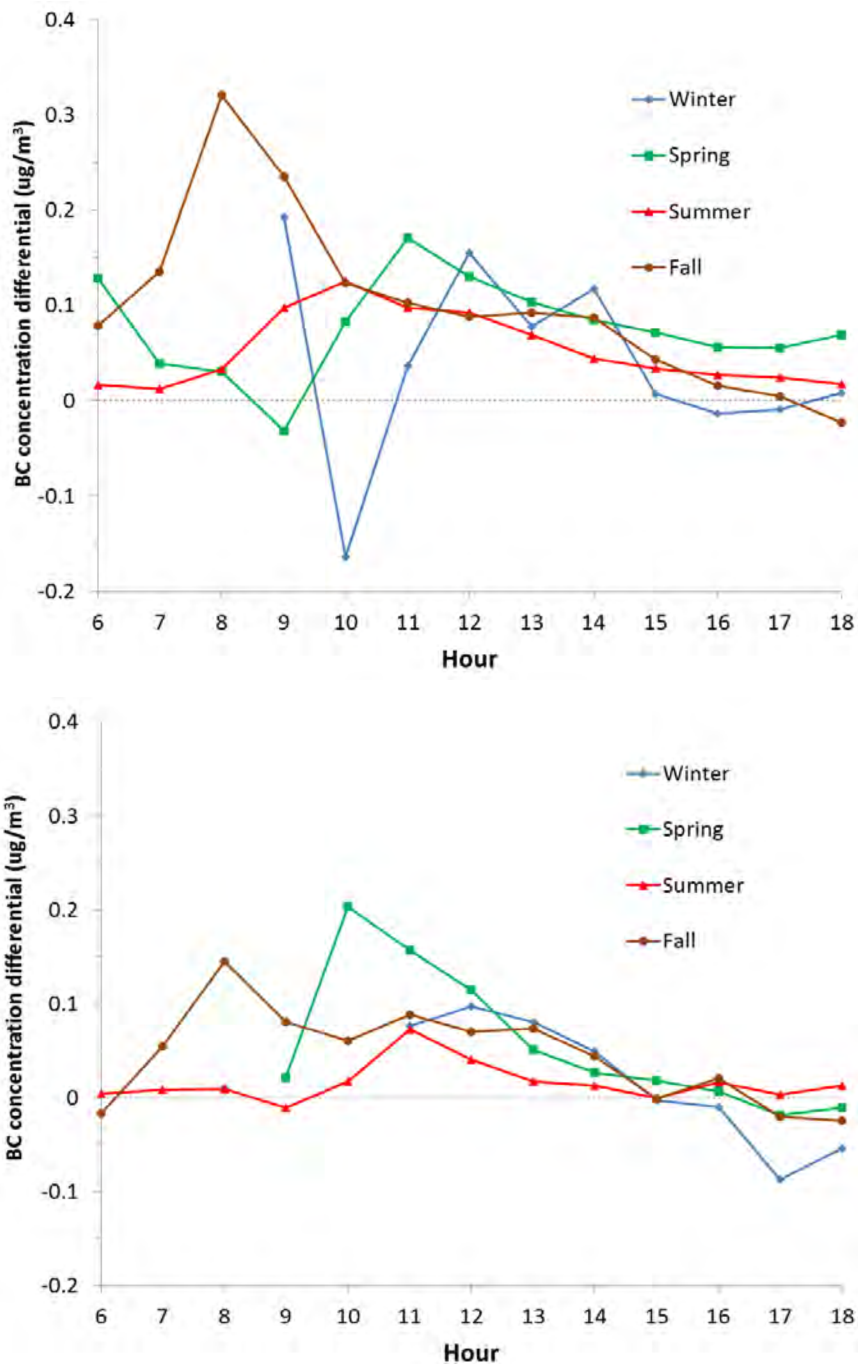


Figure 3-7. Daytime comparisons of BC differential concentrations (µg/m^3) at the North minus West pair for (top) weekday and (bottom) weekend by meteorological season.

3.1.4 Case Study Analysis

STI examined time series of BC concentrations at all four sites to look for Oil Field activity operations that corresponded with peaks in concentrations at individual sites during the intense operating periods (IOP) when the XACT 625 or PTR-TOFMS were deployed. The best example we found of Oil Field operations potentially causing localized spikes in BC concentrations was during the PTR-TOFMS July IOP. The time series of the BC concentrations during the PTR-TOFMS deployment are shown in **Figure 3-8**. BC concentrations at the East site spike a bit higher than other sites starting on July 9, 10, and 11 before settling into a pattern that matches the other sites.

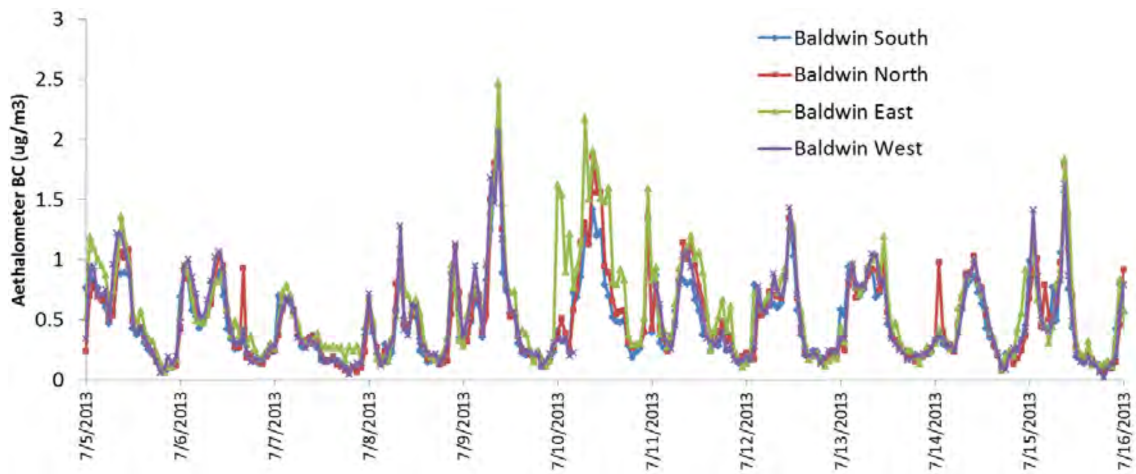


Figure 3-8. Time series of BC concentrations (µg/m^3) at all four study sites for the July 5–16 time period. Concentrations are significantly higher at the East site than at other sites on July 10 and July 11.

Figure 3-9 shows the wind direction and speed for July 8-13. The winds are light and variable very early on July 10; later in the day, they come mostly from the south.

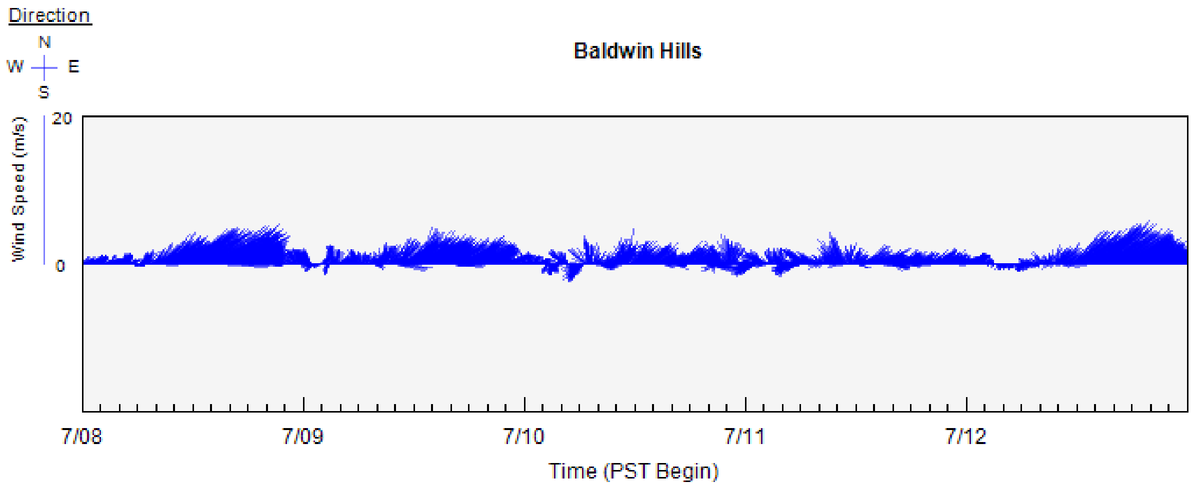


Figure 3-9. Wind bristle plot showing the direction the wind is blowing. On the morning of July 10, the winds were light and variable before settling into winds from the south.

Oil field operational notes for the July 3-16, 2013, period are provided in **Table 3-2**. On July 10, a rig was moved to location BC 6533; the rig operated at that location until July 16, when it was moved. Well location BC 6533 was located almost directly south of the East site, as shown in **Figure 3-10**.

Table 3-2. Oil Field operational reports during the PTR-TOFMS intense operating period. Comments are from the Oil Field operator.

Well Name	AM Report Date	Drill Start	Drill End	Comments
BC LAI1 5473 (BC STK1 5473)	7/3/2013			Summary, HSM, Load out move off BC 6522. HSM, Move in rig up on BC-LAI1 5473. NOTE: Mike Fernandez gave AQMD 24 hr notice f/ spud. Shut down for night.
BC LAI1 5473 (BC STK1 5473)	7/8/2013		Least 2573'	Cont, Run Platform Express Open Hole log, RD Loggers, RIH t/2573', Circulate clean, L/D drill string, HSM w H&H Casing crew R/U and ran 67jts 9-5/8" 40# K-55 LTC casing. Landed Shoe @ 2561 , F/C @ 2481.8', Flag Joints @ 1956" & 1221.7', Circulate, HSM. With 9-5/8" 36# K-55 Shoe landed @ 2561' & Float Collar @ 2481'.
BC 6533	7/10/2013			Rig down & Move rig f/BC LAI 5473 t/ BC 6533. Rig up on BC 6533, Spot sub-structure, Set back end equipment, Raise derrick, Set pipe racks, Shut down for night. Continue rig up in the morning.
BC 6533	7/11/2013	52'	473'	Completed R/U of Ensign rig 516 on BC 6533. Install riser & sound blankets in derrick. Transfer mud to pit & load walk w/directional tools. Spud well @ 1250 hrs on 07/10/2013. M/U directional tools & scribe MWD. Directional drill 14 3/4" hole f/52' to 473'. Wipe hole to shoe @ 52'. Circ hole clean. POOH & L/D directional tools. Run 10 3/4" surface casing w/shoe @ 468' & insert float @ 419'. R/U cementing head & circ hole clean. Cement 10-3/4" 40.5# K55 STC Casing, Shoe at 468' and insert float at 419'. Cement casing in place w/25 bbl cement to surface, Bumped plug t/900 psi, Insert float held, WOC.
BC 6533	7/12/2013			RIH t/ 419'. Test BOPE w/ CDOGGR. 24 Hour Forecast: Finish BOP testing. Drill out float equipment & cement. Directional drill 9 7/8" hole towards TD @ 2454'.
BC 6533	7/16/2013			R/D and tear out rig, Remove sound walls, Replaced drill line, Load out third party mud equipment, Mud docks, Prep for move t/LAI1 5473. Directional drill 9 7/8" hole towards TD @ 2454'.

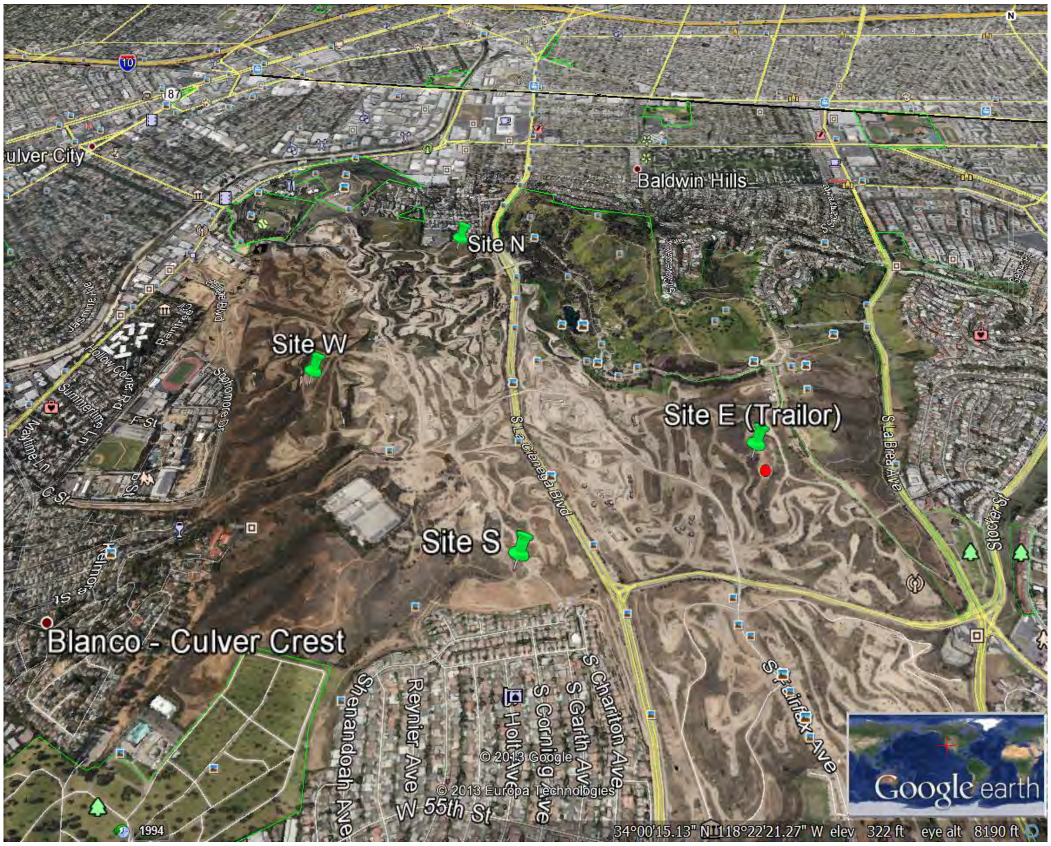


Figure 3-10. Map of the Inglewood Oil Field, site locations, and well number 6533 (red dot). Well number 6533 was the location of a drill rig on July 10–16.

This set of wind patterns, the location of a drill rig, and operational activities are consistent with a small enhancement in local BC concentrations for a two-day period attributable to Oil Field activities. However, our examination of the December and January period, during the metals operational period, revealed little in the way of Oil Field drilling operations that could be correlated with high BC concentrations. During the December and January time period, most operations occurred in the general vicinity of the South site, but were not as close to the South site as well number 6533 was to the East site.

3.2 XRF Metals

3.2.1 Metals Temporal Variability

We developed box plots to examine diurnal patterns and weekday-versus-weekend differences for metals concentrations, using hourly measurements during the 2.5-month sampling period from November 12, 2012, to January 29, 2013, at the East monitoring site.

Figure 3-11 presents diurnal box plots for each of the measured metal elements targeted for risk characterization; the interquartile range and median of hourly metals concentrations are shown in a box for each hour of day, with the extent of the hourly concentrations shown by whiskers, stars, and circles. Box plots for all measured elements are presented in **Appendix C**. Diurnal profiles were different for many of the species. Note that species such as cadmium, nickel, and selenium were often at or below the MDL for the species. For those species, care should be taken in examining absolute concentrations, because they are often below the method's ability to resolve them. In contrast, copper, manganese, and lead all show characteristic diurnal profiles that indicate potential emissions activity profiles during the morning hours. For some metal elements, such as chromium and mercury, a majority of concentration data (over 80%) was below MDL and the box plot therefore showed no specific diurnal profiles.

We also developed box plots for weekday and weekend average hourly concentrations. As shown in **Figure 3-12**, average hourly concentrations were higher on weekdays, when Oil Field operations occurred, for copper, lead, manganese, and selenium. Concentrations for cadmium and nickel were not distinguishable between weekdays and weekends.

3.2.2 Pollution Roses

Pollution roses were developed for measured metal concentrations to examine how pollution correlates with wind directions. At the East monitoring site, prevailing wind directions are west-southwest (onshore) or east-northeast (offshore). If a significantly large percentage of high pollutant concentrations is associated with any particular wind direction, it would indicate more pollution activities upwind of the monitoring site in that direction.

Figure 3-13 presents pollution roses for the six selected metal elements, which summarize hourly metal concentrations according to 16 sectors of wind direction during the sampling time period. Pollution roses were not presented for chromium and mercury, because most of their concentration data were below MDL. Pollution roses for all elements are shown in Appendix C. The Oil Field is southwest of the East site. In general, no significantly large percentage of high pollutant concentrations was particularly associated with the southwest wind direction, when the Oil Field was upwind of the East site. Across the six selected metal elements, higher concentrations (red wedges in the plots) were more likely to occur with winds from the east-northeast (12–17% of the time) than from the Oil Field to the west-southwest (3–11% of the time).

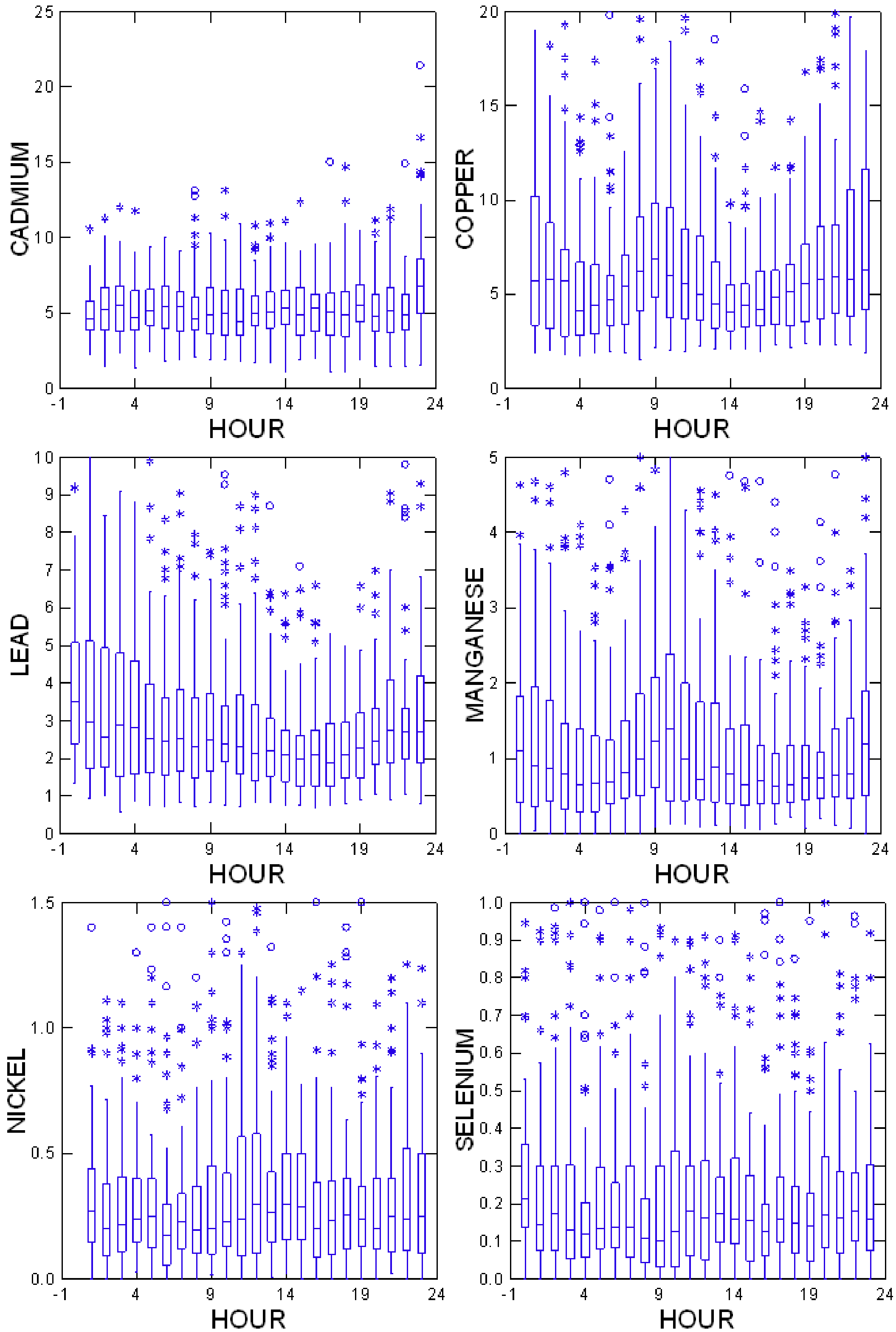


Figure 3-11. Box plots of hourly metals concentrations (ng/m^3) during the 2.5-month sample period. Whiskers represent data within 1.5 times of interquartile range; stars represent data within 3 times of interquartile range; circles represent potential outliers.

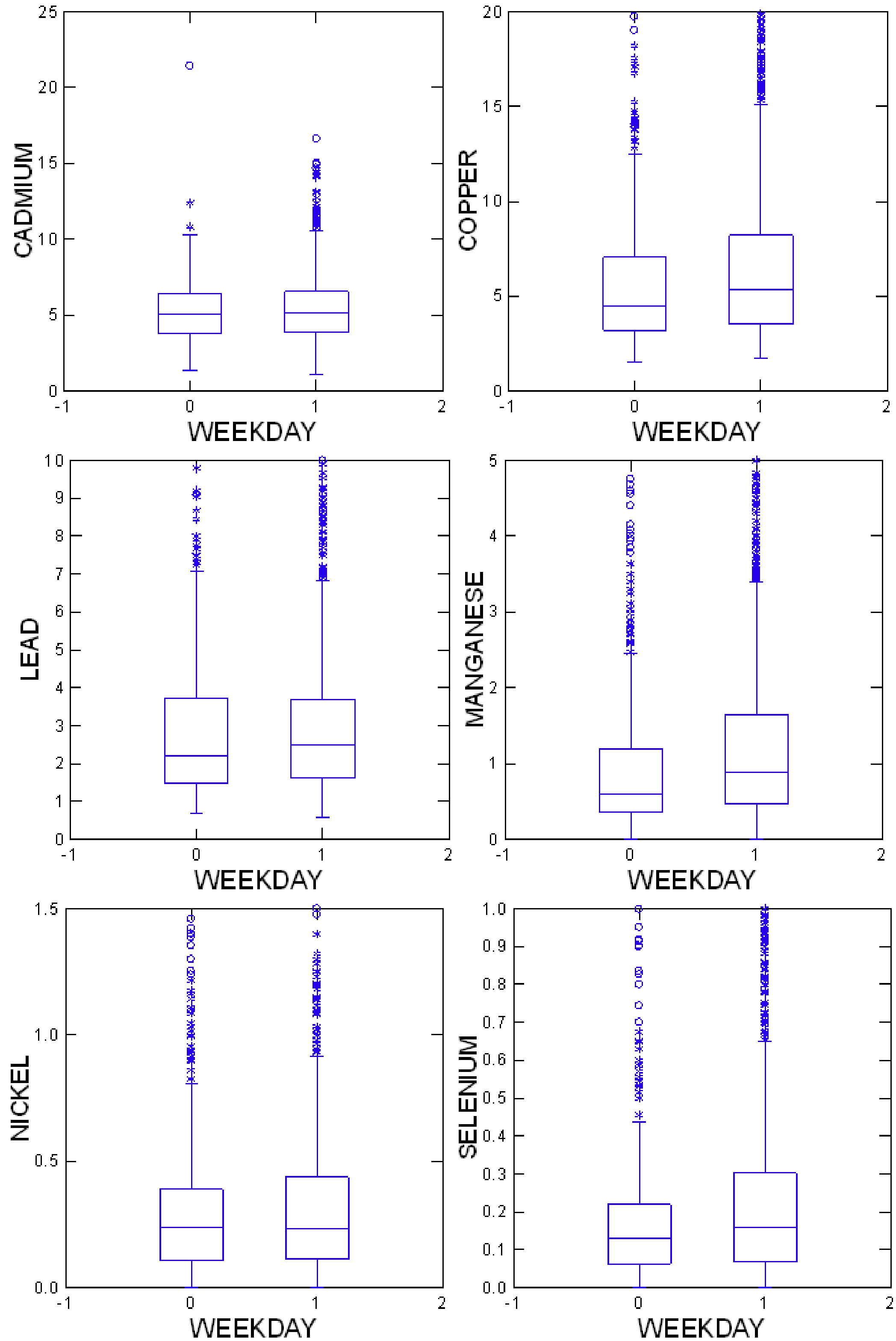


Figure 3-12. Box plots of average hourly metals concentrations (ng/m^3) during weekdays ("1") and weekends ("0"). Whiskers represent data within 1.5 times of interquartile range; stars represent data within 3 times of interquartile range; circles represent potential outliers.

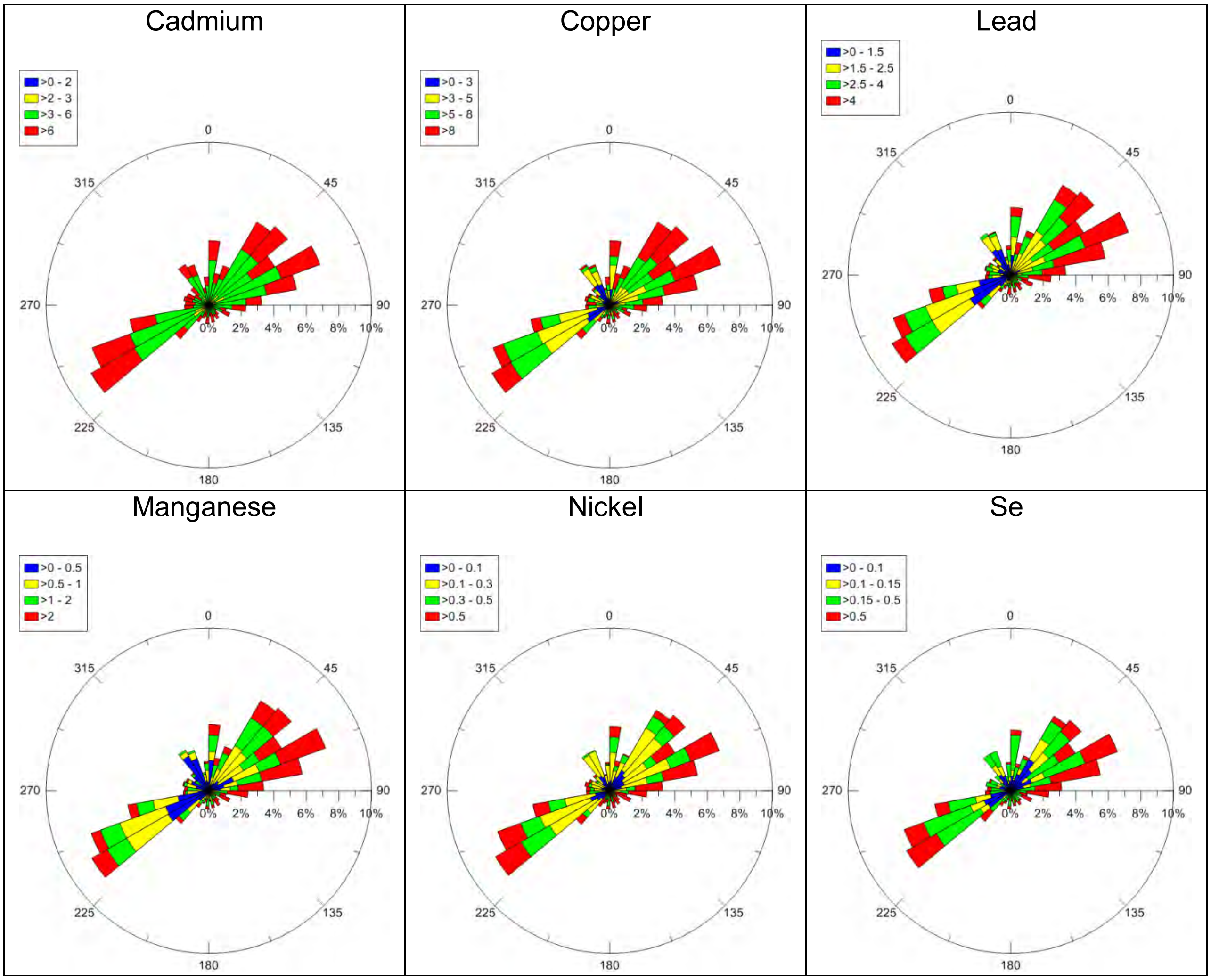


Figure 3-13. Pollution roses for hourly metals concentrations (ng/m^3) measured at the East site.

3.2.3 PMF Factor Analysis

Positive matrix factorization was applied to examine potential factors that contribute to observed metal concentrations at the East site. Among 24 metal elements with concentration measurements, 10 elements were excluded from PMF runs because of their low signal-to-noise ratios (see **Table 3-3**). Two potential outliers with very high Ca, Mn, Ni, Zn, and Cu concentrations, corresponding to sampling hours 11/17/12 20:00 and 11/29/12 4:00, were identified on the basis of Dixon's Q-test and were excluded from PMF runs. Samples with missing metal observations were also excluded from PMF runs.

Table 3-3. Summary of metal concentration measurements.

Pollutant	Used in PMF?	Signal-to-Noise Ratio	MDL (ng/m³)	Min (ng/m³)	25th (ng/m³)	Median (ng/m³)	75th (ng/m³)	Max (ng/m³)
Sulfur	Yes	2.99	4.00	68.2	125.3	162.7	262.0	4235
Potassium	Yes	2.99	2.37	44.4	71.0	86.5	112.5	1825
Iron	Yes	2.99	0.76	0.7	28.1	60.2	112.8	485.7
Copper	Yes	2.97	0.27	1.5	3.4	5.3	8.1	323.8
Lead	Yes	2.90	0.22	0.6	1.6	2.4	3.9	27.9
Zinc	Yes	2.85	0.23	0.0	2.1	4.8	10.1	256.0
Bromine	Yes	2.81	0.19	0.0	1.3	2.2	4.8	74.6
Calcium	Yes	2.54	0.90	0.0	3.6	10.8	24.3	1924.0
Titanium	Yes	2.52	0.38	0.0	1.3	2.7	5.5	44.6
Manganese	Yes	2.02	0.28	0.0	0.4	0.8	1.7	30.2
Strontium	Yes	1.91	0.45	0.2	0.7	1.0	1.4	36.9
Barium	Yes	1.67	0.95	0.0	0.8	2.2	4.8	96.0
Selenium	Yes	1.22	0.14	0.0	0.1	0.2	0.4	29.3
Nickel	Yes	1.08	0.23	0.0	0.1	0.2	0.5	248.4
Germanium	No	0.89	0.12	0.0	0.1	0.1	0.2	0.7
Cadmium	No	0.65	5.75	1.1	3.9	5.1	6.5	21.4
Silver	No	0.59	4.33	0.0	2.0	3.2	5.0	23.9
Vanadium	No	0.43	0.29	0.0	0.0	0.0	0.2	4.6
Chromium	No	0.29	0.29	0.0	0.0	0.0	0.1	25.4
Rubidium	No	0.26	0.34	0.0	0.0	0.1	0.3	2.4
Scandium	No	0.10	0.55	0.0	0.1	0.2	0.3	1.2
Arsenic	No	0.06	0.11	0.0	0.0	0.0	0.0	2.1
Cobalt	No	0.02	0.32	0.0	0.0	0.0	0.0	12.4
Mercury	No	0.01	0.19	0.0	0.0	0.0	0.0	0.3

As shown in **Table 3-4**, the PMF analysis suggested seven reasonably defined factors associated with 14 metal elements. The identification of these factors was based on their profiles: the concentration of each metal element apportioned to a factor's total concentration (see **Figure 3-14**), diurnal patterns, and changes of factor contributions in relation to wind directions. Time series of PMF factor contributions were also developed and are shown in **Figure 3-15**. These factor profiles and time series do not indicate significant impacts from the Oil Field.

Table 3-4. Summary of metal PMF factors.

PMF Factor	Potential Sources	Element/Species	Diurnal Pattern
Se	Coal combustion	Selenium	No clear diurnal pattern.
K/Sr	Wood-burning stove and fireplace	Potassium Strontium	Strong evening peak; high contributions during holiday nights.
S/Br	Marine vessels	Bromine Sulfur	Highly variable time series.
Ti/Fe/Cu/Ba	Crustal materials and industry plants	Barium Copper Iron Titanium	Highly variable time series.
Mn/Ni	Oil operations	Manganese Nickel	Highly variable time series; relatively low contributions during holidays.
Lead/Zinc	General aviation airports or tire wear	Lead Zinc	Highly variable time series.
Calcium	Soil and blowing dust	Calcium	No clear diurnal pattern.

3.2.4 Case Study Analysis

The XRF metals analysis, based on examinations of temporal variability, pollution roses, and PMF modeling results, showed no significant impacts from the Oil Field on metal concentrations measured at the East site. We also conducted a few brief case studies to further assess specific patterns of concentrations for several metal elements.

Manganese and Nickel

Manganese and nickel were likely related to oil operations and were reasonably identified in the PMF analysis. A factor contribution rose (**Figure 3-16**) showed that a small percentage of higher oil factor contributions could occur with the southwest wind direction (when the East monitoring site is downwind of the Oil Field) This is consistent with the findings from pollution roses presented in Section 3.2.2 (e.g., for nickel). In addition, relatively low factor contributions were found during holidays (e.g., Christmas and New Year), when oil operations were limited (see **Figure 3-17**). However, case study analysis indicated that none of the five highest manganese-nickel hourly concentrations during the monitoring period were associated with drilling operations within 1500 feet of the East site.

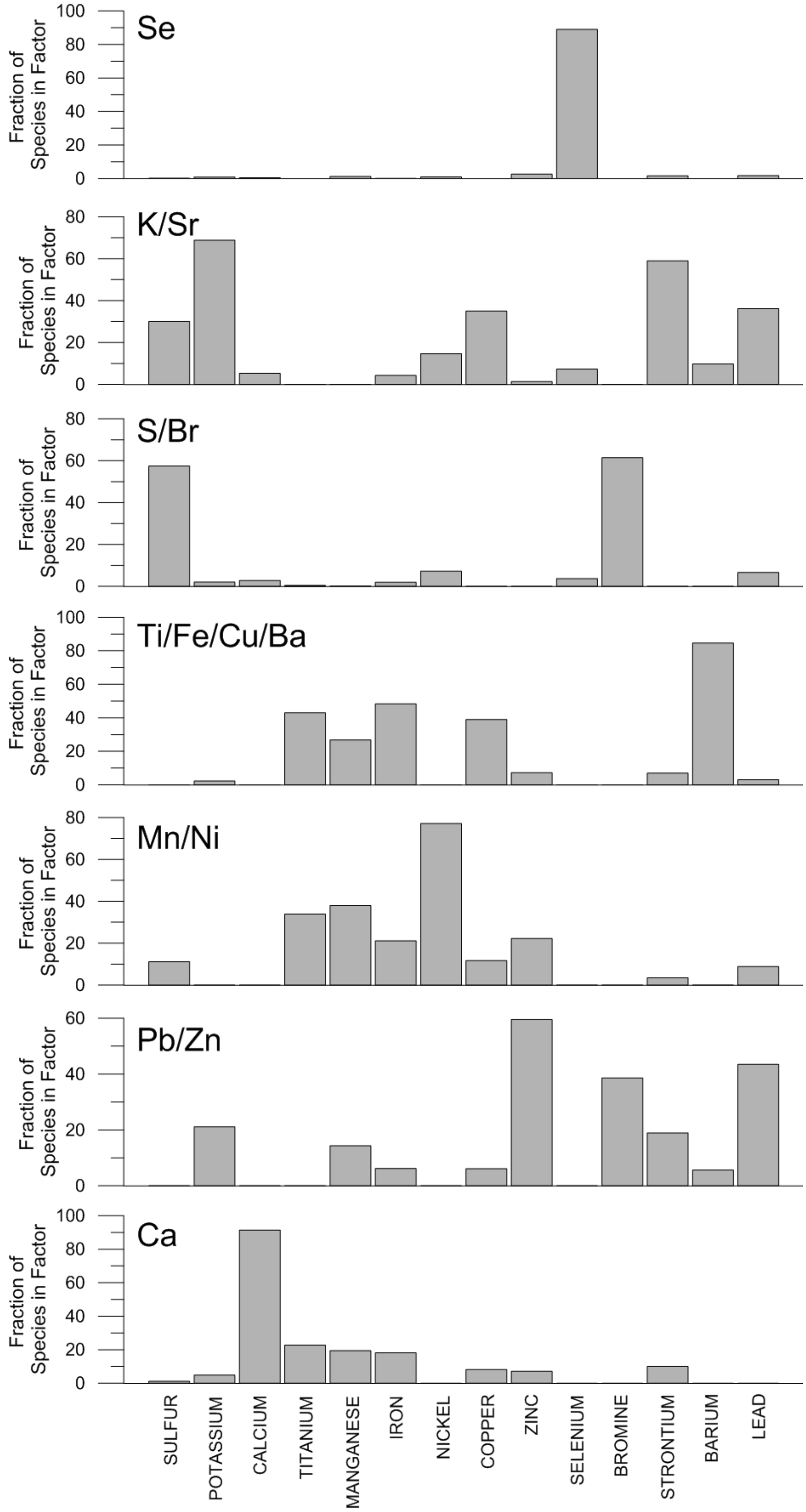


Figure 3-14. PMF factor profiles for metal elements.

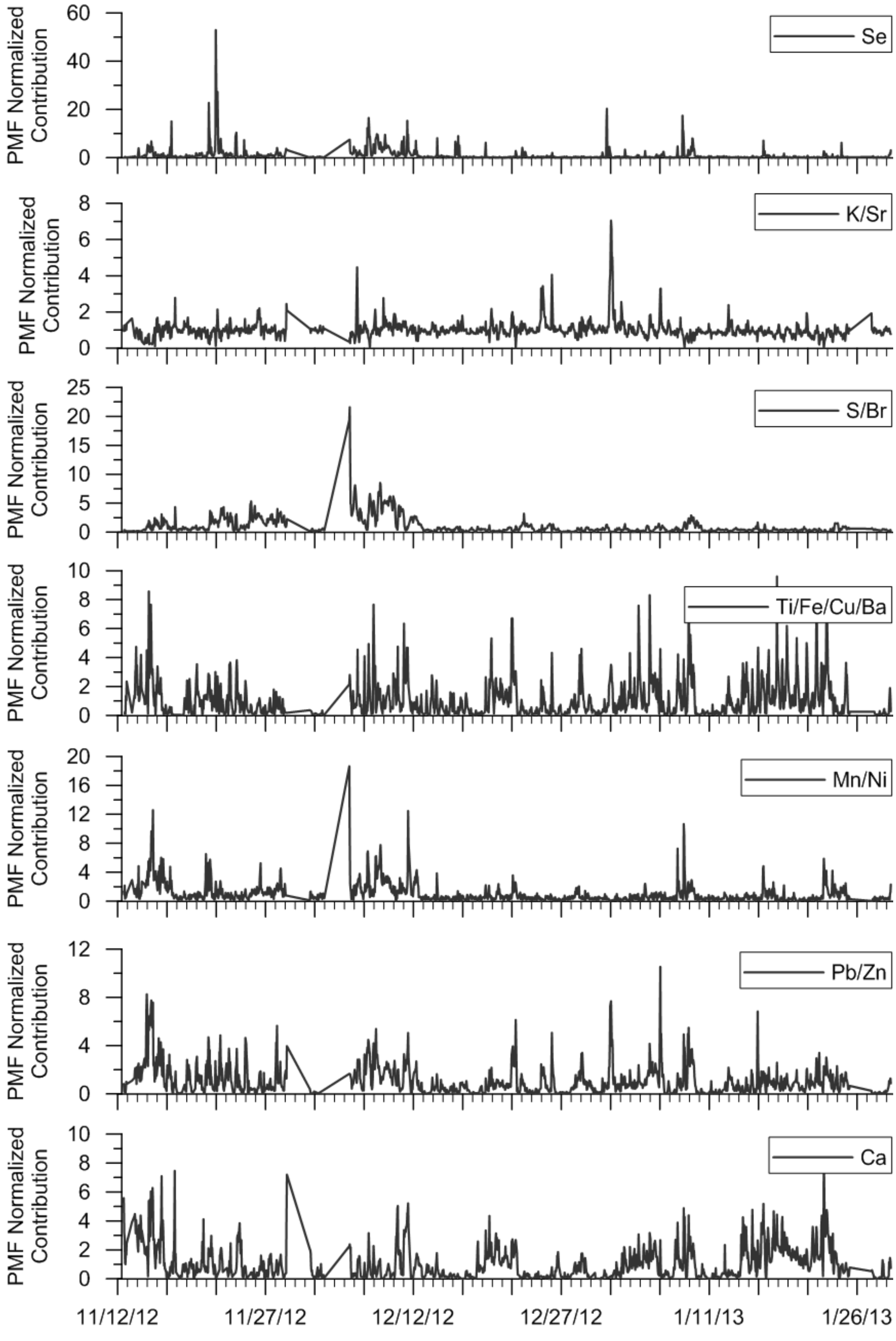


Figure 3-15. Time series of PMF metal factor normalized contributions.

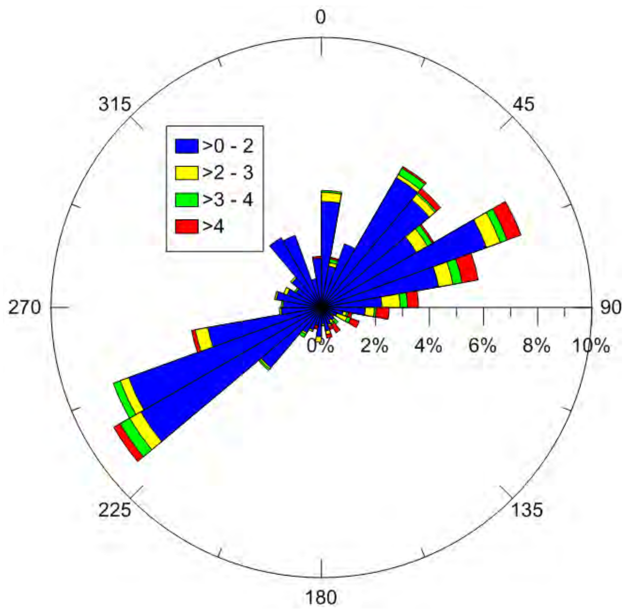


Figure 3-16. Contribution rose for the Oil factor (mainly related to Mn and Ni) in the PMF analysis.

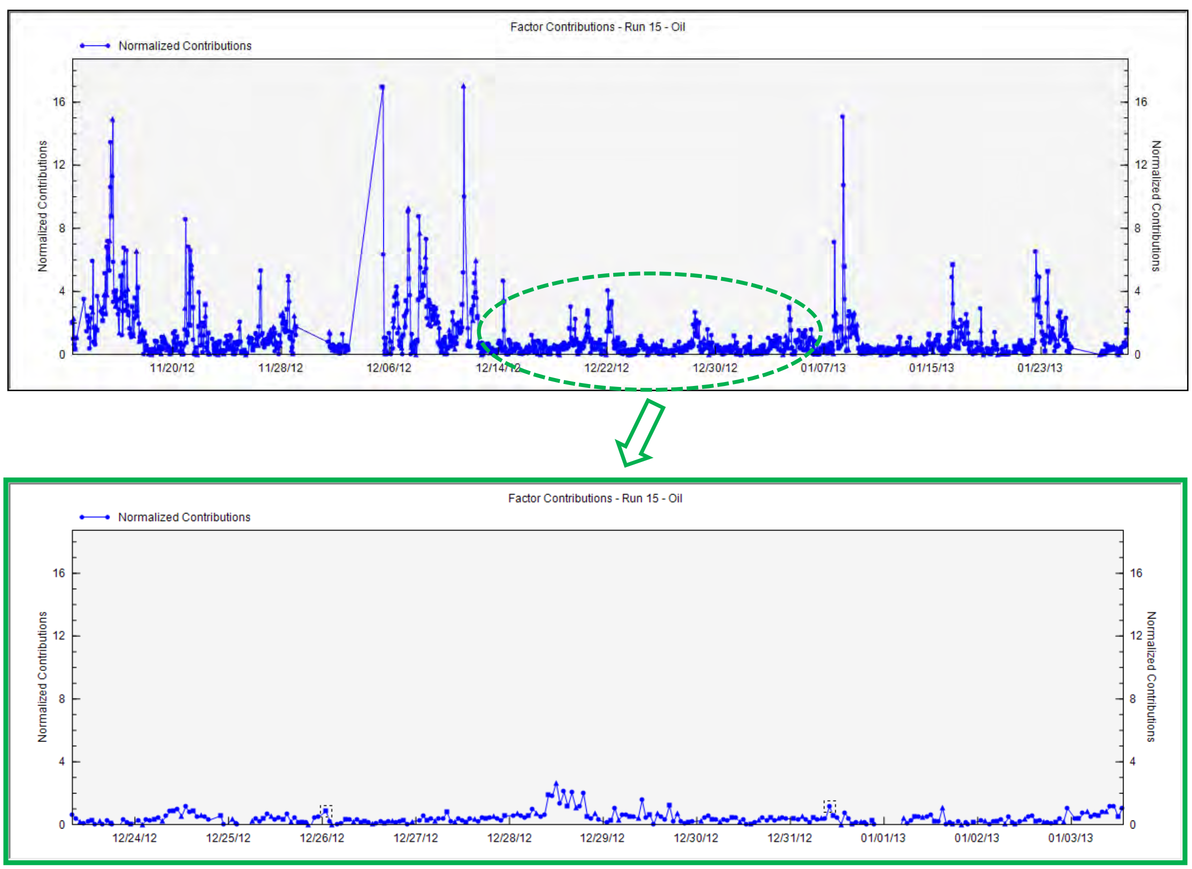


Figure 3-17. Time series of relatively low normalized contributions associated with the PMF Oil factor.

Potassium

Potassium was related to the wood burning factor identified in the PMF analysis. As shown in **Figure 3-18**, higher potassium concentrations and wood burning factor contributions were observed during holiday nights (e.g., Christmas and New Year), when a lot of wood burning activities likely occurred.

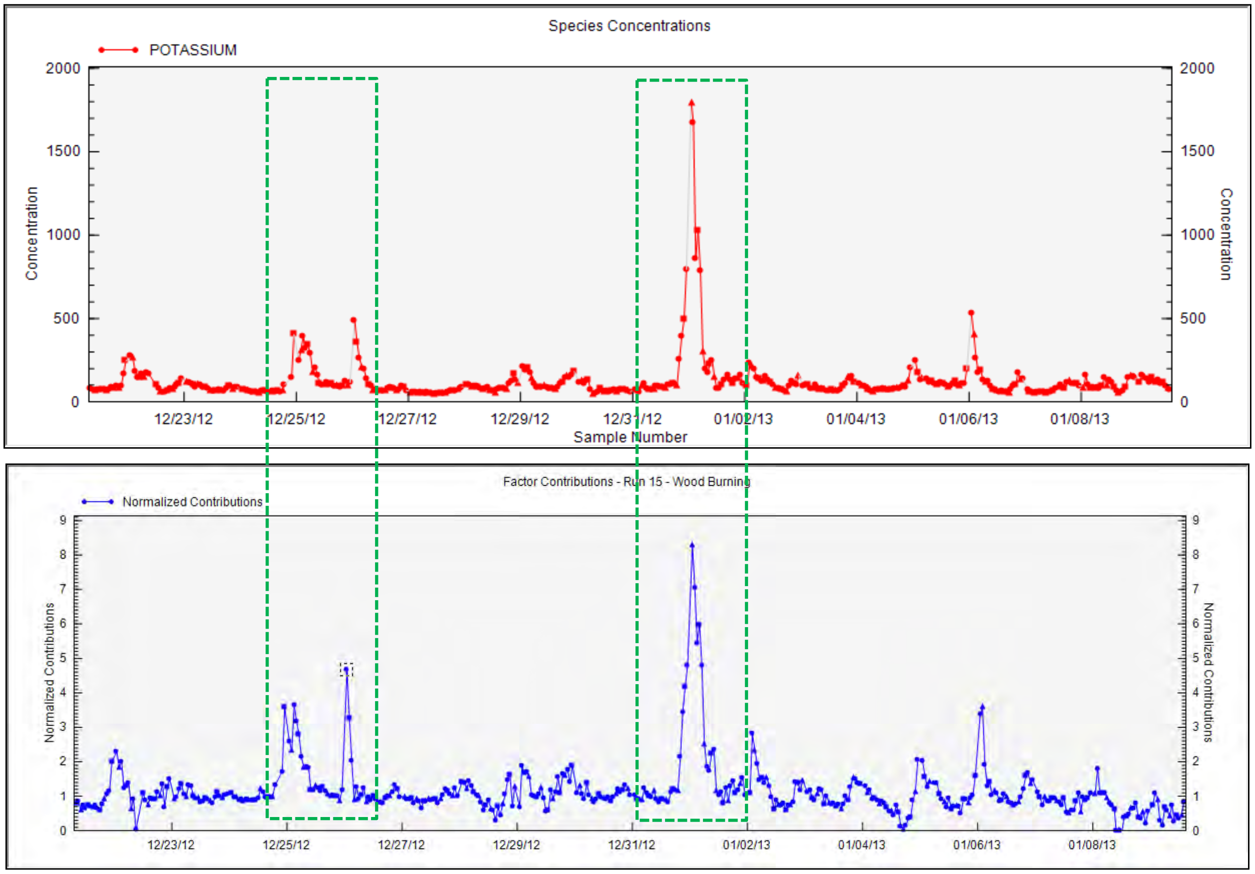


Figure 3-18. Time series of high potassium concentrations (ng/m^3) and normalized contributions associated with the PMF wood burning factor.

Lead and Zinc

Time series of lead and zinc concentrations were developed and compared with wind directions. As shown in **Figure 3-19**, higher lead or zinc concentrations were associated with various wind directions, suggesting that major impacts on concentrations of these metal elements were not likely from a single source in a particular direction near the monitoring site.

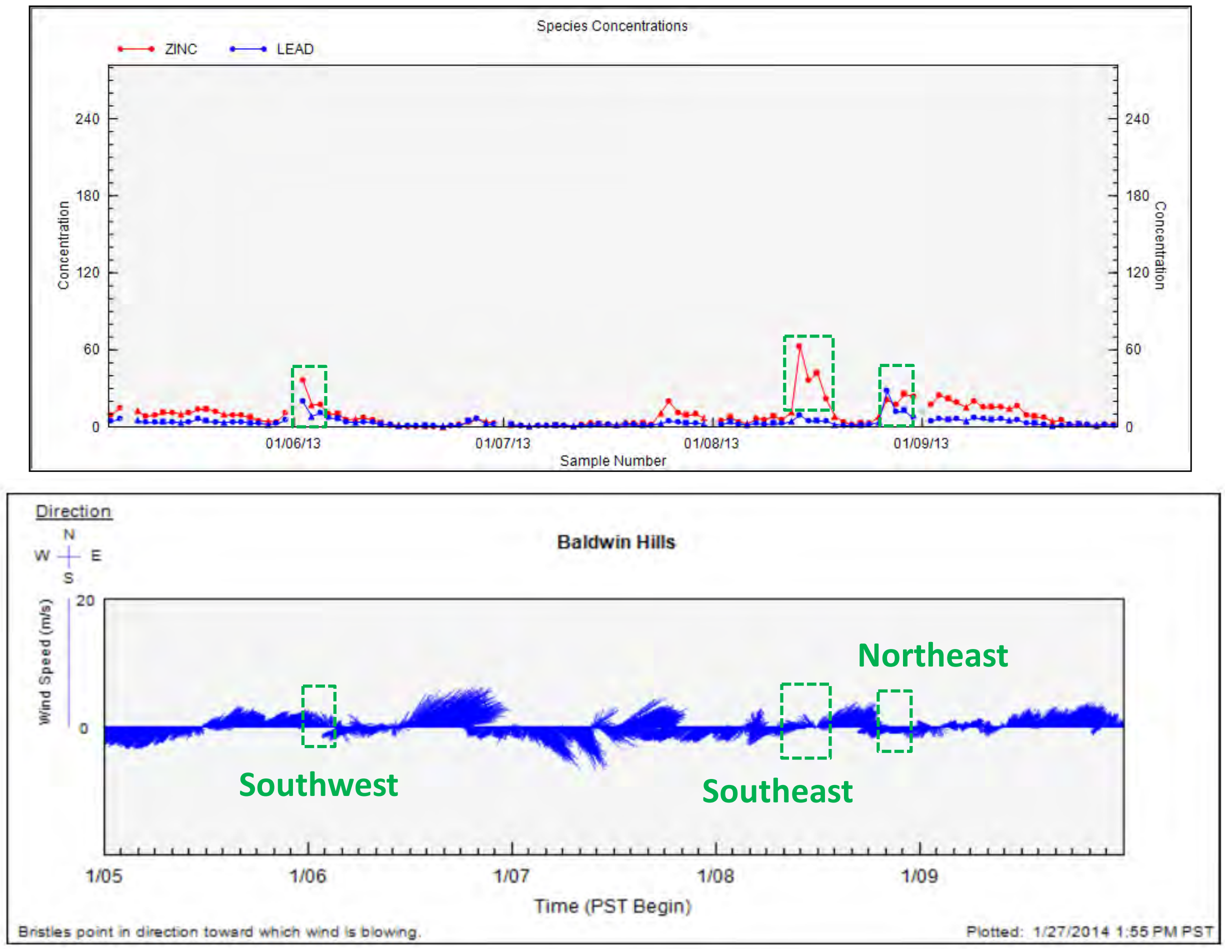


Figure 3-19. Time series of high lead and zinc concentrations (ng/m^3) and wind directions.

Cadmium

Given the observation of some high concentration measurements and the toxicity of cadmium, we further examined cadmium concentrations to assess its potential patterns and relationship with oil operation activities. During the sampling time period, mean and median cadmium concentrations were 5.35 ng/m^3 and 5.10 ng/m^3, respectively; however, 64% of cadmium samples were below the MDL (5.75 ng/m^3). Scatter plots showed no correlation between cadmium and other metal elements. Additionally, no correlation was found between cadmium and BC concentration differences for the East minus South pair, used to evaluate potential impacts from oil operational activities.

The time series of cadmium concentrations show no diurnal pattern and high variability through the entire sampling period. There was high variability during holiday weeks (approximately 12/21/12 to 1/8/13, during the Christmas and New Year holidays), when oil operation activities were very limited. We further assessed the top 20 highest cadmium concentrations, and found that these concentrations occurred under various wind directions; only four of these 20 samples occurred during the day. In particular, three of the 20 highest cadmium concentrations were observed under west-southwest wind direction (when the Oil Field is upwind of the sampling East site), but they were all during evening hours.

In PMF runs (see Section 3.2.3), cadmium was excluded because of a low signal-to-noise ratio. To further evaluate how cadmium may interact with other metal elements in factor contribution analysis, we conducted an extra PMF run to include cadmium as a strong species. The PMF results showed that cadmium was pulled into a factor with potassium and strontium, which is likely related to evening activities such as wood smokes. Cadmium was not shown to have significant contributions to the manganese and nickel factor, which is more likely from oil operational activities.

The case study analyses for cadmium, as described above, suggest no correlation between cadmium and oil operational activities during this sampling period.

3.3 PTR-TOFMS Volatile Organic Compounds

3.3.1 VOC Diurnal Patterns

As explained in Section 2.4.3, seven VOCs were measured in units of parts per billion (ppb) as well as the arbitrary units particular to the PTR-TOFMS instrument. We examined the time series and diurnal patterns of these VOCs in context with BC to see (1) whether there were similar temporal patterns among VOC species, indicating similar sources; and (2) whether VOCs had any similarity to variations in BC. Similarities in either case would indicate similar sources for BC and VOCs. The VOCs with ppb units were acetaldehyde, butadiene, acrolein, benzene, toluene, xylenes, and naphthalene.

Figures 3-20 and 3-21 show the time series and diurnal box plots of the VOCs, BC, and wind direction during the two-week VOC sampling period. In box plots, the interquartile range of the data are shown in a box, and the extent of the concentrations are shown by the whiskers. All species tend to have a morning peak, likely due to peak emissions during local morning rush hour plus influence from the Los Angeles Basin rush hour. Butadiene, acrolein, and naphthalene also have spikes of high concentrations, which are further evaluated in Section 3.3.3. The similar patterns across VOCs and BC suggest they are predominantly from local and regional combustion sources, i.e., vehicular emissions that tend to dominate VOCs in the Los Angeles area.

Next, we looked at how each of the seven VOCs compared to the difference in BC concentrations between the East and South sites, which indicates the oil operations' contribution to BC. A modest correlation between this difference and any species would indicate how much of that VOC species is from oil operations. Results are shown in **Figure 3-22**. No VOC had any correlation with the BC difference, though there were some high BC difference values that also had high VOC concentrations of acetaldehyde. These individual high values are used as case study examples in Section 3.3.3. The low correlation of VOC concentrations with BC difference indicates there is likely little consistent influence on VOC levels from the oil operations, although there may be influence for limited hours.

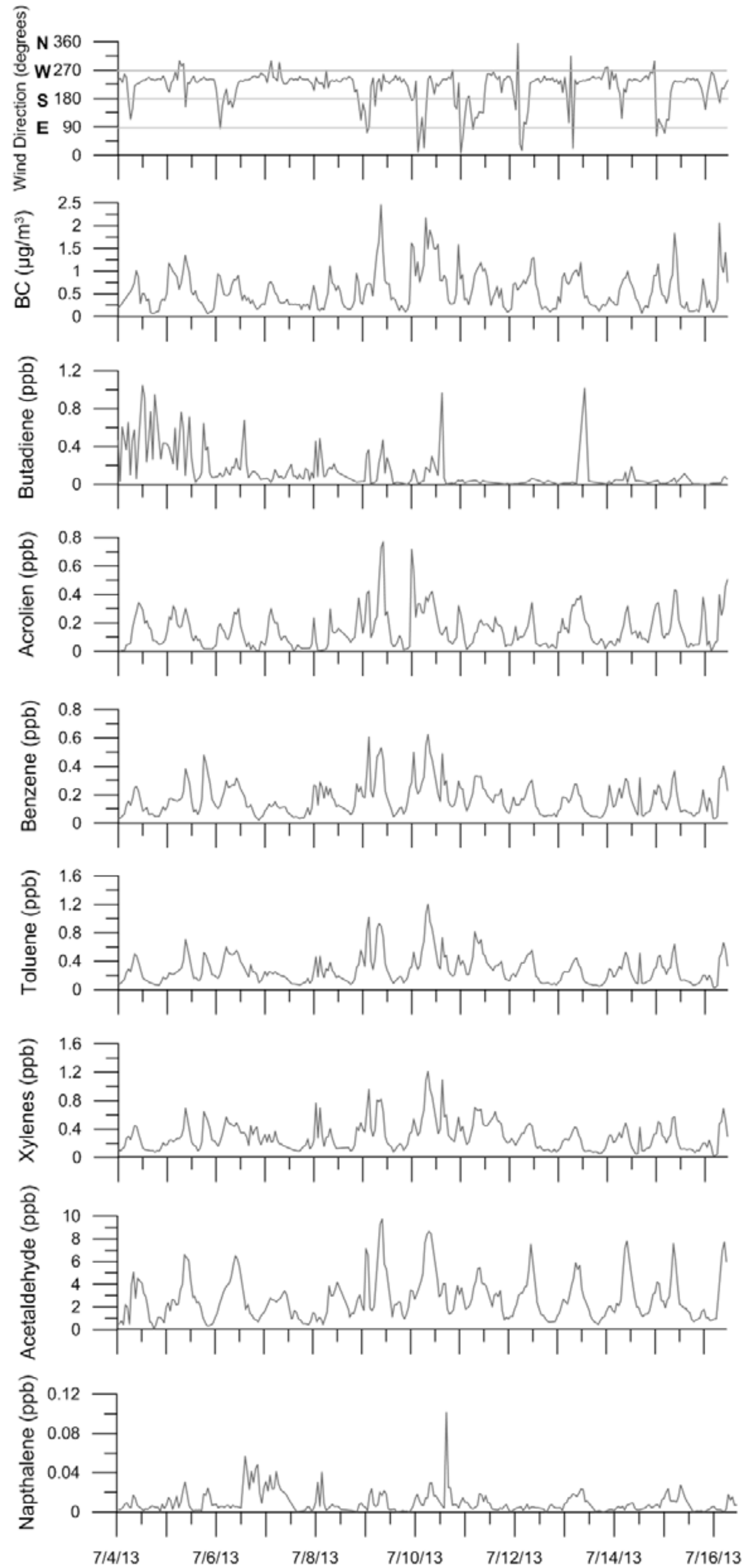


Figure 3-20. Time series of hourly VOC (ppb), BC (µg/m^3) and wind direction during the summer VOC intensive operating period.

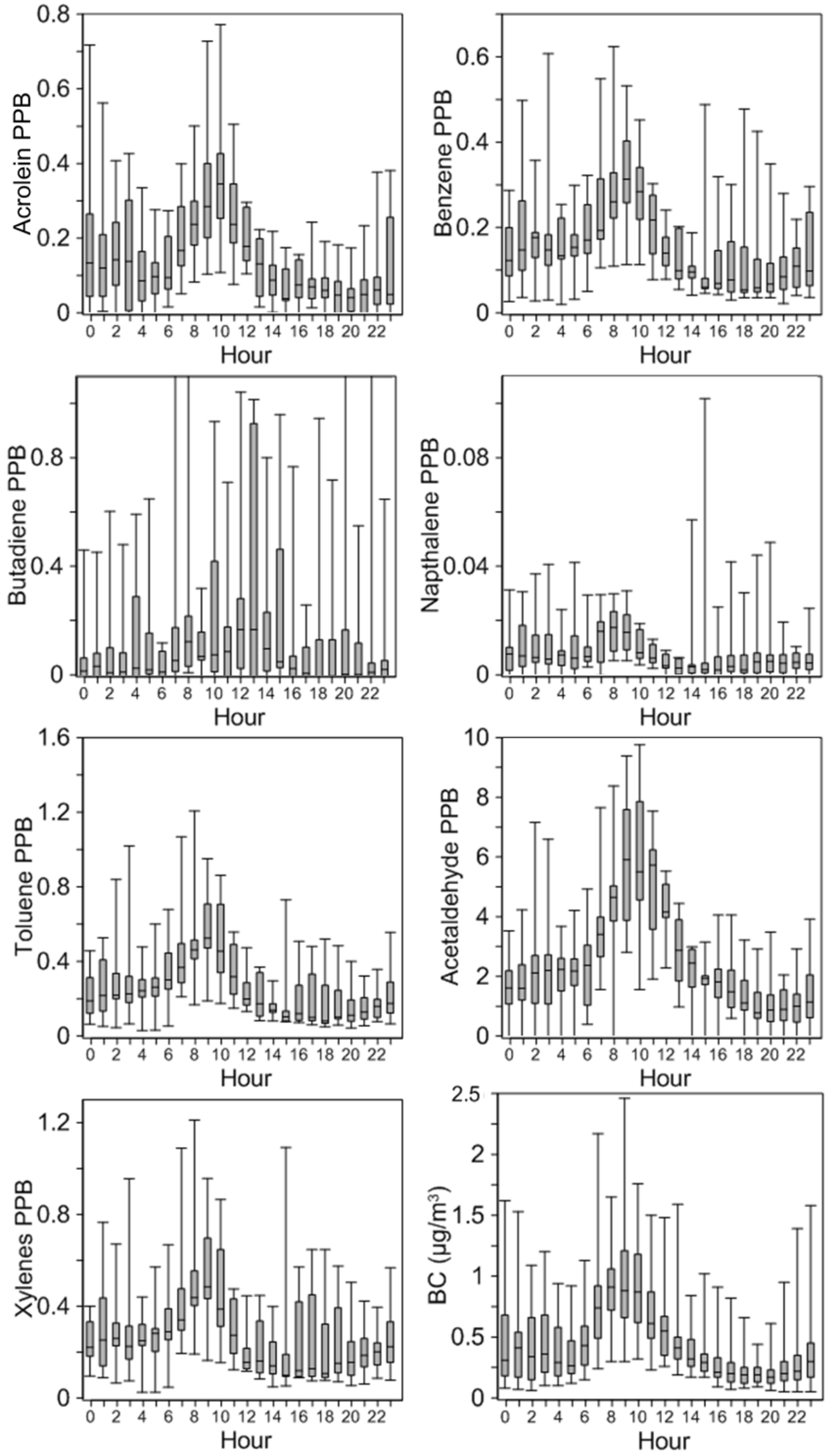


Figure 3-21. Box plots of VOC and BC concentrations by hour (ppb for VOC; µg/m^3 for BC).

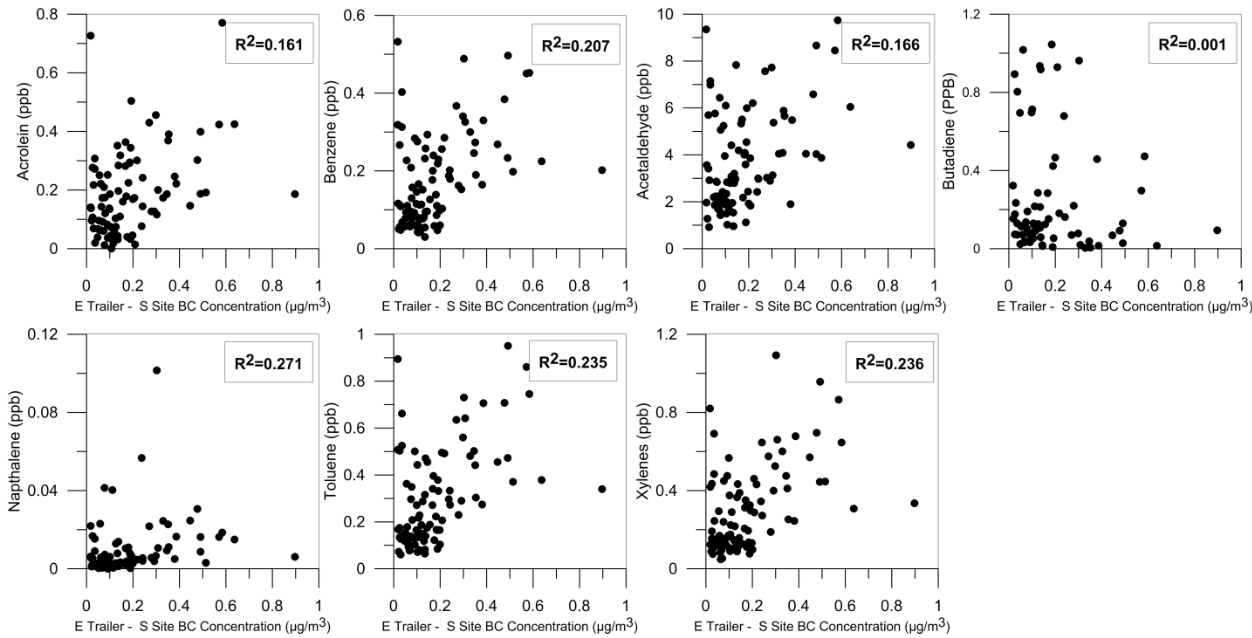


Figure 3-22. Scatter plots of VOC concentrations (ppb) with BC difference concentrations (μg/m^3) between the East and South sites.

3.3.2 VOC PMF Factor Analysis

A total of 23 VOC species with arbitrary units were measured by the PTR-TOFMS with significant signal-to-noise ratio to be included in the analysis. These include the seven species with ppb values, plus others such as formaldehyde, ethanol, acetone, isoprene, methyl ethyl ketone, and benzaldehyde. Some of these species, however, are identifiable only by their mass-to-charge ratio (*m/z)*, with multiple species possible for a given *m/z*. In these cases, we use the basic chemical formula of the *m/z*, e.g., C_3H_7+ for *m/z* 43.0542, which is a combination of n-propyl and isopropyl. **Table 3-5** summarizes the *m/z* available for PMF analysis, the ion associated with each *m/z*, and, where applicable, the likely VOC species name.

PMF was applied in order to separate out factors that influence the VOCs. No unique tracer for Oil Field operations was identified, so we used a given PMF factor's variation with wind direction, time of day, and the BC signal from the Oil Field to determine whether the PMF factor is likely to be associated with the Oil Field. Typically in PMF analysis of VOC data, the PMF factors are more representative of atmospheric chemical and transport processes, rather than specific sources, since many VOC species have multiple sources and short atmospheric lifetimes. This was the case here, where three PMF factors were identified, two of which—a reactive alkene/alkyne factor and a factor with oxygenated VOCs—were more associated with atmospheric processes. The additional factor was typical of mobile source emissions.

Table 3-5. Summary of PTR-TOFMS species including the *m/z* available for PMF analysis, the ion associated with each *m/z*, and, where applicable, the likely VOC species name.

m/z	Ion	Name	Concentrations Calibrated for ppb	Used in PMF?
31.0178	CH_2OH^+	Formaldehyde	No	Yes
33.0335	CH_4OH^+	Methanol	No	Yes
41.0391	$C_3H_5^+$	Propyne	No	Yes
43.0542	$C_3H_7^+$	Propyl groups	No	Yes
45.0335	$C_2H_4OH^+$	Acetaldehyde	Yes	Yes
47.0497	$C_2H_6OH^+$	Ethanol	No	Yes
55.0548	$C_4H_7^+$	1,3-Butadiene	Yes	No – signal/noise=0
57.0335	$C_2H_5CO^+$	Acrolein	Yes	Yes
57.0699	$C_4H_9^+$		No	Yes
59.0491	$C_3H_6OH^+$	Acetone	No	Yes
69.0699	$C_5H_9^+$	Isoprene	No	Yes
71.0491	$C_3H_6COH^+$	Methyl ethyl ketone	No	Yes
71.0855	$C_5H_{11}^+$		No	Yes
73.0648	$C_4H_8OH^+$	Methyl vinyl ketone	No	Yes
75.0446	$C_3H_6O_2H^+$		No	Yes
79.0542	$C_6H_8^+$	Benzene	Yes	Yes
83.089	$C_6H_{11}^+$		No	Yes
85.0648	$C_4H_8COH^+$		No	Yes
93.0699	$C_7H_9^+$	Toluene	Yes	Yes
97.1012	$C_7H_{13}^+$		No	Yes
107.049	$C_7H_6OH^+$	Benzaldehyde	No	Yes
107.0855	$C_8H_{11}^+$	Xylene	Yes	Yes
111.118	$C_8H_{15}^+$		No	Yes
125.132	$C_9H_{17}^+$		No	Yes
129.069	$C_{10}H_9^+$	Naphthalene	Yes	No – signal/noise=0

Table 3-6 summarizes the PMF factors; **Figure 3-23** shows the profiles of the three factors; and **Figure 3-24** shows the time series of the three factors, the BC concentrations at the East site, and the BC differential between the East and South sites. **Figure 3-25** shows pollution roses for the three PMF factors. Since the patterns are essentially the same for all three factors, wind direction analysis of VOCs and the VOC PMF factors does not provide information on potential sources. The mobile source factor was composed of species typical of exhaust, such as benzene, toluene and xylenes, as well as ethanol and benzaldehyde, which may be secondarily formed from exhaust. This factor had a strong morning and midday peak, typical of the morning rush hour, and likely came from emissions throughout the Los Angeles

Basin. The alkene/alkyne factor was composed of reactive unsaturated VOCs such as propyne and isoprene. These species have relatively short atmospheric lifetimes, and thus they vary together, forming their own factor. They are likely from multiple sources, including mobile sources and biogenic emissions, but their variations are more influenced by their atmospheric reactivity rather than by variations in emissions. The last factor, composed of oxygenated VOCs such as formaldehyde and acetaldehyde, was similar in that it was composed of VOCs that vary together in the atmosphere and can be from multiple sources. The VOCs in this oxygenates factor are emitted as primary emissions from combustion and can also be formed in the atmosphere; thus, this factor is at least as representative of atmospheric processes as it is of a primary emissions source.

Table 3-6. Summary of VOC PMF factors.

Factor	Description	Species	Diurnal Pattern	Correlation with E-S Site BC Difference?
Mobile source	Typical mobile source signature of BTEX, plus methanol	Benzene, Toluene, Xylene, Ethanol, Benzaldehyde	Strong morning and midday peak	No
Alkenes/alkynes	Unsaturated VOCs; very reactive	Propyne, Isoprene, etc.	Highly variable time series	No
Oxygenates	VOCs with oxygens, excluding benzaldehyde and ethanol	Formaldehyde, Methyl ethyl ketone, Methanol, Acetaldehyde, Acrolein, Acetone, etc.	Modest morning, midday peak	No

None of the factor profiles or time series indicated that they were specifically from the oil operations. To further examine the possibility of Oil Field impact, we used the BC concentrations' difference between the East and South sites as an indicator of the oil operations' BC contribution and compared this difference to the factor contributions. A modest correlation or better between a factor's contributions and the BC difference would indicate that the factor may also be from oil operations. **Figure 3-26** shows scatter plots of the BC difference with each factor's contributions, for all hours and for daytime hours only. There is little correlation between the BC difference and the factor contributions, indicating that none of these factors are directly attributable to the oil operations. This is consistent with the observations that individual species had little correlation with the BC difference.

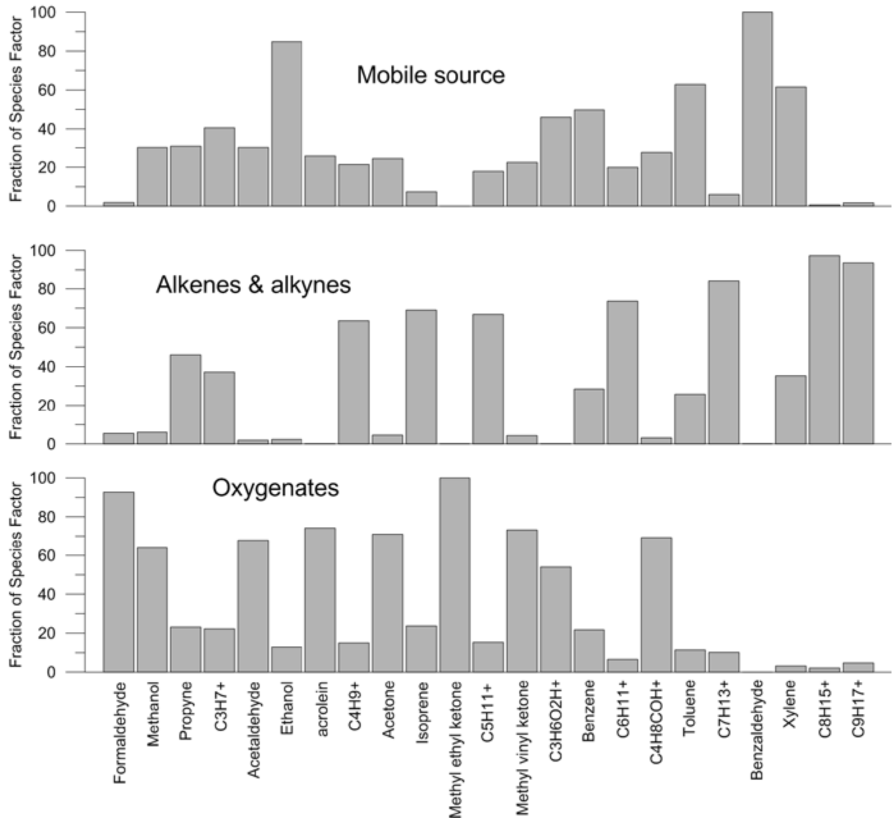


Figure 3-23. PMF VOC factor profiles.

3.3.3 VOC Case Study Analysis

While there was no consistent signal in the VOC data from the oil operations seen in earlier analyses, as a last step we examined the highest 5th percentile of BC difference concentrations that occurred concurrently with daytime VOC sampling, to see whether times of high BC differences also had high VOC concentrations. High VOC concentrations and the highest BC difference values occurring at the same time might indicate that, for certain specific hours, there was some qualified influence from the oil operations on VOC levels.

Table 3-7 summarizes the hourly BC difference and VOC concentrations during the highest 5th percentile of BC difference values that occurred during the daytimes of the VOC sampling period. Winds were typically out of the west-southwest. The 1,3-butadiene and naphthalene concentrations were low during these high BC difference periods. Of the six highest BC difference hours, four of these coincided with the highest 5th percentile concentrations of acetaldehyde and toluene, and three coincided with the highest 5th percentile concentrations of benzene and xylenes. Oil Field operations were active south of the site during these hours, so it appears that on some discrete hours, there is likely a noticeable, if not statistically quantifiable, influence from oil operations on acetaldehyde, benzene, and toluene. Each of the hourly episodes with high VOC concentrations was associated with either drill rig operations 518 feet from the East site, workover rig operations 661 feet from the East site, or both. All of the episodes occurred during workover rig operational hours.

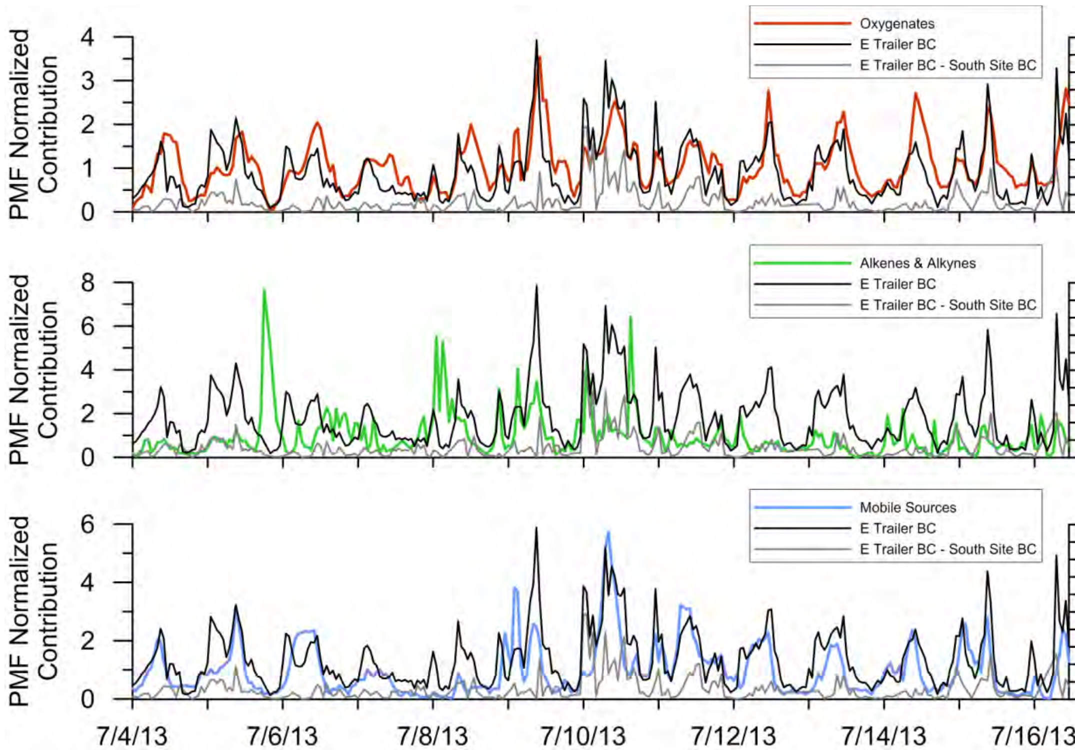


Figure 3-24. Time series of PMF factor normalized contributions, BC, and East minus South BC difference.

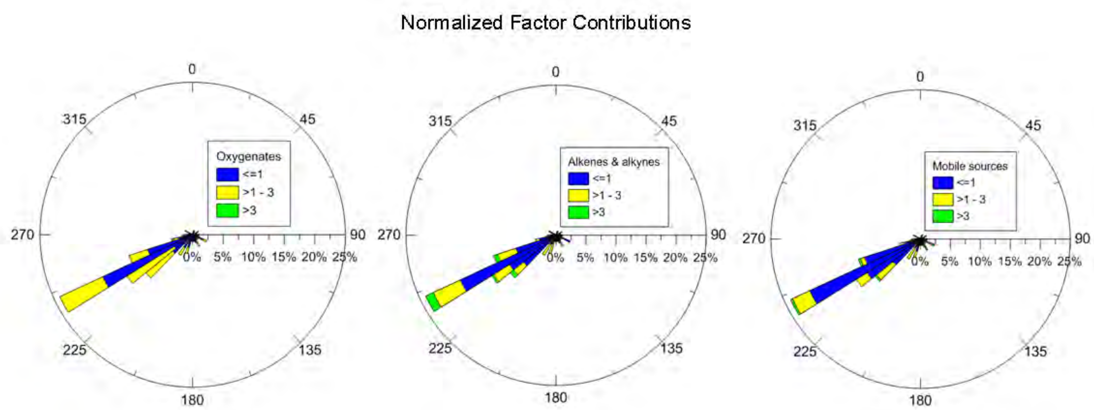


Figure 3-25. Pollution roses for VOC PMF normalized factor contributions.

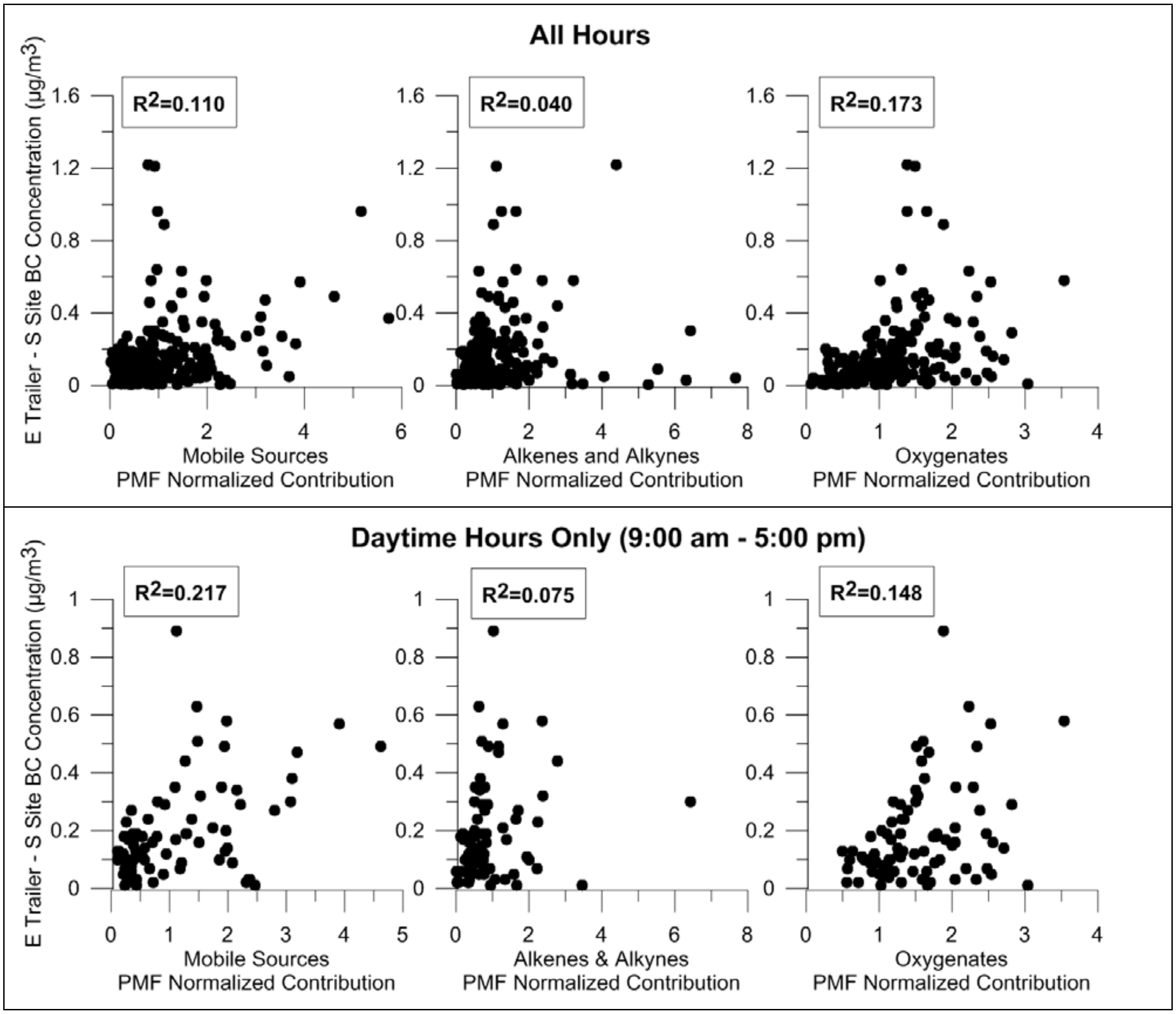


Figure 3-26. Scatter plot of PMF VOC factor normalized contributions and BC difference during all hours and daytime hours (9:00 a.m. to 5:00 p.m.).

Table 3-7. Wind direction and concentrations of BC difference and VOCs during the highest 5th percentile concentrations of BC difference between the East and South sites. For comparison, the highest 5th percentile of each species is shown in bold.

Date and Time	BC Difference µg/m^3	Wind Direction	1,3-Butadiene (ppb)	Acrolein (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)	Naphthalene (ppb)	Acetaldehyde (ppb)
7/10/13 13:00	0.897	SW	0.093	0.186	0.202	0.340	0.336	0.006	4.423
7/15/13 10:00	0.637	SW	0.016	**0.425**	0.225	0.378	0.307	0.015	**6.051**
7/9/13 10:00	0.584	W	0.472	**0.771**	**0.452**	**0.745**	0.646	0.019	**9.733**
7/10/13 10:00	0.571	SW	0.296	0.423	**0.450**	**0.861**	**0.865**	0.016	**8.449**
7/11/13 13:00	0.513	SW	0	0.192	0.198	0.370	0.447	0.003	3.874
7/10/13 9:00	0.491	W	0.129	0.399	**0.497**	**0.951**	**0.957**	0.016	**8.664**
7/11/13 12:00	0.491	SW	0.028	0.187	0.234	0.473	0.445	0.009	4.031
7/5/13 9:00	0.477	SE	0.093	0.302	0.384	**0.708**	**0.696**	0.031	6.585
95th percentile concentration	0.491		0.918	0.425	0.403	0.708	0.691	0.025	7.719

3.4 Risk and Hazard Characterization

3.4.1 Diesel PM Risk and Hazard Characterization

Black carbon can be used as a proxy for DPM concentrations. In the MATES III exposure study, elemental carbon (EC) concentrations (µg/m^3) were used as a proxy for DPM concentrations. EC concentrations were multiplied by a factor ranging from 1.04 to 1.95 to estimate DPM concentrations (South Coast Air Quality Management District, 2008).

Dozens of studies have compared elemental carbon and black carbon measurement methods and have attempted to compare instrument response. An excellent summary of those studies is available in Appendix 1 of the U.S. Environmental Protection Agency's *Black Carbon Report to Congress* (U.S. Environmental Protection Agency, 2012). Table A1-3 and Figure A1-2 of the EPA report show that more than 65% of intercomparison studies showed BC/EC ratios of between 0.7 and 1.3.

We note that draft MATES IV measurements indicate that BC concentrations in the Los Angeles Basin averaged between ~0.95 to ~1.7 µg/m^3 during 2012-2013, with a basin average of about 1.3 µg/m^3. Our average measurements from November 2011 through November 2012 indicated average BC concentrations of approximately 0.67 µg/m^3 for the four monitoring sites, which is significantly lower than any BC site in MATES IV. Some of this discrepancy may be due to the offset in sampling periods, or due to cleaner coastal air being more influential at the Baldwin Hills sites.

For the purposes of this comparison, we used a BC:EC ratio of 1.5 based on the SCAQMD BC results to bound our estimates of DPM. For the conversion from EC to DPM, we will use the MATES IV draft report ratio of 0.82 to calculate our DPM:EC ratio.

Average DPM concentration estimates are shown in **Table 3-8** for each of the four Baldwin sites. The annual mean BC concentrations at each site is known very well, but the conversion to DPM requires assumptions that reduce our certainty in the estimates of those concentrations. Note that these are total cancer and noncancer estimates that do not identify the fraction of risk attributable to any particular emissions source.

Table 3-8. Summary of the average BC, EC, and DPM concentrations, and the corresponding risk and hazard characterization, at each Baldwin monitoring location for the November 2011 through November 2012 monitoring period.

Site	Average BC (µg/m^3)	BC:EC ratio of 1.5 (µg/m^3)	EC:DPM ratio of 0.82 (µg/m^3)	Cancer Risk (per million)	Noncancer Hazard Quotient
East	0.676	1.014	0.83	249	0.17
South	0.641	0.9615	0.79	237	0.16
West	0.724	1.086	0.89	267	0.18
North	0.672	1.008	0.83	248	0.17

Total cancer risks from DPM do not point to the total Oil Field contribution to cancer risks. As shown in Section 3.1.3, under west-southwest winds, daytime concentrations often showed an increment in concentrations. Under east-northeast winds, concentration gradients across the Oil Field were negative or zero, indicating no significant contribution of the Oil Field.

Table 3-9 summarizes the potential increment of BC concentrations across the Oil Field under west-southwest winds, which account for approximately half of all hourly measurements taken during the year-long study. Average contributions at the East minus South pair are higher than at the North minus West pair in most seasons. Total contributions for the year were estimated by dividing the BC difference for the pair by the BC concentration at the downwind site. Relative Oil Field contributions were estimated to be 5.2% at the North minus West pair and 8.6% at the East minus South pair. It is likely that emissions from traffic on La Cienega Blvd. are contributing to the East minus South pair, which is consistent with the higher contributions from that site pair overall, during most seasons, weekdays, and during average and maximum daytime increments. Finally, we note that the actual exposures to the Oil Field contributions across an annual mean are a little more than half of the values listed because the winds are from directions other than the Oil Field almost half of the time.

Table 3-9. Comparison of absolute and percentage contributions of the Oil Field operations to BC concentrations on the east side of the Oil Field when winds are from the west-southwest under a variety of conditions.

Increment Metric	North – West (μg/m^3)	East – South (μg/m^3)	% Contribution (North – West)	% Contribution (East – South)
WSW annual increment	0.036	0.056	5.2%	8.6%
WSW winter increment	0.023	0.067	3.3%	10.3%
WSW spring increment	0.057	0.037	8.2%	5.7%
WSW summer increment	0.021	0.07	3.0%	10.7%
WSW Fall increment	0.048	0.052	6.9%	8.0%
WSW average daytime positive increment	0.072	0.154	10.3%	23.6%
WSW maximum average hourly increment	0.146	0.242	20.9%	37.0%

We do not display results for when winds are from the east-northeast. Concentration differentials are routinely negative, indicating lower concentrations across the Oil Field. Winds from the east-northeast happened for about 25% of the overall study. Under east-northeasterly winds, residents on the western edge of the Oil Field are typically exposed to BC concentrations that are 0.065 to 0.096 μg/m^3 lower on average than those affecting residents on the eastern side of the Oil Field.

3.4.2 Metals Risk Characterization

Table 3-10 includes a comparison between the mean and maximum 1-hr concentrations of toxic metals and the dose-response factors for this study. The dose-response factors are the non-cancer reference exposure levels (REL) for both chronic (annual) and acute (less than a day) and 1-in-a-million cancer risk benchmark level.

Table 3-10. Comparison between dose-response factors and metal concentrations.

Metal Element	Chronic REL[a] (ng/m^3)	Acute REL[a] (ng/m^3)	Cancer 1-in-a-Million Level (ng/m^3)	Mean (Hourly Average in 2.5-Month) (ng/m^3)	Maximum 1-Hr (ng/m^3)
Arsenic	15	200 (8-hr)	0.300	0.013	2.112
Cadmium	20		0.238	5.35[b]	21.4
Chromium	200			0.195	25.4
Copper		100,000 (1-hr)		6.847	323.8
Lead	150		83.0	3.173	27.9
Manganese	90	170 (8-hr)		1.424	30.2
Mercury	30	600 (1-hr)		0.004	0.303
Nickel	14	200 (1-hr)	3.8	0.694	248.4
Selenium	20,000			0.474	29.3

[a] Chronic and acute RELs were obtained from the Office of Environmental Health Hazard Assessment (OEHHA); see http://oehha.ca.gov/air/allrels.html.
[b] Average concentrations for cadmium are below the reported method detection limit for the XACT instrument (5.78 ng/m^3).

Among the metals measured, there was one reported hourly value for any metal that exceeded the acute REL standard; this was for the nickel REL of 200 ng/m^3. This hourly value occurred on November 17, 2012, at 10:00 PM LST. Multiple other metals had high concentrations on that hour, including manganese, iron, zinc, and potassium. Winds for that hour were from the northeast, which is in the direction of Kenneth Hahn State Park, the opposite direction from the Oil Field. BC concentrations for that same hour were below 1 µg/m^3. It is unclear what caused the high nickel concentration, but it did not appear to be associated with onsite operations at the Oil Field.

Comparing the mean concentrations for the 2.5-month monitoring period to chronic RELs indicates that no metals were above their dose-response level. The metal with the closest concentration to an REL was cadmium, which was almost a factor of four below the chronic REL value. Moreover, for most of the metals, the maximum 1-hr concentration observed was below the chronic REL value (again, except for nickel).

Finally, comparing the mean 2.5-month concentration to the 1-in-a-million level cancer risk for each of the metals indicates that arsenic, lead, and nickel are all below the level of concern. In contrast, the mean cadmium concentration measured by the XRF instrument was above the 1-in-a-million level of concern, leading to an excess cancer risk for cadmium of 22.5-in-a-million. STI scientists consider this result uncertain for a number of reasons. First, we note that MDLs for cadmium measurements are at 5.75 ng/m^3, and the mean measured concentration was below the MDL. Second, 64% of individual hourly measurements were below the MDL. Third, the lowest 1-hr concentration reported by the XRF instrument was 1.1 ng/m^3, which is above the 1-in-a-million benchmark of 0.238 ng/m^3. This is almost as high as annual mean measurements of cadmium in the MATES III study, which reported average concentrations of 1.5 to 1.6 ng/m^3, based on a 2.0 ng/m^3 MDL, and it is a factor of 10 higher than average concentrations of 0.1 ng/m^3 reported in the draft MATES IV study.

Cadmium concentrations showed no wind direction dependence, no distinguishable diurnal pattern, and no weekday-weekend differences. As a result, while cadmium concentrations were higher than the 1-in-a-million risk level value, we cannot attribute what fraction, if any, of the local concentrations may be attributable to the Oil Field. We note that the discrepancy in concentrations between our measurements and the SCAQMD MATES III and MATES IV measurements may be partly a result of our 2.5-month sampling period relative to the annual means calculated in MATES; it is plausible that winter concentrations could be higher than summer concentrations as a result of lower wintertime mixing heights and winds.

3.4.3 VOC Risk Characterization

Concentrations of the VOC species were compared to non-cancer and cancer benchmarks, shown in **Table 3-11**. The product of the mean concentration and the 1-in-a-million cancer risk benchmark for a given species was used to assess the cancer risk. No VOC species average was above the chronic REL, although acrolein was very close. Each of the pollutants with cancer risk levels was above the 1-in-a-million level, with 1,3-butadiene having the highest cancer risk for this two-week period, followed by benzene, acetaldehyde, and naphthalene. Note that the two-week average concentration is unlikely to be representative of the annual mean exposure for any of these pollutants, as the seasonal patterns in these pollutants may vary by a factor of three or more (McCarthy et al., 2007). However, these concentrations are similar to those observed in MATES III and are useful as benchmarks for assessing potential risks from the Oil Field operations.

Table 3-11. Comparison of VOC concentrations to OEHHA dose-response factors.

Pollutant	Chronic REL (µg/m^3)	Acute REL (µg/m^3)	Cancer 1-in-a-Million Level	2-Week Average (µg/m^3)	1-hr Maximum (µg/m^3)	Excess Cancer Risk (per Million)
1,3-Butadiene	2	9	0.00588	0.22	2.31	37
Acrolein	0.35	2.5		0.33	1.77	
Benzene	60	1300	0.0345	0.55	1.70	16
Toluene	5000	37000		1.08	3.58	
Xylenes	300			1.31	4.74	
Naphthalene	9		0.0294	0.05	0.53	1.7
Acetaldehyde	140	470	0.37	4.72	17.5	13

As noted in Section 3.3, the two weeks of five-minute average measurements did not show any statistically significant contributions of Oil Field operations to the identified source factors contributing to concentrations of these toxic air pollutants. Due to the short deployment, it is not possible to rule out Oil Field contributions to ambient VOC concentrations; however, diurnal time series and case studies were not consistent with the hypothesis that the Oil Field was a major contributor to any of the VOCs we examined.

3.5 Supplementary Emissions Activity Analysis

Emissions activity data from on-field and roadway activities were used to attempt to distinguish among the different possible sources of higher black carbon concentrations across the Oil Field that occurred when winds were from the west-southwest. The key distinguishing information we had to work with from the BC differential analyses included

- Differentials were greater at the East minus South pair of monitors than at the North minus West pair. It was hypothesized that onroad emissions from motor vehicles were responsible for some of the higher concentrations for the East minus South pair.
- Concentration differentials were highest during daytime business hours, particularly from 8:00 a.m. LST to about 3:00 p.m.
- Concentration differentials were higher on weekdays than weekends.

Emissions activity data were examined to see what Oil Field and traffic activity were consistent with the activity patterns seen in the BC differential analysis. Of the emissions sources with available activity data, we see that the timing of heavy-duty truck traffic, medium-duty vehicle traffic, light-duty vehicle traffic, and maintenance and workover rig operation is consistent with the observed temporal profile of increased BC concentrations across the Oil Field. Each of these sources has higher daytime and weekday emissions activity.

The East minus South pair has a higher BC differential than the North minus West site pairing; this is consistent with both roadway and Oil Field maintenance and workover rig emissions. La Cienega Blvd. north of Stocker is between the East minus South pair; thus we expect some influence from the roadway emissions to the observed differential. Given the available activity data, it is not possible to separate the Oil Field and traffic contributions at this site pairing since the observed patterns are consistent with both traffic and maintenance and workover rig operations.

In contrast, the North minus West pair has no intervening roadway; both sites are west of La Cienega Blvd. Therefore, the BC differential under west-southwesterly winds should not have any roadway influence at the North minus West pair. This site pair still has higher weekday and daytime BC differential concentrations (under WSW winds) than weekend and nighttime conditions. The North minus West pair also has a lower BC concentration differential than the East minus South pair on average during each season. This observational evidence is consistent with the temporal activity patterns of Oil Field maintenance and workover rigs without the confounding traffic influence. Thus, we conclude that this site pair is capturing a small but real source of Oil Field emissions of diesel PM.

Table 3-12 shows a summary of some characteristics of the supplemental emission sources and a statement of whether or not those characteristics are consistent with the characteristics of the BC differentials. Source characteristics include a qualitative magnitude of the activity and a classification of the diurnal emissions pattern. The BC differential diurnal pattern is consistent with the diurnal pattern of workover and maintenance rigs and with some, but not all, of the on-road diesel activity diurnal patterns on La Cienega Boulevard.

Table 3-12. Emission sources temporal activity patterns and consistency with observed BC differential temporal patterns

Emissions Source	Approximate Magnitude	Higher on Weekdays than Weekends?	Higher During Daytime Business Hours?	Peak Hour	Consistent with BC Differential?
La Cienega north of Stocker - Heavy-duty diesel	30 vehicles	Yes	Yes	8:00 AM	Yes
La Cienega south of Stocker - Heavy-duty diesel	100 vehicles	Yes	Yes	6:00 PM	No
La Cienega north of Stocker - Medium-duty vehicles	1,000 vehicles	Yes, but only during AM	Yes	4:00 PM	No
La Cienega south of Stocker - Medium-duty vehicles	1,100 vehicles	Yes, but only during AM	Yes	8:00 AM	Yes
La Cienega north of Stocker - Light-duty vehicles	3,500 vehicles	Yes, but only during AM	Yes	6:00 PM	No
La Cienega south of Stocker - Light-duty vehicles	4,300 vehicles	Yes, but only during AM	Yes	7:00 AM	Yes
Stocker and Fairfax Gate- Car and truck entries	40 vehicles	No	Yes	6:00 AM	No
Stocker and Fairfax Gate- Heavy-duty diesel entries	3 vehicles	No	Yes	10:00 AM	No
Drill rig	1 rig - 3 parts	No	No	Not available	No
Workover and maintenance rigs	6 rigs	Yes	Yes	Not available	Yes

4. Discussion

4.1 Comparison of Risk and Hazard Across Target Air Toxics

Section 3.4 discusses the individual risk and hazard associated with each pollutant in the Oil Field. **Figures 4-1 and 4-2** compare the total excess cancer risk and noncancer hazard index measured by pollutant in the Baldwin Hills Air Quality Study. Note that all DPM risk and hazard values in this section of the report use the more conservative estimates (BC*1.5 = EC) that lead to higher cancer risk and noncancer hazard estimates. As expected, Diesel PM had the highest individual contribution to total cancer risk, with values more than ten times higher than the sum of the risk of all other pollutants measured in the study. This cancer risk estimate for DPM is quantitatively comparable to the estimates of total cancer risk in the MATES IV study, which found total risk from Diesel PM to be approximately 285-in-a-million.

Regarding excess cancer risk, the OEHHA states, “For chemicals that are listed as causing cancer, the "no significant risk level” is defined as the level of exposure that would result in not more than one excess case of cancer in 100,000 individuals exposed to the chemical over a 70-year lifetime. In other words, a person exposed to the chemical at the “no significant risk level” for 70 years would not have more than a “one in 100,000” chance of developing cancer as a result of that exposure.”[3] Benzene, 1,3-butadiene, and the combination of formaldehyde and acetaldehyde were found to make up the largest individual components of risk after Diesel PM. Cadmium was found to contribute slightly to risk, but our estimate is about 50 times higher than the MATES IV estimate, which may be due to instrument measurement differences. We recommend a comparison of ICP-MS and XRF cadmium measurements using filters collected in the western Los Angeles Basin to resolve the potential cadmium discrepancy.

Figure 4-1 shows that estimated diesel particulate matter concentrations in the area constitute the dominant contribution to excess cancer risk from ambient air. The relative contributions from the Oil Field are shown as the smaller bar within the total local risk. Total risk estimates for each of the air toxics are in reasonable agreement with SCAQMD MATES IV estimates of excess cancer risk across the Los Angeles Basin, with the exception of cadmium.

In comparison to the cancer risks, which are well above a screening value of 1-in-a-million excess cancer cases, all noncancer hazard index values shown in Figure 4-2 are below a value of 1.0. A noncancer risk of 1.0 is considered the “health reference level” and is expected to be below the level at which adverse human health effects would occur. Thus, acrolein, which has the highest noncancer hazard index at 0.94, is expected to have no adverse health impacts. However, we note that for most of the toxics shown in Figure 4-2, there is some additional uncertainty associated with the shorter sampling periods (2.5 months for metals, 2 weeks for VOCs); these values do not necessarily represent true annual mean concentrations. Additionally, we are considering each pollutant’s effect individually; these pollutants may have additive or synergistic effects that would lead to higher estimated cumulative risks than the estimates shown below.

[3] See “Proposition 65 in Plain Language” at http://www.oehha.ca.gov/prop65/background/p65plain.html.

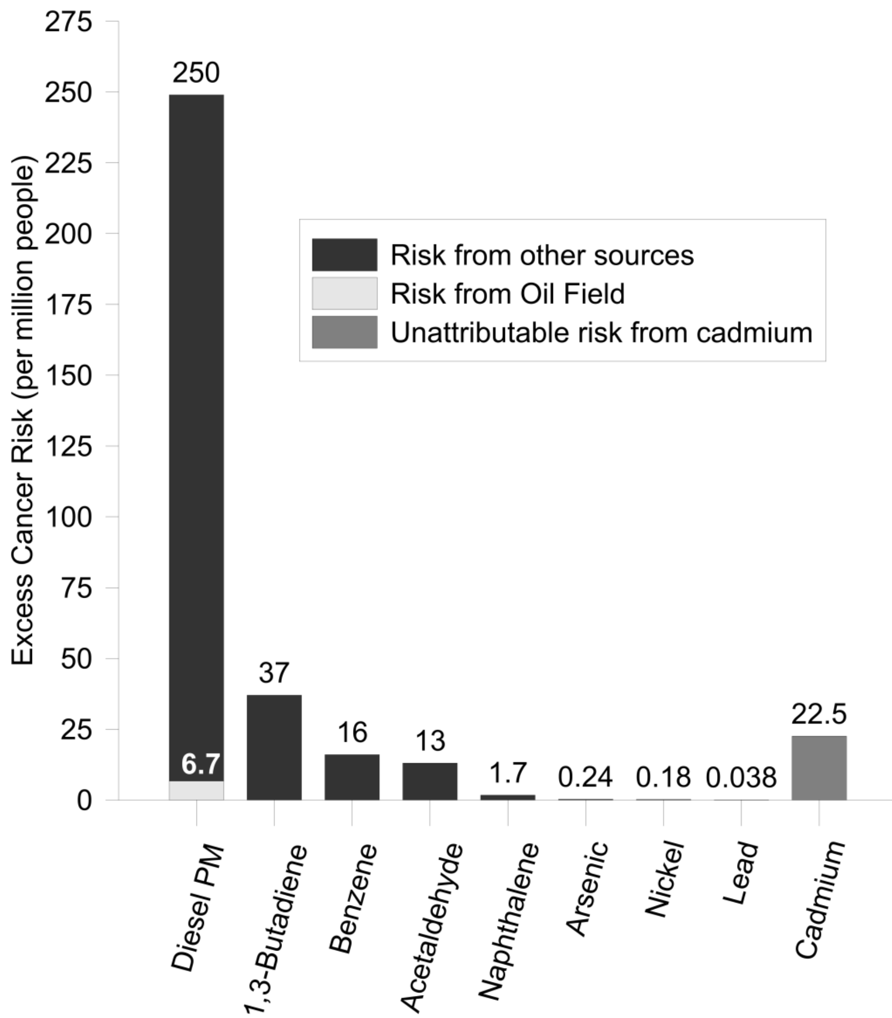


Figure 4-1. Individual pollutant contributions to total excess cancer risk (per million people) at the Baldwin Hills Air Quality Study. The graph shows total risk from ambient air and the incremental contribution of the Oil Field. Cadmium risk could not be attributed and should be validated through measurement intercomparison studies.

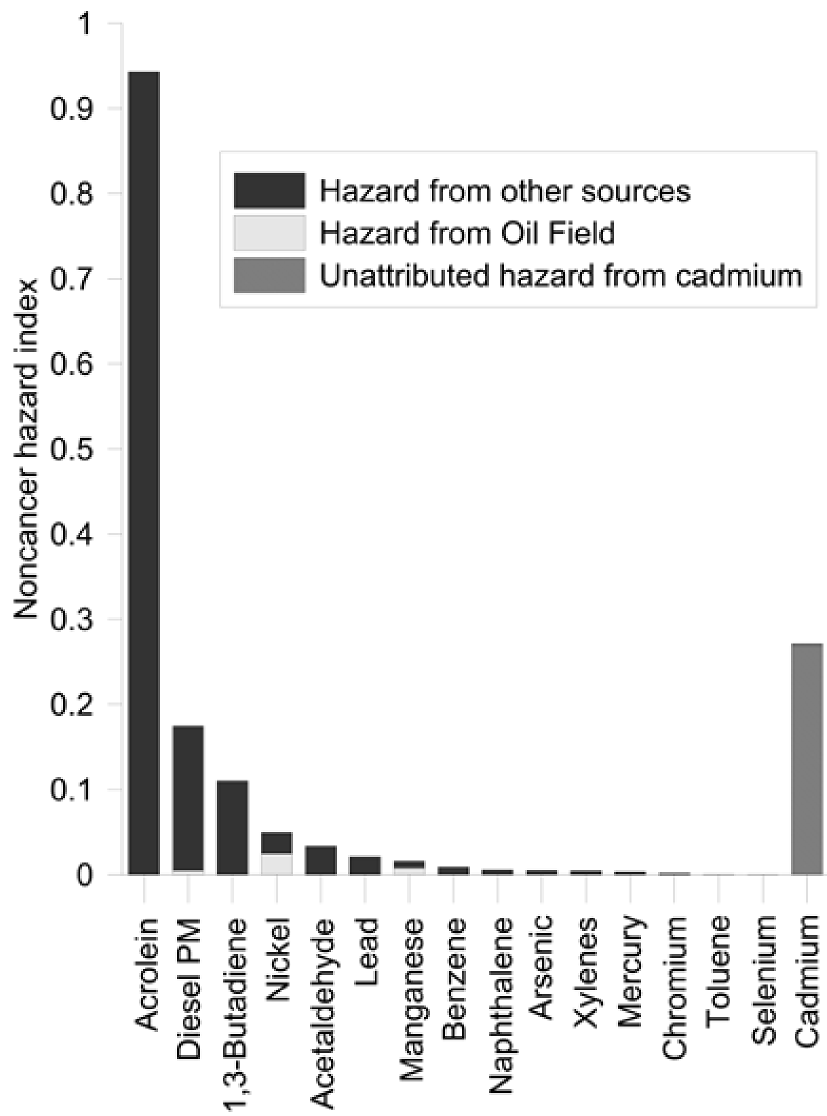


Figure 4-2. Relative contributions to the chronic noncancer hazard index for the Baldwin Hills Air Quality Study. This graph shows total chronic noncancer hazard from ambient air and the incremental contribution of the Oil Field. If the noncancer hazard index is below a value of one, then no adverse effects are expected.

In summary, Diesel PM is the pollutant of most concern identified by this monitoring study based on total ambient concentrations. This finding is consistent with previous risk assessments performed in the SCAQMD and the quantitative results from those larger studies of air quality in the Los Angeles Basin.

4.2 Assessment of the Oil Field Contributions to Risk and Hazard

Of the pollutants examined, only Diesel PM showed solid evidence of significant contributions from the Oil Field to chronic cancer risk or noncancer hazard. Under west-southwest conditions, concentrations of DPM across the Oil Field increased by 5.2 to 8.6%

on average. The wind direction frequency bins are shown in **Table 4-1**. West-southwesterly (onshore flow) winds were dominant, occurring 53% of the time. East-northeast winds, or offshore flow, were the second most common, occurring 25% of the time. Winds from the south or north were much less frequent, at 13.1 and 7.8% of the time, respectively.

Table 4-1. The percentage of hours during which wind originated from four major directions.

Direction	Wind Direction Angles	Percent of Total Winds
East-northeast	30°–120°	25.0
North-northwest	300°–30°	7.8
South-southeast	120°–210°	13.1
West-southwest	210°–300°	53.0

Under west-southwesterly conditions, residents to the east of the Oil Field were exposed to higher DPM concentrations than those on the west of the Oil Field. However, under other wind regimes, these residents were not exposed to Oil Field contributions. For example, under east-northeast winds, concentrations of DPM on the eastern side of the Oil Field would not be influenced by the Oil Field operations. Similarly, south-southeasterly flow and north-northwesterly flow would not expose residents on the eastern side of the Oil Field to Oil Field contributions. Therefore, the total contribution of pollutants from the Oil Field to residents on the eastern side of the Oil Field comes during the 53% of the time when winds are west-southwesterly. This reduces the estimated contribution to 2.6 to 4.6% of the total DPM exposure. Taking the most conservative estimate of DPM cancer risk of 250 per million, we estimate that the Oil Field may be directly responsible for approximately 6.7 to 11.3 per million of the total DPM risk. Given that the higher estimate of 11.3 per million is likely influenced by traffic on La Cienega Boulevard emissions of DPM, we consider this a conservative upper estimate of total risk to residents on the eastern side of the Oil Field. The contributions to excess cancer risk and to noncancer hazard index are shown in Figures 4-1 and 4-2.

The differential analysis showed a decrease in BC concentrations when winds were from the east-northeast. Therefore, there is no evidence of Oil Field operations contributing to enhanced DPM exposure under those wind conditions.

Winds from the south-southeast and north-northwest were much less frequent than the primary onshore-offshore flow. As a result, Oil Field operations have proportionately less potential impact because residents downwind of the Oil Field in these directions will be exposed much less of the time.

We found no evidence of contributions to other key species such as benzene, acetaldehyde, acrolein, or 1,3-butadiene. It is possible that the Oil Field operations could contribute significantly to some of these species, but we have no compelling evidence to suggest it does, based on the two weeks of VOC monitoring. Additionally, the concentrations observed at the Oil Field are generally consistent with concentrations observed in other parts of the Los Angeles Basin, suggesting that any possible contributions of the Oil Field are incremental or marginal, rather than a dominant local source.

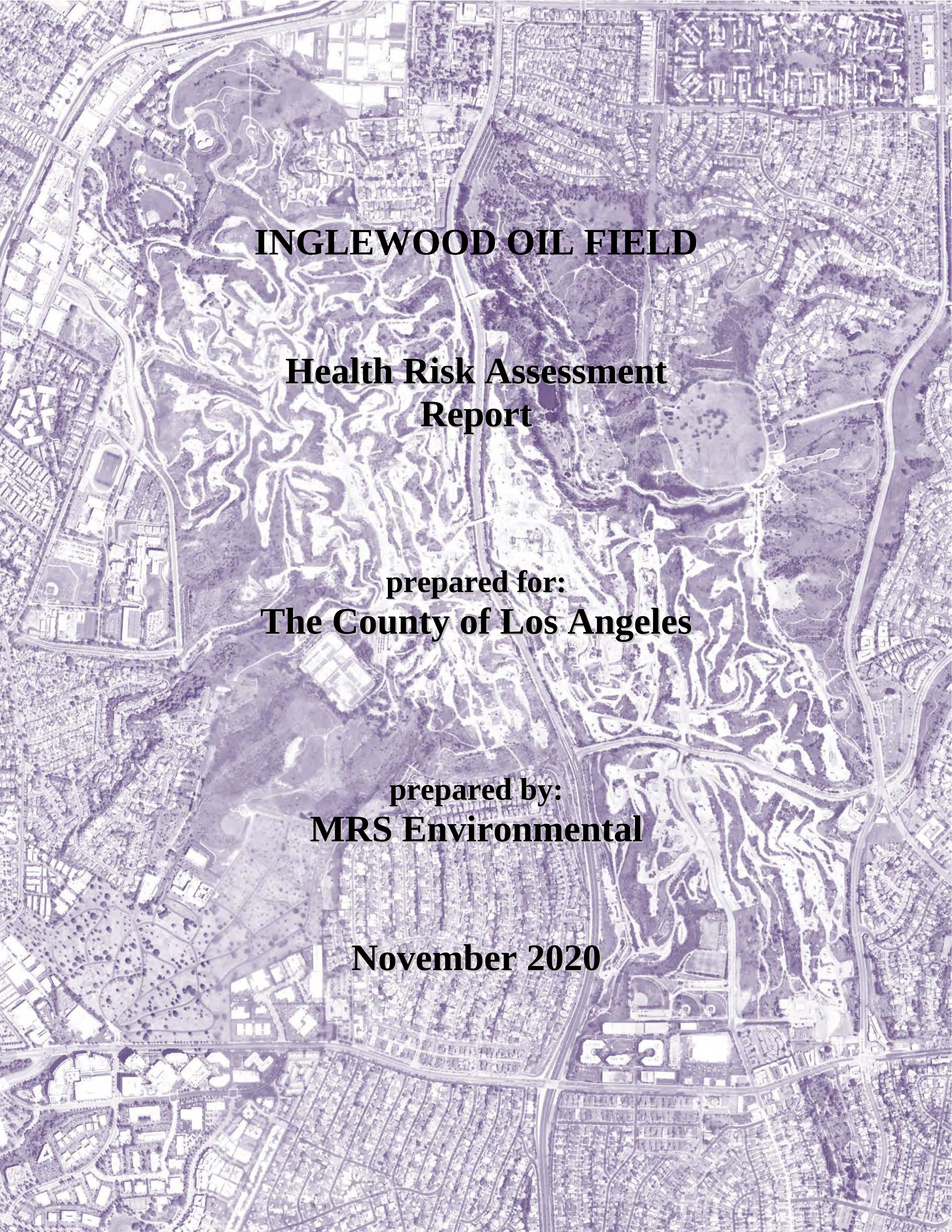
The contribution of the Oil Field to cadmium concentrations is more complicated because of the detection limit issues with the analytical method. The average cadmium concentration was below the MDL. Wind direction, day-of-week, and time-of-day analyses showed no patterns in concentrations that would suggest Oil Field contributions. However, the average concentration of cadmium was a little more than three times higher than concentrations reported in MATES III and more than 50 times higher than concentrations in the draft MATES IV report. This could be evidence of a local contribution from the Oil Field. It may also indicate higher wintertime concentrations or issues with the analytical method. While cadmium cancer risk in this study is 22.5-in-a-million, attribution of the source of the cadmium is not possible with the available data.

Nickel and manganese concentrations may be influenced by Oil Field operations, but their total cancer risk and noncancer hazard are negligible.

Therefore, we find the total maximum cancer risk that can be plausibly attributed to the Oil Field operations is in excess of 11.3 per million cancer risk. This number is a conservative estimate, and may include contributions from La Cienega Blvd. emissions and does not include any contribution from cadmium.

Excerpt of reference cited at point d. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_health-risk-assessment-report.pdf



INGLEWOOD OIL FIELD

Health Risk Assessment Report

prepared for:
The County of Los Angeles

prepared by:
MRS Environmental

November 2020

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DEFINITIONS, ACRONYMS AND ABBREVIATIONS

Acute Health Impacts	Non-cancer health impacts for short-term, one-hour peak exposures to potential facility emissions. The total sum of the ratio of concentrations of each toxic air contaminant to its acute reference exposure level (REL).
Chronic Health Impacts	Non-cancer health impacts for long-term exposure to potential facility emissions. The total sum of the ratio of concentrations of each toxic air contaminant to its chronic reference exposure level (REL).
8-Hour Chronic Health Impacts	The ratio of the predicted air toxic exposure to the air concentrations at or below which health impacts would not be expected with repeated daily 8- hour exposures over a significant fraction of a lifetime. The 8-hour noncancer hazard index is considered a chronic risk as it uses an 8-hour concentration that represents the long-term average of repeated 8-hour daily averages that occur.
Cancer Risk	The health risk associated with long-term exposures resulting from emissions of carcinogenic agents.
AB 2588	Assembly Bill 2588
AE	Annual Emissions
AER	Annual Emissions Report
AERMOD	American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
ARB	California Air Resources Board
BL	Breathing Loss
BPIP	Building Profile Input Program
CE	Control Efficiency
CSF	Cancer Slope Factor
DICE	Diesel Internal Combustion Engines
DPM	Diesel Particulate Matter
EF	Emission Factor
EPA	U.S. Environmental Protection Agency
HARP2	Hot Spots Analysis and Reporting Program 2
HI	Hazard Index
HRA	Health Risk Assessment
ICE	Internal Combustion Engine
lb	Pound
lb/lb-mol	Pound per Pound Mole
lb/MMscf	Pounds per Million Standard Cubic Feet
m	Meter
MEIR	Maximally Exposed Individual Resident
MEIW	Maximally Exposed Individual Worker
MHE	Maximum Hourly Emissions
MSDS	Material Safety Data Sheet
µg/m3	Micrograms per Cubic Meter

NOx	Oxides of Nitrogen
OEHHA	Office of Environmental Health Hazard Assessment
PF	Potency Factor
PM	Particulate Matter
PM10	Particulate Matter less than 10 Microns in Diameter
PMI	Point of Maximum Impact
Ppmv	Parts per Million by Volume
REL	Reference Exposure Level
RY	Reporting Year
SCAQMD	South Coast Air Quality Management District
scf/lb-mol	Standard Cubic Feet per Pound Mole
scfm	Standard Cubic Feet per Minute
SOx	Oxides of Sulfur
TAC	Toxic Air Contaminant
URF	Unit Risk Factor
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound
WL	Working Loss

Summary

The Inglewood Oil Field (IOF) has operated since the discovery of oil and natural gas resources in the area in 1924. Over the field's history 1,600 wells have been drilled within the historical boundaries of the field. Today, the oil field's boundary covers approximately 1,000 acres making it one of the largest contiguous urban oil fields in the United States.

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and potentially expose the general public and workers to these airborne pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this analysis is to determine whether a significant health risk would result from the publics continued exposure to these emissions as routinely emitted during project operations.

A health risk assessment (HRA) utilizes emissions levels from the oil field equipment, as reported to the SCAQMD, and operations along with historical site-specific meteorological data and computerized dispersion models to estimate the pollutant concentrations at receptors and the resulting short (acute) or longer term (chronic and cancer) health impacts. There are stringent guidance documents promulgated by the California Office of Health Hazard Assessment (OEHHA) and the South Coast Air Quality Management District (SCAQMD) which were followed in the development of this analysis. The modeling inputs and methodology were reviewed by the SCAQMD (see Section 5.1).

An HRA was prepared in 2008 as part of the oil field Community Standards District (CSD) EIR. This HRA is being prepared to address the changes to the OEHHA HRA guidelines as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations. The HRA is a CEQA HRA, as per CAPCOA Land Use guidelines (CAPCOA 2009), which means that, as opposed to an AB2588 HRA, this analysis is more conservative and includes mobile sources that are present at the field. Therefore, this HRA includes all potential sources of Toxic Air Contaminants (TACs) and is the same approach that was utilized in preparing the previous 2008 EIR HRA during the development of the CSD.

This HRA was prepared to address the changes to the OEHHA HRA guidelines (related to childhood exposure calculations and exposure durations, amongst others) as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations.

Analysis Scenarios

The analysis examined two operating scenarios: the year 2019 operations and a worst-case future operating scenario. During the year 2019, there was no drilling occurring at the oil field and operations were limited to normal production and maintenance operations. The 2019 operating year with no drilling is typical of recent operating years as the last new well drilled at the oil field was in 2014.

The future worst-case operation scenario assumed the average level of drilling that could occur under the limits of the CSD between 2021 and the end of the CSD in 2028 (46 wells drilled per year), with extensive drilling occurring at the limits allowed by the CSD. The worst-case future scenario assumed that this level of operations would continue into the future, even though potential drilling at the oil field during the post-2028 period are uncertain.

Analysis Results

For both scenarios, the results of the HRA are shown in Table ES.1 below.

For the 2019 operations scenario, the estimated peak risks at the facility boundary would be a peak cancer risk of 5.2 cases per million, and an acute and chronic risk of 0.48 and 0.06 HI, which are below the SCAQMD thresholds for AB2588 facilities, defined as below 10 cancer cases per million and below a Hazard Index (HI) of 1.0. The peak cancer risk at the nearest residence would be 1.0 cancer cases per million, which would be below the SCAQMD AB2588 thresholds.

For the worst-case future operations scenario including drilling of 46 wells per year, the estimated peak cancer risks at the facility boundary (PMI at the fence line) would be 13.8 cancer cases per million, and an acute and chronic HI of 0.55 and 0.18. The cancer risk would be above the SCAQMD thresholds for AB2588 facilities; however, the peak acute and chronic risks would be below the thresholds. The peak cancer risk would occur near Kenneth Hahn Park along the fence line. The peak cancer risk at the nearest residence would be 5.6 cancer cases per million, which would be below the SCAQMD AB2588 thresholds.

Based on the worst-case scenario and the 2019 operational scenario, the level of drilling that would result in peak cancer risk levels below the SCAQMD threshold level would correspond to about 25 wells drilled per year average.

Table ES.1 Risks Results

Location	Location Description	Cancer Risk, per million	Acute Risk, HI	Chronic Risk, HI
2019 Year Operating Scenario				
PMI	Highest value along the oil field fence line	5.2	0.48	0.06
MEIR	Highest value at any residence	1.0	0.09	0.01
MEIW	Peak value at any work location	0.07	0.05	0.003
School	Highest value at any school	0.63	0.04	0.004
Worst-case Future Year Operating Scenario				
PMI	Highest value along the oil field fence line	13.8	0.55	0.18
MEIR	Highest value at any residence	5.6	0.11	0.03
MEIW	Peak value at any work location	0.34	0.05	0.005
School	Highest value at any school	5.1	0.05	0.014

Note: health index (HI), point of maximum impact (PMI), the maximally exposed individual resident (MEIR), the maximally exposed individual worker (MEIW).

1.0 Introduction

The Inglewood Oil Field (IOF) has operated since the discovery of oil and natural gas resources in the area in 1924. Over the field's history 1,600 wells have been drilled within the historical boundaries of the field. Today, the oil field's boundary covers approximately 1,000 acres making it one of the largest contiguous urban oil fields in the United States.

A Community Standards District (CSD) was established at the oil field in 2008 and has been overseen by the County of Los Angeles since. As part of the CSD, an EIR was prepared that included a Health Risk Assessment (HRA). The Inglewood Oil Field was purchased by Sentinel Peak Resources in 2016.

This HRA was prepared to address the changes to the OEHHA HRA guidelines (related to childhood exposure calculations and exposure durations, amongst others) as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations. The HRA is a CEQA HRA, as per CAPCOA Land Use guidelines (CAPCOA 2009), which means that, as opposed to an AB2588 HRA, mobile sources that are present at the field are also included. This is the same approach that was utilized in preparing the previous 2008 EIR HRA during the development of the CSD.

This HRA report follows the outline specified in Appendix C of the SCAQMD supplemental risk assessment guidelines for preparing an HRA. The modeling inputs and methodology were reviewed by the SCAQMD (see Section 5.1).

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and potentially expose the general public and workers to these airborne pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this analysis is to determine whether a significant health risk would result from the publics continued exposure to these emissions as routinely emitted during project operations.

The following sections provide a description of facility operations, modeling parameters, area and populations, hazard identification, exposure assessment, risk characterization, and appendices and computer files.

Attachment A includes the HRA Review Checklist and the Health Risk Assessment Summary Form. Attachments B and C include detailed equipment and emissions listing for the 2019 operations and the future worst-case operations. Attachment D includes source test files. Attachment E includes detailed HRA results by receptor and maps showing the receptor locations.

2.0 Facility, Emissions and Modeling Setup

Information on the facility operations, TAC emissions, pathways, dispersion modeling, meteorological data, emissions sources, dose-response and receptor grids are discussed below.

2.1 Description of Facility Operations

Facility information is shown in Table 1 below.

Table 1 Facility Information

Item	Value
Name of facility and the address	5640 S Fairfax Ave, Los Angeles, CA 90056
SCAQMD ID	184301
Area of the field	885 acres (in Los Angeles County and Culver City)
Number of Active Wells	675 Active wells (436 producers, 239 injectors)

Current activities at the Inglewood Oil Field involve extracting oil and gas from subsurface reservoirs located between 500 and 10,000 feet deep, processing the crude oil to remove water and processing the gas to remove hydrogen sulfide and gas liquids. Crude oil is then shipped by pipeline to area refineries to be processed into gasoline and other products. The gas is shipped by pipeline to The Gas Company for end use by consumers and industry or is shipped to area refineries for use in the refining processes. Processing activities at the Inglewood Oil Field include the following:

- Gross Fluid Production Gathering and Testing;
- Crude Oil Handling;
- Water Processing;
- Water Injection;
- Gas Gathering/Gas Processing;
- Well Drilling, Maintenance and Workovers; and
- Ancillary Systems.

2.2 TAC Emissions

Toxic Air Contaminants (TAC) emissions occur from a number of processes and equipment at the oilfield, including the following:

- Drilling rig diesel engines;
- Well maintenance rig diesel engines;
- Emergency generator diesel engine;
- Fire water pump diesel engine;
- Heaters;
- Storage tanks;
- Flare;
- Well heads and associated equipment;
- Well cellars;
- Fugitive components;
- Construction equipment (backhoes, loaders, graders, fork lifts, etc);
- Onsite vehicles, both gasoline and diesel; and
- Onsite fugitive dust.

Emitting substances and emissions levels, both peak hour and annual emissions, are listed in Attachments B and C.

Table 2 below is a summary of the emissions levels for each TAC pollutant.

Table 2 TAC Field-Wide Emissions Levels Summary – 2019 Operations

Pollutant	CAS	All Equipment			
		Annual Pounds	Peak Hour pounds	Annual grams/sec	Peak Hr grams/sec
PAHs [PAH, POM] All except napth	1151	8.0E-01	8.4E-04	1.2E-05	1.1E-04
Silica, crystalline	1175	2.1E+03	1.0E+00	3.0E-02	1.3E-01
Diesel exhaust particulates	9901	1.4E+01	3.9E-01	2.0E-04	5.0E-02
Formaldehyde	50000	4.1E+01	5.2E-02	6.0E-04	6.6E-03
Benzoapyrene	50328	1.8E-05	8.5E-09	2.6E-10	1.1E-09
Carbon tetrachloride	56235	1.1E-05	1.1E-05	1.6E-10	1.4E-06
Benzaanthracene	56553	3.3E-04	1.6E-07	4.7E-09	2.0E-08
Methanol	67561	1.9E-02	1.9E-02	2.7E-07	2.4E-03
Chloroform	67663	8.4E-05	8.4E-05	1.2E-09	1.1E-05
Benzene	71432	3.3E+02	4.3E-02	4.7E-03	5.5E-03
Vinyl chloride	75014	4.4E-06	4.4E-06	6.3E-11	5.6E-07
Acetaldehyde	75070	8.4E-01	2.6E-02	1.2E-05	3.3E-03
Methylene chloride {Dichloromethane}	75092	2.5E-03	2.5E-03	3.6E-08	3.2E-04
1,2-Dichloropropane {Propylene dichloride}	78875	8.0E-05	8.0E-05	1.1E-09	1.0E-05
1,1,2-Trichloroethane {Vinyl trichloride}	79005	9.4E-05	9.4E-05	1.4E-09	1.2E-05
1,1,2,2-Tetrachloroethane	79345	1.6E-04	1.6E-04	2.2E-09	2.0E-05
PAH: napthalene	91203	1.4E+00	5.4E-04	2.0E-05	6.7E-05
Ethyl benzene	100414	7.5E+01	1.6E-02	1.1E-03	2.0E-03
Styrene	100425	2.0E-01	1.7E-04	2.9E-06	2.1E-05
Ethylene dibromide {1,2-Dibromoethane}	106934	1.3E-05	1.3E-05	1.9E-10	1.6E-06
Butadiene [1,3]	106990	2.9E+00	4.4E-03	4.2E-05	5.6E-04
Acrolein	107028	3.5E-01	1.7E-02	5.1E-06	2.1E-03
Ethylene dichloride {1,2-Dichloroethane}	107062	6.9E-06	6.9E-06	1.0E-10	8.7E-07
Toluene	108883	2.8E+02	3.9E-02	4.0E-03	4.9E-03
Hexane	110543	1.2E+02	1.5E-02	1.8E-03	1.9E-03
Benzobfluoranthene	205992	2.4E-04	1.2E-07	3.5E-09	1.5E-08
Benzokfluoranthene	207089	2.4E-04	1.2E-07	3.5E-09	1.5E-08
Chrysene	218019	3.7E-04	1.8E-07	5.3E-09	2.2E-08
1,3-Dichloropropene	542756	7.8E-05	7.8E-05	1.1E-09	9.8E-06
Xylenes	1330207	1.6E+02	2.2E-02	2.4E-03	2.8E-03
2378TetrachlorodibenzopDioxinTCDD	1746016	4.5E-11	2.2E-14	6.5E-16	2.7E-15
Octachlorodibenzopdioxin	3268879	2.6E-09	1.2E-12	3.7E-14	1.5E-13

Table 2 TAC Field-Wide Emissions Levels Summary – 2019 Operations

Pollutant	CAS	All Equipment			
		Annual Pounds	Peak Hour pounds	Annual grams/sec	Peak Hr grams/sec
Aluminum	7429905	1.7E+03	8.1E-01	2.4E-02	1.0E-01
Lead compounds (inorganic)	7439921	1.8E+01	8.8E-03	2.6E-04	1.1E-03
Manganese	7439965	2.0E+01	9.6E-03	2.9E-04	1.2E-03
Mercury and mercury compounds	7439976	3.7E-05	2.2E-05	5.3E-10	2.8E-06
Nickel	7440020	1.4E+00	7.1E-04	2.0E-05	9.0E-05
Arsenic and Compounds (inorganic)	7440382	3.1E-01	1.7E-04	4.5E-06	2.1E-05
Barium	7440393	2.0E+01	9.8E-03	2.9E-04	1.2E-03
Beryllium	7440417	2.1E-02	1.0E-05	3.0E-07	1.3E-06
Cadmium	7440439	4.8E-01	2.5E-04	6.9E-06	3.1E-05
Chromium (total)	7440473	5.2E+00	2.5E-03	7.5E-05	3.1E-04
Copper	7440508	1.8E+00	9.3E-04	2.6E-05	1.2E-04
Zinc	7440666	1.3E+01	6.1E-03	1.8E-04	7.6E-04
Hydrochloric acid	7647010	2.1E-03	2.1E-03	3.0E-08	2.6E-04
Ammonia	7664417	4.4E+02	1.9E-01	6.3E-03	2.4E-02
Selenium and compounds	7782492	2.1E-02	3.5E-05	3.0E-07	4.4E-06
Hydrogen sulfide	7783064	9.7E-01	1.1E-04	1.4E-05	1.4E-05
Chromium, hexavalent (and compounds)	18540299	1.3E-03	1.9E-06	1.9E-08	2.3E-07
123789HexachlorodibenzopDioxin	19408743	2.7E-11	1.3E-14	3.9E-16	1.6E-15
1234678HeptachlorodibenzopDioxin	35822469	3.2E-10	1.6E-13	4.7E-15	2.0E-14
Octachlorodibenzofuran	39001020	7.5E-10	3.6E-13	1.1E-14	4.5E-14
123478HexachlorodibenzopDioxin	39227286	2.1E-11	1.0E-14	3.0E-16	1.3E-15
12378PentachlorodibenzopDioxin	40321764	2.0E-11	9.7E-15	2.9E-16	1.2E-15
2378Tetrachlorodibenzofuran	51207319	1.5E-10	7.2E-14	2.2E-15	9.1E-15
1234789Heptachlorodibenzofuran	55673897	2.1E-11	1.0E-14	3.0E-16	1.3E-15
23478Pentachlorodibenzofuran	57117314	5.3E-11	2.5E-14	7.6E-16	3.2E-15
12378Pentachlorodibenzofuranj	57117416	7.2E-11	3.4E-14	1.0E-15	4.3E-15
123678Hexachlorodibenzofuran	57117449	6.3E-11	3.0E-14	9.1E-16	3.8E-15
123678HexachlorodibenzopDioxin	57653857	4.3E-11	2.1E-14	6.2E-16	2.6E-15
234678Hexachlorodibenzofuran	60851345	7.4E-11	3.6E-14	1.1E-15	4.5E-15
1234678Heptachlorodibenzofuran	67562394	6.6E-10	3.2E-13	9.5E-15	4.0E-14
123478Hexachlorodibenzofuran	70648269	5.9E-11	2.8E-14	8.6E-16	3.6E-15
123789Hexachlorodibenzofuran	72918219	1.7E-11	8.3E-15	2.5E-16	1.0E-15

2.3 Multipathway Substances and Their Pathways

Based on SCAQMD guidelines, the inhalation pathway is addressed for all modeled sources and substances. Residential cancer and non-cancer risks for multi-pathway substances evaluated the following non-inhalation exposure pathways: dermal exposure, soil ingestion, plant ingestion, and mother's milk. Worker cancer and non-cancer risks for multi-pathway substances were modeled with the pathways of dermal exposure and soil ingestion. The OEHHA guidelines also lists other pathways, which include water ingestion, dairy and beef, and poultry and eggs. However, these pathways are not applicable exposure routes for the facility due to the surrounding land use. Table 3 lists the pathways evaluated for all emitted substances at the facility.

Table 3 TAC Pollutants and Multipathways

Pollutant	CAS	Multi pathway?	Inhalation	Dermal	Soil Ingestion	Homegrown Produce	Mothers Milk
PAHs [PAH, POM] All except napth	1151	Y	R&W	R&W	R&W	R	R
Silica, crystalline5	1175		R&W				
Diesel exhaust particulates	9901		R&W				
Formaldehyde	50000		R&W				
Benzoapyrene	50328		R&W				
Carbon tetrachloride	56235		R&W				
Benzaanthracene	56553		R&W				
Methanol	67561		R&W				
Chloroform	67663		R&W				
Benzene	71432		R&W				
Vinyl chloride	75014		R&W				
Acetaldehyde	75070		R&W				
Methylene chloride {Dichloromethane}	75092		R&W				
1,2-Dichloropropane {Propylene dichloride}	78875		R&W				
1,1,2-Trichloroethane {Vinyl trichloride}	79005		R&W				
1,1,2,2-Tetrachloroethane	79345		R&W				
PAH: napthalene	91203	Y	R&W	R&W	R&W	R	R
Ethyl benzene	100414		R&W				
Styrene	100425		R&W				
Ethylene dibromide {1,2-Dibromoethane}	106934		R&W				
Butadiene [1,3]	106990		R&W				
Acrolein	107028		R&W				
Ethylene dichloride {1,2-Dichloroethane}	107062		R&W				
Toluene	108883		R&W				
Hexane	110543		R&W				
Benzobfluoranthene	205992		R&W				
Benzokfluoranthene	207089		R&W				
Chrysene	218019		R&W				
1,3-Dichloropropene	542756		R&W				
Xylenes	1330207		R&W				
2378TetrachlorodibenzopDioxinTCDD	1746016		R&W				
Octachlorodibenzopdioxin	3268879		R&W				
Aluminum	7429905		R&W				

Table 3 TAC Pollutants and Multipathways

Pollutant	CAS	Multi pathway?	Inhalation	Dermal	Soil Ingestion	Homegrown Produce	Mothers Milk
Lead compounds (inorganic)	7439921	Y	R&W	R&W	R&W	R	R
Manganese	7439965		R&W				
Mercury and mercury compounds	7439976	Y	R&W	R&W	R&W	R	R
Nickel	7440020	Y	R&W	R&W	R&W	R	R
Arsenic and Compounds (inorganic)	7440382	Y	R&W	R&W	R&W	R	R
Barium	7440393		R&W				
Beryllium	7440417		R&W				
Cadmium	7440439	Y	R&W	R&W	R&W	R	R
Chromium (total)	7440473	Y	R&W	R&W	R&W	R	R
Copper	7440508		R&W				
Zinc	7440666		R&W				
Hydrochloric acid	7647010		R&W				
Ammonia	7664417		R&W				
Selenium and compounds	7782492	Y	R&W	R&W	R&W	R	R
Hydrogen sulfide	7783064		R&W				
Chromium, hexavalent (and compounds)	18540299	Y	R&W	R&W	R&W	R	R
123789HexachlorodibenzopDioxin	19408743		R&W				
1234678HeptachlorodibenzopDioxin	35822469		R&W				
Octachlorodibenzofuran	39001020		R&W				
123478HexachlorodibenzopDioxin	39227286		R&W				
12378PentachlorodibenzopDioxin	40321764		R&W				
2378Tetrachlorodibenzofuran	51207319		R&W				
1234789Heptachlorodibenzofuran	55673897		R&W				
23478Pentachlorodibenzofuran	57117314		R&W				
12378Pentachlorodibenzofuranj	57117416		R&W				
123678Hexachlorodibenzofuran	57117449		R&W				
123678HexachlorodibenzopDioxin	57653857		R&W				
234678Hexachlorodibenzofuran	60851345		R&W				
1234678Heptachlorodibenzofuran	67562394		R&W				
123478Hexachlorodibenzofuran	70648269		R&W				
123789Hexachlorodibenzofuran	72918219		R&W				

Based on OEHHA 2015 Table 5.1
R= Residential, W= Worker

2.4 Dispersion Modeling and Exposure Assessment

Air dispersion modeling is performed for the exposure assessment of the health risk assessment. This HRA utilizes the most recent version of AERMOD (version 18081) to estimate ambient concentrations of pollutants offsite. Modeled results were then integrated into the latest version of HARP2 (version 19121). The air dispersion analysis was performed in accordance with OEHHA

Guidance, the SCAQMD Supplemental Guidelines, and SCAQMD Modeling Guidance for AERMOD. Elevations were determined using AERMAP version 18081.

Dispersion modeling assumptions are listed in Table 4 below.

Table 4 Dispersion Modeling Assumptions

Parameter	Value
Use regulatory default	Yes
Urban or rural	Urban County: Los Angeles Population: 9,818,605
Include Building Downwash	Yes
Meteorological Data	IOF met station, 2015-2019, processed by Breeze Software using AERMET 19121. Upper air data station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) Base elevation: Met station site at IOF = 124 meters
Fence line spacing	25 meters
Grid spacing	100 meters
Coordinate System and Datum	UTM And NAD 83 zone 11 (as per HARP2, NAD83 and WGS84 are very similar and can be treated the same without significant difference)
Analysis Option	Cancer Residential: RMP Derived Method Workers and Non-cancer: OEHHA Derived Method
Deposition rate	0.02 m/s
Exposure assumptions	HARP defaults except dermal pathway = “warm”
Residential exposure duration for cancer analysis	30 years for individual receptors 70 years for cancer burden
Worker exposure duration for cancer analysis	25 year exposure
Facility Operating Schedule	24 hours per day/7 days per week
Urban options	Applied to all sources, population = 9,818,605. Roughness=1.0 m
Flagpole Height	0 meters
Elevations	Determined through AERMAP
Regulatory Defaults	Used
Appy fraction of time at residence for < 16yrs age	No
Apply fraction of time at residence for > 16yrs age	Yes
Mandatory minimum Pathways	SCAQMD mandatory minimum: inhalation, soil, dermal, mothers milk, homegrown produce

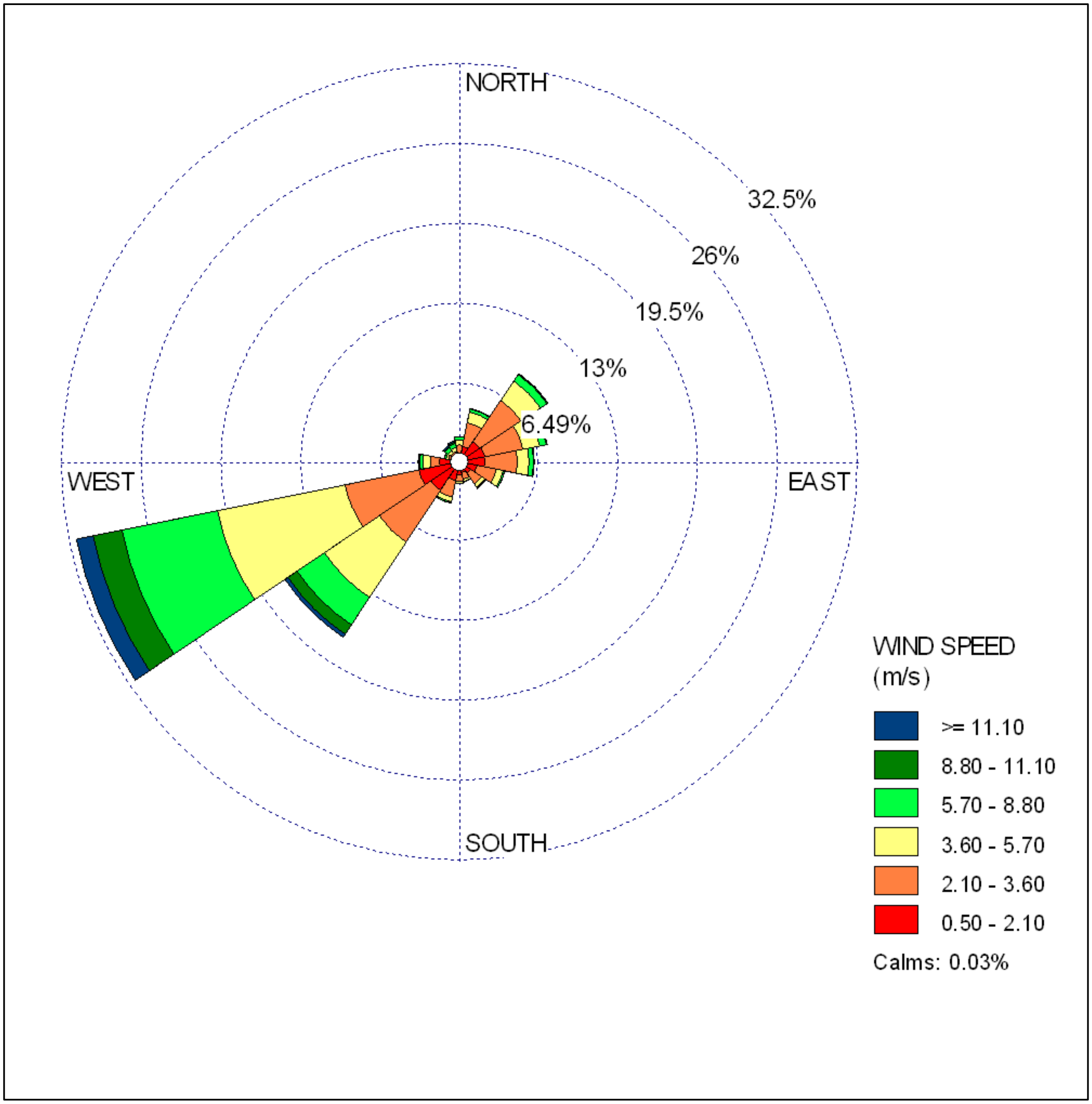
2.5 Meteorological Data

The IOF has a meteorological station onsite. Five years of meteorological data for the years 2015-2019 was processed by BREEZE Software to produce the surface and upper air AERMOD-ready files. Some missing data was supplemented with the data set collected at Los Angeles International Airport meteorological station (KLAX) as the most representative backup surface station for the facility. LAX is the closest meteorological station and is expected to record similar meteorological conditions to that of the facility. A Wind Rose for the IOF met station is shown in Figure 1

The surface data used for the meteorological analysis utilized the data gathered at the IOF site from 2015 through 2019.

The upper air data utilized the upper air location station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) as recommended and utilized by the SCAQMD.

Figure 1 IOF Met Station Wind Rose



Years of data: 2015 – 2019

2.6 Emissions Source Listing

Emission sources were categorized into three basic types: point, area, or line sources. Table 5 summarizes the dispersion modeling assumptions. Detailed source information is included in Attachments B and C. A discussion of each source category is shown below.

Table 5 Source Type Summary

Source	HARP IDs	HARP Type	How Applied?	Base_Elev [m]	Release Height [m]
FLARE, GROUND FLARE	554988	Point	Point	98.44	18.3
HEATER, H-100	554965	Point	Point	102.65	22.13
FIRE PUMP	554957	Point	Point	85.47	2.60
WAUKESHA EMERGENCY Gen	554983	Point	Point	88.86	4.0
Gasoline Dispensing	564886	Volume	Volume	73.76	1.0*
BC tank farm	901	Area	Entire Tank Farm	83.73	7.0
Central Sales/Packard tank farm	902	Area	Entire Tank Farm	96.87	5.3
LAI-A tank Farm	903	Area	Entire Tank Farm	76.1	6.1
LAI-B tank Farm	904	Area	Entire Tank Farm	79.9	7.3
TVIC Tank Farm	905	Area	Entire Tank Farm	100.7	6.7
TVIC Remote Tank Farm	906	Area	Entire Tank Farm	119.45	7.3
Water Treatment Plant	907	Area	Entire Tank Farm	94.47	6.9
Gas Plant-Fugitives	910	Area	Entire Plant	97.86	1.0
Well Grid-Workovers	1-407	Area	by # wells	28-150	1.0
Well Grid-Drilling	1-407	Area	by # wells	28-150	1.0
Well Grid-Fugitives	1-407	Area	by # wells	28-150	1.0
Well Grid-Construction	1-407	Area	by Area of WellGrid	28-150	1.0
Vehicles-Combustion	500-524	Line	Along Main Roads	76-122	0.78
Vehicles-Fugitive Dust	500-524	Line	Along Main Roads	76-122	0.78

*Although the SCAQMD has specific procedures for modeling gasoline stations, given the size of the property and the distance to nearest receptors from the gas station, modeling this as volume source was used as a reasonable estimate. The release height was used to simulate the loading/refueling emissions component.

Combustion Sources

Generally, all stationary sources with combustion sources are point sources, such as the diesel generators, heaters and flares. All stacks, except for the Waukesha generator and the fire pump, are vertical stacks with release temperature and velocity as per manufacturer data. The Waukesha Generator and the fire pump have horizontal stacks that are uncapped. Heights of stacks were measured in-field.

Emissions and emission factors are based on those in the SCAQMD Annual Emissions Report (AER) for the year 2019.

The heater is assumed to operate 24/7, 365 day per year, with the peak hour calculated based on the 24/7/365 schedule.

The flare utilizes the 2019 throughput data for the annual emissions and the flare capacity for the peak hour.

The fire pump and generator annual emissions are based on a single hour per year of testing, with the peak hour based on the fuel use during that single hour, as per the 2019 AER.

Tank Farms

The IOF has a total of 43 tanks that are grouped into 5 tank farm areas: BC Tank Setting, LAI Tank Setting, Packard Tank Setting, TVIC Tank Setting and the Water Plant. The tank farms are grouped into area sources that cover each of the entire tank farm area with a height equal to the average tank height of 24 feet (7.3m). Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Gas Plant

The gas plant fugitive emissions are grouped into a single area source that covers the entire gas plant area with an average height of 1 meter. Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Wells and Field Fugitives

The field has a large number of active wells, well cellars and fugitive sources that are located throughout the field. In order to capture these sources, the field is divided into a set of area source “well grids” with either 1.0 or 0.10 acres in area, depending on the location of the sources and the proximity to the field boundaries. All sources within each well grid cell are assigned to that cells area source emissions, meaning the emissions from all of the active wells, injection wells and idle wells located within that cell are assigned to that cells area emissions. Fugitive emissions are assigned to each cell based on the total fugitive emissions from the in-field (non-gas) plant fugitive emissions sources weighted by the individual cells area. Well grids are assigned a height of 1 meter based on the height of the well pumping units emission source height (packing valve). Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Vehicle Emissions

Vehicle onsite activity is due to pickup trucks (gasoline) and diesel delivery and maintenance trucks. Vehicle emissions are assigned to the main roads that travel through the field. Roads are defined as line sources and are a total of 2.4 miles in length composed of a main road and a side road area. The main road travels along the spine of the field from Stocker Road to the TVIC area. The side road travels from the main road through the LAI and BC tank farms. Vehicle emissions are assigned evenly along the entire main road length with 20% of vehicle traffic assigned to the side road.

Fugitive dust emissions from vehicle travel are assigned along the same line sources evenly distributed along the roadways as a function of vehicle traffic. Fugitive dust emissions are based on assuming that 50% of the roadways are paved. CalEEMod defaults are used for paved and unpaved road dust. Vehicle weights are based on the fleet average vehicle weight weighted by annual miles. Detailed calculations are included in Attachment B.

Vehicle tailpipe emission factors are based on USEPA Moves program (USEPA 2016 and 2018). Fugitive dust TAC emissions are based on the CARB profile 394. Vehicle miles are logged by the operator and this information was used to estimate total annual and peak hour on-site mileage.

Vehicles are assumed to operate only during the daytime, from 7am – 7pm. The EMISFACT HROFDY parameter in AERMOD will be set to a value to "2" during the daytime hours and zero at night. For the acute analysis, the HARP2 variable emission additional run was conducted (EMISFACT HROFDY values of "1" during the daytime).

The annual emissions are based on the total annual miles, with the peak hour of vehicle emissions is based on the estimated peak hour vehicle miles.

Construction Emissions

Construction emissions could occur at any location in the field. Therefore, construction emissions are evenly distributed by area across all of the well grid cells covering the field. Emissions and emission factors are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016.

Construction emissions are assumed to occur continuously, with the peak hour being the annual emissions divided by 52 weeks, 5 days per week and 12 hours per day.

Well Maintenance Rig Emissions

Total field-wide maintenance rig emissions are distributed to the well grid cells based on the number of active wells within each grid cell. Emissions and emission factors are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016. As the workover rigs utilize Tier 4 engines, with substantially lower DPM emissions than the SCAQMD December 2016 Guidance, a reduction percentage of 85% was applied to the TAC emissions from workover diesel engines, equivalent to a CARB Level III catalyst certification reduction percentage.

Well maintenance emissions are assumed to occur continuously, with the peak hour being the annual emissions divided by 50 weeks per year, 5 days per week and 12 hours per day.

Well Drilling and Future Emissions

Well drilling could occur at the IOF under the current CSD allowances. No drilling has occurred at the IOF since Sentinel Peak has taken over in 2016 and there are no current plans for drilling. However, as the CSD allows drilling, and the future of the field in terms of ownership and drilling plans are not known at this time, two scenarios are examined to address drilling emissions:

1. No drilling activities, as per the activities at the field in 2019.
2. Drilling activities at the maximum allowable levels defined by the CSD.

As regulated by the CSD, drilling activities are not allowed within a 400 foot buffer of the oil field boundary.

The CSD allows for a maximum of 53 wells to be drilled in one year with a total of 500 wells allowed to be drilled by 2028 since the start of the CSD in 2008. As of 2020, a total of 132 wells have been drilled since 2008. Bonus wells are also allowed based on the abandonment of wells within setback areas. Table 6 shows the estimated worst-case drilling scenario through 2028 with the maximum allowed drilling of wells a per the CSD. Note also that wells are generally abandoned each year at a historical rate of 5-6 wells abandoned per year.

Table 6 Estimated Future Well Drilling Activity at CSD Maximum Levels

Year	Wells Drilled /yr	Bonus Used /yr	Annual Wells Drilled	Wells Cumulative	Wells Abandoned	Bonus Earned	Bonus Remaining	Field Active Oil Wells
2009	0	0	0	0	10	5	5	517
2010	19	0	19	19	2	2	7	527
2011	40	5	45	64	4	2	4	510
2012	20	0	20	84	4	3	7	469
2013	30	0	30	114	8	7	14	453
2014	18	0	18	132	5	1	15	431
2015	0	0	0	132	10	7	22	418
2016	0	0	0	132	8	6	28	428
2017	0	0	0	132	0	0	28	436
2018	0	0	0	132	2	2	30	436
2019	0	0	0	132	7	4	34	438
2020	0	0	0	132	12	6	40	426
2021	35	18	53	185	11	7	29	468
2022	35	11	46	231	11	7	25	503
2023	35	10	45	276	11	7	22	537
2024	35	10	45	321	11	7	19	571
2025	35	10	45	366	11	7	16	605
2026	35	10	45	411	10	6	12	640
2027	35	10	45	456	10	6	8	675
2028	33	11	44	500	5	3	0	714
Total		***95***		***500***	***152***	***95***		

For the years after 2028, the number of wells at the field would be affected by the wells abandoned, which would decrease the number of wells at the field, and the level of drilling. Table 7 shows the estimated post-2028 wells inventory assuming the average well abandonment rate along with the average drilling rate from 2021 - 2028. It should be noted that drilling of wells under the CSD is only approved until the year 2028. Any additional drilling beyond that date is speculative and the process is not clear at this time. Information about additional wells is provided only to show maximum number of wells for the purpose of understanding the worst case scenario and the risk associated with it.

Table 7 Well Inventory Post 2028

Year	Wells Abandoned	Wells Drilled	Field Active Oil wells
2029	5.5	46	755
2030	5.5	46	795
2031	5.5	46	836
2032	5.5	46	876
2033	5.5	46	917
2034	5.5	46	957
2035	5.5	46	998
2036	5.5	46	1038
2037	5.5	46	1079
2038	5.5	46	1119
2039	5.5	46	1160
2040	5.5	46	1201
2041	5.5	46	1241
2042	5.5	46	1282
2043	5.5	46	1322
2044	5.5	46	1363
2045	5.5	46	1403
2046	5.5	46	1444
2047	5.5	46	1484
2048	5.5	46	1525
2049	5.5	46	1565
2050	5.5	46	1606
Average Since 2020	-	46	1003

In order to estimate the 30-year worst case cancer risk levels, field activity over the 30 years from 2020-2050 assuming the worst-case scenario above is proposed. Over the 30-year period from 2020-2050, the field would have an average of 1,003 active wells with a yearly average of 46 wells drilled per year as a worst case. These drilling emissions will be placed evenly within each well grid cell. Only well grid cells that are located outside of the 400 foot buffer would be assigned drilling emissions.

For future well drilling, the number of producing wells could increase, and production at the field could increase as a worst case, thereby potentially increasing emissions from a number of sources. Therefore, for the future worst-case scenario, the following emissions sources would change:

- Drilling emissions would occur at the worst-case annual average rate (average wells drilled as allowed by the CSD until year 2028) with a peak hour of 2 drilling rigs;
- Fugitive emissions from wells would increase proportional to the number of active oil wells;
- Workover emissions would increase proportional to the number of active oil wells with a peak hour of 8 workover rigs operating (as per the CSD limits);

- Equipment emissions from most tanks and processes (heaters, etc.) would increase by the proportional number of active oil wells.

The following sources emissions would not change under the future scenario:

- Field fugitive emission sources (piping and connections not at a well site);
- Construction emissions;
- Onsite vehicle emissions;
- Equipment including the flare, fire pump, generator, and gasoline dispensing.

Emissions and emission factors for drilling are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016. As the workover rigs utilize Tier 4 engines (or Tier 3 with CARB Level III catalysts), with substantially lower DPM emissions than the SCAQMD December 2016 Guidance, a reduction percentage of 90% was applied to the TAC emissions from drilling diesel engines, which is the reduction percentage required by the CSD.

Annual emissions are based on the average number of wells drilled. Peak hour emissions are based on the number of wells drilled and the days per well, along with 24 hours per day of drilling.

2.7 Dose-Response Assessment

A dose-response assessment was then performed using the Hot Spots Analysis and Reporting Program 2 (HARP2) model, version 19121, developed by the California Air Resources Board (ARB). This HRA evaluates upper-level estimates of potential cancer, non-cancer chronic, and non-cancer acute health effects at the point of maximum impact (PMI), the maximally exposed individual resident (MEIR), the maximally exposed individual worker (MEIW), and at sensitive receptors. The potential excess cancer burden was also evaluated.

For cancer and non-cancer health impacts, Table 8 shows target organ systems by substance for non-cancer impacts.

Table 8 Non-cancer Target Organs by Substance

Pollutant	CAS	Target Organ System
Formaldehyde	50000	Eyes (sensory irritation)
Carbon tetrachloride	56235	Alimentary System (Liver); Nervous System Reproductive/Developmental
Methanol	67561	Nervous System
Chloroform	67663	Nervous System; Respiratory System; Reproductive/Developmental
Benzene	71432	Reproductive/Developmental; Immune System; Hematologic System
Vinyl chloride	75014	Nervous System; Eyes; Respiratory System
Acetaldehyde	75070	Eyes; Respiratory System (sensory irritation)
Methylene chloride {Dichloromethane}	75092	Nervous System; Cardiovascular System
Styrene	100425	Eyes; Respiratory System; Reproductive/Developmental
Butadiene [1,3]	106990	Development
Acrolein	107028	Eyes; Respiratory System (sensory irritation)
Toluene	108883	Nervous System; Respiratory System; Eyes; Reproductive/Developmental

Table 8 Non-cancer Target Organs by Substance

Pollutant	CAS	Target Organ System
Xylenes	1330207	Eyes; Respiratory System; Nervous System
Mercury and mercury compounds	7439976	Nervous System; Development
Nickel	7440020	Immune System
Arsenic and Compounds (inorganic)	7440382	Development; Cardiovascular System; Nervous System
Copper	7440508	Respiratory System
Hydrochloric acid	7647010	Eyes; Respiratory System
Ammonia	7664417	Eyes; Respiratory System

Source: OEHHA 2015 Guidelines Table 6.1

2.8 Buildings

Buildings affect dispersion by producing downdrafts in wind fields and increasing the ground-level concentrations of pollutants of sources that are close to buildings. AERMOD and BPIP (the building program in AERMOD and HARP2) only address building influences from point sources. Buildings located farther than five times the height of the building from a source do not generally influence the dispersion and are therefore not addressed in the BPIP program. The field has 4 different point sources (flare, heater, generator and fire pump) and therefore only buildings located within 5 times the building height of those sources have been included in the HARP2 building BPIP modeling assessment. These include the following:

- Tanks T-50, T-56A/B/C located in proximity to the Generator
- Tanks T-9B, T-2A, T-2B located in proximity to the Fire Pump

These tanks are assumed to be square buildings with a height of 24 feet (7.3 meters, the average tank height), and a side dimension of 40 feet (12.2 meters, the average tank diameter) with a single tier. Below are listed the building parameters.

Table 9 Building Parameters

Building	Proximate to Point Source	Height, m
T-50	Generator	7.3
T-56A	Generator	7.3
T-56B	Generator	7.3
T-56C	Generator	7.3
T-9B	Fire Pump	7.3
T-2A	Fire Pump	7.3
T-2B	Fire Pump	7.3

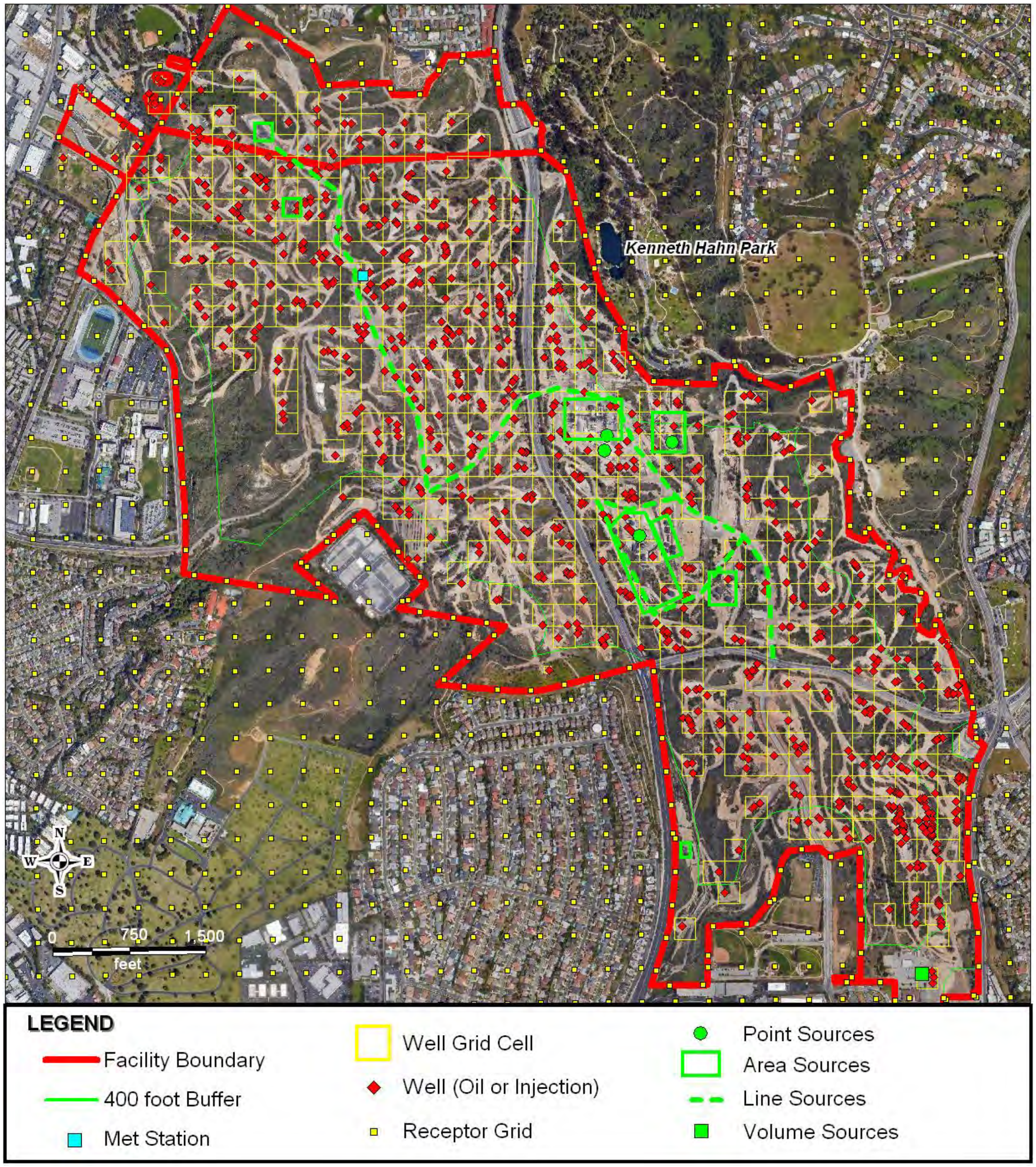
2.9 Area Populations and Receptor Grids

In order to identify the maximum impacted receptor locations, receptor networks were constructed which include the IOF property boundary line with a spacing of 100 meters, and a receptor grid containing receptors spaced 100 meters apart out to a 1-2 km radius. The locations of the off-site residential and worker receptor areas were identified based on Google Earth/Maps. Discrete receptors were identified for the sensitive receptors and are shown in Figure 2.

Estimates of population exposure will be based on census tract data as included in HARP2.

There are a number of schools located within 2 km of the IOF, including Baldwin Hill Elementary School, Windsor Hills, La Tijera Elementary, El Rincon Elementary and Culver City High School. Therefore, for exposure, estimates of under 16 years of age exposure will assume 100% of the time in the exposure area (at home or at school).

Figure 2 IOF Sources and Receptors



2.10 Version of the Risk Assessment Guidelines

The HARP2 version 19121 model was used along with the SCAQMD AB 2588 and Rule 1402 Supplemental Guidelines dated September 2018 (SCAQMD 2018).

2.11 Elevations

Elevations of sources and receptors are determined using AERMAP within the HARP2 modeling program. AERMAP model outputs are included in the modeling files. The Digital Elevation Model (DEM) files are also include and include: Beverly hills (30m), Inglewood (10m), Hollywood (30m) and Venice (10m).

3.0 Hazard Identification

Table 2 shows all substances emitted from the facility including the CAS and estimated emissions levels. The physical form of the substance are all air emissions and/or particulates.

All substances in Table 2 were evaluated for cancer risk and/or non- cancer acute and chronic health impacts in HARP2.

Table 3 identifies the substances that present a potential cancer risk or chronic non-cancer hazard via non-inhalation routes of exposure.

All estimated emissions from the facility are listed in Table 2 and include those from continuous or intermittent processes.

Attachment B and C shows the emissions by sources for all sources and TAC Pollutants.

4.0 Exposure Assessment

This section describes the information related to the air dispersion modeling process that is reported in the risk assessment. In addition, doses calculated by pathway of exposure for each substance are included in this section and presented as results from the HARP2 model.

4.1 Facility Description

Section 2.1 provides information on the facility. The local topography is rolling hills with a high of about 150 meters in elevation and a low of about 50 meters in elevation.

Figures 2 shows the facility plot plan identifying emission source locations, property line, and receptor locations.

As the area is urban, there are no water or grazing intake areas.

4.2 Emissions Inventory

Attachments B and C shows the sources used in the modeling along with the source specific parameters. Section 2.6 includes a summary listing of all sources.

All equipment at the field operates 24 hours per day, 7 days per week. Vehicle use is the only variable emission source analyzed in this analysis as almost all vehicle use occurs during the daytime. All other sources assumed that all emissions occur 24/7.

Emission control equipment and emissions measuring methods are listed in Attachments B and C.

Emission rates and total and hourly emissions are listed in Attachments B and C.

Facility total emission rates by substance for all pollutants are listed in Table 2 and in Attachments B and C.

The emission rates for each toxic substance, grouped by source, in table form are located in Attachments B and C, the table includes the following:

- Source name;
- Source identification number;
- Substance name and CAS number;
- Annual average emissions for each substance (lbs/yr and g/s); and,
- Maximum one hour emissions for each substance (lbs/hr and g/s).

There are no radionuclides emitted at the facility and are therefore not included in the analysis.

Table 2 and Attachments B and C shows the facility total emission rates by substance for all pollutants including the following information:

- Substance name and CAS number;
- Annual average emissions for each substance (lbs/yr and g/s); and
- Maximum one-hour emissions for each substance (lbs/hr and g/s).

4.3 Air Dispersion Modeling

Meteorological data is discussed in Section 2.5.

The IOF has a meteorological station onsite. Five years of meteorological data for the years 2015-2019 was processed by BREEZE Software to produce the surface and upper air AERMOD-ready files. Some missing data was supplemented with the data set collected at Los Angeles International Airport meteorological station (KLAX) as the most representative backup surface station for the facility. LAX is the closest meteorological station and is expected to record similar meteorological conditions to that of the facility. Wind Rose for the IOF met station are shown in Figure 1.

The upper air data utilized the upper air location station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) as recommended and utilized by the SCAQMD.

5.0 Risk Characterization Results

HARP generates the risk characterization data needed to generate the risk results as presented in this report. All HARP files are included in the HRA submittals.

The potential cancer risk for the PMI, MEIR, and sensitive receptors of interest are presented in the HRA's text, tables, and maps using a residential 30-year exposure period. MEIW location will use appropriate exposure periods as per the requirements; as the facility operates 24/7, no adjustments to MEIW are proposed.

The report presents the results of a Tier-1 exposure assessment as per HARP2 and OEHHA Guidelines.

The following information are presented in previous sections of the HRA:

- Description of receptors to be quantified – Section 2.9 presents a description of the receptors; and,

- The site-specific inputs used for each exposure pathway (e.g., water or grazing intake assumptions) are discussed in Section 2.3.

5.1 SCAQMD Review of the Modeling Report

A modeling protocol report was submitted to the SCAQMD in September 2020 for comments. The following comments were received from the SCAQMD:

- "Overall, the project looks good. It is obvious that time was spent on the modeling and gridding is good."
- "There are some emissions included that would typically occur in an environmental assessment but would not be included in an AB 2588 submittal, such as construction emissions, motor vehicle tailpipe and averaging of emissions. Regarding construction emissions, this actually makes the review more conservative, so that is not a bad thing overall looking at the risk. "
- "AB 2588 would not consider future emissions and would only analyze the 2019 emissions."
- "Based on the size of the site, the use of a single source for gasoline stations is acceptable."
- Some editorial and model version comments on the report.

The SCAQMD did not do a detailed review of the meteorological data and upper air data or confirm that the emissions would meet the Air Toxic Inventory Reporting requirements under AB2588, although emissions from the annual submissions to the SCAQMD, which are reviewed and approved by the SCAQMD annually, were used.

5.2 Year 2019 Operations Health Risk Results

The HRA presents the results of the analysis for cancer, acute and chronic health impacts. Cancer risk are defined as the number of cancer cases that are projected to be generated per million people exposed.

Chronic and acute impacts are based on the reference exposure level (REL) as an indicator of potential adverse non-cancer health effects. A REL is a concentration at which no adverse health effects are anticipated. RELs are provided by OEHHA and incorporated into the HARP2 model. A hazard index (HI) is defined as the ratio of the pollutant concentration estimated by the models at the receptors to the REL. When several pollutants affect the same organ system in the body (e.g., respiratory system, nervous system, reproductive system), there can be a cumulative effect on the target organ. In these cases, the sum of the HI for all chemicals emitted that impact the same target organ is performed by the HARP2 model. An HI of over 1.0 would indicate that the receptor is exposed to a cumulative effect exceeding the REL.

The SCAQMD has establish thresholds for AB2588 analysis of 10 cancer cases per million and any HI of over 1.0.

The following tables provide the detailed results of the HRA analysis for the 2019-year operations. Section 5.2 presents summaries of the future operations HRA results.

Table 10 Year 2019 Cancer Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Cancer Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	5.2	Benzene (39%), Arsenic (31%), DieselExhPM (13%), Lead (8%), Cadmium (6%)	Roads (48%), WellGrids (33%), Gas Plant (17%), Packard Tank Farm (1%), Flare (0%),
MEIR	1775	373,379	3,762,767	1.0	Benzene (58%), DieselExhPM (25%), Arsenic (11%), Lead (3%), Cadmium (2%),	WellGrids (64%), Roads (16%), BC Tank Farm (9%), Gas Plant (4%), LAI-A Tank Farm (3%),
MEIW	1818	372,038	3,764,399	0.07	Benzene (59%), DieselExhPM (33%), Arsenic (5%), Lead (1%), Cadmium (1%),	WellGrids (87%), Roads (7%), Gas Plant (2%), TVIC Remote Tank Farm (1%), TVIC Tank Farm (1%),

Notes: UTM Zone 11, NAD83, Cancer risk per million.

Table 11 Year 2019 Cancer Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Cancer Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.27
Village Tree School	1298	371,602	3,765,015	0.10
Linwood How Elem School	1299	371,458	3,765,442	0.07
Willows Community School	1300	372,537	3,765,521	0.08
Baldwin Dill Elem School	1301	373,913	3,765,441	0.21
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.44
Windsor Hill Magnet School	1303	374,735	3,762,558	0.44
Community Christian Elem	1304	374,502	3,761,177	0.08
ICEF School	1305	373,575	3,761,806	0.34
La Tijera Elem School	1306	373,549	3,760,990	0.11
Frank Parent School	1307	372,980	3,761,081	0.15
El Rincon Elem School	1308	371,566	3,762,615	0.27
West La College South	1309	372,008	3,763,263	0.49
We LA College North	1310	372,011	3,763,812	0.63
Culver City HS	1311	370,802	3,763,850	0.15
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.86
Shenandoah Ave	1775	373,379	3,762,767	0.99
Stoneview Ave	1831	372,932	3,764,576	0.89
S Cloverdale Ave	997	373,900	3,764,100	0.92
Punta Alta Ave	964	374,200	3,764,000	0.86

Table 12 Year 2019 Acute Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Acute Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1847	373,743	3,763,650	0.48	Acrolein (73%), Nickel (15%), Benzene (5%), Arsenic (3%), Formaldehyde (3%),	Generator (79%), Roads (16%), WellGrids (2%), Gas Plant (1%), Packard Tank Farm (1%),
MEIR	1775	373,379	3,762,767	0.09	Nickel (46%), Acrolein (25%), Benzene (14%), Arsenic (10%), Formaldehyde (4%),	Roads (53%), Generator (29%), WellGrids (12%), Fire Pump (2%), Gas Plant (2%),
MEIW	1818	372,038	3,764,399	0.05	Nickel (54%), Benzene (16%), Acrolein (14%), Arsenic (12%), Formaldehyde (3%),	Roads (63%), WellGrids (18%), Generator (15%), Fire Pump (1%), Gas Plant (1%),

Notes: UTM Zone 11, NAD83, Acute risk hazard index.

Table 13 Year 2019 Acute Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Acute Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.03
Village Tree School	1298	371,602	3,765,015	0.02
Linwood How Elem School	1299	371,458	3,765,442	0.01
Willows Community School	1300	372,537	3,765,521	0.02
Baldwin Dill Elem School	1301	373,913	3,765,441	0.02
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.02
Windsor Hill Magnet School	1303	374,735	3,762,558	0.04
Community Christian Elem	1304	374,502	3,761,177	0.02
ICEF School	1305	373,575	3,761,806	0.03
La Tijera Elem School	1306	373,549	3,760,990	0.02
Frank Parent School	1307	372,980	3,761,081	0.02
El Rincon Elem School	1308	371,566	3,762,615	0.02
West La College South	1309	372,008	3,763,263	0.04
We LA College North	1310	372,011	3,763,812	0.04
Culver City HS	1311	370,802	3,763,850	0.02
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.06
Shenandoah Ave	1775	373,379	3,762,767	0.09
Stoneview Ave	1831	372,932	3,764,576	0.05
S Cloverdale Ave	997	373,900	3,764,100	0.06
Punta Alta Ave	964	374,200	3,764,000	0.05

Table 14 Year 2019 Chronic Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Chronic Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	0.06	Silica, Crystln (54%), Manganese (17%), Benzene (17%), Nickel (7%), Cadmium (2%),	Roads (95%), WellGrids (3%), Gas Plant (2%), Packard Tank Farm (0%), BC Tank Farm (0%),
MEIR	1775	373,379	3,762,767	0.01	Silica, Crystln (41%), Benzene (36%), Manganese (13%), Nickel (6%), Cadmium (1%),	Roads (80%), WellGrids (13%), BC Tank Farm (3%), Gas Plant (1%), LAI-A Tank Farm (1%),
MEIW	1818	372,038	3,764,399	0.003	Benzene (55%), Silica, Crystln (28%), Manganese (9%), Nickel (4%), DieselExhPM (2%),	Roads (65%), WellGrids (32%), Gas Plant (1%), TVIC Remote Tank Farm (1%), TVIC Tank Farm (1%),

Notes: UTM Zone 11, NAD83, Chronic risk hazard index.

Table 15 Year 2019 Chronic Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Chronic Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.0009
Village Tree School	1298	371,602	3,765,015	0.0004
Linwood How Elem School	1299	371,458	3,765,442	0.0003
Willows Community School	1300	372,537	3,765,521	0.0004
Baldwin Dill Elem School	1301	373,913	3,765,441	0.0018
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.0044
Windsor Hill Magnet School	1303	374,735	3,762,558	0.0014
Community Christian Elem	1304	374,502	3,761,177	0.0003
ICEF School	1305	373,575	3,761,806	0.0011
La Tijera Elem School	1306	373,549	3,760,990	0.0004
Frank Parent School	1307	372,980	3,761,081	0.0005
El Rincon Elem School	1308	371,566	3,762,615	0.0010
West La College South	1309	372,008	3,763,263	0.0020
We LA College North	1310	372,011	3,763,812	0.0022
Culver City HS	1311	370,802	3,763,850	0.0005
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.0026
Shenandoah Ave	1775	373,379	3,762,767	0.0040
Stoneview Ave	1831	372,932	3,764,576	0.0096
S Cloverdale Ave	997	373,900	3,764,100	0.0108
Punta Alta Ave	964	374,200	3,764,000	0.0095

The chronic risk 8-hour results all fall below 0.01 HI at all receptors; therefore, detailed results are not shown.

Table 16 Year 2019 Risk Population Exposure

Risk Level	Population Exposure
Cancer greater than 1 in a million	353

Note: Calculated in HARP2 using Census Block centroids

Table 17 Year 2019 Excess Cancer Burden

Risk Level	Excess Cancer Burden
Excess Cancer Burden	4.3e-4

Note: Calculated in HARP2 using Census Block centroids

Figure 3 Year 2019 Cancer Risk Contours and Location PMI, MEIR, MEIW

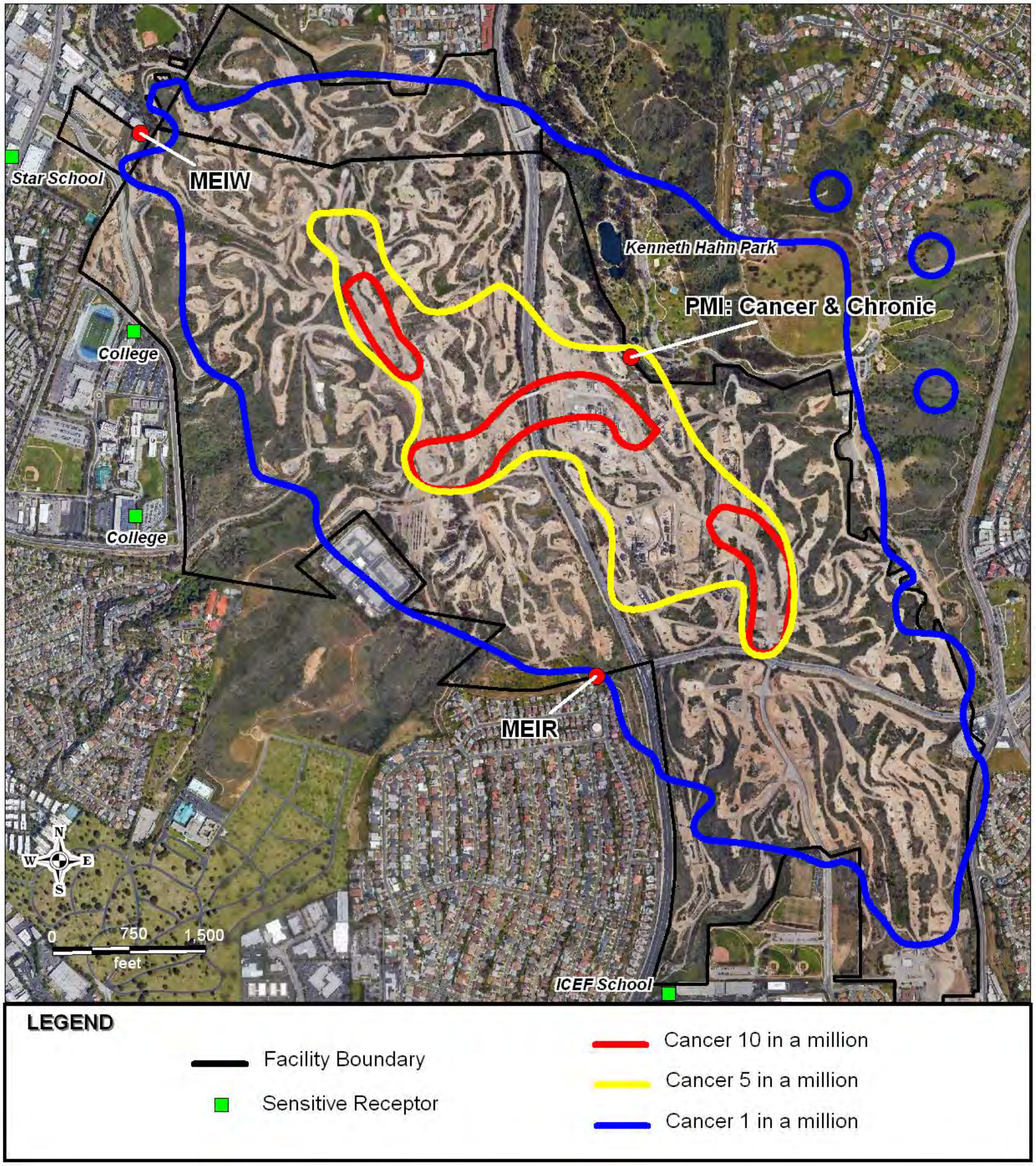
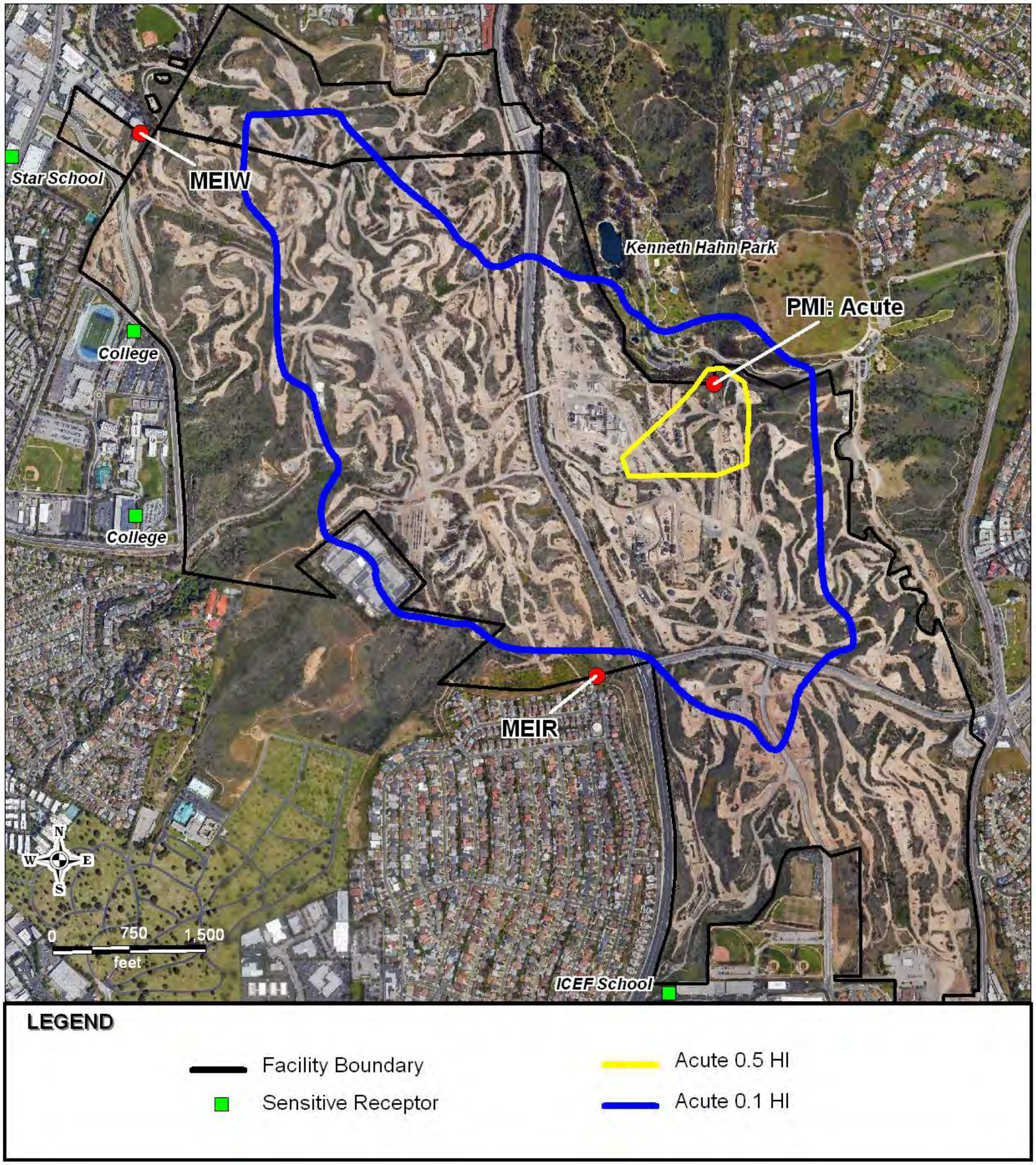


Figure 4 Year 2019 Acute Risk Contours and Location PMI, MEIR, MEIW



5.3 Future Operations Health Risk Results

Health risks in the future are a function of the extent of operations, primarily drilling, that may occur in the future. The current operator indicates that future operations would be similar to 2019 with minimal to zero drilling. However, the CSD allows for drilling until the year 2028. After the year 2028, the level of field activities are unknown. Estimated future operations levels are discussed in section 2.6. The health risks are summarized in the following tables for the different future scenarios. As the future operations are speculative, the information is not presented to the same level of detail as Year 2019 which is presented to the AB2588 level of detail. Figure 5.3 shows a map of the cancer risks. The worst case future acute and chronic risk maps are very similar to the 2019 operations.

The cancer risk drivers for the future worst-case scenario is primarily diesel exhaust (64-89% depending on receptor) followed by benzene (9-16%) and arsenic (1-12%). For acute and chronic, the pollutant drivers are similar to the 2019 operating year scenario.

For the worst-case future operations scenario including drilling of 46 wells per year, the estimated peak cancer risks at the facility boundary (PMI at the fence line) would be 13.8 cancer cases per million, and an acute and chronic HI of 0.55 and 0.18. The cancer risk would be above the SCAQMD AB2588 thresholds; however, the peak acute and chronic risks would be below the thresholds. The peak cancer risk would occur near Kenneth Hahn Park along the fence line. The peak cancer risk at the nearest residence would be 5.6, which would be below the SCAQMD AB2588 thresholds.

Based on the worst-case scenario and the 2019 operational scenario, the level of drilling that would result in peak cancer risk levels at the PMI below the SCAQMD threshold level would correspond to about 25 wells drilled per year average.

Table 18 Future Worst Case Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Cancer Risk	Acute Risk	Chronic Risk
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	13.8	0.55	0.18
MEIR	1775	373,379	3,762,767	5.63	0.11	0.03
MEIW	1818	372,038	3,764,399	0.34	0.05	0.005

Cancer, acute and chronic risk levels at different receptors are shown in Table 19.

The estimated exposed populations and cancer burden are shown in Tables 20 and 21. These numbers are estimated in the HARP2 modeling program based on census blocks and the resulting modeling results.

Table 19 Future Worst-Case Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Cancer Risk	Acute Risk	Chronic Risk
Sensitive Receptors						
Star School	1297	371,655	3,764,335	1.71	0.03	0.0030
Village Tree School	1298	371,602	3,765,015	0.60	0.02	0.0014
Linwood How Elem School	1299	371,458	3,765,442	0.39	0.02	0.0010
Willows Community School	1300	372,537	3,765,521	0.45	0.02	0.0014
Baldwin Dill Elem School	1301	373,913	3,765,441	1.16	0.02	0.0055
Hillcrest Drive Elem School	1302	375,384	3,764,569	1.68	0.02	0.0136
Windsor Hill Magnet School	1303	374,735	3,762,558	2.15	0.05	0.0018
Community Christian Elem	1304	374,502	3,761,177	0.41	0.02	0.0011
ICEF School	1305	373,575	3,761,806	1.93	0.04	0.0024
La Tijera Elem School	1306	373,549	3,760,990	0.62	0.02	0.0010
Frank Parent School	1307	372,980	3,761,081	0.82	0.02	0.0012
El Rincon Elem School	1308	371,566	3,762,615	1.63	0.02	0.0032
West LA College South	1309	372,008	3,763,263	3.19	0.04	0.0067
West LA College North	1310	372,011	3,763,812	5.05	0.05	0.0077
Culver City HS	1311	370,802	3,763,850	0.99	0.02	0.0018
Residential Receptors						
Brea Crest Dr	355	374,500	3,762,300	4.14	0.06	0.0034
Shenandoah Ave	1775	373,379	3,762,767	5.63	0.11	0.0129
Stoneview Ave	1831	372,932	3,764,576	4.70	0.06	0.0296
S Cloverdale Ave	997	373,900	3,764,100	3.28	0.07	0.0328
Punta Alta Ave	964	374,200	3,764,000	2.76	0.05	0.0288

Table 20 Future Worst Case Risk Population Exposure

Risk Level	Population Exposure
Cancer greater than 1 in a million	16,797

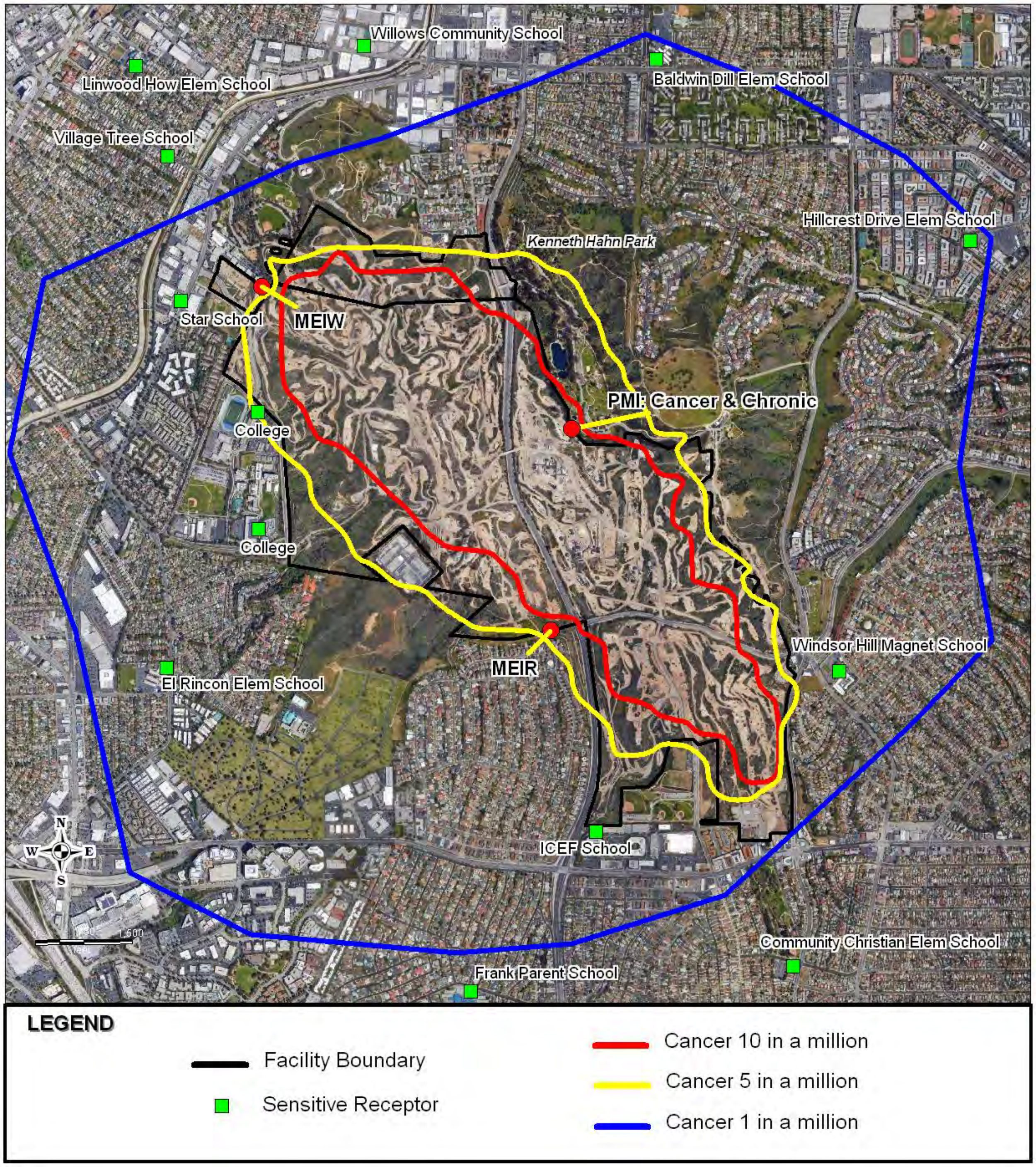
Note: Calculated in HARP2 using Census Block centroids

Table 21 Future Worst Case Excess Cancer Burden

Risk Level	Excess Cancer Burden
Excess Cancer Burden	0.0356

Note: Calculated in HARP2 using Census Block centroids

Figure 5 **Future Worst-Case Cancer Risk Contours and Location PMI, MEIR, MEIW**



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January 29, 2024

County of Los Angeles Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

Re: Comments on Proposed Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2); Board of Supervisors Meeting, January 30, 2024

Dear Board of Supervisors:

We represent Sentinel Peak Resources California LLC ("Sentinel") regarding the County of Los Angeles's ("County") proposed Baldwin Hills Community Standards District ("BHCSD") amendment, which would amend Title 22 of the Los Angeles County Code "to prohibit the location of new oil wells and production facilities, make existing oil wells and production facilities as nonconforming due to use, and maintaining regulations for existing oil wells and production facilities during the amortization period." (September 7, 2023 Draft BHCSD Amendment, p. 1.)

Sentinel owns and operates oil and gas production facilities in the County that are governed by the existing BHCSD. Sentinel has vested rights that are jeopardized by the proposed amendment, not only under the existing BHCSD, but pursuant to operations that have existed for decades prior to the establishment of the BHCSD—which the County acknowledged in its adoption of the existing BHCSD. Quite simply, the County has not established a legitimate basis for its action. The County's proposed amendment would amortize the newly created non-conforming uses over an unspecified time period, and the proposed amendment does not identify a specific amortization period. Instead, the proposed amendment refers to Section 22.172 of the Los Angeles County Code for Nonconforming Uses, Buildings and Structures, which includes provisions for different amortization periods.

Following the Regional Planning Commission's ("RPC") August 16, 2023, hearing on the proposed amendment—where RPC staff confirmed they had previously failed to adequately meet with stakeholders to discuss the BHCD amendment—RPC staff met with stakeholders, including Sentinel, and indicated the applicable amortization period is 20 years pursuant to Sections 22.172.050.B and 22.172.050.B.1.f. However, the proposed amendment does not identify these provisions from Section 22.172, and in any event, Sections 22.172.050.B and 22.172.050.B.1.f themselves identify a variety of different amortization periods. The applicable amortization period of the proposed amendment is still unclear.

Further, the County has not demonstrated that amortization is applicable to oil and gas operations, nor has it performed an amortization analysis to support any amortization period. An amortization analysis may consider available reserves, capital investments, revenue, operating expenses, and a reasonable rate of return. (See January 29, 2024 Alvarez & Marsal memorandum, attached.) The proposed amendment does not appear to consider any of these factors.

The proposed amendment is not consistent with the County's General Plan, and it is in fatal conflict with the State's statutory obligation to administer oil and gas regulations in a way that ensures the state has adequate oil and gas resources, as recently held by the California Supreme Court.

We submit these comments ahead of the January 30, 2024 public hearing on the proposed amendment—to which we were provided one week's notice—to share Sentinel's objections. Not only is the proposed amendment legally invalid, but the County has also failed to conduct a proper environmental analysis, including, but not limited to, fulfilling its obligations under the California Environmental Quality Act ("CEQA"), not the least of which is its failure to designate land uses under the General Plan to replace the existing oil and gas operations, resulting in improper piecemealing. Sentinel urges the Board of Supervisors to postpone consideration of the proposed amendment; direct the Regional Planning Commission to take necessary, additional steps to study the environmental impact of the proposed amendment, including completing a legally proper environmental analysis required by CEQA, reviewing in good faith the issues raised by public comment letters; and reconsidering the proposed amendment as currently drafted.

I. <u>The Proposed Amendment Is Preempted by State Law</u>

The proposed amendment conflicts with existing California law and is therefore preempted, as recently addressed by the California Supreme Court in *Chevron U.S.A. Inc. v. County of Monterey* (2023) 15 Cal.5th 135 ("*County of Monterey*"). In *County of Monterey*, the Supreme Court considered the validity of a Monterey County ordinance banning oil and gas wastewater injection and impoundment and the drilling of new oil and gas wells in the county's unincorporated areas ("Measure Z"). On August 3, 2023, the California Supreme Court affirmed the lower courts' determination that Measure Z was preempted by state law.

The California Constitution provides that a "county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws." (Cal. Const., Art. XI, § 7.) "If otherwise valid local legislation conflicts with state law, it is preempted by such law and is void." (*County of Monterey*, *supra*, 15 Cal.5th at 142, citing *Sherwin-Williams Co. v. City of Los Angeles* (1993) 4 Cal.4th 893, 89.) A preempting conflict may arise in three ways: when the local legislation "duplicates, contradicts, or enters an area fully occupied by general law, either expressly or by legislative implication." (*County of Monterey*, *supra*, 15 Cal.5th at 142, citation omitted.) Preemption based on contradiction applies when the local legislation is "inimical" to state law or when it "cannot be reconciled with state law." (*Id.*, at 145, citations omitted.) Further, "state law may preempt local law when local law prohibits not only what a state statute 'demands' but also what the statute permits or authorizes." (*County of Monterey*, *supra*, at 149, quoting *City of Riverside v. Inland Empire Patients Health & Wellness Center, Inc.* (2013) 56 Cal.4th 729, 763 ("City of Riverside") (conc. opn. of Liu, J.).) Thus, if a local ordinance attempts to "prohibit conduct proscribed or *permitted* by state law[,] either explicitly or implicitly, it would be preempted." (*County of Monterey*, *supra*, 15 Cal.5th at 149, citing *City of Riverside*, *supra*, at p. 758.)

Applying this standard, the Supreme Court in *County of Monterey* found that Measure Z—which provides that "certain oil production methods may *never* be used by anyone, anywhere, in the County"—contradicts Public Resources Code section 3106's "mandate that the state 'shall' supervise oil operation in a way that permits well operators to 'utilize *all* methods and practices' the [State Oil & Gas] supervisor has approved" and "directs the [State Oil & Gas] supervisor to administer the state's regulations in a way that serves the dual purpose of ***ensuring*** the state has adequate oil and gas resources, while protecting the environment." (*County of Monterey*, *supra*, 15 Cal.5th at 144-45, emphasis added.) That is, "section 3106 implicitly limits a local entity's authority" by directing the [State Oil & Gas] *supervisor* to make decisions regarding all oil production methods. (*Id.* at 149.) In contravention of section 3106, "Measure Z authorizes *the County* to make decisions regarding some of those methods." (*Id.* at 146.) In particular, the Court held that broad language prohibiting the drilling of wells amounts to "a ban on certain oil production methods in existing oil fields." (*Id*. at 147.)

Here, the proposed CSD amendment similarly seeks to prohibit a permissible method of oil production in the existing Inglewood Oil Field: the drilling of new wells. As the Supreme Court has already held in *County of Monterey*, Public Resources Code section 3106 grants the California Geologic Energy Management Division ("CalGEM") with the authority to regulate all aspects of oil and gas production. A local law authorizing the County to make decisions about methods of oil and gas production—namely to prohibit such methods permitted by state law—would therefore be preempted. The proposed amendment seeks to do as much and is thus preempted, and the County cannot legally adopt the amendment.[1]

II. **The Proposed Amendment Does Not Identify an Amortization Period**

The County's proposed amendment would impose an amortization period on oil and gas operations, but it fails to identify a specific amortization period or provide evidence of factual support for the application of *any* amortization period. The County has not provided *any* evidence related to the potential factors for an amortization analysis described in the attached report from Alvarez & Marsal.

County staff have stated that the applicable amortization period is 20 years pursuant to Sections 22.172.050.B and 22.172.050.B.1.f of the Los Angeles County Code. However, the amendment does not identify Section 22.172 or any of its subsections, and Sections 22.172.050.B and 22.172.050.B.1.f identify a variety of different amortization periods—ranging from 1 year for unimproved land to 50 years for certain building types, including certain "[f]actories and industrial buildings." Thus, the applicable amortization period is still unclear.

Additionally, "an amortization period is not an absolute or unqualified defense to a takings claim." (*Levin Richmond Terminal Corp. v. City of Richmond,* 2020 U.S. Dist. LEXIS 156103, *36-37, emphasis added.) Rather, the legislation must provide a "reasonable amortization period commensurate with the investment involved." (*Id.,* quoting *Elysium Institute, Inc. v. County of Los Angeles* (1991) 232 Cal. App. 3d 408, 436.) While amortization does not apply to oil and gas interests (see Section III), even assuming that it does for the sake of argument, any amortization process requires a detailed, factual analysis evaluating numerous factors for a particular property, such as investment in the use, fair market value, and remaining useful life. (*See Metromedia, Inc. v. City of San Diego* (1980) 26 Cal.3d 848, 883-884, rev. on other grounds *Metromedia, Inc. v. San Diego* (1981) 453 U.S. 490.) The County bypasses this crucial step required to legally adopt its proposed amendment. No study has been conducted regarding an appropriate amortization period, and (even worse than with the recent oil ordinance adopted by the City of Los Angeles) no Mitigated Negative Declaration ("MND") has been prepared to support the proposed amendment or any amortization period. Proper analysis, including an amortization study, needs to be prepared before any amortization ordinance is adopted.

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[1] The proposed amendment is also preempted because state law has "fully occupied" the field of regulating the production of oil and gas, including drilling, operations, abandonment, and maintenance. The extensive host of State laws and associated regulations clearly reflect an intent to occupy the entire area of oil and gas production. As the proposed amendment also prohibits the drilling of injection wells regulated by the federal Safe Drinking Water Act, it is likewise preempted under federal law.

Any amortization period adopted must recognize that oil and gas operations require constant maintenance and ongoing investments to the operation's infrastructure. An amortization period must account for the need to regularly invest in order to continue to maintain profitable productivity levels.

III. **Amortization Does Not Apply to the Extraction of Mineral Resources**

The County fails to evaluate the legal propriety of establishing an amortization period for the extraction of mineral resources and ignores the legal doctrine that would invalidate this proposed amendment – the diminishing asset doctrine. (*See Hansen Bros. Enters. v. Board of Supervisors* (1996) 12 Cal.4th 533.) The California Supreme Court in *Hansen* recognized the "diminishing asset" doctrine and defined the scope of vested rights for mining, quarrying and other extractive uses, recognizing the unique qualities of extractive uses and holding that it includes an expansion of those uses.

As explained in the context of a quarry, the court in *Hansen* stated:

> The very nature and use of an extractive business contemplates the continuance of such use of the entire parcel of land as a whole, without limitation or restriction to the immediate area excavated at the time the ordinance was passed. A mineral extractive operation is susceptible of use and has value only in the place where the resources are found, and once the minerals are extracted it cannot again be used for that purpose. 'Quarry property is generally a one-use property. The rock must be quarried at the site where it exists, or not at all. An absolute prohibition, therefore, practically amounts to a taking of the property since it denies the owner the right to engage in the only business for which the land is fitted.'

(*Hansen,* 12 Cal.4th at 553-54 (and cases cited therein).)

Similarly, Sentinel's vested oil and gas rights—consistent with Sentinel's historic use even prior to the establishment of the existing BHCSD—are uniquely situated in the County, and the proposed amendment seeks to terminate the extraction of those resources in the entire County, without the ability to extract them elsewhere. (*See Los Angeles v. Gage* (1954) 127 Cal.App.2d 442.) The proposed amendment will deprive Sentinel of the right to engage in the only business for which its subsurface mineral rights are fitted. Under the diminishing asset doctrine, Sentinel is entitled to produce oil and gas resources under its vested rights until the resource is exhausted or otherwise uneconomical to produce—the continued production of oil and gas resources is the expanded use and is protected under *Hansen.* Moreover, in its adoption of the existing BHCSD, the County recognized as much: "Because oil operations have been ongoing at the Inglewood Field for more than

80 years, [operators have] certain rights to produce the oil and gas resources at the field and ***new zoning regulations cannot diminish those rights***." (10/21/2008 Motion amending CSD, at p. 3, emphasis added.)[2]

IV. <u>**The County Has Not Completed the Required CEQA Process**</u>

The County's circumvention of the CEQA process is against well-established laws, making the proposed amendment illegal if adopted. The County has failed to properly consider the significant impacts that the proposed amendment will have towards the availability of mineral resources, which is required under CEQA. In addition, California and the County will continue to rely on fossil fuels to meet most of their energy demands, particularly in the critical transportation sector. However, since the oil transmission capabilities of the State is mostly disconnected from the other lower-48 states and therefore unable to secure domestic crude oil sources to support its energy needs, the percentage of foreign oil imports to California will continue to increase as a result of the proposed amendment's restrictions.[3] Despite this reality, the County has failed to consider the increases in greenhouse gas ("GHG") emissions that will result from the proposed amendment's adoption. Because the oil and gas operations in the County are highly regulated, unlike foreign sources of oil, a reduction in production from the operations within the County will necessarily result in an immediate, significant, and foreseeable increase in the importation of foreign oil (which is necessarily more carbon intensive than oil produced in California), driving GHG emissions higher from ships and other vessels needed to import the oil to California and the County. These emissions, however, can be significantly reduced by the continuation of oil and gas production within the County. Yet the County has failed to analyze the proposed amendment's potentially significant GHG impacts under CEQA, including how the proposed amendment would result in emissions that conflict with the State's GHG reduction goals.

For instance, the City of Los Angeles published an Oil and Gas Health Report dated July 25, 2019, which confirms that 1.6 billion barrels of recoverable oil and gas reserves remain beneath the City, alone "rivaling the reserves of the Middle Eastern countries, like Saudi Arabia, Iraq, and Kuwait 14,000 miles away."[4] Even more oil can reasonably be expected to be within the County's borders, including within the BHCSD. However, the County's

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[2] https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

[3] Californians for Energy Independence, *What Is An Energy Island?*, https://www.energyindependenceca.com/what-is-an-energy-island/; Kern Economic Development Corp., *Where California Gets Its Energy*, available at https://kernedc.com/wp-content/uploads/2021/08/Kern-EDC-CA-Oil-Imports-Fact-Sheet.pdf; California Policy Center, https://californiapolicycenter.org/reality-check-half-of-californias-energy-comes-from-crude-oil/; U.S. Energy Information Administration, https://www.eia.gov/state/?sid=CA#tabs-1.

[4] https://clkrep.lacity.org/onlinedocs/2017/17-0447_rpt_BPW_07-29-2019.pdf

proposal for elimination of oil and gas operations will not eliminate the County's ongoing demand for oil and gas products. To meet demand, every barrel of oil per day that is not produced within the County must necessarily be produced elsewhere, requiring further expenses and negative environmental impacts by instead requiring the importation of oil. Additionally, reliance on foreign oil from Middle Eastern countries—and in the midst of ongoing crises in Ukraine, Gaza, and Yemen—will create national security concerns. And indeed, over the past several years, California sources of petroleum have been replaced by foreign sources, increasingly from Saudi Arabia, Iraq, and Colombia—countries that do not adhere to California's high environmental and human rights standards.[5] According to the Yale University Environmental Performance Index, in 2020 Saudi Arabia and Iraq ranked in the lower half of all countries for environmental protection, far below U.S. levels,[6] and both countries ranked in the bottom 25 percent on the Freedom House index of political and civil rights in 2020.[7]

The County also fails to analyze the potentially significant environmental effects to air quality, aesthetics, traffic, odor, and noise that may be caused by the accelerated rate of abandonment activities as a result of the proposed amendment.

The County is also required to analyze reasonably foreseeable indirect impacts under CEQA, which extends to the adoption of lead agency ordinances that result in changes to land use patterns. CEQA review is necessary to assess the potential impacts that may result from the development of the sites as they are abandoned. If a direct change in the physical environment will cause another change in the environment, the secondary effect must be evaluated as an indirect effect of the project. (CEQA Guidelines, § 15064(d).) The impact analysis must consider the potential for growth-inducing impacts, including increases in population growth and construction that may result from discontinuing and removing legally established oil wells and production facilities. (CEQA Guidelines § 15126(d), 15126.2(d).) The County fails entirely to consider these impacts.

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[5] California Energy Commission, *Oil Supply Sources To California Refineries*, available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries; see, e.g. California Energy Commission, *Foreign Sources of Crude Oil Imports to California 2018*, available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/foreign-sources-crude-oil-imports; U.S. Energy Information Administration, *California State Energy Profile*, available at https://www.eia.gov/state/print.php?sid=CA.

[6] Environmental Performance Index, "2020 EPI Results," Yale Univ., available at https://epi.yale.edu/epi-results/2020/component/epi.

[7] Freedom House, *Global Freedom Scores,* available at https://freedomhouse.org/countries/freedom-world/scores.

Not to mention, the County entirely fails to address the EIR for the existing BHCSD, completed in October 2008, which analyzed the potential environmental effects associated with the operation of the Inglewood Oil Field and continued drilling of new wells over the next 20 years. In addition to the other potentially significant impacts described above, the EIR recognized, in relevant part, the increased GHG emissions associated with the importation of foreign crude oil: "The use of foreign crude oil is associated with substantial emissions associated with transportation [which] causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil." (See Final EIR for BHCSD,[8] at 4.2-42 to 4.2-45.) The Board concluded in 2008 that any "remaining unavoidable environmental effects of continuing operations at the oil field will be reduced to the extent possible by the CSD and are outweighed by social, economic and environmental benefits provided by the CSD." (10/21/2008 Motion adopting Final EIR and amending CSD, at pp. 4-5.)[9] County staff has provided no justification for ignoring this prior conclusion by the Board. The County must address the existing EIR — just as was done for the existing BHCSD — and complete the legally required CEQA process for the proposed amendment.

Ultimately, the County has a duty to thoroughly evaluate and analyze the significant impacts to mineral resources, air quality, GHG emissions, and other environmental effects under CEQA before the proposed amendment may be considered for adoption. But as it stands, the County has performed inadequate analysis regarding the direct, cumulative, and indirect impacts the proposed amendment will have on the environment. And as evidenced by the significant environmental impacts that the proposed amendment will have on the environment, the fair argument standard would require the County to prepare an Environmental Impact Report ("EIR"). (*No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68; *Friends of "B" Street v. City of Hayward* (1980) 106 Cal.App.3d 988; Cal. Pub. Res. Code §§ 21080(c)-(d), and 21100(a); CEQA Guidelines § 15064(f)(1).) "Given the statute's text, and its purpose of informing the public about potential environmental consequences, it is quite clear that an EIR is required even if the project's ultimate effect on the environment is far from certain." (*Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist.* (2015) 62 Cal.4th 369, 382-83.) And, in addition, because the County is faced with the fair arguments raised herein and by other public comments that the proposed amendment may have a significant effect on the environment, the County is required to prepare an EIR. (*Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1104; CEQA Guidelines § 15064(f)(1).) Since the County has not done so, it has not completed the CEQA process and may not approve or adopt the proposed amendment.

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[8] https://inglewoodoilfield.com/wp-content/uploads/2017/10/baldwin_hills_community_standards_district_final_eir-.pdf

[9] https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

V. The County Improperly Relies on Exemptions to Sidestep the CEQA Process

The County has failed to conduct any CEQA review at all, improperly relying on the proposition that the proposed amendment fits within several exemptions to CEQA. In doing so, the County fails to provide sufficient evidence for its assertions. The County's determination that the proposed amendment fits within the CEQA exemptions will only be upheld if supported by substantial evidence. (*North Coast Rivers Alliance v. Westlands Water Dist.* (2014) 227 Cal. App. 4th 832, 852.) The proposed amendment and the County's Staff Report fail to provide necessary evidence to qualify for a CEQA exemption. No MND was prepared, and further no amortization study has been conducted. Instead, the County only provides conclusory statements regarding potential impacts, which are insufficient to support the exemptions claimed. Additionally, the proposed amendment does not qualify for any of the purported CEQA exemptions.

First, the proposed amendment does not fall within the "common sense exemption" under sections 15061(b)(2)-(3). The reduction in the ability to conduct local oil production within the County can and will have a material effect on the availability of mineral resources within the County and, consequently, GHG emissions due to the increased demand for foreign oil and the transport of foreign oil to the County. And importantly, CEQA recognizes that limitations in the access of mineral resources creates a significant environmental impact. Further, the County has not properly evaluated the impacts to air quality that well abandonment and well plugging may have on the environment. As the proposed amendment works to limit the ability to access oil and gas within the County, which constitute a "known mineral resource that would be of value to the region and the residents of the state," the loss of such creates a significant environmental impact. (*See* State CEQA Guidelines, Appendix G, section XII(a).) Therefore, the County cannot accurately state that the proposed amendment does not have any potential for causing significant environmental impacts, and a proper study is required under CEQA.

Second, the "existing facilities exemption" (Class 1) under section 15301 does not apply. Substantial evidence does not support application of this exemption. The proposed amendment necessarily involves significant changes to existing facilities because it requires their removal, thereby catalyzing further, foreseeable environmental consequences.

Third, the Class 8 exemption under section 15308 for actions by regulatory agencies for the protection of the environment is similarly inapplicable. That exemption only applies to "actions taken by regulatory agencies, as authorized by state or local amendment, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." The County is a legislative body—not a regulatory agency—and thus the exemption cannot apply.

Additionally, the Class 8 exemption does not apply to agency actions that improve one element of the environment but have significant effects on another. (*Dunn-Edwards Corp. v. Bay Area Air Quality Management District* (1992) 9 Cal.App.4th 644.) The County cannot simply "circumvent CEQA merely by characterizing its ordinance[] as environmentally friendly and therefore exempt" under a Class 8 exemption. (*Save the Plastic Bag Coalition v. County of Marin* (2013) 218 Cal.App.4th 209, 219-220.) Substantial evidence indicates the proposed amendment would have significant, adverse impacts to the County's mineral resources, air quality, and GHG emissions.

Finally, the Class 8 exemption is inapplicable to projects that result in cumulative impacts. (*San Lorenzo Valley Community Advocate for Responsible Education v. San Lorenzo Unified School District* (2006) 139 Cal.App.4th 1356, 1381.) The proposed amendment would result in cumulative environmental impacts from the many other restrictions on oil and gas operations concurrently being adopted, including by the City of Los Angeles and the increased setback provisions adopted by SB 1137.

Regardless, none of the CEQA exemptions apply because the "unusual circumstances exception" under section 15300.2(c) bars reliance upon any exemption located within sections 15301 through 15333. An unusual circumstance refers to "some feature of the project that distinguishes it from others in the exempt class." (*San Lorenzo Valley Community Advocate for Responsible Education v. San Lorenzo Unified School District* (2006) 139 Cal.App.4th 1356, 1381.) The proposed amendment presents "unusual circumstances" for several reasons. The proposed amendment does not impose procedures for the protection of the environment, but instead imposes an arbitrary and economically unsupportable amortization period to unlawfully eviscerate property rights. Further, the unusual circumstances exception applies when evidence demonstrates a project will have a significant impact on the environment. (*World Business Academy v. Cal. State Lands Commission* (2018) 24 Cal.App.5th 476, 499.) The proposed amendment will clearly have a significant impact on the environment. The loss of availability of known mineral resources that would be of value to the region and the residents of the state constitutes a significant impact on the environment under State CEQA Guidelines. (CEQA Guidelines, Appendix G, section XII(a).) State CEQA Guidelines, Appendix G, section XII(b) similarly finds a resulting significant environmental impact from "the loss of availability of a locally-important mineral resource recovery site delineated on a local general, specific plan or other land use plan[.]" In both respects, the proposed amendment creates a significant environmental impact, which distinguishes the proposed amendment from other ordinances covered under these CEQA exemptions.

VI. <u>The County Engaged in Improper Piecemealing under CEQA</u>

The County has failed to designate land uses for the area to replace oil and gas land uses that the proposed amendment seeks to eliminate, which constitutes improper piecemealing under CEQA. CEQA defines "project" as the "whole of an action" (CEQA

Guidelines, § 15378) and "forbids piecemeal review of the significant environmental impacts of a project." (*Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal. App. 4th 1209, 1222, citations omitted.) "Environmental considerations may not be submerged by chopping a single CEQA project into smaller parts for piecemeal assessment." (*Nelson v. County of Kern* (2010) 190 Cal.App.4th 252, 271.) Moreover, when the activity involves a regulation, "the whole of activity constituting the 'project' includes the enactment, implementation and enforcement of the regulation." (*POET, LLC v. State Air Resources Bd.* ("*Poet II*") (2017) 12 Cal.App.5th 52.) The test for determining which acts are part of the whole is whether the acts in question are "related to each other." Actions can be "related in (1) time, (2) physical location and (3) the entity undertaking the action." (*Id.*, *at* p. 74 [quoting *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1227].) Another relevant factor is "how closely related the acts were to the overall objective of the project…The relationship between the particular act and the remainder of the project is sufficiently close when the proposed physical act is among the various steps which taken together obtain an objective." (*Poet II*, *supra*, at p. 75 [citing *Tuolumne County Citizens, supra*, at p. 1226], internal quotation marks omitted.)

Here, the entire activity before the County is the phasing-out of oil operations within the BHCSD area, but the County only analyzes a portion of that project in its Staff Report. The phasing-out of oil operations would necessarily include the designation of land uses to replace the oil and gas land uses prohibited by the proposed amendment. The designation achieves the same overall objective of eliminating oil and gas land uses within the BHCSD, would be adopted by the same entity, covers the same geographical matter, addresses the same subject matter, and is temporally connected to the proposed amendment, thereby making it "related to" the proposed amendment. It is also a reasonably foreseeable consequence of the proposed amendment and indeed "part of a single, coordinated effort" by the County to phase out all oil and gas operations in the BHCSD. (*Poet II¸supra*, at p. 75.) Thus, the County must designate such land uses and analyze them in the EIR that the County is legally required to complete, as discussed in Sections IV and V above.

VII. <u>The Proposed Amendment Is Inconsistent with the General Plan</u>

In contrast to the existing BHCSD, which is consistent with the County's General Plan as analyzed in its EIR and related Staff Report (see 2008 BHCSD EIR at 4.8.5; July 24, 2008 RPC Staff Report at pp. 15-16), the County has failed to demonstrate how the proposed amendment is compatible and consistent with the General Plan. Instead, the Staff Report simply states in a conclusory manner that "[t]he Amendment is consistent with and supportive of the goals, policies, and principles of the General Plan," listing Land Use Policies 7.1, 7.8, 9.1, and 9.4—none of which specifically pertain to oil and gas. (Staff

Report at pp. 3-4.) The County, however, has not shown how the proposed amendment is consistent with other relevant goals, policies, and principles of the General Plan.

For example, the General Plan's Land Use Element states:

> The General Plan encourages the protection of major facilities, such as landfills, solid waste disposal sites, energy facilities, natural gas storage facilities, oil and gas production and processing facilities, military installations, and airports from the encroachment of incompatible uses.

(General Plan Land Use Element, p. 74.)[10] Similarly, the General Plan's Conservation and Natural Resources Element states:

> The General Plan protects Mineral Resources, as well as the conservation and production of these resources, by encouraging compatible land uses in surrounding and adjacent areas.

(General Plan Conservation and Natural Resources Element, pp. 155-156 & Figure 9.6.)[11]

As such, Land Use Policy 7.5 states:

> Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.

(General Plan Land Use Element, p. 87.) The General Plan also includes a map of Mineral Resources Zones (Figure 9.6),[12] which depicts oil and gas resources, including the Inglewood Oil Field. None of these General Plan provisions, though directly related to oil and gas uses, have been addressed by the County.

VIII. <u>The Proposed Amendment Violates Due Process and Equal Protection Under the U.S. and California Constitutions</u>

The U.S. and California Constitution guarantee equal protection of the laws and adequate due process. These rights also apply in the land use context. (Cal. Const., Art. 1, § 7(a); U.S. Const. amend V, XIV; *College Area Renters & Landlord Ass'n v. City of San Diego* (1996) 43 Cal.App.4th 677, 686.) Substantive due process addresses improper governmental

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[10] https://planning.lacounty.gov/wp-content/uploads/2022/11/6.0_gp_final-general-plan-ch6.pdf.

[11] https://planning.lacounty.gov/wp-content/uploads/2022/11/9.0_gp_final-general-plan-ch9.pdf

[12] https://planning.lacounty.gov/wp-content/uploads/2022/11/9.1_Chapter9_Figures.pdf

interference with property rights and irrational actions by government decision-makers. (*Lingle v. Chevron U.S.A. Inc.* (2005) 544 U.S. 528, 541; *Arnel Development Co. v. City of Costa Mesa* (1981) 126 Cal.App.3d 330, 337.)

Adoption of the proposed amendment would violate Sentinel's due process rights under article I, section 7 of the California Constitution and the Due Process Clause of the Fourteenth Amendment to the U.S. Constitution. There is no legitimate interest in terminating oil and gas operations in the BHCSD, nor is there any legitimate interest in eliminating an industry that is already regulated, permitted by various government entities, and contributes to the local economy. The proposed amendment would also interfere with Sentinel's vested rights to complete the development and production of oil and gas resources within the BHCSD, pursuant to Sentinel's current and historic operations prior to the establishment of the BHCSD. There are substantive due process requirements that vested rights cannot be terminated or impaired by ordinary police power regulations and can be revoked or impaired only to serve a "compelling state interest," such as harm, danger, or menace to public health and safety or public nuisance. The government's interference with vested rights must be narrowly tailored to address the compelling interest and its magnitude. The County, however, has not identified any compelling state interest to justify terminating or impairing Sentinel's vested rights, nor are there any. Moreover, the County has not followed the necessary procedures to demonstrate that oil and gas production in the BHCSD results in any environmental, health, or safety hazards. Further, the County exempts certain other oil and gas uses without any explanation for those exemptions.

IX. The Proposed Amendment Would Constitute a Taking of Vested Rights in Violation of the U.S. and California Constitutions

The U.S. and California Constitutions provide that private property shall not be taken without just compensation. (U.S. Const. amend. V; Cal. Const., Art. 1, § 19.) These constitutional protections apply to regulatory takings. (*Lucas v. S.C. Coastal Council* (1992) 505 U.S. 1003, 1014.) "The right to remove oil and gas from the ground is a property right." (*Maples v. Kern Cty. Assessment Appeals Bd.* (2002) 103 Cal.App.4th 172, 186.) Moreover, a land use regulation constitutes to a facial taking of property when it "denies an owner economically viable use of his land" (*id.* at 1016, citations omitted), and the implementation of the proposed amendment strips a property owner of "substantial economic use" of their affected property. (*See Maritrans Inc. v. U.S.* (2003) 342 F.3d 1344, 1351-52.)

Sentinel has vested property rights to develop and produce oil and gas resources, consistent with its historical use and its ownership in mineral rights and right to conduct its operations in the BHCSD. There are many years of oil and minerals yet to be extracted from Sentinel's mineral rights and leases, and Sentinel's reasonable, investment-backed expectation was that it would continue to produce and develop oil and gas until its leased assets are no longer capable of producing oil and gas in commercial quantities. The proposed amendment, however, ignores these rights, requiring abandonment of these wells. The County's proposed amendment, if implemented, serves to affect an unconstitutional taking of Sentinel's property as an owner and lessee of mineral rights and as an oil and gas operator, along with the property of other landowners and mineral rights holders in connection to Sentinel's leasehold interests.

X. The Proposed Amendment Would Interfere with Sentinel's Contractual Relations

Both the U.S. and California Constitutions prohibit the enactment of laws effecting a "substantial impairment" of contracts, which applies to public contracts as well as contracts between private parties. (*Alameda County Sheriff's Assn. v. Alameda County Employees' Retirement Assn.* (2020) 9 Cal.5th 1032, 1074.)

Sentinel has contracts with various private parties, which impose obligations on Sentinel that likely will continue beyond the date the amortization period expires, once determined. The proposed amendment will impair these contracts by forcing Sentinel to terminate its operations on or well before the amortization deadline, which will undermine Sentinel's reasonable expectations under the contracts.

XI. The County's Liability for Damages Under the Civil Rights Act

The federal Civil Rights Act, 42 U.S.C. § 1983 ("Section 1983"), provides a cause of action for damages based on claims arising from violations of federal rights. (*Sveen v. Melin* (2018) 138 U.S. 1815, 1822.) As discussed at length herein, the proposed amendment will significantly impair Sentinel's constitutional rights, including its right to just compensation, due process rights, and equal protection rights. Accordingly, if the County adopts the proposed amendment, the County and its Supervisors will place themselves at significant risk of liability under Section 1983, including for payment of damages suffered as a result of unreasonably phasing out oil and gas production within the BHCSD.

XII. Approval of the Proposed Amendment Would Not Be a Legitimate Exercise of the Police Power

The proposed amendment is arbitrary, capricious, entirely lacking in evidentiary support, and contrary to established public policy supporting the extraction of oil and gas in the County, including within the BHCSD. While the County is afforded latitude in adopting land use regulations, the County's police power is not unlimited. Land use regulations, such as the County's proposed amendment, must be "reasonable in object and not arbitrary in operation [in order to] constitute a valid exercise of that power" and reasonably related to the public welfare, which the County fails to demonstrate. (*La Mesa* *v. Tweed & Gambrell Planning Mill* (1956) 146 Cal. App. 2d 762, 768; *Associated Home Builders, Inc. v. City of Livermore* (1976) 18 Cal.3d 582.) As discussed above, the adoption of the CSD amendment would have tremendous negative impacts that have not been analyzed by the County.

Moreover, adoption of the proposed amendment will result in the loss of good-paying industry jobs, such as those for which Sentinel supplies to the County's residents through its oil and gas operations. But fatally, the County fails to forecast the probable effect of the amendment, fails to identify the competing interests involved, and fails to justify why the amendment reflects a reasonable accommodation of competing interests.

For all of these reasons, we urge the County to postpone consideration of the proposed BHCSD amendment unless and until it cures the numerous legal defects discussed herein.

Sincerely,

Nicki Carlsen

Attorney for Sentinel Peak Resources California LLC

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January 29, 2024

To: Sentinel Peak Resources California LLC

Subject: Items that May be Considered in Amortization

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1. Alvarez & Marsal has been retained by counsel on behalf of Sentinel Peak Resources California LLC in a matter related to the Inglewood oil field in Los Angeles County.

2. I have been asked by counsel to provide an illustrative list of the types of items that may be considered in an amortization calculation assuming such amortization calculation is legally permissible.

3. An amortization calculation of producing oil and gas reserves may consider, but is not limited to, the following categories of information:

   a. An understanding of the extent of the resources in the oil and gas field.

   b. An assessment of capital investment into the producing oil and gas field including:

      i. the purchase or acquisition price,

      ii. facility and maintenance capital,

      iii. recompletion or workover capital,

      iv. development capital,

      v. required remediation costs, and

      vi. required abandonment capital.

   c. Revenue derived from the production of oil and gas from the field.

d. Operating expenses associated with the production of oil and gas from the field including:

    i. fixed and variable lease operating expenses,

    ii. royalty expenses,

    iii. ad valorem taxes,

    iv. severance taxes,

    v. general and administrative costs,

    vi. income taxes, and

    vii. any other costs allocable to the production of oil and gas.

e. A reasonable rate of return.

4. Additional factors may be considered depending on the specific characteristics of the oil and gas field.

Kind Regards,

Robert Lang

Robert Lang, CFA, ABV

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Certification

Chartered Financial Analyst (CFA)

Professional History

Navigant Consulting (2010 – 2016)

UHY Advisors (2005 – 2010)

Arthur Andersen/FTI Consulting (1995-2005)

Professional Affiliations

CFA Society

CFA Society of Dallas

American Bar Association Commercial Litigation—Energy Committee

Education

Baylor University, BBA—Financial Services

For more than 25 years, Robert has been trusted by attorneys and companies to analyze complex commercial disputes and measure the financial impact of external events, operational changes, and other market factors. He has served as an expert and testified in high profile cases involving hundreds of millions of dollars and has led large investigations into complex economic and accounting issues.

Mr. Lang earned a Bachelor's of Business Administration in Finance from Baylor University. He holds the Chartered Financial Analyst (CFA) designation and is accredited by the AICPA in Business Valuation. Robert serves as a guest lecturer in the Graduate Accounting program at Baylor University, where he also serves on the Advisory Board for the Accounting and Business Law department.

Many of Robert's cases involve the measurement of value and quantifying the creation or destruction of value. He has analyzed the value of entities and assets ranging from oil & gas operations to steel mills to complex securities to the world's largest cancer tumor bank. He has performed these assignments for clients in the US, Canada, Mexico, South America, the Middle East and Asia.

Robert has assisted companies across a wide variety of industries and has a particular expertise in the energy industry, dealing with matters throughout the product life cycle. Robert has assisted oilfield services, E&P, midstream, and downstream entities with valuation issues, transaction support/analysis, business interruptions, royalty disputes and many other matters. Representative practice areas and example engagements include:

Energy Related Disputes

- Performed several calculations of damages and testified at jury trial regarding lost profits and fraud damages suffered by a supplier of materials used for construction of well pads at shale drilling sites.
- Calculated damages and provided expert testimony in a large claim on behalf of an offshore oil & gas operator in litigation over repair, rebuild, and pollution cleanup costs.
- Analyzed damages and drafted expert report on over $150mm of economic losses suffered by a refinery. Analysis included review of economic and operational issues leading to bankruptcy and determination of resulting losses.
- Assisted a major natural gas producer faced with hundreds of royalty litigation cases regarding midstream deductions. Analyzed gathering costs including review of cost of service model used to determine cost. Evaluated reasonableness of terms, including targeted rate of return, negotiated with the midstream company after producer spun it out into a separate entity. Reviewed net wellhead prices and reasonableness of all

deductions. Analyzed impact of trading operations on royalty payments.

- Assisted a major oil and gas client in developing a "net-back pricing" model for litigation that tracked the delivery of and payment for product originating in 4,000 wells and covering five pricing pools over seven years.

- Conducted royalty audits and performed numerous damage calculations in royalty disputes on behalf of major oil and gas clients.

- Calculated damages and drafted expert report to determine the lost profits suffered by a refinery as a result of contractor negligence and the resulting inability to produce cyclohexane and paraxylene. Analysis included an estimation of "but for" market prices in the absence of the supply shock.

- Calculated lost profits and performed valuations in a dispute between a major oil and gas company and numerous franchised service stations.

- Assisted oilfield services company with complex database analysis to identify and characterize competing sales in an anti-trust matter.

- Assisted a litigation trust with financial advisory and litigation related to the bankruptcy of a coal producer. Reconstructed the accounting environment of the bankrupt entity, analyzed more than 50 entities and thousands of related party transactions, performed solvency and valuation analysis, and calculated damages.

- Calculated contract damages in a pricing dispute between a Marcellus natural gas fracking operator and an oilfield services company.

- Analyzed project economics and calculated damages on behalf of an oil field services company involved in converting natural gas into clean diesel. Analyzed the impact of several interruptions on the project.

Valuation, Forensic Accounting, and Commercial Damages

- Testified as an expert regarding lost profits and lost value suffered by a hedge fund due to alleged errors made by a drilling operator in E&P operations in the Monterrey Shale.

- Conducted valuation analysis and testified as an expert for a manufacturing client regarding the lost profits and value related to lost business opportunities.

- Analyzed damages and testified as an expert regarding lost business value in a dispute between former business partners of a consumer products company.

- Analyzed damages and testified as an expert regarding the lost profits and lost business value that resulted from an alleged faulty installation of Customer Relationship Management software.

- Determined loss research value suffered by an academic medical center following a tropical storm. Analyzed impact to hundreds of clinical and hospital operations and determined value of destroyed research. Testified as an expert on over $100mm of losses when claim was litigated. Judge ultimately awarded the exact damage calculation.

- Performed valuation analysis and testified in bench trial regarding the difference in standard and liquidated values.

- Calculated lost business value and provided expert opinion regarding the construction of fueling stations for a major airline.

- Analyzed financial viability for a Children's Hospital under various scenarios. Issued expert report and testified at deposition.

- Advised a large REIT and its portfolio companies on strategies to recover losses suffered due to the Covid19 pandemic.

- Established a Project Management Office (PMO) for an academic medical center to oversee the management of recovery and liquidity opportunities related to Covid19 losses. Identified and pursued recovery from numerous federal programs and identified sources of liquidity.

- Analyzing the financial impact of opioid addiction and abuse on over 1,500 county, municipal and state governments in national multi-district litigation.

- Provided expert testimony regarding lost profits alleged by an owner of a clay mining operation in Georgia. Following my rebuttal testimony in deposition, opposing side decided to not call their expert at trial.

- Calculated damages and testified regarding lost profits suffered by a warehouse equipment distributor due to an alleged breach of contract.

- Served as court-appointed auditor in an alleged real-estate investment Ponzi scheme. Traced funds, identified improper transfers, and analyzed distributions within over 100 investment and development funds.

- Performed analysis and testified at trial regarding an alleged Ponzi scheme involving 1031 exchange investments and alleged violations of the

Texas Securities Act.

- Calculated damages and investigated allegations in a healthcare quit am action.
- Analyzed lost profits suffered by a regional airline that resulted from non-performance of a software vendor that was engaged to install an ERP system.
- Developed damage analysis and drafted expert report regarding an investment fund's participation in a regional shopping mall as compared with suitable alternative investments.
- Assisted a multibillion-dollar underwriter in litigation regarding the profitability of its automotive extended-warranty business and the causes of decreasing margins.
- Quantified damages for defendant in a breach of contract suit concerning the distributorship agreement of a large athletic shoe company.
- Performed analysis of tracking data collected from a website in a class action lawsuit alleging deceptive billing practices against a dating website.

Bankruptcy Litigation and Restructuring

- Designated as an expert and performed valuation and solvency analysis in a dispute between a trustee and the previous owners of a multi-billion dollar telecommunications company.
- Calculated damages, rebutted opposing expert's calculation of lost business value, and analyzed solvency issues for a telecom company concerning a breach of contract with a developer of GPS technology who claimed the alleged breach forced bankruptcy.
- Analyzed debtors' plans for reorganization while working on behalf of creditors' committees in several bankruptcy matters.
- Advised a large manufacturer in restructuring various operations and financial structure.
- Developed damage model, refuted opposing expert's analysis, and drafted expert report for a utility industry client concerning the valuation of an acquired security alarm company and the impact of the software on the operations of the business.

- Analyzed transactions and calculated damages alleged by several municipalities against the bank that assisted in bond issuances.

Insurance and Construction Claims

- Assisted numerous clients in preparing insurance claims and negotiating settlements for business interruption and property damage totaling nearly $1 billion. Served as the National Practice Leader for the Business Insurance Claims practice of a large accounting firm. Clients have included universities, hotels, hospitals, retailers, engine manufacturer, cement plant, power plant, steel plants, retailers, grocery stores, golf clubs, and numerous other manufacturers.

General Strategic and Business Advisory

- Helped a textile manufacturer identify the causes of lagging profits, streamline operations, reduce throughput, determine which plants to close, and determine the impact to shareholder value of the recommendations.

- Assisted several start-up businesses in formulating business plans, building financial infrastructure and structuring the financing.

- Assisted several growing private companies in securing private placements of additional capital.

Excerpt of reference cited at footnote 2 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

AGN. NO._____

MOTION BY SUPERVISOR YVONNE B. BURKE **OCTOBER 21, 2008**

RELATES TO ITEM NO. 58

RE: BALDWIN HILLS COMMUNITY STANDARDS DISTRICT

The Inglewood Oil Field has been a fixture in the Baldwin Hills for more than 80 years. For much of that time, the oil field and the surrounding community coexisted in relative harmony. In recent years, however, local residents expressed concerns regarding odors, noise, vibration, and visual blight caused by the operation. In 2006, State and local agencies joined in investigating residents' complaints.

To allow time for the County to study the oil operation, the Board of Supervisors, at my urging, adopted an interim ordinance as a direct and necessary response to the residents' concerns. The initial interim ordinance placed temporary restrictions on oil productions until an environmental analysis could be performed and permanent restrictions adopted. In May of 2007, that measure was extended and amended to prohibit the drilling of new wells and the deepening of existing wells. The maximum

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ANTONOVICH	________________
BURKE	________________

two-year term of the interim ordinance expired in June, 2008. Since that time, PXP, the operator of the Inglewood Field, has voluntarily refrained from drilling any wells.

The County Department of Regional Planning determined in its study that a new zoning ordinance, called a Community Standards District or "CSD" is the most appropriate mechanism for further regulating the Inglewood Field. The new CSD will define the boundary of the field and establish permanent development standards, operating procedures, and requirements for the oil operation.

In 2006, when residents of Baldwin Hills, Culver City and others called for additional environmental information to guide development of the CSD, PXP agreed to submit an application for formation of a CSD, thereby making PXP responsible for funding the environmental review, and PXP agreed to fund an Environmental Impact Report (EIR). The County selected an environmental consultant with significant experience and knowledge of oil production to prepare the EIR, which analyzed a draft CSD prepared by PXP as well as potential impacts from oil field operations for the next 20 years, based on PXP's estimate of the maximum number of wells it would drill over that time period. The EIR is an exhaustive document and identified necessary mitigation measures to reduce impacts from such operations, and thus recommends mitigation measures beyond those set forth in PXP's proposed CSD. As a result of that EIR review process, significant changes were made by the County to the CSD ultimately resulting in the CSD recommended by the Regional Planning Commission.

This is the first-ever comprehensive environmental analysis of an established oil field conforming with County General Plan policies and zoning regulations, and marks the first time an EIR has been prepared for a CSD.

As the County developed the revised CSD, we were faced with certain limitations and constraints. Because oil operations have been ongoing at the Inglewood Field for more than 80 years, PXP has certain rights to produce the oil and gas resources at the field and new zoning regulations cannot diminish those rights.

Moreover, the State of California, through the Department of Oil, Gas and Geothermal Resources (DOGGR), has exclusive jurisdiction over subsurface oil and gas activities. Although local regulation is allowed with regard to surface activities, such as land use control and environmental protection, the County's CSD cannot conflict with those exclusive state regulations.

Finally, most of the field is not owned by PXP, but remains a collection of privately owned parcels. PXP maintains lease agreements with the owners that allow it to explore, drill, and produce oil and gas in exchange for royalty payments. Because these parcels are privately owned, the CSD cannot control their use once the oil and gas resources are exhausted.

The County, however, is a part of a Joint Powers Authority that over the last 15 years has acquired easements and fees over 600 acres in the Baldwin Hills.

Despite these limitations, I am committed to the Baldwin Hills CSD, which

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contains the most stringent oil and gas regulations in Southern California, and arguably for the state and country, for an established onshore or offshore oil field and will ensure that all oil operations are performed in the safest manner possible to protect surrounding communities. I am very proud of the fact that to date, since April, 2007, county staff and its consultants have held 18 community meetings in both large public venues and small neighborhood coffees in peoples' homes in their efforts to educate the community and receive community input to the EIR and CSD process. Therefore, to ensure this continued community input, the CSD requires the formation of a Community Advisory Panel appointed by the director of Planning comprised of members of the surrounding communities.

I THEREFORE MOVE THAT THE BOARD OF SUPERVISORS:

Close the public hearing and approve the FEIR prepared for the Baldwin Hills CSD; certify that it has reviewed and considered the environmental information contained in the FEIR; certify that the FEIR has been completed in compliance with CEQA, the CEQA Guidelines, and County CEQA Guidelines and reflects the independent judgment of the Board as to the environmental consequences of the proposed CSD; determine that the mitigation measures required by the CSD are the only mitigation measures that are feasible; determine that the remaining unavoidable environmental effects of continuing operations at the oil field will be reduced to the

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extent possible by the CSD and are outweighed by social, economic, and environmental benefits provided by the CSD, and adopt the Findings of Fact and Statement of Overriding Considerations for the CSD.

I FURTHER MOVE THAT THE BOARD OF SUPERVISORS:

Instruct the County Counsel and Regional Planning Department to prepare the following changes to the ordinance establishing the Baldwin Hills Community Standards District, and submit the revised ordinance to the Board of Supervisors for final consideration on October 28, 2008:

- Add a provision so that the number of new wells drilled during the first year shall be limited to 24.
- Add a provision, capping the total number of newly drilled wells over the next 20 years to 600 wells for an average of 30 wells per year.
- Revise the provision on the maximum number of wells that may be drilled or redrilled in one year under the Director's Review procedure to 53 wells, with a maximum of 45 for drilling new wells and the remaining wells of that annual total limited to redrilling of existing wells.
- Add a provision to prevent over-concentration in any one year of drilling activities in any one area, if located near developed areas.
- The CSD now requires Public Works to refer to DOGGR the results of

investigations by PXP which are required when complaints are made by the public or public entities about damage to their property potentially caused by subsidence and PXP concurs with that assertion. That provision should be changed to require Public Works to forward to DOGGR any concerns Public Works has about subsidence causing damage, regardless of the conclusion of the PXP report investigating subsidence damage claims. Thus, the process will be, the public submits claims of damage to PXP, which is then required to investigate those claims, prepare a report and submit that to Public Works. Public Works will analyze PXP's report. If either PXP concurs that damage was caused by Oil Field operations or if Public Works believes that damage was caused by Oil Field operations even when PXP disagrees, then Public Works will submit its concerns to DOGGR, which has jurisdiction to require PXP to take action in response to damage.

- Include the recommendation of the Department of Regional Planning regarding fines for violations of the CSD except leave in a provision that allows for time to cure the violation.

- Include a modification procedure similar to those in other CSDs. This CSD includes a number of technical requirements, many of which are not in wide use and may be untested or which may become outdated. Thus, the CSD should include a procedure to modify provisions when necessary.

- Add a provision to the CSD that requests Regional Planning to develop an

Implementation Plan for the CSD that addresses the requirements that must be included in each of the plans that are prepared by the Operator and approved by the County. The Implementation Plan shall include any specific Plan items deemed necessary by the EIR to reduce environmental impacts to less than significant in those cases where impacts can be so reduced.

- Require a uniform time frame for review of plans needed prior to new drilling. The time frame for the Director to review the Air Monitoring Plan should match the 45-day review period for the annual Drilling, Redrilling and Well Abandonment and Well Pad Restoration Plan.

- Require shut-down of operations for exceedance of hydrogen sulfide and hydrocarbon thresholds unless shut-down would create a safety hazard.

- Require the operator to conduct the initial community meeting within 180 days, instead of the current 60-day requirement. Sixty days is too soon for a report back to the community on all the important work this ordinance will require in the first year. The community deserves a full update in 180 days, when the work should be complete.

- Allow the existing gas plant flare to remain on-site as back-up if the South Coast Air Quality Management District (AQMD) determines it may stay. The CSD requires a new gas flare, estimated to cost $2 million, to mitigate vibration impacts that have been so distressing for the community. It may, however, be beneficial to keep the

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existing flare as back-up, and AQMD's review and permitting of the new flare will determine whether the existing flare can stay.

- The CSD establishes a Multiple Agency Coordination Committee (MACC) to ensure appropriate communication between the County and other agencies with regulatory oversight of the oil field. Members of the MACC will include: Regional Planning, County Fire Department, Public Works and County Department of Public Health. Also, SCAQMD, Regional Water Board, DOGGR and Culver City Fire Department will be invited to appoint a representative from their agency as a member of the MACC. The MACC process, combined with the requirement for an on-site Environmental Compliance Coordinator, will provide the strongest assurance to the County, on an ongoing basis, that the oil field complies with all local, state and federal laws, rules and regulations. This ongoing review provides the same or better oversight as the five-year third-party audit to be paid for by the Operator that was required by the Commission-recommended CSD. Thus, that audit provision should be removed from the CSD. This should not be confused with the County's periodic five-year review to assess the effectiveness of the CSD provisions.

- The CSD should allow alternatives for construction equipment engine technology that reduces the air impact emissions to less than significant. The CSD requires the installation of new technology on off-road diesel construction equipment and drill rig engines to reduce air emissions. The CSD should include a third alternative to allow for other options that would result in less than significant impacts to air quality and to allow for technological advancement.

- Implement the new conceptual landscaping plan designed by the architect of the Baldwin Hills Park Master Plan to be completed in phases over a two to five year period. The proposed well-by-well landscaping plan in the CSD currently is not the ideal approach. Instead, the operator will be required to implement the oil field screening and landscaping plan designed by the architect for the Baldwin Hills Park Master Plan.

- The CSD included in the Board packet inadvertently deleted a section on the Emergency Response Plan in the Development Standards. That section should be reinserted into the CSD.

- Include a single uniform process for reporting complaints. One new section is created to prescribe a uniform process for reporting complaints.

- DOGGR has made clear that it has the exclusive regulatory province to determine whether a well should be abandoned and also expressed concern about the provision regarding hearings on ultimate shut-down of the facility when daily production is reduced to a certain level. It is anticipated that the County will interface with DOGGR through the MACC, and will utilize authority created by the CSD to review all idle wells and report to DOGGR any wells the County believes may meet DOGGR's criteria for abandonment. The well abandonment provision of the CSD was modified at the Commission level. The provision regarding consideration of facility shutdown when production decreases to a certain level should be changed to require a hearing when output has been reduced to 630 barrels per day, rather than 2,000 barrels per day, to address DOGGR's concerns.

- Add to the Review Requirements in the Periodic Review section of the CSD to include, at the option of the County, a public survey on various "quality of life" issues similar to the survey my office is funding.

- Eliminate redundant requirements for equipment storage. The oil field will be required to comply with County Code requirements for outdoor storage, which were restated in the CSD.

- Require public review of Auditor-Controller reports. The CSD should include a provision that the County Auditor-Controller makes available its reports concerning the administration of draw-down accounts established to implement and enforce the ordinance.

# # # # #

(YBB:MSB:ec PXP CSD MOT 102108)

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.energyindependenceca.com/what-is-an-energy-island/

What is an Energy Island?

California is an Energy Island

A combination of geographical factors and public policy choices has led to California becoming an energy island — we are disconnected from the other lower-48 states and therefore unable to secure additional domestic crude oil sources to support our energy needs of fueling transportation, powering businesses, growing food and producing everyday products.

Unique challenges exist that create this dynamic including lack of pipeline infrastructure and little public support for oil by rail or truck. Of course, California is not an actual island, and it is blessed with abundant natural resources, but the policies it has adopted are forcing Californians to rely more and more on distant energy sources to meet our needs.

Currently, California imports more than 70% of its crude oil supplies, most of it from foreign sources. If California continues on this trajectory, it would be choosing even greater dependence on foreign oil which threatens reliability, sustainability and affordability for California's diverse communities. Instead, California's leaders can protect working families, consumers and our global environment by promoting in-state production under the world's most stringent safety, labor, and environmental standards.

Why Domestic Supplies Cannot Replace California Production

CALIFORNIA IS EXTREMELY LIMITED IN ITS ABILITY TO IMPORT CRUDE OIL FROM THE REST OF THE NATION: Within the 48 contiguous states, pipeline infrastructure, rail and truck transportation are the constraining factors. With Alaska, other existing commitments limit opportunities to increase supplies.

PIPELINE INFRASTRUCTURE: No crude oil pipelines exist from other states. Regulatory approvals make this an untenable option.

ALASKA: Alaska has been a declining source. While there has been an increase in investment that may counter that trend, it will not be enough to offset California's current production levels in the foreseeable future.

RAIL AND TRUCK TRANSPORTATION: Limited crude oil is transported by rail. Rail transport is extremely expensive, highly controversial, and would require an increase of 243,000 rail cars to meet current demands. Truck transport is unfeasible due to limited capacity.

If we want a domestic supply, we need to produce it here in California

WHAT'S AT RISK FROM CALIFORNIA'S DEPENDENCE ON FOREIGN CRUDE OIL: Reliance on foreign energy imports create risks including reliability of our energy supply, market volatility, international turmoil, global environmental quality, and increased global air emissions.

RELIABILITY AND AFFORDABILITY: Volatile Markets Volatility exists within the global oil market due to geo-political and economic reasons. This includes: unforeseen circumstances, new costly investments, needs of other foreign countries like China, India and Europe, and trade wars

Strait of Hormuz A blockage of the Strait of Hormuz, the only sea passage from the Persian Gulf, is possible due to regional skirmishes. One-third of the world's sea-borne oil passes through it every day.Unstable Foreign Countries Foreign countries may limit or shut off supplies due to embargoes or other means.

WORKER SAFETY AND ENVIRONMENTAL PROTECTIONS: Imported oil is not produced to California's stringent safety, labor, and environmental standards.

CONTROL AND SECURITY: What's our risk level for control? Is California okay handing over control of our energy needs to a remote source and putting our energy security at risk?

OUR COMMITMENT: Our industry is an active partner in helping California set an example to other states and other countries by producing the affordable, reliable energy we need in a way that safeguards public health, safety, and the environment. We share the state's commitment to a vibrant economic, energy and environmental future that strengthens California's working families, local employers, diverse communities and abiding values.

Sources:
"Sources of Crude Oil Imports to California, 2017." California Energy Commission. https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_foreign_crude_sources.html (https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_foreign_crude_sources.html)
"Oil Imports by Rail, 2017," California Energy Commission,

https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_crude_by_rail.html (https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_crude_by_rail.html)
U.S. Energy Information Administration, October 13, 2015. https://www.eia.gov/todayinenergy/detail.php?id=23312 (https://www.eia.gov/todayinenergy/detail.php?id=23312)

WHY CALIFORNIA IS AN ENERGY ISLAND AND HOW THAT IMPACTS OUR STATE

WHAT'S AN ENERGY ISLAND?

A combination of geographical factors and public policy choices has led to California becoming an energy island -- we are disconnected from the other lower-48 states and therefore unable to secure additional domestic crude oil sources to support our energy needs of fueling transportation, powering businesses, growing food and producing everyday products. Unique challenges exist that create this dynamic including lack of pipeline infrastructure and little public support for oil by rail or truck. Of course, California is not an actual island, and it is blessed with abundant natural resources, but the policies it has adopted are forcing Californians to rely more and more on distant energy sources to meet our needs. Currently, California imports more than 70% of its crude oil supplies, most of it from foreign sources.

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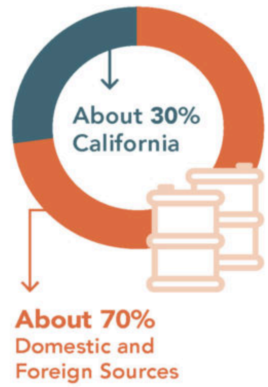

WHY DOMESTIC SUPPLIES CANNOT REPLACE CALIFORNIA PRODUCTION

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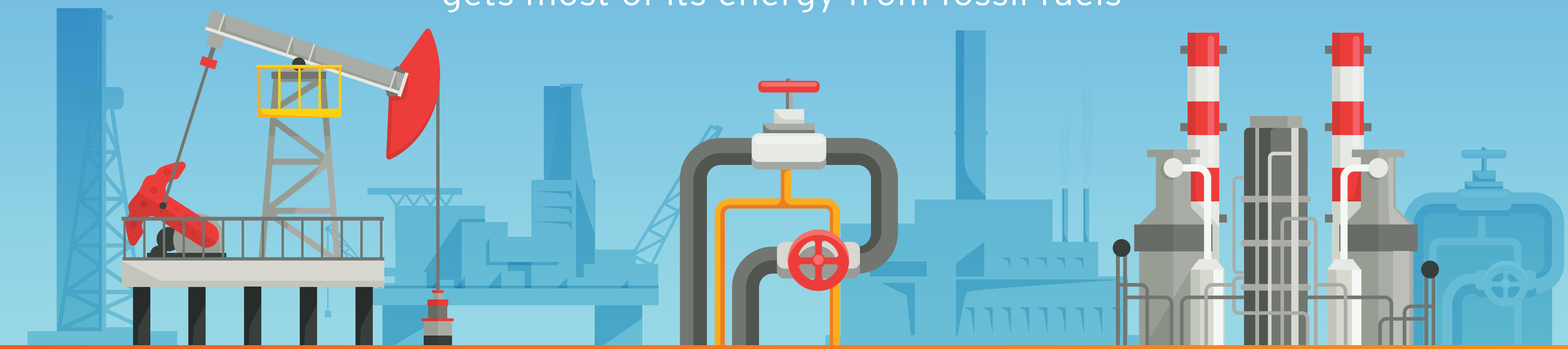
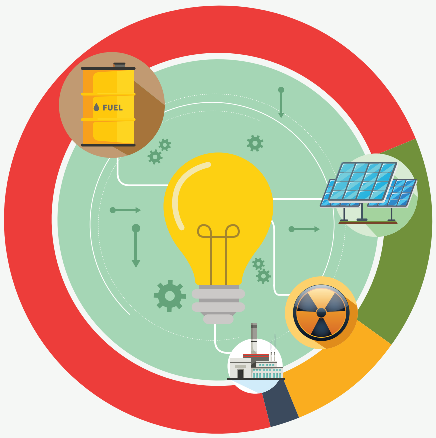
Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://kernedc.com/wp-content/uploads/2021/08/Kern-EDC-CA-Oil-Imports-Fact-Sheet.pdf

WHERE CALIFORNIA GETS ITS ENERGY

California is the world's 5th-largest economy and gets most of its energy from fossil fuels





73% Fossil Fuel

16% Renewables

9% Other

2% Nuclear

U.S. Energy Information Administration

California Oil Production

463,000 BBL /day

California Oil Usage

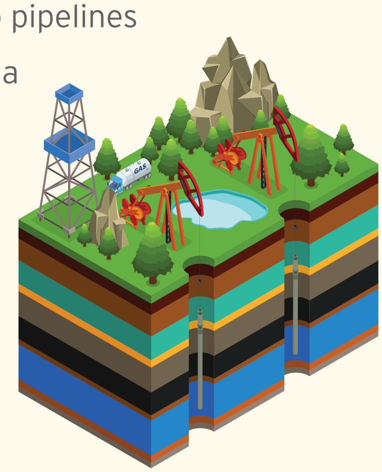
1,800,000 BBL /day

California Energy Commission

California uses almost **4x** more oil than it produces and accounts for 55% of net energy imports for the entire United States

CALIFORNIA, THE "ENERGY ISLAND"

There are currently no pipelines to bring oil to California from any other part of the United States. California must rely on imported oil to make up the difference



CALIFORNIA'S **TOP 5** *FOREIGN OIL SOURCES (2019)*

- *Saudi Arabia* **87,601,000 BBL**
- *Ecuador* **62,370,000 BBL**
- *Iraq* **58,730,000 BBL**
- *Colombia* **32,814,000 BBL**
- *Nigeria* **19,528,000 BBL**

California Energy Commission

WHY IT MATTERS

LESS ACCOUNTABILITY

Oil exporting countries do not adhere to California's safety, labor, human rights, and environmental standards

ENVIRONMENT HEALTH INDEX

U.S.	82.8
COLOMBIA	51.6
ECUADOR	50.2
SAUDI ARABIA	47.5
IRAQ	39.5
NIGERIA	31

Yale University

GLOBAL FREEDOM SCORES

U.S.	85
ECUADOR	67
COLOMBIA	65
NIGERIA	45
IRAQ	29
SAUDI ARABIA	7

Freedom House

HIGHER COSTS

Imported foreign oil costs Californians over

$25 BILLION

a year and is less reliable and less sustainable

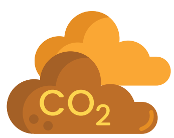
Capitol Matrix Consulting

NEGATIVE ENVIRONMENTAL IMPACT

THE LARGEST OIL TANKERS BURN NEARLY **4 TONS** OF FUEL EVERY DAY THEY ARE ANCHORED

International Council on Clean Transportation

EACH SHIP EMITS **11+ TONS** OF CARBON DIOXIDE PER DAY

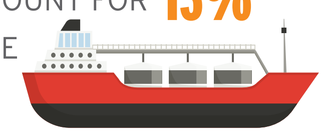


International Council on Clean Transportation

A FOREIGN OIL TANKER TRAVELS AN ESTIMATED **8,865 MILES** AND AVERAGES **0.004 MILES PER GALLON** TO CALIFORNIA'S PORTS

Energy & Infrastructure of PTS Advance

OIL TANKERS ACCOUNT FOR **13%** OF WORLD MARINE CO2 EMISSIONS



International Council on Clean Transportation

KERNEDC
ECONOMIC DEVELOPMENT CORPORATION

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://californiapolicycenter.org/reality-check-half-of-californias-energy-comes-from-crude-oil/

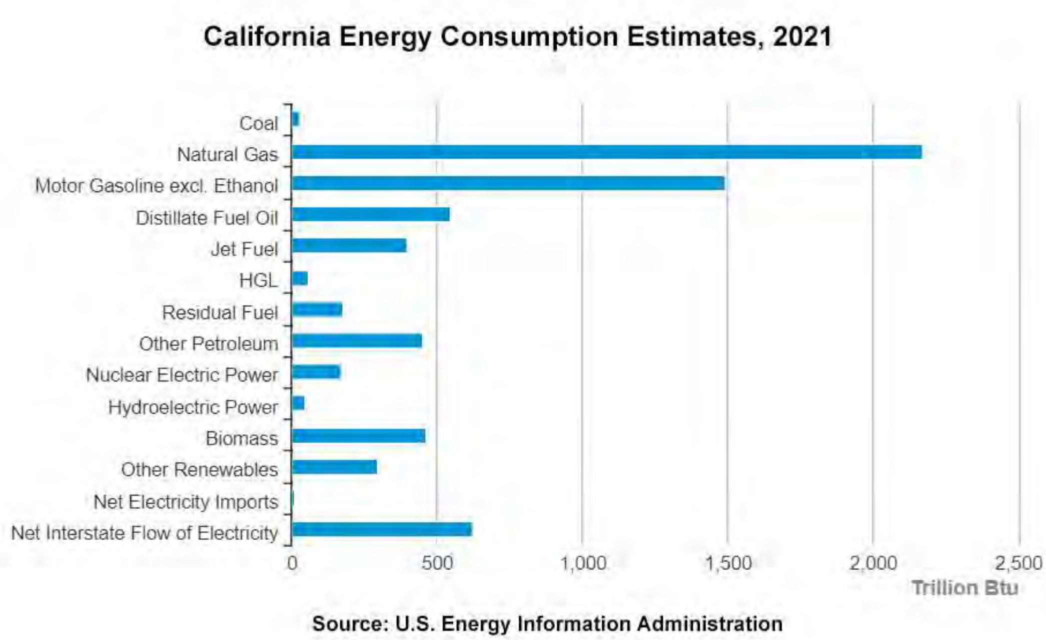
by **Edward Ring**

January 26, 2024

Despite Spending Billions on Climate-Change Initiatives, 84 Percent of California's Energy Still Comes from Fossil Fuels

Here's a reality check that ought to keep politicians up at night in California. Despite being a sunny, solar-friendly state, with ample areas **blessed with high wind**, California still derives 50 percent of its total energy from crude oil. Another 34 percent comes from natural gas. This fossil fuel total for California energy, 84 percent, actually exceeds the **world average for 2022**, which — including coal — came in at 82 percent.

These figures come from the U.S. Energy Information Administration report "**California Energy Consumption Estimates – Consumption by Source**" for 2021, which is the most recent year for which data is posted. This data is verified by another EIA report, produced in conjunction with Lawrence Livermore National Laboratory, "**California Energy Consumption in 2021**."

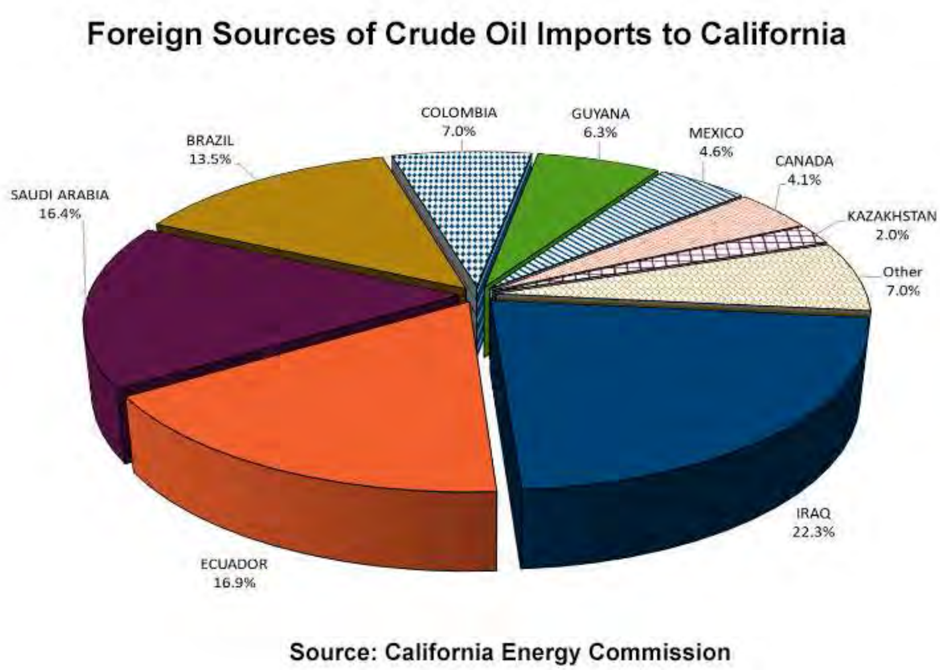


So from two authoritative sources we get the same result: half the fuel Californians rely on to power their civilization comes from crude oil. And yet California's state legislature has declared war on oil, along with natural gas. And here, it gets even more interesting.

Also relying on EIA statistics, but turning to a chart featured in "California Energy Production Estimates, 2021," it is possible to determine how much oil and natural gas is produced in-state. The numbers are shocking.

Californians import 93 percent of their natural gas, and 76 percent of their crude oil.

Another chart, "Foreign Sources of Crude Oil Imports to California," courtesy of the California Energy Commission, shows where it comes from: Iraq 22.3%, Ecuador 16.9%, Saudi Arabia 16.4%, Brazil 13.5%, Colombia 7%, Guyana 6.3%, Mexico 4.6%, Canada 4.1%, faraway Kazakhstan 2.0%, and assorted other nations, another 7 percent.



Since half of California's energy comes from oil, it's easy to quantify the impact if problems arise with the supply from any of these nations. More to the point, why aren't we drilling here in California?

Won't our drilling practices be more environmentally responsible? And won't it benefit the environment to not have dozens of oil tankers perpetually belching bunker fuel exhaust off the coast of Long Beach, and that only after they've belched their way across the Pacific

Ocean? Even if Californians cut consumption of oil by 50 percent, we would still have to more than double our production of in-state oil before we'd eliminate imported oil.

Instead of recognizing that renewable energy technologies are not ready to pick up the slack, the state legislature has taken further steps to end oil production in California. SB 1137, signed by Governor Newsom in 2022, creates "health protection zones" within 3,200 feet of any "sensitive receptor," i.e., any establishment open to the public or any residence.

The practical impact of SB 1137 will not only be to ban most future drilling, but also impose restrictions (and invite lawsuits) that will compel the shutdowns of existing wells. Fighting for its life, and in the interests of all working Californians, the industry has qualified a referendum on SB 1137 that will be on the state ballot this November.

The big alleged problem? The unhealthy air quality caused by methane leaks from these wells. But methane is lighter than air, meaning whatever minor leakage may occur at any of California's strictly monitored wells will quickly dissipate upwards. Perhaps we may fulminate over the supposed climate impact of releasing methane into our atmosphere. But exporting that problem to other nations where wells will be even more prone to methane leakage is not a moral choice. It just kills good jobs right here in California.

California consumes 1.8 million barrels of oil per day, but only produces 463,000 barrels per day. In 1986, its production peak, California produced 1.1 million barrels per day.

The state did not run out of oil and gas reserves. The industry ran into the regulators.

What California's policymakers have not come to terms with is the fact that we are importing nearly everything relating to energy production in California. Not just crude oil and natural gas, but wind turbines and blades, photovoltaic panels, and batteries.

How is this considered sustainable? We have created a regulatory environment in California where it is nearly impossible to dig, drill, develop, mine, log, graze, grow, or manufacture anything.

Governor Newsom needs to face the reality that fossil fuel is going to be an integral part of California's energy landscape for decades to come, and that he is obligated to preserve the quality of life it enables. Newsom needs to work with energy producers, water agencies, and farming interests to formulate a new agenda for the state that puts people first.

Edward Ring is a senior fellow with the California Policy Center, which he co-founded in 2013. Ring is the author of *Fixing California: Abundance, Pragmatism, Optimism (2021)* and *The Abundance Choice: Our Fight for More Water in California (2022)*.

by **John Moorlach**

January 25, 2024

Newsom's Missed Opportunity on California's Annual Budgets

During my business career as a Certified Public Accountant and Certified Financial Planner, I also served on a credit counseling nonprofit board and advised those who were deep in debt on a plan toward becoming fiscally sound again.

During a good financial year, these individuals needed to dramatically reduce their existing debts. The unexpected bonus should go toward their high credit card balances. This reduces their monthly payments in the months ahead and makes staying within personal budgets more manageable.

This brings me to California. Sacramento has enjoyed some fiscally remarkable years during Gov. Gavin Newsom's tenure, but he failed to dramatically reduce the state's massive liabilities. According to the last audited financial statement the State Controller's office has released, the Golden State's balance sheet is upside down to the tune of $174 billion. And the recent bonus years were wasted.

The massive debt load started in 1999, with the passage of Senate Bill 400, which changed the pension formula for California Highway Patrol officers from 2 percent of final salary multiplied

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.eia.gov/state/?sid=CA#tabs-1

U.S. Energy Information Administration

Skip to sub-navigation

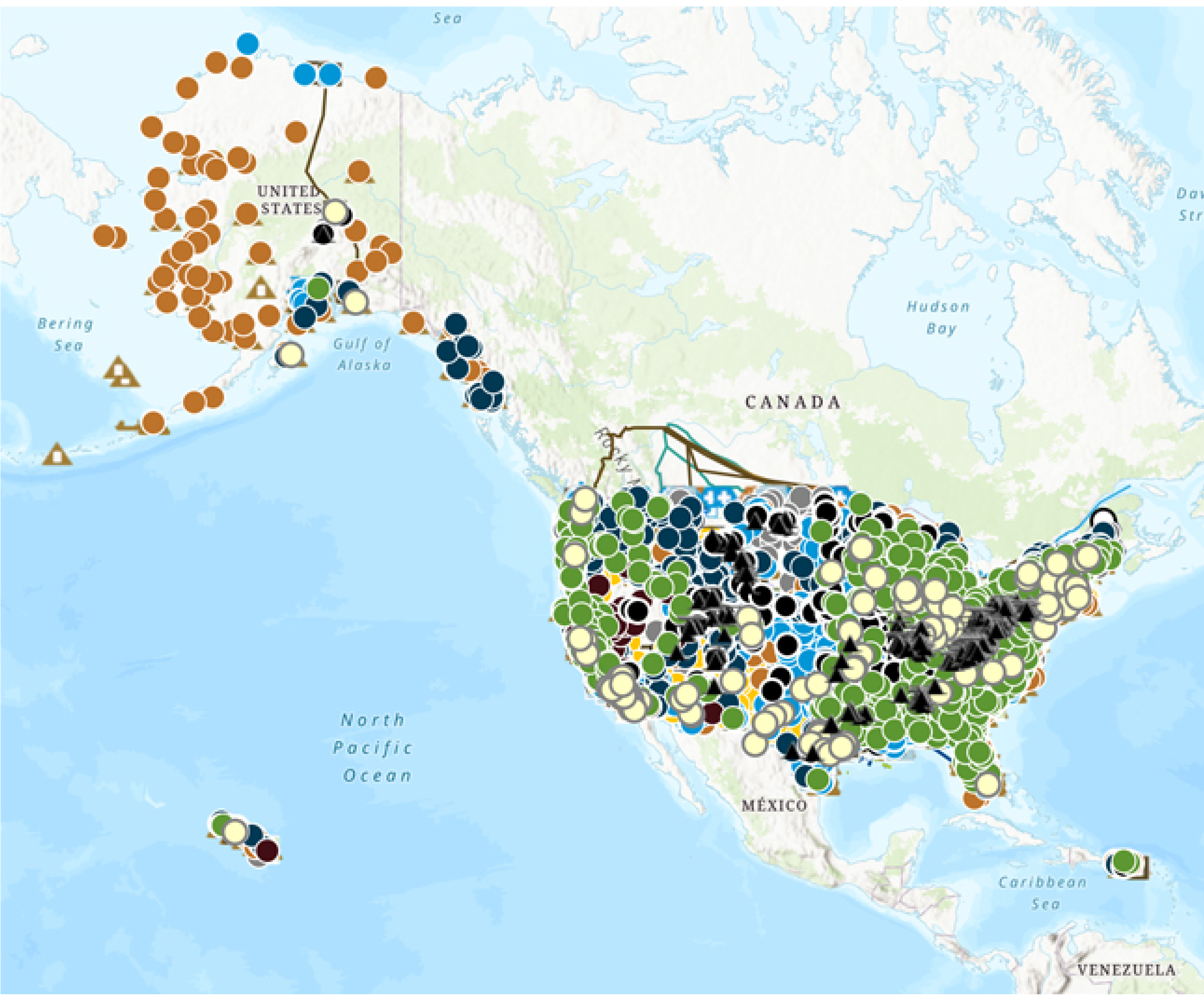
California 

State Profile and Energy Estimates

Changes to the State Energy Data System (SEDS) Notice: In October 2023, we updated the way we calculate primary energy consumption of electricity generation from noncombustible renewable energy sources (solar, wind, hydroelectric, and geothermal). Visit our Changes to 1960—2022 conversion factor for renewable energy page to learn more.

Profile Overview

U.S Energy Atlas with total energy layers



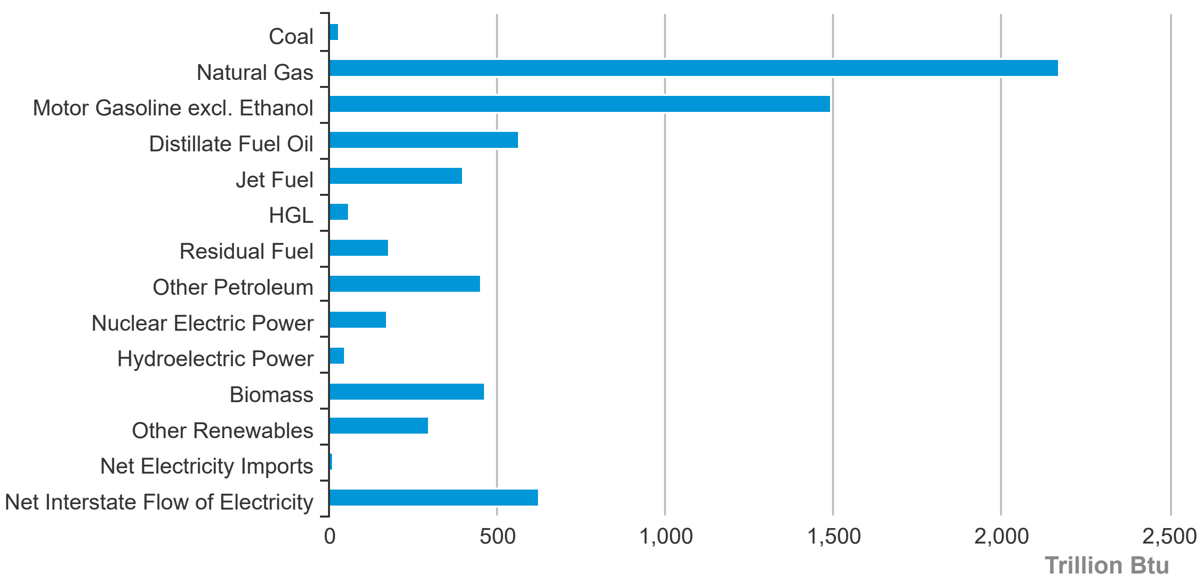
View the interactive map

Quick Facts

- In 2022, California was the seventh-largest producer of crude oil among the 50 states, and, as of January 2022, the state ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states.
- In 2020, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than in all but three other states.
- In 2022, renewable resources, including hydroelectric power and small-scale, customer-sited solar power, accounted for 49% of California's in-state electricity generation. Natural gas fueled another 42%. Nuclear power supplied almost all the rest.
- In 2022, California was the fourth-largest electricity producer in the nation. The state was also the nation's third-largest electricity consumer, and additional needed electricity supplies came from out-of-state generators.

Last Updated: April 20, 2023

California Energy Consumption Estimates, 2021



Source: Energy Information Administration, State Energy Data System

Excerpt of reference cited at footnote 4 to Alston & Bird's January 29, 2024 Letter

Full version available at https://clkrep.lacity.org/onlinedocs/2017/17-0447_rpt_BPW_07-29-2019.pdf

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

OFFICE OF THE
BOARD OF PUBLIC WORKS

FERNANDO CAMPOS
EXECUTIVE OFFICER

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http://bpw.lacity.org

July 29, 2019

Honorable Herb J. Wesson, Jr., Los Angeles City President
Honorable Gilbert Cedillo, Los Angeles City Councilmember
Honorable Nury Martinez, Los Angeles City Councilmember
Honorable Paul Koretz, Los Angeles City Councilmember
Honorable Mike Bonin, Los Angeles City Councilmember
Honorable Marqueece Harris-Dawson, Los Angeles City Councilmember
Honorable Jose Huizar, Los Angeles City Councilmember
Honorable David Ryu, Chair - Health, Mental Health, and Education Committee
Honorable Mitch O'Farrell, Member - Health, Mental Health, and Education Committee
Honorable Curren Price, Member - Health, Mental Health, and Education Committee

FROM: Uduak-Joe Ntuk, Petroleum Administrator
Office of Petroleum and Natural Gas Administration & Safety

SUBJECT: COUNCIL FILE NO 17-0447 – FEASIBILITY OF AMENDING CURRENT CITY LAND USE CODES IN CONNECTION WITH HEALTH IMPACTS AT OIL AND GAS WELLS AND DRILL SITES

On April 19, 2017, Council Motion #17-0447 (Wesson-Huizar) Feasibility of Amending Current City Land Use Codes in Connection with Health Impacts at Oil and Gas Wells and Drill Sites, was introduced and on June 14, 2017, the Health, Mental Health and Education Committee approved the motion with modified recommendations. On June 30, 2017, the City Council adopted the motion, with additional modifications, instructing the Petroleum Administrator in collaboration with the City Attorney, Los Angeles County Department of Public Health (LACDPH), relevant City departments, and other health agencies and regulatory entities as necessary to report on the following:

1. What types of health and environmental impacts can be measured at and around oil and gas wells and drill sites;
2. Whether, what kind, and what distance a setback and potential mitigation measures from sensitive receptors should be established;
3. An evaluation of the various types of materials used at oil and gas sites that can have health impacts, how those materials are used, and what authority the City has over regulating their use;
4. An evaluation of the various types of drill sites, including active oil fields, abandoned oil fields, and gas storage fields;

5. What agencies currently govern or regulate oil and gas sites, including a matrix of energy, oil, and gas operators and their respective regulatory agencies, related to health impacts in the City and what authority does the City have to regulate those health impacts;
6. The upcoming LACDPH Interim Guidance on Urban Oil and Gas Operations;
7. Any recommendations from the LACDPH on whether a Health Impact or Health Risk Assessment Report on oil and gas drill site operations within the City is recommended, including the necessary resources and time to complete each type of study;
8. Any recommendation to enhance public health collaboration regarding oil and gas drill site oversight between the City, County and other related health agencies;
9. A draft Memorandum of Agreement between the City and the LACDPH, and/or other regulatory agencies, with suggested terms, including emergency protocols, communication strategy, and clear delineation of public health roles and responsibilities;
10. An analysis of the economic, employment, and fiscal impacts of establishing a distance setback around oil and gas wells; and
11. Analysis of the human rights standards and environmental standards of the countries exporting oil used by the Los Angeles residents;

The Petroleum Administrator and the Office of Petroleum and Natural Gas Administration and Safety conducted an extensive inventory of oil and gas facilities within the City of Los Angeles, participated in public hearing on the report at the Los Angeles City Health Commission, collected historical records from multiple private and public databases, synthesized thousands of pages of technical reports, and retained a consultants to study the potential health impacts at oil and gas wells and drill sites within the City of Los Angeles.

The attached report identifies oil and gas infrastructure within the City of Los Angeles, evaluated materials used at such sites, studied the peer reviewed scientific literature on human health and oil & gas development, assessments of chemicals used at City oil & gas drill sites, and includes hundreds of appendices of referenced documents.

RECOMMENDATIONS
It is recommended that the Los Angeles City Council, subject to the Mayor's approval:

1. Instruct the City Planning Department with the assistance of the Petroleum Administrator and the City Attorney's Office to prepare a report outlining the feasibility of establishing in the zoning code a physical surface setback distance of 600 feet from sensitive receptors on existing oil and gas wells, associated production facilities, and drill sites. The report shall address the discontinuance of non-conforming land uses resulting from the new requirements. The report shall also address a requirement to provide relief and an administrative remedy to comply with state and federal due process and takings law for any oil and gas operators or stakeholders in an oil and gas production that are affected by the new zoning requirements. The estimated cost to the City is at least $724 million in anticipated litigation, lost oil production, well abandonment, environmental remediation and cleanup, and surface land value;

2. Instruct the City Planning Department with the assistance of the Petroleum Administrator and the City Attorney's Office to prepare a report outlining the feasibility of establishing in the zoning code a physical surface setback distance of 1,500 feet from sensitive receptors on future oil and gas development. The report shall also address a requirement to provide relief and an

administrative remedy to comply with state and federal due process and takings law for any oil and gas operators or stakeholders in an oil and gas production that are affected by the new zoning requirements. The potential cost to the City could range from $1.2 billion to $97.6 billion in constitutional taking by mineral rights owners of the remaining 1.6 billion barrels of recoverable oil and gas reserves. The estimated cost of litigation over the anticipated property takings claims to the City is expected to be at least $1 million per year for several years to defend the City;

3. Request that the City Attorney report back with legal analysis on the possible implementation of changes to the City's Zoning Code relative to establishing new setback requirements, as well as pursuing takings compensation for oil and gas operators;

4. Instruct the City Planning Department, with the assistance of the City Attorney and Petroleum Administrator, to report back on options on how to amend the Zoning Code relative to oil and gas facilities (LAMC Section 13.01) to better reflect alignment with surrounding sensitive land uses, align with Los Angeles County's code, enhanced operating conditions, and regulatory best practices; include the required funding, staffing, and environmental consultants cost estimates;

5. Instruct the Petroleum Administrator and the Los Angeles County Department of Public Health to report back on costs and coordination on conducting Health Risk Assessments (HRA) at each oil and gas drill site adjacent to residential and industrial zoned areas within the City of Los Angeles;

6. Instruct the Petroleum Administrator and other relevant City Staff to report back on possible measures to establish Community Emergency Preparedness and Comprehensive Safety Plans at oil and gas drills sites across the City;

7. Instruct the Petroleum Administrator and other relevant City staff to participate in California Air Resources Board Study of Neighborhood Air Near Petroleum Sources (SNAPS) and the Assembly Bill 617 studies to incorporated the findings into the development of citywide continuous fenceline air monitoring and community notification program;

8. Instruct the LAFD with the assistance of the City Attorney to negotiate with Los Angeles County to designate Health Officer Authority to Los Angeles City Fire Department through an MOU for enhanced local oversight and improved health coordination;

9. Instruct LAFD and the City Attorney to negotiate with Los Angeles County to transfer the Hazardous Waste Generator Program to Los Angeles City Fire Department for enhanced local oversight and improved health coordination;

10. Instruct CLA to add to the City's Legislative Agenda the funding for additional oil and gas health studies to be conducted by State, SCAQMD, and Los Angeles County Department of Public Health; and

11. Instruct the Petroleum Administrator, Office of Finance, CAO, and other relevant City Staff to establish Oil and Gas Restricted Funds for drill site abandonment, environmental remediation, consultant studies, clean up assessment, strengthening current oversight, as outlined in this report. Additionally, explore re-establishing a barrel tax to support these new funds and provide revenue to support enhanced oil and gas oversight.

Section 3. Evaluation of Drill Sites and Oil Fields

Oil and natural gas production is also known as upstream, because it includes the extraction and initial separation of oil, water and natural gas from hydrocarbon formations, but not the subsequent transportation, processing and storage (midstream), or the refining of petroleum or marketing and use of petroleum products (downstream). An upstream oil and natural gas producer sells the oil from the field where it is produced to a midstream pipeline company, which transports oil and natural gas to downstream companies that operate refineries or natural gas to utilities to operate power plants, and to natural gas storage and distribution facilities. These different activities are conducted by specialized companies and governed by sector-specific regulations. Upstream oil and natural gas production is thus distinct in terms of both operations and regulations from midstream pipeline companies, downstream refining and marketing companies, and utilities that operate natural gas storage facilities and power plants and sell natural gas and electricity. This report is primarily focused on upstream operations within the City of Los Angeles.

The Los Angeles geological basin has one of the highest concentrations of crude oil per acre in the world. There are thousands of feet of oil-bearing sandstone rock formations underlying the City and the surrounding areas in Orange and Los Angeles Counties that comprise the Los Angeles Basin. In 1892, Edward Doheny and Charles Canfield drilled the first successful oil well in the Los Angeles City Oil Field (modern day Echo Park). Their discovery set off a series of major oil discoveries in the early 1900's and led to the City's first major population boom. Even after more than century of prolific production, the US Geological Survey estimates 1.6 billion barrels of recoverable oil remain in place beneath the City, rivaling the reserves in the Middle Eastern countries, like Saudi Arabia, Iraq, and Kuwait 14,000 miles away.

Petroleum production in most fields in the City and most of the Los Angeles Basin has several natural characteristics that are distinct to each field's specific geochemistry, depth, sulfur content, and production volumes. Oil and natural gas wells in the City are distinguished by their low pressures and low flow rates. Associated production facilities in the City also typically hold small fluid volumes, since the oil is generally sent directly by pipeline to local refineries. In addition, there are two key attributes of the produced fluids that comes from wells in the City – the gas-to-oil (GOR) ratio and the water-to-oil (WOR) ratio. The gas-to-oil ratio, a measure of the natural gas content in the produced fluid from the formation, is very low in the Los Angeles Basin, which means that it is typically less volatile and generates lower air emissions of methane and volatile organic compounds. The water-to-oil ratio, a measure of the water content in the production fluid, is very high in the Los Angeles Basin, which means that the vast majority of the fluid produced is water, rather than oil or gas. After the oil is separated, the water is either disposed of via a local sanitation district or re-injected into the subsurface formation in a closed loop.

F. Implementation of Setback Distance

The establishment of physical surface setback distance from oil and gas wells from sensitive receptors would need to be based on the City's land use zoning codes. City Council may consider adopting an ordinance that requires a specific setback from sensitive land uses that applies to existing wells, future wells, or both. Any future ordinance will be subject to legal challenges by landowners and operators as a "taking" under the federal and state Constitutions. The City does have a prescribed method for the termination of nonconforming oil and gas wells within the City's Zoning Code. Establishing a setback distance on existing oil and gas wells may be declared as a non-conforming land use. The land use decision would be required by the City Council to instruct the City Planning Department to prepare an ordinance. LAMC 12.23-C.4, is the pertinent code section:

> *(a) No well for the production of oil, gas or other hydrocarbon substances, which is a nonconforming use, shall be re-drilled or deepened.*
>
> *(b) All such wells, including any incidental storage tanks and drilling or production equipment, shall be completely removed within 20 years from June 1, 1946, or within 20 years from date such use became nonconforming, if said date was subsequent to June 1, 1946; provided, however, a Zoning Administrator may, upon individual application, allow such wells to continue to operate after said removal date, if he determines that such continued operation would be reasonably compatible with the surrounding area and in connection therewith may impose such conditions, including time limitations, as he deems necessary to achieve such compatibility.*

The City Planning Department is prepared to provide a follow up summary of the outreach and adoption process with an approximate timeline for completion, an estimate of funding needs for anticipated contractual services, such as preparation of appropriate environmental review and other technical studies, and necessary staff resources to research, prepare, and process the ordinance through adoption and implementation.

Section 11. Economic and Fiscal Impacts of Establishing Setbacks

In 2015, the Los Angeles Economic Development Corporation produced a report on the economic impacts of the Oil and Gas Industry in California. The report estimated that the industry's statewide direct output of more than $111 billion generates more than $148 billion in direct economic activity, contributing 2.7 percent of the state's gross domestic product (GDP) and supporting 368,100 total jobs in 2015, or 1.6 percent of California's employment. Additionally, the oil and gas industry generates $26.4 billion in state and local tax revenues and $28.5 billion in sales and excise taxes. For Los Angeles County, it found the direct output of more than $5.2 billion in direct economic activity, contributing $133 million in tax revenue, and supported 31,236 total jobs in 2015. The report covered employment, economic activity, and jobs of all sections of the industry, not just the upstream sector.

A. Community Economic Report

"The Oil and Gas Extraction Sector in the City of Los Angeles," by David Rigby, Ph.D. and Michael Shin, Ph.D. and Geografio LLC (2017) (Report is Appendix A2-4)

This report estimates the economic impact of potential oil and gas well closures within the City. Analysis focuses on 2015, the most recent year for which input-output data were available when the project started. Data from DOGGR, supplemented where possible by the U.S. Energy Information Administration, along with benchmark oil and gas well-price data valued economic output in the oil and gas extraction industry for the state of California in 2015 at approximately $9.7 billion. This represents approximately half of 1% of the state's overall output, its gross product. Within the City, the oil and gas extraction sector generated output valued at $182 million in 2015, accounting for about one-tenth of 1% of the City's gross product.

According to data from the California Employment Development Department (EDD) and the U.S. Bureau of the Census Non-Employer Survey, the oil and gas extraction industry (North American Industrial Classification 211) employed 345 workers in the City of Los Angeles in 2015 out of a total city-wide workforce of just under 2 million. CA DOGGR data identified 508 active wells within the City in 2015 with positive levels of production. A geographic information system fixed the location of these well sites and then mapped protective buffers, setback distances of 1,500 feet and 2,500 feet, around sensitive land uses as identified by CARB. The GIS analysis established that 429 of the active 508 wells in the City were located within 2,500 feet of sensitive land uses. These 429 wells were responsible for approximately 78% of the value of output in the oil and gas extraction sector of the City in 2015. Input-output analysis of the Los Angeles economy reveals that closing 429 oil and gas wells and eliminating 78% of production within the oil and gas extraction industry (consistent with the 2,500 feet setback distance) would have the following impacts:

- 269 jobs would be lost within the oil and gas extraction industry
- 266 jobs would be lost within other sectors of the economy
- 535 total jobs would be lost across the City.

The report noted that use of the 1,500 feet setback distance would result in the overall loss of approximately 532 jobs citywide. They do not believe that the loss of local oil and gas extraction capacity would have a significant impact on local energy prices. However, they believe that there could be additional employment loss in local parts of the oil and gas transportation system associated with well closures.

Table 17: Private non-farm employment in California, Los Angeles County and the City of Los Angeles, 2015 (Wage and salary employment and self-employment: EDD+NES)

NAICS	Industry name	California	Los Angeles County	City of Los Angeles
21	Mining, Quarrying, Oil & Gas	29,758	5,051	577 (0.03%)
211	- Oil & Gas Extraction	14,175	3,201	345(0.02%)
22	Utilities	58,757	12,229	2,833(0.17%)
23	Construction	948,370	188,155	59,208(3.46%)
31-33	Manufacturing	1,332,133	370, 694	94, 481(5.53%)
42	Wholesale	777,742	246,213	75,494(4.41%)
44-45	Retail	1,890,618	447,935	164,770(9.64%)
48-49	Transportation & Warehousing	720,142	198,544	81,657(4.78%)
51	Information	543,425	233,992	74,911(4.38%)
52	Finance & Insurance	610,496	147,087	70,676(4.13%)
53	Real Estate, Renting & Leasing	594,401	197,494	64,838(3.79%)
54	Professional, Scientific & Technical Services	1,748,815	431,917	183,392(10.72%)
55	Management of Companies	229,682	57,365	17,819(1.04%)
56	Waste Management	1,303,984	341,548	116,050(6.79%)
61	Educational Services	388,039	120,311	59,151(3.46%)
62	Health Care & Social Assistance	2,352,714	718,366	291,769(17.06%)
71	Arts, Entertainment & Recreation	497,317	178,458	73,858(4.32%)
72	Accommodation & Food Services	1,575,749	416,088	158,371(9.26%)
81	Other Services (except Public Administration)	1,000,805	295,717	120,112(7.02%)
	Total	16,602,947	4,607,164	1,709,967

A second way that the report proposed city ordinance might generate benefits to the city that offset some of the anticipated employment losses, noted in Section 4 of this report, is through job creation related to remediation activities at oil and gas well sites that are shut down. Once a decision has been made to halt production at an oil well, a process of remediation can begin. Remediation is undertaken to ensure that underground reserves of oil and gas, and any saline or fresh water aquifers penetrated by the well, remain isolated from one another over time. Well remediation requirements vary with local and state regulations, but typically involve the "plugging and abandonment" of a well site. The California Code of Regulations, Section 1723 outlines the requirements for well plugging and abandonment in California. The process of plugging typically involves the filling of the well hole with drilling mud and the placement of cement plugs across all oil or gas zones, any water interfaces and at the surface. Additional cement plugs may be required depending on the condition of the well. Plugs placed into the well-bore prevent communication between subsurface rock layers (Testa and Jacobs, 2014).

The process of remediation involves use of a drilling rig to remove equipment inside the well and to ensure that the well is unobstructed so that isolation plugs can be effectively installed.

Additional work involves removal of the well-head, sampling and testing for soil, and possibly water, contamination surrounding the well site. Older wells might have above surface or underground tanks that require further clean up, removal and additional testing for subsurface leakage and contamination. Contaminated soils require careful disposal, before the well site can be brought back to the required standards for commercial or even residential use. It is important for the city and oil producers to ensure timely remediation at oil and gas wells for idle wells pose significant concerns. Indeed, the California Department of Conservation's Division of Oil, Gas, & Geothermal Resources (DOGGR), estimated more than 23,000 idle wells in the state pose risks of desertion and contamination. State Assembly Bill 2729 (2016) is aimed at reducing such risk.

However, remediation work, calculated over the year, for each of these sites was estimated to involve 0.5 workers. Thus, 215 full-year jobs would be generated in the city if all wells in the proposed setback zone were remediated at once. These jobs would generate additional employment across the city as a result of multiplier effects associated with the purchase of inputs and consumption from wages; an additional 141 jobs would be generated elsewhere in the Los Angeles economy. These figures are based on the closure of 429 active wells and assume an average well site remediation cost of approximately $109,000. Pollution savings summary also included the removal of 199,000 metric tons of carbon dioxide equivalents released each year in the City of Los Angeles as a result of oil and gas extraction and supporting industrial activities.

B. Industry Economic Reports

Economic and Fiscal Effects of Set-Back Requirements on the Oil and Gas Industry in Los Angeles, by Capital Matrix Consulting, March 2018 (Appendix A2-8)

According to the Capital Matrix Consulting (CMC) report, oil production within Los Angeles City comes primarily from six fields located fully or partly within its boundaries. About forty percent (40%) of the total is from onshore portions of the Wilmington Field, pumped by wells located in and around the Port of Los Angeles. Other significant sources of oil are the Las Cienegas, San Vincente, and Cascade fields, as well as portions of the Beverly Hills and Torrance fields.

They found that there were about thirty (30) producers operating in Los Angeles City in 2016. About eighty-five percent (85%) of total oil production came from the top six (6) companies. These include: Sentinel Peak Resources (with production in Beverly Hills, Las Cienegas, and San Vincente fields), Warren E&P (Wilmington Field), California Resources (primarily its Tidelands operations in Wilmington Field), DCOR (Cascade Field), and Pacific Coast Energy Company (Beverly Hills Field).

Los Angeles City: Of the County-wide totals, $430 million in economic output, $270 million in gross regional product, 1,480 jobs, $155 million in labor income, and $35 million in state and local tax payments are related to oil and gas production in the City. The effects on Los Angeles City production would be even more pronounced. A 500-foot setback would eliminate sixty-three percent (63%) of production, and a 2,500-foot setback would eliminate eighty-seven percent (87%) of oil production in the City in the CMC report.

Corresponding economic and fiscal impacts: As shown in Table 18, a 500-foot setback imposed by Los Angeles City would result in losses of $255 million in economic output, 890 high paying jobs, $88 million in labor income, and $22 million in state and local taxes. Adoption of a 2,500-foot setback would result in job losses of 1,221, labor income losses of $122 million, and state and local tax reductions of $29 million.

Table 18. Economic and Fiscal Impacts of Setback Ordinances Imposed By Los Angeles City - Direct and Multiplier Effects (Annual Average Reductions - 2020 to 2025); CMC Report

	Setback Distance		
Loss In:	**500 foot**	**1,500 Foot**	**2,500 Foot**
Oil production (%)	63%	86%	87%
Economic Output ($ Millions)	$255	$340	$344
Employment	890	1,210	1,221
Labor Income ($ Millions)	$88	$120	$122
State/Local Taxes ($ Millions)	$22	$28	$29

Los Angeles City oil and gas operations: The CMC report showed that there were 541 workers oil and gas industry establishments operating in the City in 2016. These employees were paid a combined total of $77 million, which works out to an average annual wage of $143,000. The high rate partly reflects the presence of the California Resources Corporation and Breitburn Energy Partners headquarters within the City. An additional 112 employees were employed in pipeline construction industries in the City. In the City average wages in the oil production industry are quite high compared to other private sector jobs.

Table 19. Economic and Fiscal Impacts of Setback Ordinances Imposed By Los Angeles City - Direct and Multiplier Effects (Annual Average Reductions - 2020 to 2025); CMC report

Type of Impact	Economic Output	Gross Regional Product	Number of Jobs	Labor Income
Direct	$175	$110	530	$76
Indirect	29	18	122	14
Induced	71	43	471	25
Total	$275	$171	1,123	$115
Multiplier	1.6	1.6	2.1	1.5

The combined countywide average for all oil and gas-related jobs is over $100,000, and the oil and gas extraction segment has an average wage of over $160,000. The high average wage in this segment partly reflects high wages paid by oil producers generally, but also is due to the significant number of well-paid jobs in headquarter, centralized purchasing, and logistical operations in the County (**See Figure 19**).

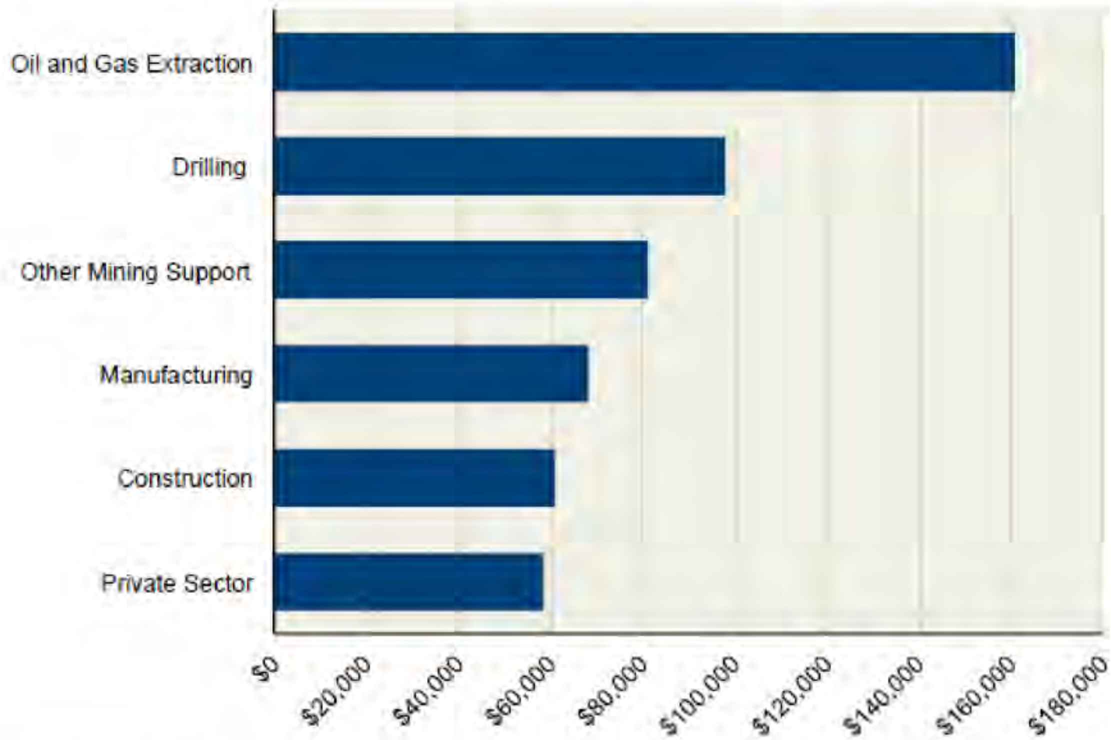


Figure 19. Los Angeles County Average Annual Wage by Industry in 2016, CMC report

Potential City Tax Impacts

State and local taxes generated by oil and gas production within City boundaries total $25.9 million, of which $15 million is state taxes and $10.8 million is local taxes. Most of the local taxes are from sales and property taxes. The City does not have a barrel tax, but Table 20 shows the County has a 40 cents per barrel tax that generates approximately $8.7 million per year.

The CMC report also evaluated tax revenues from: property taxes on oil reserves and equipment; state corporate taxes on company profits; personal income taxes on wages and royalties; state and local sales taxes on oil producers' purchases of materials, fuels, and equipment; severance taxes imposed by about a dozen cities; and the DOGGR administrative fee used to support a variety of its regulatory activities. The multiplier effects include (1) personal income taxes paid on employees' wages, and (2) state and local taxes paid on subsequent rounds of income and expenditures generated by supplying businesses and their employees.

Table 20. State and Local Taxes Generated by Oil and Gas Production in Los Angeles County and Los Angeles City in 2018 (Dollars in Thousands), CMC report

Tax Source	Los Angeles County		Los Angeles City	
	Total Amount	Per Barrel Amount	Total Amount	Per Barrel Amount
On producers & royalty owners:				
State:				
Corporation Tax	$25,000	$1.15	$3,200	$1.15
Personal income	10,270	0.47	1,320	0.47
Sales	14,110	0.65	2,010	0.72
DOGGR	12,550	0.58	1,610	0.58
Total, state	**$61,930**	**$2.85**	**$8,140**	**$2.91**
Local:				
Property	$44,140	$2.03	$5,880	$2.11
Sales	9,140	0.42	$1,170	0.42
Severance	8,710	0.40	0	-
Other	3,270	0.15	420	0.15
Total, local	**$65,260**	**$3.00**	**$7,470**	**$2.81**
Multiplier impacts:				
State	$54,500	$2.50	$6,920	$2.48
Local	23,600	1.09	3,400	1.21
Total, multiplier impacts	**$72,970**	**$3.59**	**$8,680**	**$3.69**
Combined, Direct and Multiplier:				
State	$116,430	$5.36	$15,060	$4.94
Local	88,860	4.09	10.870	3.61
Total, combined	**$205,290**	**$9.45**	**$25,930**	**$8.55**

Separate from the income, jobs, and tax revenue, there is additional financial value identified by the CMC report. The economic value of the oil and gas reserves can be measured by estimating the present discounted value of after-tax cash flows (i.e. annual revenues minus operational and investment costs) generated from all future extraction of oil from these reserves. The actual value depends on several factors, one of the most important of which is the future price of crude oil. They projected a valuation based on low, moderate, and high assumptions, they estimate that the economic value of the oil reserves in LA County would be worth $1.2 billion under the lower-end oil price forecast, $2.3 billion under the moderate price forecast, and $3.4 billion under the high-end price forecast. The lost value could also result in a major liability if mineral rights property owners and producers were to prevail in "takings" lawsuits under the United States and California Constitutions.

At a minimum, it would cost millions of dollars in litigation expenses to defend against such lawsuits. If the plaintiffs were to prevail, the City would be required to pay the present value of the lost profits from the oil and gas that would no longer be recovered in these fields to the oil companies and owners of the mineral rights affected by the ordinance.

C. Setback Implementation Potential Fiscal Impact to the City

Oil and natural gas production values within the City are not publically available for six months to year. The most recent full year production data is from 2017. The average daily crude oil production rate for the City has ranged from approximately 7,600 - 8,000 barrels of oil per day (BOPD). The annual total cumulative oil and gas production in the City for 2017 was 2.5 million barrels (bbl) of oil and more than 4.9 million cubic feet (MCF) of natural gas.

Local governments and industry typically use the Midway Sunset Oil Field in Central California as a proxy for a State oil price. The American Petroleum Institute gravity (API gravity) is a measure of crude oil by density which dictates the price per barrel. Midway Sunset crude oil is set at 13 API gravity which is similar to most types of crude oil produced in California. In 2017, the Midway Sunset Oil Price ranged from $44.33/bbl to $59.24/bbl, with an annual average oil price of $48.19/bbl. While in 2018, its daily price fluctuated higher from $53.03/bbl to $71.58/bbl, with an average annual oil price of $68.02/bbl. The December 2018 Deloitte Advisory Firm Resource Evaluation Report projected the 2019 Average Midway Sunset crude oil price at $59.00.

The present value of the current oil production (2.5 million barrels) within the City at the Midway Sunset oil price of $59/barrel is conservatively estimated at least $148 million per year. However, any change in oil price can significantly increase or decrease this value. The United State Energy Information Administration (US EIA) estimates oil price will be $72/barrel in 2020, which would increase the value at $185 million.

This estimate does not reflect the higher API gravity crude oil produced within the City or a valuation of the produced natural gas that would increase the net present value of the city wide petroleum production. The actual current value of oil and gas production will be greater due to expected higher oil prices in the future and the additional value of the natural gas produced. The following is the City's Petroleum Administrator's cost estimate for each potential fiscal impact.

<u>Value of Future Crude Oil Production</u>:

In 2012, as the U.S. Geological Survey (USGS) estimated that between 1.4 and 5.6 billion barrels of recoverable oil remain in just ten (10) of the Los Angeles basin oil fields; three (3) of them (Inglewood, Torrance, and Wilmington/Belmont) lie partially within the City boundaries. In an updated 2018 geological evaluation, done by USGS geologist Don Gautier, concluded that approximately 1.6 billion barrels of additional volume of recoverable crude oil exist within the City that could be produced using existing technology. Applying the Midway-Sunset projected oil price of $59/bbl to the 1.6 billion barrels of remaining recoverable reserves provides $94.4 billion in present value. Price Water House Cooper (PWC) projects a 6% rate of return for the oil industry in 2019. The projected future value of the remaining oil reserves belonging to mineral rights owners in the City calculated for a 20 year period at 6% interest rate is $97.6 billion.

Estimated future value of recoverable petroleum reserves is $97.6 billion.

Land Value:

Land values in the City vary by location according to a 2017 study of metropolitan land values across the United States. Economists David Albouy and Minchul Shin of the University of Illinois, and Gabriel Ehrlich of the University of Michigan, relied on data from CoStar, a national real-estate database, covering land transactions from 2005 through 2010. The study estimated the total land value of the Los Angeles-Long Beach, CA area at $2.3 trillion. The average land value per acre city wide was estimated at $2.6 million and the value of central downtown land was $16 million per acre.

The sixteen remaining oil drilling sites are spread across the City of Los Angeles equate to 24 acres of surface land. The drill sites in non-central areas are estimated land value of $85 million. The drill sites in central areas are estimated land value of $15 million. The costs vary from location to location and would likely be higher than this estimate due to the regional housing crisis. In an imminent domain proceeding or litigation over the deprivation a surface owner's property rights, then the land owner would need to be compensated at a fair market price.

The estimated current surface land value of the drill sites in the City is $100 million.

Well Abandonment:

Oil and gas well abandonments must meet standards required by CA DOGGR to be abandoned when operators end operations. There are approximately 1,100 active and idle oil wells within the City. As of 2018, there are 819 active wells and 296 idle wells, of which, the inactive wells can be reactivated at any time.

The abandonment of an oil well in the Los Angeles Region can cost anywhere from $50,000 to $500,000 per well according to news reports from CIPA. The two (2) wells recently abandoned on Firmin Street in the Echo Park area of the City cost the state about $375,000. Sixty-Five percent (65%) of active and idle wells are located within drill sites which should be on the lower end of the cost scale. The remaining wells will likely require higher abandonment costs due to their locations in difficult to access urban settings. Drill site well abandonments are estimated to cost $250,000 per well for seven hundred twenty-five (725) wells at a projected cost of $181 million. Non-drill site wells are estimated to cost $375,000 per well for the three hundred seventy-five (375) wells, which would total approximately $140 million. The cost would likely be greater than this amount because many of the wells have old broken equipment inside them and damaged casing which takes longer and is more expensive to abandon. In a property taking's litigation, these costs would be an item of dispute or if a company declared bankruptcy the City would need to identify the funding to abandon the wells.

Total Well Abandonment Cost Estimate - $321 million

Environmental Remediation and Cleanup:

After each drill site's wells are abandoned, the environmental cleanup process must begin to restore the site to its prior natural state to allow for an alternative land use. The site cleanup is typically regulated by DTSC or the LARWQCB. Drill site cleanup will likely include tank removal, pipeline abandonment, building demolition, concrete removal, soil testing, soil removal, health risk assessments, and both Phase 1 & 2 environmental site assessments. Depending on the desired level of cleanup, residential or industrial levels, the costs can vary significantly.

In 2011, the Beverly Hills City Council voted to ban all oil drilling within the city limits by December 31, 2016. After implementation of this law and cancellation of the oil operating lease, the operator of the one active drill site within the City of Beverly Hills, Venoco Incorporated, declared bankruptcy. Venoco was discharged of its well abandonment and environmental remediation responsibilities in Federal Court, even though they were in listed in their lease agreement. The City of Beverly Hills is now managing the project on behalf of the Beverly Hills Unified School District (BHUSD) to properly secure and plug nineteen (19) oil wells located on School District property (0.73 acres) adjacent to the Beverly Hills High School. Prior to bankruptcy, Venoco said the task would be "expensive and complicated" and that it could take "several years" at an estimated cost of $10 - $15 million to cleanup. Well abandonment was estimated to be half of the total project cost. In December 5, 2017, the City of Beverly Hills and the Beverly Hills School District entered into an agreement whereby the City of Beverly Hills would take on project management responsibilities to monitor and plug the wells. The City of Beverly Hills advanced $8 million in costs for site monitoring and plugging. This amount is subject to 50% reimbursement by the Beverly Hills School District. The city and school district only received $760,000 from the bankruptcy court proceedings. The Beverly Hills example is the basis of an anticipated estimated environmental remediation and cleanup cost estimate of $6.25 million per acre. The City of Los Angeles has twenty-four (24) acres of active oil and gas drill sites that will eventually need to be abandoned and remediated.

Total Environmental Remediation and Cleanup Cost Estimate - $ 150 million

Expected Litigation Costs:

In 2019, Assemblymember Muratsuchi introduced Assembly Bill 345 (See Appendix A2-19) to establish a statewide 2,500 foot setback from oil and gas wells. The Assembly Appropriations Committee summarized the fiscal effects of expanded setbacks proposed under Assembly Bill 345. The Committee's analysis (Appendices A2-20 & A2-A21), noted total lost revenues from oil production of up to $3.5 billion, annual lost production revenue of up to $350 million per year, annual lost tax revenue in the range of $100 million per year, and additional state regulatory costs of $4 million per year. These cost burdens would be felt most acutely in the Los Angeles area because it would have impacted 87% of oil production in the City. The analysis concluded that the bill would give rise to litigation over takings "at significant cost to the state." The bill analysis indicated implementation of the law would require at least $1 million per year in litigation costs. The City Attorney's Office agrees that the City can expect to spend a similar amount per year to defend the implementation of a setback distance within the City.

Estimated Annual Litigation Cost = $1 million per year

<u>Total Potential Fiscal Impact to the City of Setback Implementation:</u>

- Current Oil Production - **$148 - $185 million**
- Future Oil Production - **$97.6 billion**
- Land Value - **$100 million**
- Well Abandonment - **$321 million**
- Environmental Clean Up - **$150 million**
- Litigation - **$1 million per year**

The estimated potential cost to the City of establishing a setback distance on existing operation is $724 million, which includes the minimum value of the current oil production, land value costs, well abandonment costs, environmental clean-up costs, and five years of litigation expenses. It may be lower if the sites are not cleaned up, wells stay unplugged, and the City is successful in the court systems. The estimated potential cost to the City of establishing a future setback distance could be as high as $97.6 billion in compensation for the future value of mineral rights owed from takings litigation.

D. Establishment of Oil and Gas Restricted Funds

In 2018, Los Angeles City Controller Ron Galperin published a report titled, "Review of the City of Los Angeles' Oil and Gas Drilling Sites" (Appendix A2-2). The review was initiated for several reasons, but two (2) that are directly related to this report. First, the review wanted to determine if appropriate coverage existed to protect the City and its residents from financial risks associated with oil and gas wells. Secondly, it sought to implement effective processes to collect revenues and recover costs. In order to successfully implement the recommendations in his report, he confirmed that it will require additional financial resources. The report also noted that as the City enhances its local oil and gas oversight framework, it should prioritize cost recovery.

The report highlighted the City's large real estate portfolio (almost 9,000 distinct parcels) that includes parks, libraries, municipal facilities, buildings, and vacant land. The value of the City's properties are not limited to surface structures, but it also has recoverable deposits of oil and gas may be found in subsurface locations beneath these parcels. The City's ability to generate revenue by using its real estate assets for oil and gas extraction activity depends on the extent to

This report should not lead to any public panic or belief in a widespread public health crisis. There is a lack empirical evidence correlating oil and gas operations within the City of Los Angeles to widespread negative health impacts. The lack of evidence of public health impacts from oil and natural gas operations has been demonstrated locally in multiple studies by the Los Angeles County Department of Public Health, the Los Angeles County Oil & Gas Strike Team, the South Coast Air Quality Management District and the comprehensive Kern County Environmental Impact Report and Health Risk Assessment. Both CA DOGGR and SCAQMD – as well as the dozens of other regulatory agencies – have specific environmental legal authority, including the ability to order a shutdown of operations which constitute an imminent threat to public health and/or safety.

Establishing a Setback Distance on Existing Operations

If City policy makers decide to establish a setback distance, there are several options to consider. A physical surface setback can be established in the zoning code for existing oil and gas wells. The precise setback distance for the City of Los Angeles to adopt is unclear from the literature review or approaches by other jurisdictions. The Los Angeles County Department of Public Health recommended expanding the minimum setback distance beyond 300 feet for both the citing of new wells and the development of sensitive land uses near existing operations. CA DOGGR has a "critical wells" designation for wells that are 300 feet from the centerline of the well to any building intended for human occupancy or any airport runway. The CA DOGGR distance is not a physical setback distance, but the threshold for additional safety measures, such as additional requirements for well blowout prevention equipment, emergency backup systems, and additional control valves.

While the State of California has no established statewide setback for oil and gas development, some local jurisdictions have established setbacks for residences and sites of sensitive receptors. In 2018, the City of Arvin adopted an ordinance (Appendix A2-31) that establishes setback distances of 300 feet for new development and 600 feet for new drilling operations near sensitive sites, such as parks, hospitals, and schools. However, neither setback distance impacted any existing or future oil and gas development. The California Attorney General's Office issued a letter (Appendix A2-32) prior to the adoption of their ordinance stating that the proposed prohibited zones and setbacks are within the City's power to regulate land use and within the City's police powers, as long as it does not contradict state law. The Attorney General's letter stated the following, "the Ordinance will not prevent the operation of oil and gas wells currently existing within the prohibited zones and/or setbacks if these sites can demonstrate vested rights and will not eliminate future access to subsurface oil and gas resources located in the restricted areas." In the Arvin setback ordinance, if the setbacks had impacted existing oil and gas operations, then the Attorney General's Office believed the action to be pre-empted by state law as interfering with the state's goals to develop and utilize oil and gas resources.

Texas, Pennsylvania, Colorado, New Mexico and other major oil and gas producing states do have regulations that set a minimum surface setback requirement from sensitive receptors to where oil and gas can be produced. Those surface setback requirements are larger than those that exist in the State of California more generally. Those states produce mainly natural gas from deep low permeability shale geological formations that are located in rural, typically unpopulated, areas. Oil fields in the City of Los Angeles and across Southern California are different, being they are high permeability, low pressure sandstone geological formations.

However, nearly all the setback distances were for future oil and gas development and did not impact existing oil and gas operations. For example the State of Maryland has a 2,000 foot setback distance, but they only have ten (10) active natural gas wells in the whole state. In Texas, the 1,500 foot setback distances in Dallas and Flower Mound are the only mitigation that is required for oil and gas sites.

The City's PSE consultants stated, "the science is relatively clear that the development of oil and gas immediately adjacent to places where people live, work and play poses hazards and risks to public health and that some minimum distance from sensitive receptors should be considered." As such, they advised that a setback greater than 500 feet and up to 5,290 feet should be considered. The studies that evaluated health impacts at 2,500 feet or greater were nearly all from unconventional natural gas operations outside of California. They evaluated noise, perinatal, cancer, and non-cancer health effects in Pennsylvania, Oklahoma, and Colorado.

Of all 131 events reported within the City of Los Angeles by the SCAQMD chemical database, eighty-one (81) events or sixty-two percent (62%) of all events were within 600 feet of the sensitive receptor. Of all chemicals reported to the SCAQMD dataset, 22 were identified as hazardous air pollutants (HAPs) under the Clean Air Act, half of which were reported as used in the City of Los Angeles. The chemical inventory assessment does show chemicals of concern and HAPs are present, but again the City does not have empirical evidence that they have become airborne above observable unhealthy thresholds. If a surface setback distance alone is established from sensitive receptors, it should be at least 600 feet due to the uncertainty of airborne chemicals of concern and at least 500 feet which was the minimum threshold evaluated in the multiple epidemiological literature studies. Kern County setback distances ranged from 210 to 367 feet for deeper wells than City of Los Angeles oil and gas wells. A setback distance of 600 feet would be further than both Kern County's and meet the LADPH recommendations.

The best available emission control technologies and operational management approaches should be deployed on all oil and gas wells and ancillary infrastructure to limit emissions of toxic air pollutants. The stronger the regulatory environment, the more enhanced operating conditions, required engineering controls, annual inspections, and utilization of the best available technology can significantly reduce the need for potential setback distances.

If a surface setback distance is established, it could conservatively cost the City of Los Angeles at least a $148 million for existing oil and gas production and up to $97.6 billion in lost property values by mineral rights owners from the remaining 1.6 billion of recoverable oil and gas reserves beneath the City boundaries.

Establishing a Setback Distance on Future Development

A physical surface setback for future oil and gas development can be established by ordinance. In the review of other jurisdictions, nearly all, except for the City of Arvin, established setback distances for future development. Our consultants did recommend limiting the density of wells and other oil and gas development infrastructure at oil and gas producing areas within and near the City of Los Angeles.

In one general health study (Lewis et al. 2018), a group of health care providers, public health practitioners, environmental advocates, and researchers were surveyed about the safe distances from unconventional oil and gas development from vulnerable groups. The group reached consensus (defined as agreement among 70% of participants) that the minimum safe distance from unconventional oil and gas development is ¼ mile (1,320 feet) and additional setbacks should be established near sensitive receptors. There was a lack of consensus by the group around setback distances between ¼ - 2 miles (1,320 – 10,560 feet), due to limited health and exposure studies. It should be noted that this study did not expressly assess health effects.

The furthest distance considered by the Los Angeles County Department of Public Health was 1,500 feet. The County noted that additional mitigation is not likely to be needed at this distance and that some uncertainty remains due to gaps in long term health and exposure data. Fires, Explosions, and Other Emergencies were listed, but no defined mitigations were itemized and there was no evaluation of the fire code requirements for drill sites, nor fire suppression systems. The two out-of-state examples of 1,500 feet are the cities of Dallas and Flower Mound. Both distances are the only mitigation associated with that setback requirement, and those regulations are still being litigated in the Texas state court system. Additionally, 1,500 feet is the furthest jurisdictional distance limit that the City could set before potentially conflicting with other jurisdictional authorities, like the Ports of Long Beach and Los Angeles, Los Angeles World Airports, Unincorporated Los Angeles County, and adjacent municipalities.

If a surface setback distance is established on future oil and gas development, it could potentially cost the City of Los Angeles between $1.2 billion in present value to $97.6 billion in future value in a constitutional takings claim by mineral rights owners of the remaining 1.6 billion barrels of recoverable oil and gas reserves beneath the City.

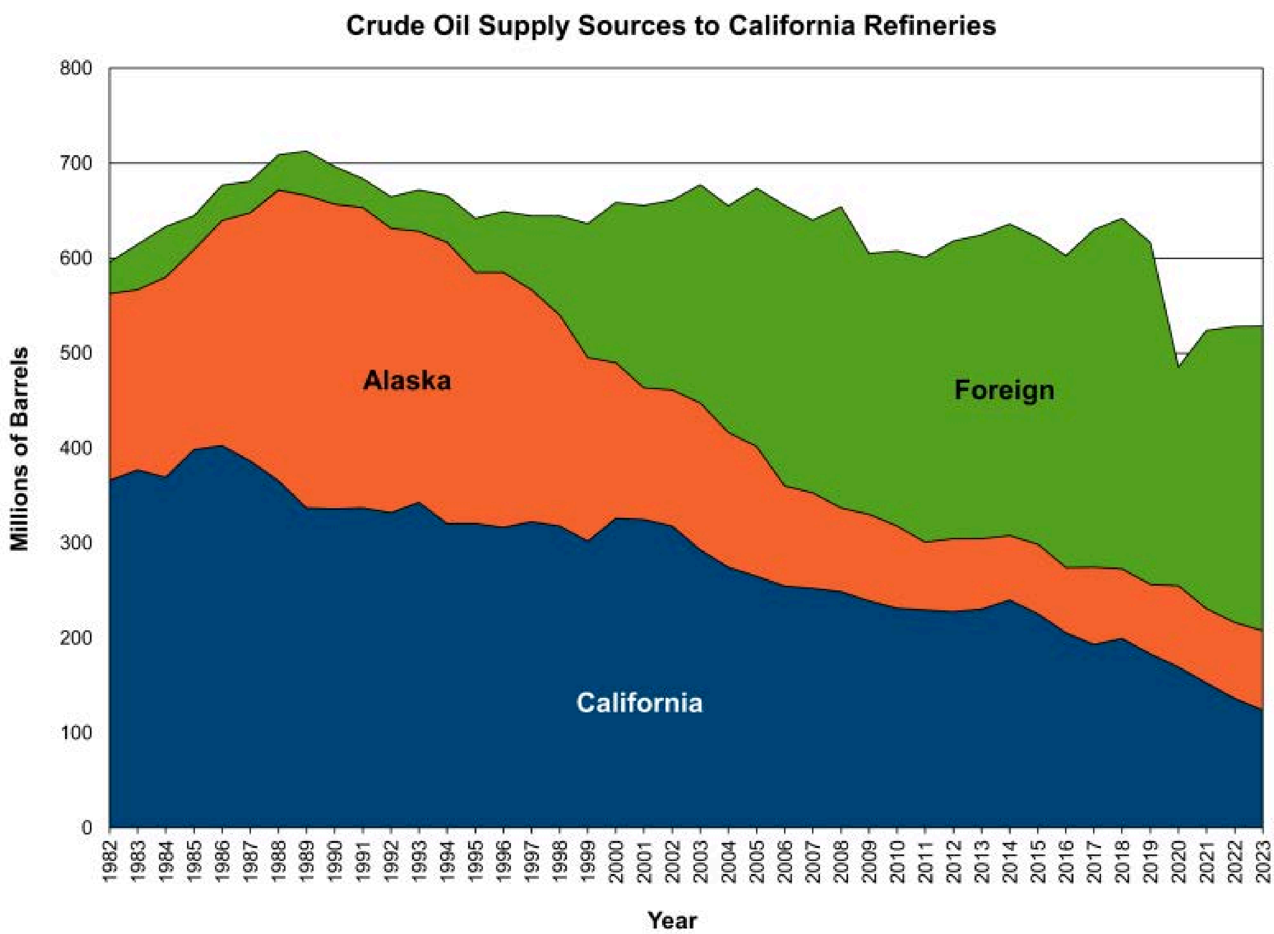
Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california

California's Petroleum Market

Annual Oil Supply Sources To California Refineries

Annual Oil Supply Sources To California Refineries



Annual Oil Supply Sources to California Refineries (In Thousands of Barrels)

Year	California**	%	Alaska	%	Foreign	%	Total
2023	123,947	23.4%	83,842	15.9%	320,793	60.7%	528,582
2022	136,052	25.8%	80,257	15.2%	311,530	59.0%	527,839
2021	152,473	29.1%	78,145	14.9%	293,417	56.0%	524,035
2020	169,211	34.9%	85,662	17.6%	230,581	47.5%	485,454
2019	183,158	29.7%	73,252	11.9%	359,712	58.4%	616,122
2018	199,658	31.1%	72,945	11.4%	369,386	57.5%	641,989
2017	197,008	31.3%	77,740	12.3%	355,150	56.4%	629,898
2016	205,528	34.1%	68,765	11.4%	328,513	54.5%	602,806
2015	225,435	36.2%	73,182	11.8%	323,336	52.0%	621,953
2014	240,095	37.7%	67,702	10.6%	328,245	51.6%	636,042
2013	230,357	36.9%	74,382	11.9%	319,677	51.2%	624,416
2012	227,626	36.8%	77,150	12.5%	313,530	50.7%	618,306
2011	229,556	38.2%	71,138	11.8%	300,016	49.9%	600,710
2010	231,339	38.1%	86,382	14.2%	289,797	47.7%	607,518
2009	239,070	39.5%	91,148	15.1%	274,883	45.4%	605,101

Year	California**	%	Alaska	%	Foreign	%	Total
2008	248,490	38.0%	88,362	13.5%	317,136	48.5%	653,988
2007	252,125	39.4%	100,899	15.8%	286,849	44.8%	639,873
2006	254,498	38.8%	105,684	16.1%	295,306	45.1%	655,488
2005	265,050	39.4%	136,237	20.2%	272,187	40.4%	673,474
2004	274,396	41.9%	141,967	21.7%	238,484	36.4%	654,847
2003	292,899	43.2%	154,524	22.8%	230,041	34.0%	677,464
2002	317,573	48.0%	143,463	21.7%	199,964	30.3%	661,000
2001	324,723	49.6%	138,693	21.2%	191,843	29.3%	655,259
2000	325,816	49.5%	163,789	24.9%	169,105	25.7%	658,710
1999	301,966	47.5%	193,327	30.4%	140,905	22.1%	636,198
1998	317,816	49.3%	221,984	34.4%	104,650	16.2%	644,450
1997	322,242	50.0%	244,623	38.0%	77,628	12.0%	644,493
1996	316,201	48.7%	268,806	41.4%	63,996	9.9%	649,003
1995	320,372	49.9%	264,530	41.2%	56,864	8.9%	641,766
1994	320,369	48.1%	296,508	44.5%	49,192	7.4%	666,069
1993	342,762	51.0%	285,565	42.5%	43,359	6.5%	671,686
1992	331,638	49.9%	299,652	45.1%	33,056	5.0%	664,346

Year	California**	%	Alaska	%	Foreign	%	Total
1991	336,931	49.3%	316,115	46.2%	30,723	4.5%	683,769
1990	336,154	48.3%	320,829	46.1%	39,454	5.7%	696,437
1989	336,876	47.3%	329,020	46.2%	46,708	6.6%	712,604
1988	365,354	51.5%	306,247	43.2%	37,217	5.3%	708,818
1987	386,676	56.8%	260,843	38.3%	33,395	4.9%	680,914
1986	402,230	59.4%	237,508	35.1%	36,877	5.5%	676,615
1985	398,280	61.8%	210,647	32.7%	35,408	5.5%	644,335
1984	369,225	58.3%	210,450	33.2%	53,262	8.4%	632,937
1983	377,125	61.4%	189,538	30.8%	47,991	7.8%	614,654
1982	365,962	61.4%	196,462	33.0%	33,553	5.6%	595,977

** California totals may also include minor amounts from North Dakota and Gulf Coast States.

Source: California Energy Commission, aggregated from Petroleum Industry Information Reporting Act data. Please note that total of foreign oil receipts to refineries will not match that shown on other pages. The Petroleum Industry Information Reporting Act (PIIRA) data gives the breakdown by foreign, California and Alaska but not the foreign countries. The PIERS data includes the foreign breakdown by country but no domestic receipts. U.S. Dept. of Commerce, U.S. Dept. of Energy, Army Corps of Engineers, and State Lands Commission all give different totals by different breakdowns.

CONTACT

Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

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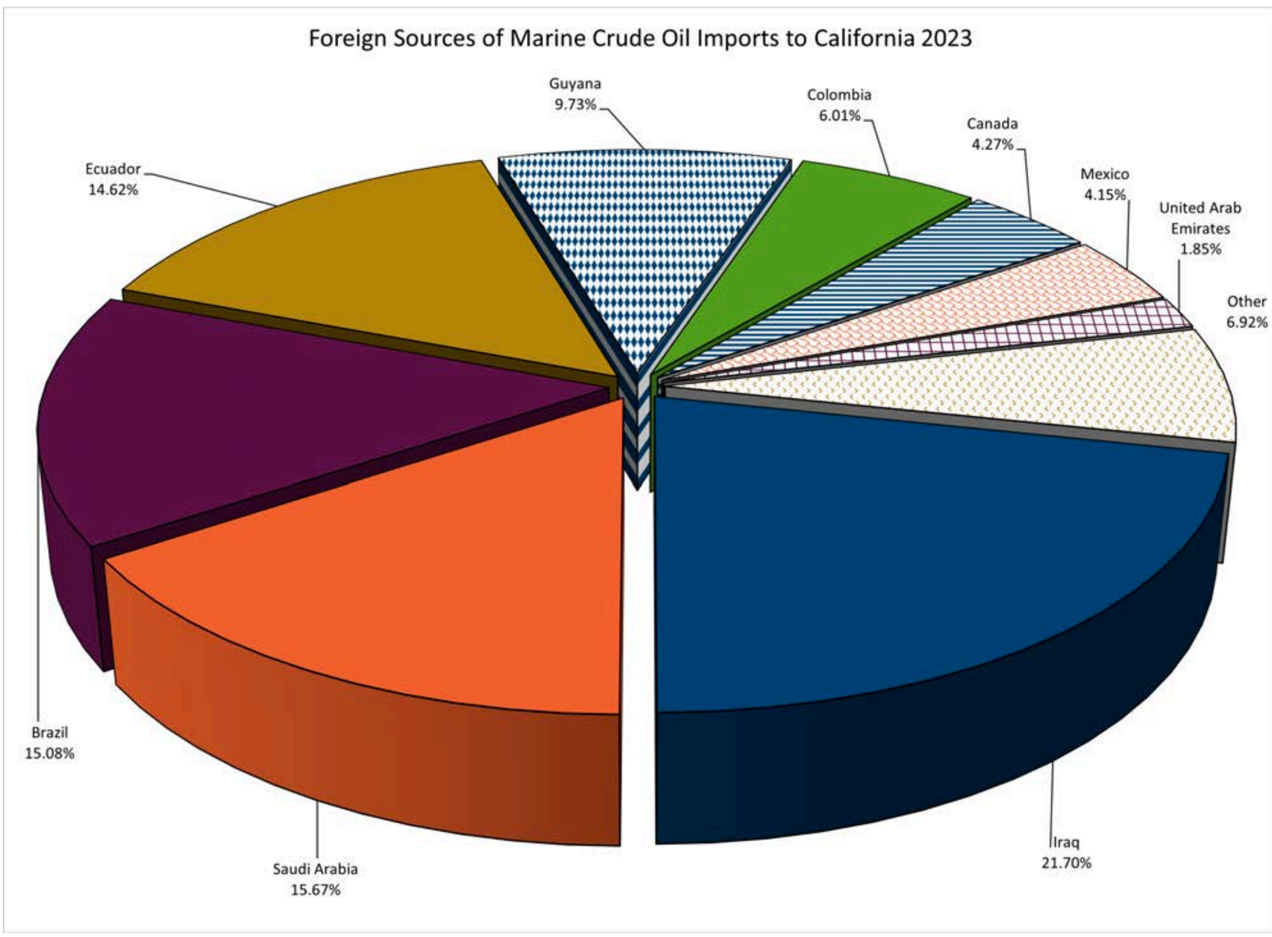
< California’s Petroleum Market

Foreign Sources of Crude Oil Imports to California

Foreign Sources of Crude Oil Imports to California

Foreign Sources of Crude Oil Imports to California 2023



Country	Thousands of Barrels	Percentage
IRAQ	69,589	21.70%
SAUDI ARABIA	50,253	15.67%
BRAZIL	48,367	15.08%
ECUADOR	46,882	14.62%
GUYANA	31,201	9.73%
COLOMBIA	19,276	6.01%
CANADA	13,709	4.27%
MEXICO	13,315	4.15%
UNITED ARAB EMITRATES	5,944	1.85%
Other	22,206	6.92%
Total	320,742	100.0%

Expand All

2022 Foreign Sources of Crude Oil Imports to California

2021 Foreign Sources of Crude Oil Imports to California

2020 Foreign Sources of Crude Oil Imports to California

Previous Years Data

Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.eia.gov/state/print.php?sid=CA

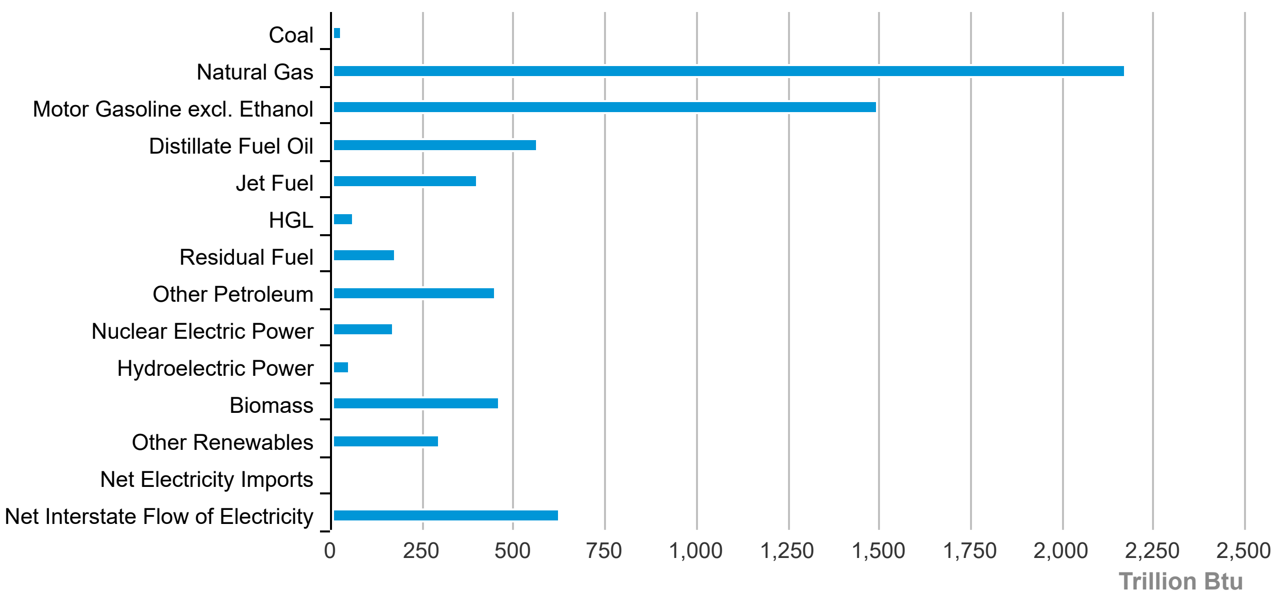
California State Energy Profile

California Quick Facts

- In 2022, California was the seventh-largest producer of crude oil among the 50 states, and, as of January 2022, the state ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states.
- In 2020, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than in all but three other states.
- In 2022, renewable resources, including hydroelectric power and small-scale, customer-sited solar power, accounted for 49% of California's in-state electricity generation. Natural gas fueled another 42%. Nuclear power supplied almost all the rest.
- In 2022, California was the fourth-largest electricity producer in the nation. The state was also the nation’s third-largest electricity consumer, and additional needed electricity supplies came from out-of-state generators.

Last Updated: April 20, 2023

California Energy Consumption Estimates, 2021



Source: Energy Information Administration, State Energy Data System

Environment

Utility-Scale Hydroelectric Net Electricity Generation	1,593 thousand MWh	7.5%	Jan-24	
Utility-Scale Solar, Wind, and Geothermal Net Electricity Generation	4,117 thousand MWh	9.0%	Jan-24	
Utility-Scale Biomass Net Electricity Generation	422 thousand MWh	10.2%	Jan-24	
Small-Scale Solar Photovoltaic Generation	1,802 thousand MWh	37.7%	Jan-24	
Fuel Ethanol Production	2,293 thousand barrels	0.6%	2021	
Renewable Energy Consumption	**California**	**U.S. Rank**	**Period**	find more
Renewable Energy Consumption as a Share of State Total	18.1 %	16	2021	
Fuel Ethanol Consumption	34,113 thousand barrels	2	2021	
Total Emissions	**California**	**Share of U.S.**	**Period**	find more
Carbon Dioxide	324.0 million metric tons	6.6%	2021	
Electric Power Industry Emissions	**California**	**Share of U.S.**	**Period**	find more
Carbon Dioxide	44,448 thousand metric tons	2.7%	2022	
Sulfur Dioxide	1 thousand metric tons	0.1%	2022	
Nitrogen Oxide	63 thousand metric tons	5.1%	2022	

Analysis

Last Updated: April 20, 2023

Overview

California has the largest economy in the nation and the fifth-largest in the world.[1,2] More than one in nine U.S. residents live in California, and it is the most populous state in the nation.[3] California also uses more energy than all other states except Texas.[4] However, energy efficiency efforts have helped make California's per capita energy use less than in almost all other states.[5,6] California has abundant renewable energy resources, including solar energy, hydroelectric power, geothermal energy, and biomass, and the state produces more electricity using renewable energy than every other state but Texas.[7] California is also rich in mineral resources. Long known for gold and other precious minerals, the state produces strategic elements at the nation's only rare earths mine.[8] Additionally, California has significant crude oil reserves, and the state's petroleum refineries have one-tenth of the nation's total crude oil refining capacity.[9,10]

California stretches two-thirds of the way up the U.S. West Coast. At its greatest distances, it is more than 1,000 miles long and 500 miles wide.[11] With such great distances to travel, transportation accounts for the largest share of the state's

Per capita residential and

energy consumption.[12] Californian's have more registered motor vehicles and travel more vehicle miles than residents in any other state.[13,14] California accounts for one-tenth of U.S. motor gasoline consumption and about one-seventh of the nation's jet fuel consumption.[15,16] Overall, the state's transportation sector accounts for about one-third of California's total energy consumption. The industrial sector uses one-fourth of the state's total energy, the residential sector accounts for about one-fifth, and the commercial sector uses one-fifth.[17] However, per capita energy consumption in both the residential and commercial sectors is lower than in all other states except Hawaii.[18] Although California has a varied climate, most of the state's more densely populated areas are relatively mild for much of the year.[19,20] Changes in weather patterns and climate have resulted in an increased use of cooling and almost three-fourths of California households have air conditioning.[21,22]

commercial sector energy use in California is lower than in all other states except Hawaii.

Electricity

In 2022, California was the nation's fourth-largest electricity producer and accounted for about 5% of all U.S. utility-scale (1-megawatt and larger) power generation.[23] Renewable resources, including hydropower and small-scale (less than 1-megawatt) customer-sited solar photovoltaic (PV) systems, supplied about half of California's total in-state electricity generation. In 2022, natural gas-fired power plants provided 42% of the state's total net generation.[24] Nuclear power's share of California's total electricity generation was about 8%, which was less than half the power nuclear supplied in 2011. The decrease resulted from the shutdown of the San Onofre nuclear power plant in January 2012. The state now has only one operating commercial nuclear power plant—the two-reactor Diablo Canyon facility.[25,26,27]

California has the nation's second-largest conventional hydroelectric generating capacity, after Washington, and it is consistently among the nation's top four hydropower producers.[28,29] Hydropower's contribution is highly variable and is dependent on rain and snowfall. Even though California is prone to drought, 2021 was the driest year in nearly a century and in-state hydroelectric power supplied about 7% to California's utility-scale net generation that year. Hydroelectric power's contribution increased slightly in 2022, supplying 8% of California's total in-state generation.[30,31,32] Nonhydroelectric renewable generation, especially solar and wind energy, offset declines in the state's hydroelectric and nuclear generation. In 2022, nonhydroelectric renewable resources provided 42% of California's total in-state electricity generation. Coal fuels only a small amount of California's in-state net generation, all of it from one industrial cogeneration plant.[33,34] A California law, enacted in 2006, limits new long-term financial investments in electricity generation based on greenhouse gas emissions. As a result, essentially all imports of coal-fired generation from other states are expected to end by 2026.[35]

California imports more electricity than any other state and typically receives between one-fifth and one-third of its electricity supply from outside of the state.[36] In 2022, in-state utility-scale electricity generation equaled about four-fifths of California's electricity sales, and the rest of the state's supply came from out of state.[37] In 2021, renewable energy generated 31% of California's imported electricity and large hydroelectric sources supplied another 16%. Nuclear energy accounted for 11% of imports and natural gas and coal each supplied almost 10%. Another 23% of imports came from unspecified sources.[38] Wildfires in California and surrounding states threaten both imports of electricity and transmission within the state.[39]

California imports more electricity than any other state.

Although California consumes more electricity than all other states except Texas and Florida, it uses less per capita than any other state, but Hawaii.[40,41] In 2022, California had the nation's second-highest average price of electricity, after Hawaii.[42] The commercial sector accounted for 46% of California's electricity sales in 2022. The residential sector, where almost one in three California households use electricity for home heating, accounted for 36% of sales.[43] About 18% of the state's electricity sales went to the industrial sector. The railroads, subways, electric buses, and iconic cable cars in California's transportation sector accounted for less than 0.3% of electricity use. [44]

California is part of the West Coast Green Highway, an extensive network of electric vehicle DC fast charging stations located along Interstate 5, and the state has more than 14,000 public electric vehicle charging stations.[45,46] As of December 31, 2021, California had more than 563,000 registered all-electric vehicles, the most of any state.[47] California also requires all public transit agencies to gradually transition to 100% zero-emission bus (ZEB) fleets. Beginning in 2029, all transit agency new bus purchases must be ZEBs.[48]

Renewable energy

California is second in the nation, after Texas, in total electricity generation from renewable resources. The state is the nation's top producer of electricity from solar energy and geothermal resources. In 2022, California was also the nation's second-largest producer of electricity from biomass, after Georgia, and the fourth-largest producer of conventional hydroelectric power, after Washington, Oregon, and New York.[49]

Solar energy is the largest source of California's renewable electricity generation.[50] The state's greatest solar resources are in California's southeastern deserts, where all of its solar thermal facilities and several of its largest solar PV plants are located. However, there are solar PV facilities throughout the state.[51] In 2022, solar energy supplied 19% of the state's utility-scale electricity net generation. When small-scale solar generation is included, solar energy provided 27% of the state's total electricity net generation.[52] In 2022, California produced 31% of the nation's total utility-scale and small-scale solar PV electricity generation and 69% of the nation's utility-scale solar thermal electricity generation.[53] At the beginning of 2023, California had more than 17,500 megawatts of utility-scale solar power capacity, more than any other state. When small-scale facilities are included, the state had almost 32,000 megawatts of total solar capacity.[54]

California is the nation’s top producer of electricity from solar and geothermal energy.

In 2022, wind accounted for 7% of California's total in-state electricity generation, and the state ranked eighth in the nation in wind-powered generation.[55,56] California wind power potential exists at several areas around the state, both onshore and offshore.[57] However, the majority of the state's wind turbines are in six major wind resource areas: Altamont, East San Diego County, Pacheco, Solano, San Gorgonio, and Tehachapi.[58] At the beginning of 2023, California had more than 6,200 megawatts of wind capacity.[59]

California is the nation's top producer of electricity from geothermal resources. In 2022, the state produced 69% of the nation's utility-scale geothermal-sourced electricity, and geothermal power accounted for about 6% of California's utility-scale generation and 5% of the state's total in-state generation.[60,61] The state's operating geothermal power plants have a combined total capacity of 1,867 megawatts.[62] Four areas in California have substantial geothermal resources—the coastal mountain ranges north of San Francisco, volcanic areas of north-central California, areas near the Salton Sea in southern California, and areas along the state's eastern border with Nevada. The Geysers, located in the Mayacamas Mountains north of San Francisco, is the largest complex of geothermal power plants in the world and has about 725 megawatts of installed capacity.[63,64]

Superheated geothermal brines in the Salton Sea Known Geothermal Resource Area in southern California contain lithium, a critical mineral used to manufacture rechargeable batteries.[65,66] The state also has the only rare earth mine in North America. The Mountain Pass mine in southern California's Mojave Desert is the largest deposit of rare earth elements in the nation. Rare earths are used in the manufacture of electric vehicles, wind turbines, and batteries, among other applications.[67] In 2020, the Mountain Pass mine produced more than 38,500 metric tons of rare earth concentrate, the largest amount in the mine's history and more than 15% of global consumption.[68]

California is second in the nation, after Georgia, in utility-scale electricity generation from biomass.[69] In 2022, biomass fueled 2% of the state's total net generation, and more than half of that was from wood and wood-derived fuels.[70] Nearly three-fifths of the state's utility-scale biomass generating capacity is at 28 power plants fueled by wood and wood waste. Landfill gas, municipal solid waste, and other biomass sources fuel 77 other biomass power plants.[71] California also has two wood pellet manufacturing facilities. Those plants can produce about 168,000 tons of pellets per year. Wood pellets are used for heating but can also be used for electricity generation.[72] About 170,000 California households use wood as their primary fuel for space heating.[73]

California consumes one-tenth of the nation's fuel ethanol supply, which is almost eight times more than the state's four fuel ethanol plants can produce.[74,75] Midwestern states provide most of the additional fuel ethanol California uses.[76] California can produce a combined total of about 72 million gallons of biodiesel annually from 4 production plants, which is about one-fourth the amount of biodiesel consumed in the state each year.[77,78] Several California petroleum refineries have added renewable diesel, derived from biomass, manufacturing capacity.[79,80] In 2021, California accounted for 99% of the nation's renewable diesel consumption.[81]

California's renewable portfolio standard (RPS), enacted in 2002 and revised several times since then, required that 33% of electricity retail sales in California come from eligible renewable resources by 2020. The state met that goal three years before the target date.[82] The RPS also requires that 60% of electricity sales come from renewables by 2030, and 100% by 2045.[83] By 2020, 59% of California's electricity already came from carbon-free sources.[84] In 2022, the state legislature set intermediate targets of 90% renewable energy and zero-carbon electricity by the end of 2035 and 95% by the end of 2040 on the way to the eventual target of 100% by 2045.[85]

Petroleum

California was the sixth-largest crude oil producer among the states in 2022 and accounted for about 3% of the nation's total onshore and offshore oil production.[86] Although California's annual crude oil production has steadily declined from its peak of 394 million barrels in 1985, the state still produced more than 122 million barrels of crude oil in 2022.[87] Reservoirs along California's Pacific Coast, including in the Los Angeles basin, and those in the state's Central Valley contain major crude oil reserves, and the state holds 4% of the nation's total proved crude oil reserves.[88,89]

Foreign suppliers provide almost half of the crude oil refined in California.

Assessments of California's offshore areas indicate the potential for large, undiscovered recoverable crude oil resources in the federally administered Outer Continental Shelf (OCS).[90] However, in 1994, concerns about the risks of offshore crude oil and natural gas development resulted in a permanent moratorium on new offshore oil and natural gas leasing in state waters.[91] Congress imposed a federal moratorium on oil and natural gas leasing in California federal waters in 1982, but it expired in 2008.[92] No new California offshore federal lease sales have occurred since then, although there are 22 older crude oil and natural gas production platforms that remain active in federal waters and 11 in state waters off the coast of California.[93,94,95]

California has about one-tenth of the nation's total crude oil refining capacity and ranks third after Texas and Louisiana.[96] A network of pipelines connects California crude oil production to the state's 13 operating petroleum refineries, which are located primarily in the Los Angeles area, the San Francisco Bay area, and the San Joaquin Valley.[97,98,99] As crude oil production in California and Alaska declined, the state's refineries increased their supply from foreign imports.[100,101] Led by Ecuador, Saudi Arabia, and Iraq, foreign suppliers provided almost half of the crude oil refined in California in 2021.[102,103]

California requires that motorists use, at a minimum, a specific blend of motor gasoline called CaRFG (California Reformulated Gasoline) to reduce emissions from motor vehicles. California refineries produce cleaner fuels in order to meet state environmental regulations. Refineries in the state often operate at or near maximum capacity because of the high demand for those petroleum products and the lack of interstate pipelines that can deliver those cleaner fuels into the state. When unplanned refinery outages occur, the lack of CaRFG deliveries available from interstate pipelines means replacement supplies of CaRFG come in by marine tanker from out-of-state U.S. refineries or from other countries. It can take several weeks to find and bring replacement motor gasoline from overseas that meets California's unique specifications.[104,105]

California is the nation's second-largest consumer of refined petroleum products, after Texas, and accounts for about 8% of U.S. total consumption.[106] In 2021, California was the nation's largest consumer of jet fuel and the second-largest consumer of motor gasoline, after Texas.[107,108] The transportation sector used about 83% of the petroleum consumed in the state. The industrial sector accounted for about 13% of state petroleum use, and the commercial sector consumed about 3%. The residential sector, where about 1 in 27 California households heat with petroleum products, mostly propane, used about 1%.[109] A minimal amount of petroleum is used for electricity generation.[110]

Natural gas

Most of California's natural gas reserves and production are in fields in the northern portion of the state's Central Valley.[111] California's natural gas output has declined steadily since 1985, and the state now accounts for less than 1% of the nation's total natural gas reserves and production.[112,113] California's natural gas production is less than one-tenth of the state's total consumption.[114,115] Several interstate natural gas pipelines enter California from Arizona, Nevada, and Oregon and bring natural gas into California from the Southwest, the Rocky Mountain region, and western Canada.[116] Although a small amount of natural gas is exported to Mexico, California consumes almost nine-tenths of the natural gas delivered to the state.[117] Some natural gas that enters the state is placed in California's 14 underground natural gas storage reservoirs in its 12 storage fields.[118] Together those fields have a natural gas storage capacity of about 600 billion cubic feet.[119]

California is the nation's second-largest natural gas consumer. Only Texas uses more.[120] In 2021, about 33% of the natural gas delivered to California consumers went to the state's industrial sector, and about 31% went to the electric power sector, where it fuels more than two-fifths of the state's total electricity generation.[121,122] The residential sector, where three in five California households use natural gas for home heating, accounted for 22% of natural gas use, and the commercial sector consumed about 12%. The transportation sector used about 1% as compressed natural gas vehicle fuel.[123,124]

California is the nation's second-largest natural gas consumer.

Coal

California does not have any coal reserves or production and has very little coal-fired electricity generation. All the generation is from one industrial facility in Trona, California.[125,126] Almost all the coal consumed in California arrives by rail and truck from mines in Utah and Colorado. A small amount comes from Pennsylvania.[127] In 2021, some coal produced in other states was exported to other countries from California ports.[128]

Energy on tribal lands

California has the largest Native American population in the nation, and the state is home to more than 100 federally recognized tribal groups.[129,130] Although tribal areas exist throughout California, they account for less than 1% of the state's land area.[131,132] Many of the tribal lands are small, including the nation's smallest reservation, the 1.32-acre parcel that contains the Pit River Tribe cemetery.[133] The largest is the forested Hoopa Valley Reservation, home of the Hupa people, in northern California's Humboldt County. More than three-fourths of that reservation's more than 85,000 acres is commercial timberland.[134]

Excerpt of reference cited at footnote 6 to Alston & Bird's January 29, 2024 Letter

Full version available at https://epi.yale.edu/epi-results/2022/component/epi

Environmental Performance Index

2022 EPI Results

View country details

COUNTRY

View category details

CATEGORY

Results Overview

The 2022 EPI provides a quantitative basis for comparing, analyzing, and understanding environmental performance for 180 countries. We score and rank these countries on their environmental performance using the most recent year of data available and calculate how these scores have changed over the previous decade.

COUNTRY	RANK	EPI SCORE
FILTER BY REGION: ALL REGIONS		
Denmark (/epi-results/2022/country/dnk)	1	77.90
United Kingdom (/epi-results/2022/country/gbr)	2	77.70
Finland (/epi-results/2022/country/fin)	3	76.50
Malta (/epi-results/2022/country/mlt)	4	75.20
Sweden (/epi-results/2022/country/swe)	5	72.70
Luxembourg (/epi-results/2022/country/lux)	6	72.30

COUNTRY	RANK	EPI SCORE
FILTER BY REGION:		
Uzbekistan (/epi-results/2022/country/uzb)	107	38.20
Thailand (/epi-results/2022/country/tha)	108	38.10
Saudi Arabia (/epi-results/2022/country/sau)	109	37.90
Nicaragua (/epi-results/2022/country/nic)	110	37.70
Niger (/epi-results/2022/country/ner)	110	37.70
Russia (/epi-results/2022/country/rus)	112	37.50
Maldives (/epi-results/2022/country/mdv)	113	37.40
Micronesia (/epi-results/2022/country/fsm)	113	37.40
Uruguay (/epi-results/2022/country/ury)	113	37.40
South Africa (/epi-results/2022/country/zaf)	116	37.20
Tajikistan (/epi-results/2022/country/tjk)	117	37.10
Turkmenistan (/epi-results/2022/country/tkm)	118	37.00
Dem. Rep. Congo (/epi-results/2022/country/cod)	119	36.90
Vanuatu (/epi-results/2022/country/vut)	119	36.90
Honduras (/epi-results/2022/country/hnd)	121	36.50
Gambia (/epi-results/2022/country/gmb)	122	36.40
Samoa (/epi-results/2022/country/wsm)	122	36.40
Marshall Islands (/epi-results/2022/country/mhl)	124	36.20
Uganda (/epi-results/2022/country/uga)	125	35.80
Kyrgyzstan (/epi-results/2022/country/kgz)	126	35.70

COUNTRY	RANK	EPI SCORE
FILTER BY REGION:		
Guatemala (/epi-results/2022/country/gtm)	167	28.00
Madagascar (/epi-results/2022/country/mdg)	167	28.00
Iraq (/epi-results/2022/country/irq)	169	27.80
Ghana (/epi-results/2022/country/gha)	170	27.70
Sudan (/epi-results/2022/country/sdn)	171	27.60
Turkey (/epi-results/2022/country/tur)	172	26.30
Haiti (/epi-results/2022/country/hti)	173	26.10
Liberia (/epi-results/2022/country/lbr)	174	24.90
Papua New Guinea (/epi-results/2022/country/png)	175	24.80
Pakistan (/epi-results/2022/country/pak)	176	24.60
Bangladesh (/epi-results/2022/country/bgd)	177	23.10
Viet Nam (/epi-results/2022/country/vnm)	178	20.10
Myanmar (/epi-results/2022/country/mmr)	179	19.40
India (/epi-results/2022/country/ind)	180	18.90

Showing 1 to 180 of 180 entries

Excerpt of reference cited at footnote 7 to Alston & Bird's January 29, 2024 Letter

Full version available at https://freedomhouse.org/countries/freedom-world/scores

Freedom House

Countries and Territories

Freedom House rates people's access to political rights and civil liberties in 210 countries and territories through its annual Freedom in the World report. Individual freedoms—ranging from the right to vote to freedom of expression and equality before the law—can be affected by state or nonstate actors. Click on a country name below to access the full country narrative report.

Viewing:

Global Freedom Scores

Internet Freedom Scores

Democracy Scores

Quick Find:

Country Name

Country	Total Score and Status	Political Rights	Civil Libertie
Abkhazia*	39 Partly Free	17	22

TOP

Country	Total Score and Status		Political Rights	Civil Liberties
Haiti	30	Not Free	11	19
Honduras	48	Partly Free	22	26
Hong Kong*	41	Partly Free	9	32
Hungary	65	Partly Free	24	41
Iceland	94	Free	37	57
India	66	Partly Free	33	33
Indian Kashmir*	26	Not Free	6	20
Indonesia	57	Partly Free	29	28
Iran	11	Not Free	4	7
Iraq	30	Not Free	16	14
Ireland	97	Free	39	58
Israel	74	Free	34	40
Italy	90	Free	36	54
Jamaica	80	Free	33	47
Japan	96	Free	40	56
Jordan	33	Not Free	11	22
Kazakhstan	23	Not Free	5	18
Kenya	52	Partly Free	22	30

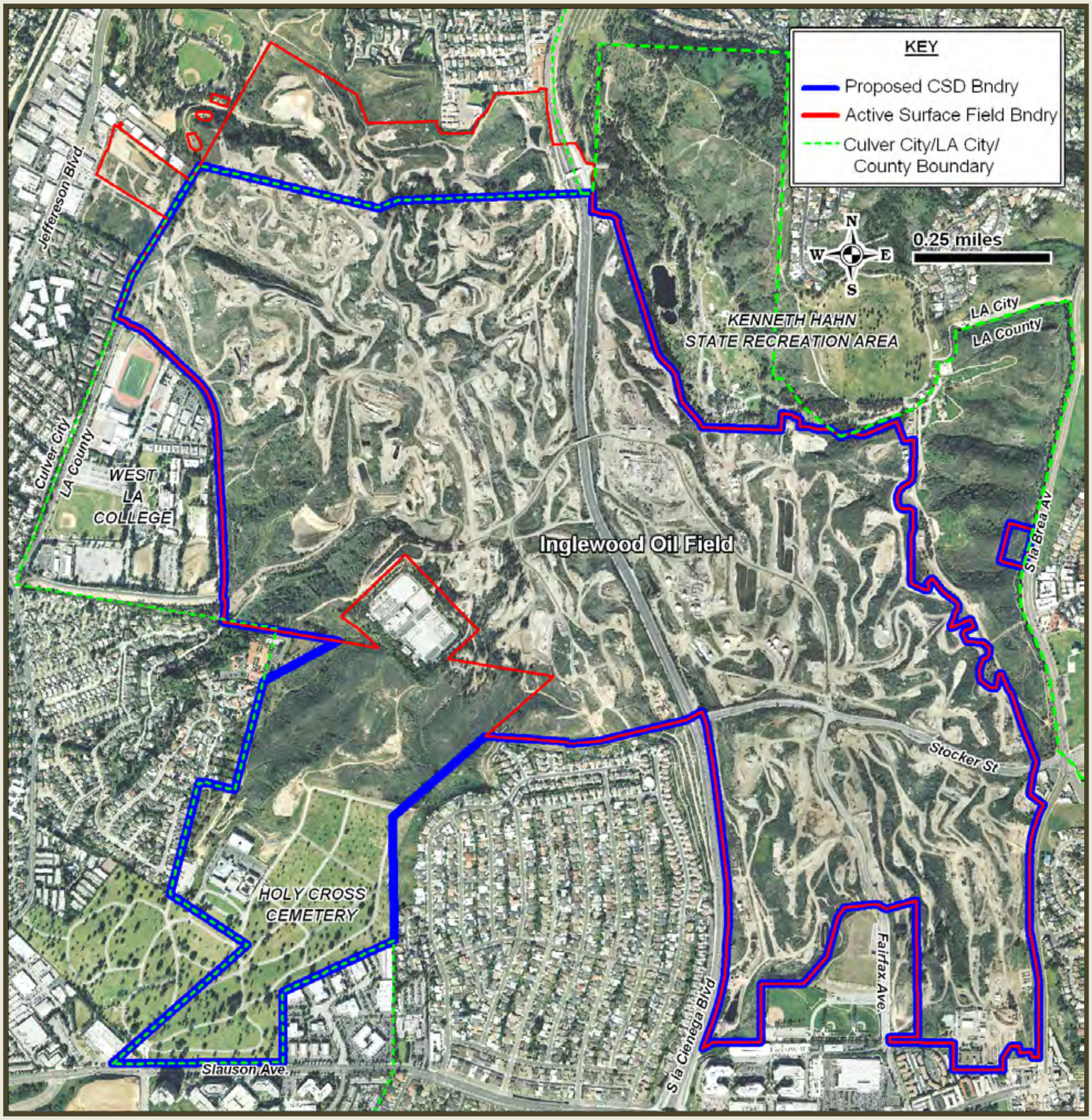
Country	Total Score and Status	Political Rights	Civil Liberties
Portugal	96 ▢ Free	39	57
Qatar	25 ▢ Not Free	7	18
Republic of the Congo	17 ▢ Not Free	2	15
Romania	83 ▢ Free	35	48
Russia	13 ▢ Not Free	4	9
Rwanda	23 ▢ Not Free	8	15
Samoa	84 ▢ Free	32	52
San Marino	97 ▢ Free	39	58
Saudi Arabia	8 ▢ Not Free	1	7
Senegal	67 ▢ Partly Free	28	39
Serbia	57 ▢ Partly Free	18	39
Seychelles	79 ▢ Free	34	45
Sierra Leone	60 ▢ Partly Free	24	36
Singapore	48 ▢ Partly Free	19	29
Slovakia	90 ▢ Free	37	53
Slovenia	96 ▢ Free	39	57
Solomon Islands	75 ▢ Free	28	47
Somalia	8 ▢ Not Free	2	6

Excerpt of reference cited at footnote 8 to Alston & Bird's January 29, 2024 Letter

Full version available at https://inglewoodoilfield.com/wp-content/uploads/2017/10/baldwin_hills_community_standards_district_final_eir-.pdf

Final Environmental Impact Report

Baldwin Hills Community Standards District



October 2008

SCH# 2007061133
County Project # R2007-00570
Environmental Case # RENVT2007-00048

Prepared For:
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Prepared By:
mrs
Marine Research Specialists

Executive Summary

Plains Exploration & Production Company (PXP), the operator of the Inglewood Oil Field and the Applicant, has submitted an application to the County of Los Angeles to establish a Community Standards District (CSD). As part of this application, PXP submitted a draft of the CSD, which served as the proposed project for this Environmental Impact Report (EIR). The location of the Inglewood Oil Field is shown in Figure ES-1.

A CSD is a supplemental district used to address special issues that are unique to certain geographic areas within the unincorporated areas of Los Angeles County. The CSD would establish permanent development standards, operating requirements and procedures for the portions of the Inglewood Oil Field that is within Los Angeles County (note that the northern most areas of the field are within Culver City). The CSD would provide a means for implementing enhanced regulations to address the unique compatibility concerns associated with operating an oil field in the midst of urban development.

For the purposes of this EIR, the CSD is the proposed project as defined by CEQA. The proposed CSD boundary is shown in Figure ES-2 and is defined as areas within the County of Los Angeles located adjacent to the active Inglewood Oil Field that are zoned to allow for oil development and designated in the Los Angeles County General Plan as a "Mineral Resource Area". A typical EIR would evaluate the environmental impacts of the proposed project. In this case the proposed project is a CSD, which is a set of development standards. The CSD by itself would not result in any physical change to the environment. The purpose of the CSD is to reduce environmental impacts of future development at the Inglewood Oil Field through the establishment of permanent development standards, operating requirements and procedures.

There were three main goals associated with the development of this EIR, which included:

1. To provide the public and decision makers with detailed information about the current and future operations at the Inglewood Oil Field.
2. To determine what types of environmental impacts could result from future oil field development activities.
3. To determine if the CSD as proposed by PXP had the necessary development standards, operating requirements and procedures to mitigate the potential environmental impacts of future oil field development activities.

In order to accomplish these goals an environmental impact analysis was conducted on a Potential Future Oil Field Development Scenario. This scenario was developed with assistance from PXP, and looked at the maximum development that could occur at the Inglewood Oil Field over the next twenty years. It should be noted that PXP has not applied for any of this future development, and it is unknown at this time what portion of this development might occur.

Based upon the environmental impact analysis of the potential future oil field development, a number of measures were developed to mitigate the identified impacts. The development standards, operating requirements and procedures in the PXP-proposed CSD were then compared with the identified measures to determine areas where the CSD proposed by PXP was deficient.

This EIR is an informational document that is being used by the general public and Los Angeles County as one element in the decision making process for adoption of a CSD for the Inglewood Oil Field. The reader should not rely exclusively on the Executive Summary as the sole basis for judgment. The EIR should be consulted for information about the proposed project, environmental analysis and recommended measures for inclusion in the CSD.

The remainder of the Executive Summary consists of the following sections:

- Background information on the Inglewood Oil Field;
- A brief description of the proposed CSD;
- A brief description of potential future oil field development;
- A summary of key impacts and mitigation measures identified for the potential future oil field development; and
- A summary of the proposed CSD analysis

The purpose of the Executive Summary is to provide the reader with a brief overview of the proposed project, the anticipated environmental effects, and the potential mitigation measures that could reduce the severity of the impacts associated with the proposed project.

This EIR was prepared in accordance with State and Los Angeles County administrative guidelines established to comply with the California Environmental Quality Act (CEQA). In compliance with CEQA Guidelines, the County, as the Lead Agency, prepared a Scoping Document for the proposed project and solicited comments through distribution of a Notice of Preparation (NOP) (issued June, 28, 2007) for a 30-day comment period. The Scoping Document and comments received in response to the NOP were used to help direct the scope of the analysis and the technical studies in the EIR. A copy of the Final Scoping Document, the NOP, and the comments received can be found in Appendix K (This appendix is available in electronic format only on the CD attached to the inside cover of the notebook).

The Draft EIR was issued on June 19, 2008 for a 60-day public comment period. During this period, six community meeting, two public workshops, and two planning commission hearings were held to discuss the Draft EIR and take comments on the document. Based upon the comments received, changes have been made to the Final EIR. Areas where the Final EIR has been changed are marked on the side of the page with a vertical line. All comments received on the Draft EIR and their corresponding responses are provided in electronic format on the CD attached to inside cover of the notebook.

Figure ES-1 Location of the Inglewood Oil Field

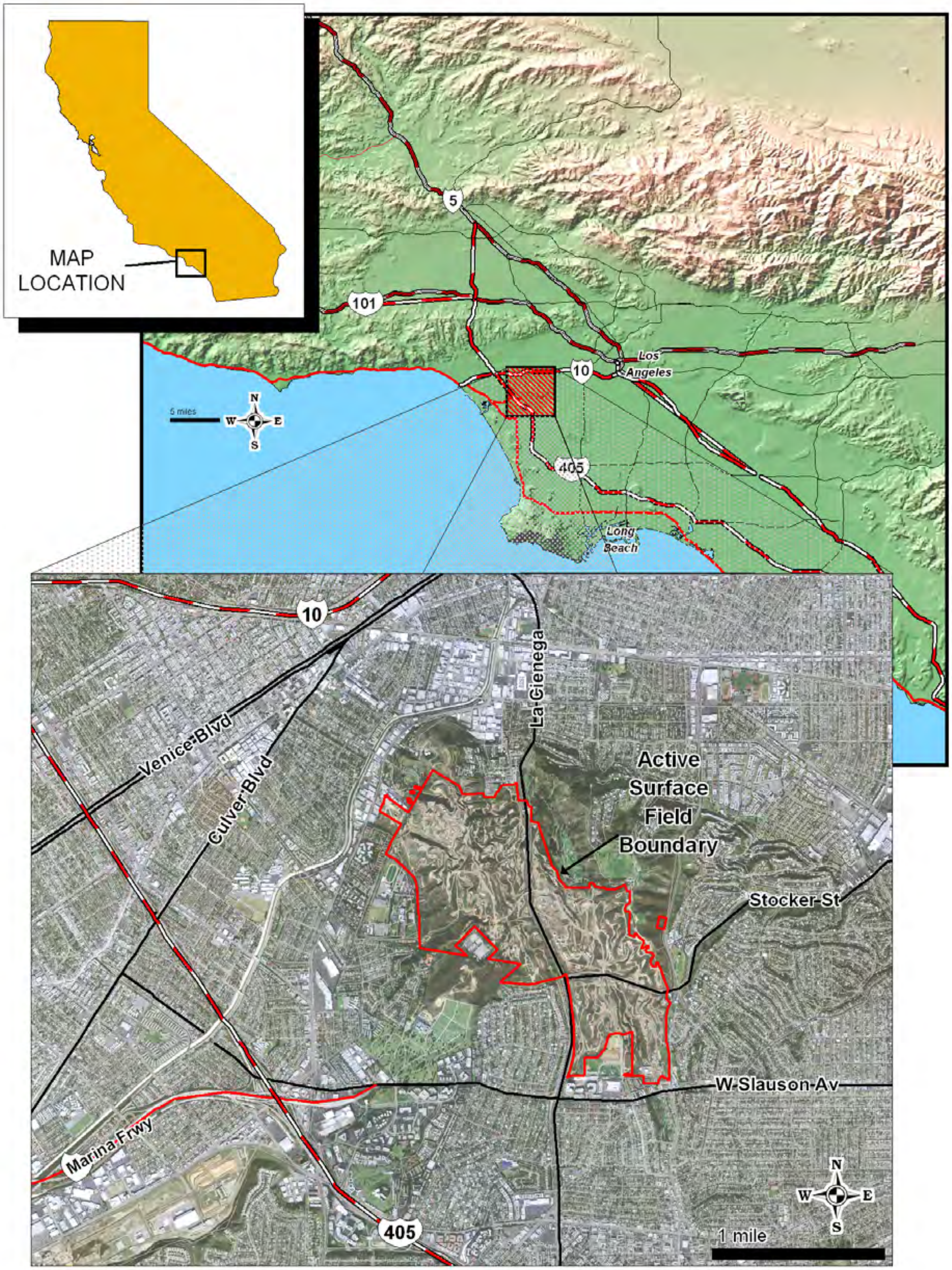
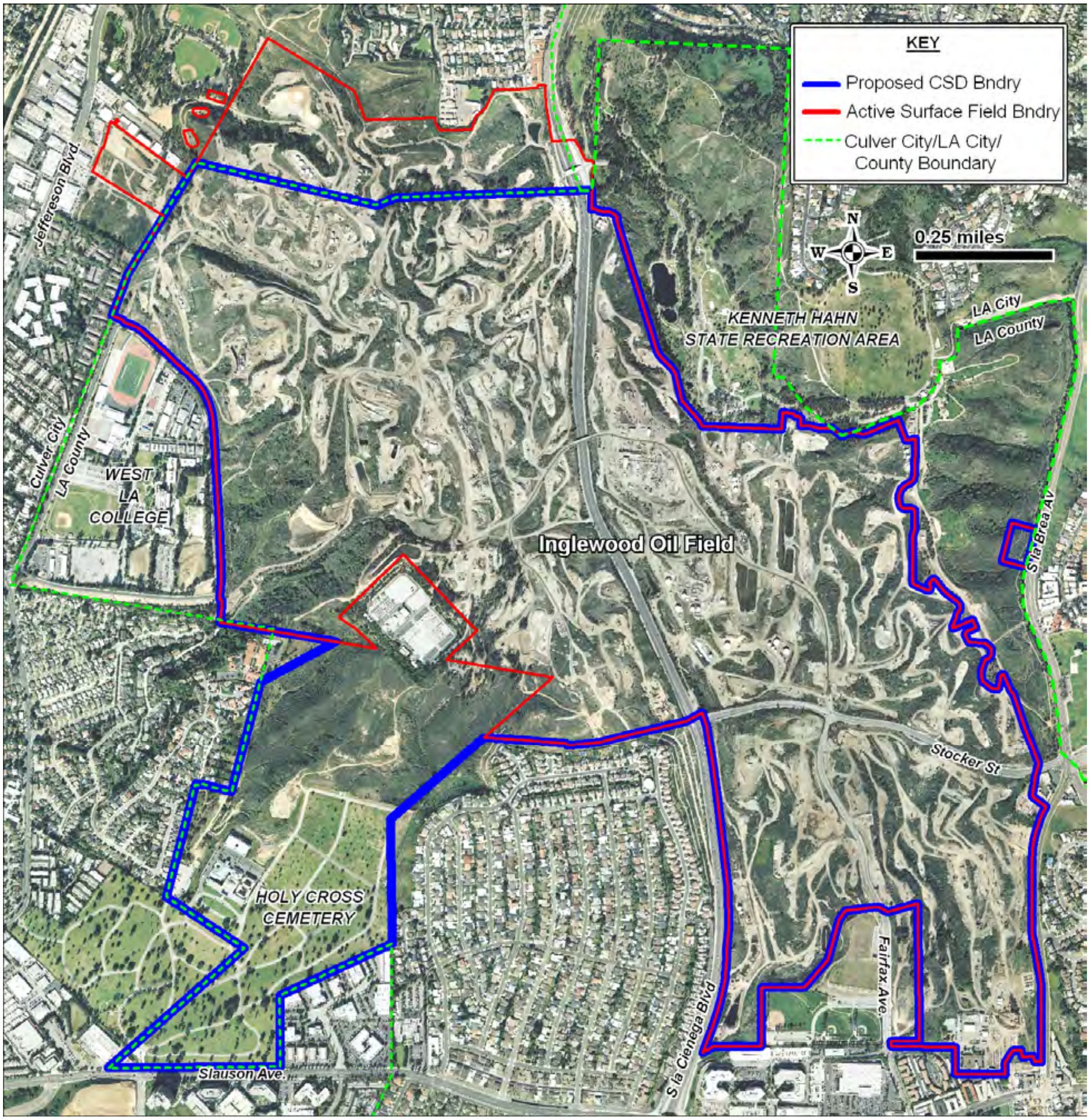


Figure ES-2 Proposed CSD Boundary



B. Background on the Inglewood Oil Field

Oil drilling in the Los Angeles Basin has a long history. According to the California Division of Oil, Gas and Geothermal Resources (DOGGR) database, almost 30,000 wells have been drilled in the Los Angeles Basin over the last 100-150 years.

The Inglewood Oil Field occupies an irregularly shaped area (Active Surface Boundary) that extends diagonally across the trend of the hills along the axis of the faulted Inglewood anticline and covers approximately 1,000 acres. Figure ES-1shows the location of the Inglewood Oil Field. Oil was first discovered in the Inglewood Field in 1924 as the result of a well drilled by Standard Oil. It was explored and developed rapidly such that its peak oil production occurred only a year later at a rate of over 90,000 barrels of oil per day (bopd). Production and development, mainly by "in-fill" drilling between wells, continued steadily to the present. Altogether, some 368 million barrels of oil and 269 billion cubic feet of natural gas have been produced from the field.

The Inglewood Oil Field has been in operation for over 82 years with over 1,600 wells being drilled during that time throughout the historical boundaries of the oil field, which has reduced over time. There are currently 1,463 wells (active, idle and abandoned) within the current surface lease boundary of the oil field (as of 2006).The terrain is gently rolling hills with native and non-native vegetation. There is heavy development of the active surface of the field with private roads, wells, pipelines, tankage and associated ancillary equipment required to operate the field. Adjacent development includes single-family homes, multiple family dwellings, and recreational, institutional, commercial and industrial uses.

The demographics of the area surrounding the Inglewood Oil Field within 1 mile are about 50% African American, 32% white, 6% Asian Pacific Islander and 12% other. About 25% of the persons are children under the age of 18 years. The mean household income is $46,000 and about 11% live in poverty.

As an added measure to ensure that study area minority populations are adequately identified, census data were gathered for Hispanic origin. Hispanic is considered an origin, not a race, by the U.S. Census Bureau. An origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person’s parents or ancestors before their arrival in the United States (U.S. Census Bureau 2005a). People who identify their origin as Spanish, Hispanic, or Latino may be of any race. Therefore, those who are counted as Hispanic are also counted under one or more race categories. Approximately 15 percent of the study area population was Hispanic in origin.

The Inglewood Oil Field is composed of various surface land and mineral rights. Activities at the Inglewood Oil Field involve the use of surface land for the establishment of well drilling, production, fluids processing, storage, etc. The area where PXP has surface land rights is shown in Figure ES-3. The surface land is the area where surface facilities can be placed, and it is typically considered the boundary of the Inglewood Oil Field. The rights to use the land “surface” for these activities are governed by applicable laws and regulations and the agreements that PXP (or previous owners) have established with various landowners.

The oil and gas reservoirs that are developed from the Inglewood Oil Field are subsurface reservoirs located between 800 and 10,000 feet deep. There are eight major oil and gas productions zones at the Inglewood Oil Field. Over 70 percent of the production wells and 90 percent of the injection wells are located in the Vickers-Rindge zone, which is at a depth of 3,500 to 4,300 feet. The majority of the production zones are made up of subzones where oil and gas is produced. The subzones are separated by layers of rock and represent distinct production area. These subzones vary in thickness and height throughout the production zone. Over the life of the oil field, 112 wells have been drilled into the Sentous zone, which is the deepest production zone. The reservoir areas that can be developed from the Inglewood Oil Field are governed by where PXP holds the mineral rights. A mineral right is part of the property rights of a parcel and may be sold, transferred, or leased. Mineral rights are distinct from “surface rights,” or the right to the use of the surface of the land for residential, agricultural, recreational, commercial, or other purposes. Mineral rights include the rights to use surface to develop minerals.

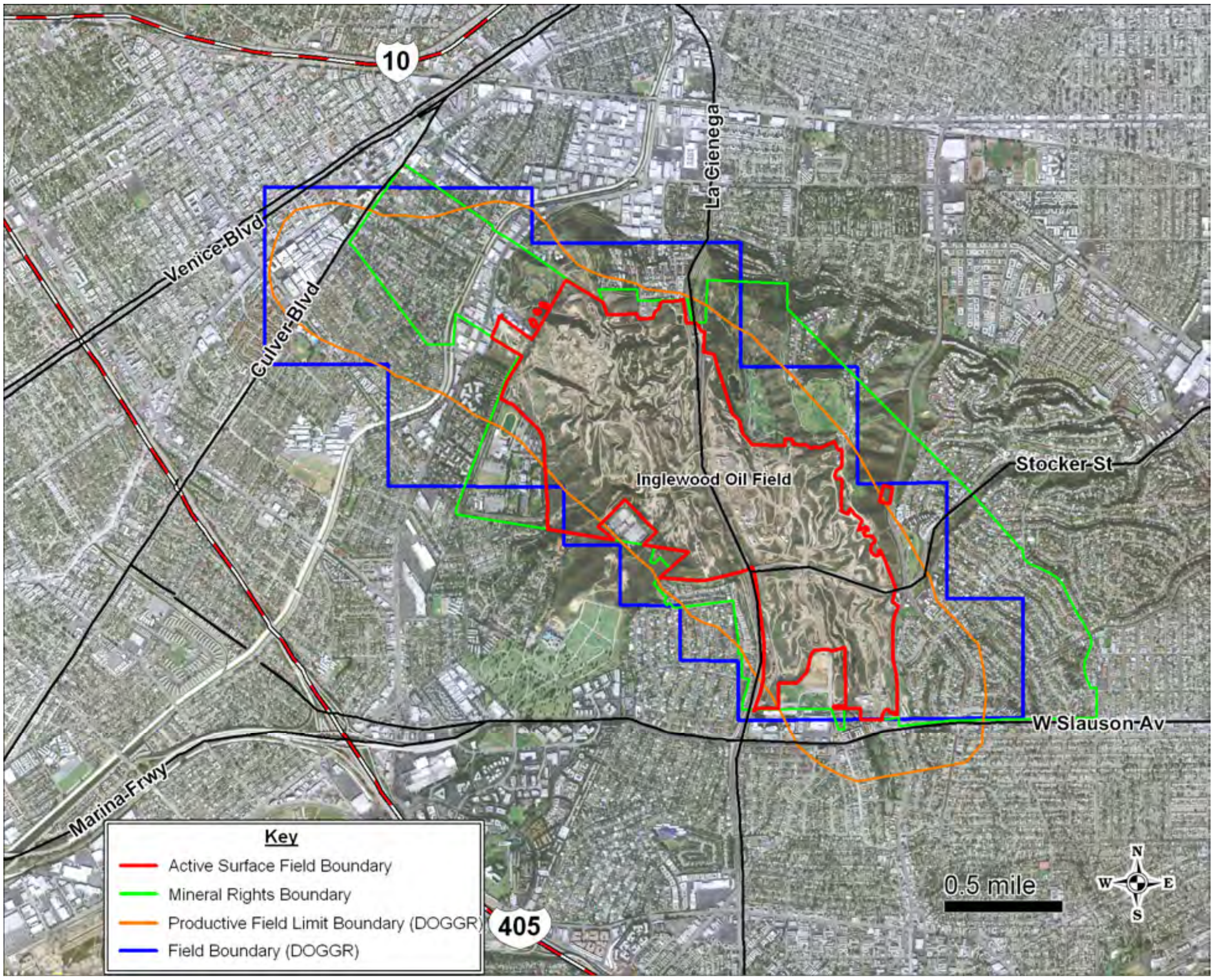
Mineral rights may be sold or retained separately from the surface rights, in which case the mineral rights are said to be “severed.” A person may own all of the mineral rights for a parcel or any fraction of the rights. A person may also own rights to only one kind of mineral, such as oil and gas, or to only one formation or depth interval. The ownership of the mineral rights in a parcel can usually be determined by examining the deed abstract for the property. There are generally restrictions on the mineral interest owner's right to use the surface if the surface rights are owned by someone else.

Figure ES-3 shows the mineral rights areas that PXP (or previous owners of the Inglewood Oil Field) have negotiated for extraction of the oil and gas resources. These are the areas where the oil field operator currently has rights to develop oil and gas resources. In a few areas of Los Angeles County, the surface and mineral rights are owned by different people. The owners of the mineral rights for these producing leases receive a royalty from the oil and gas extracted from the respective leases. The areas were the oil field operator has mineral rights access changes over time.

Also shown in Figure ES-3 is the active surface field boundary. This is the area where the oil field operator currently has access to use the land surface for the installation of surface facilities to support the oil and gas production.

DOGGR specifies the delineated extent of "productive field limit boundary" and the "field boundary", both of which are shown in Figure ES-3. The "productive field limit boundary" is the sub-surface area where oil and gas production is known to have occurred or is currently occurring. The "field boundary" is the surface area which overlies one or more common underground reservoirs where DOGGR believes oil and gas exist. Both the “productive field limit boundary” and the “field boundary” are changed by DOGGR when new geological data warrants a change.

Figure ES-3 Surface and Mineral Rights Boundaries for the Inglewood Oil Field

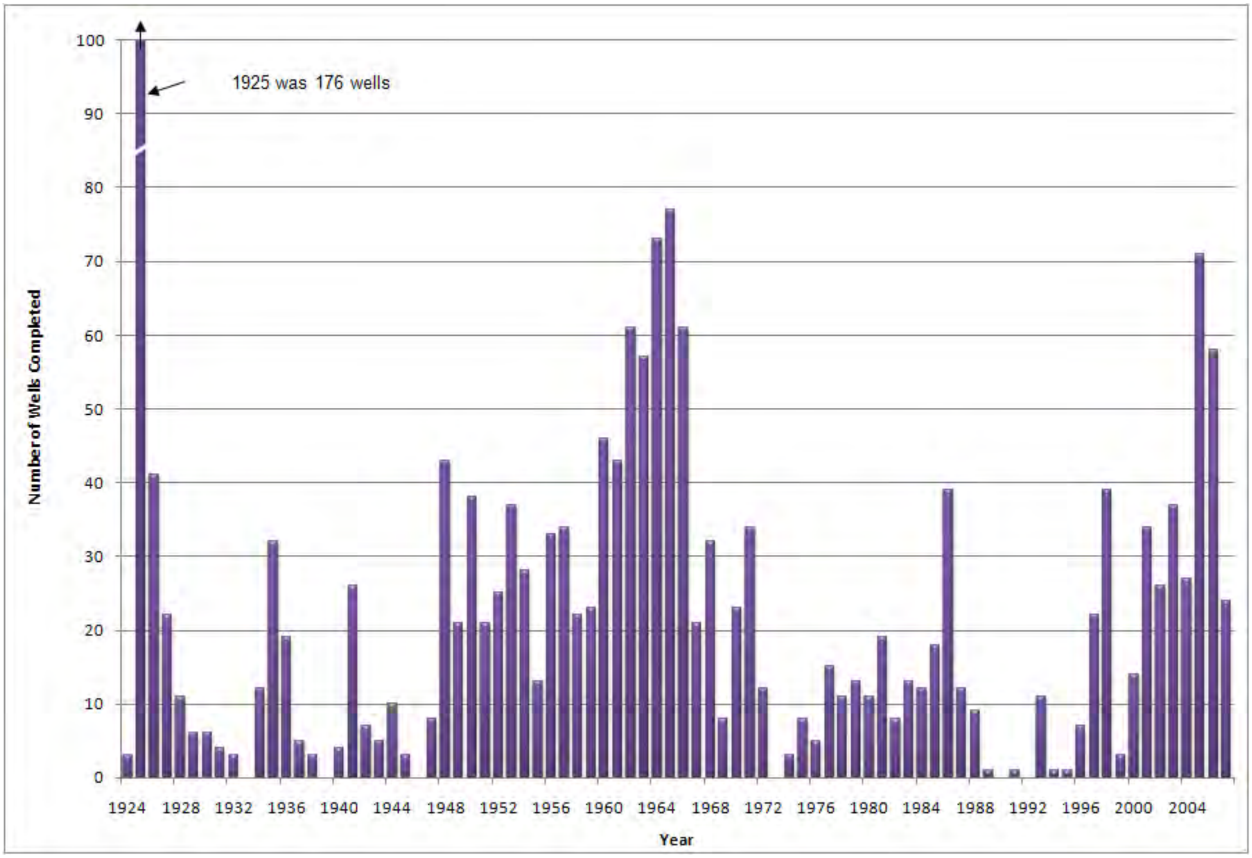


There are currently 436 active producing wells drilled from within the active surface boundary at the Inglewood Oil Field, 207 active water injection wells, 177 shut-in wells, 643 abandoned wells for a total of 1,463 wells within the current surface lease boundary of the oil field (as of 2006). .

The current production volumes from the Inglewood field are 8,700 barrels per day (bpd) oil, 300,000 bpd water, and 5,700 thousand standard cubic feet per day (mscfd) gas (as of February, 2007). Historical crude oil production volumes have ranged up to 90,000 bpd (in the 1920s) with gas production as high as 25,000 mscfd (in the 1960s).

The historical number of wells drilled per year has ranged from zero to 176 wells completed in 1925. Recently the number of wells drilled has averaged 36 per year between 2000 and 2007. See Figure ES-4 for information on number of wells drilled since 1924.

Figure ES-4 Historical Well Drilling Activity (Well Completions) Since 1924



Current activities at the Inglewood Oil Field involve extracting oil and gas from subsurface reservoirs located between 1,000 and 10,000 feet deep, processing the crude oil to remove water and processing the gas to remove water and gas liquids (e.g., propane and butane). Drilling is conducted 24 hours per day as stopping the drilling before casing is set could cause the wellbore to collapse around the drilling bit and make the restarting of the drilling operation difficult if not impossible. Crude oil is then shipped by pipeline to area refineries to be processed into gasoline and other products. The gas is shipped by pipeline to The Gas Company for end use by consumers and industry or is shipped to area refineries for use in the refining processes. The Gas Company has specifications related to the levels of H_2S, ethane, propane, and the BTU content of the gas that the gas Company will accept.

More information on the current Inglewood Oil Field operations can be found in Chapter 2 of the EIR.

C. Proposed Project- CSD

As part of their application to Los Angeles County to establish a CSD, PXP prepared a draft CSD. The PXP proposed CSD is divided into eight major parts that include the following.

A. Intent and Purpose;
B. Description of Boundary;
C. Definitions;
D. Community Wide Development Standards;
E. Community Relations;
F. Permits Required; and
G. Procedures for Obtaining Approval From Department of Regional Planning,

Section D of the CSD provides the development standards, operating requirements and procedures proposed for the Inglewood Oil Field. This section addresses issues covering drilling operations, production operations, maintenance operations, landscaping, grading, operation of oil field recovery heaters (steam generators), non-producing and idle wells, as well as some general conditions. A copy of the PXP proposed CSD is attached at the end of the Executive Summary.

D. Potential Future Inglewood Oil Field Development

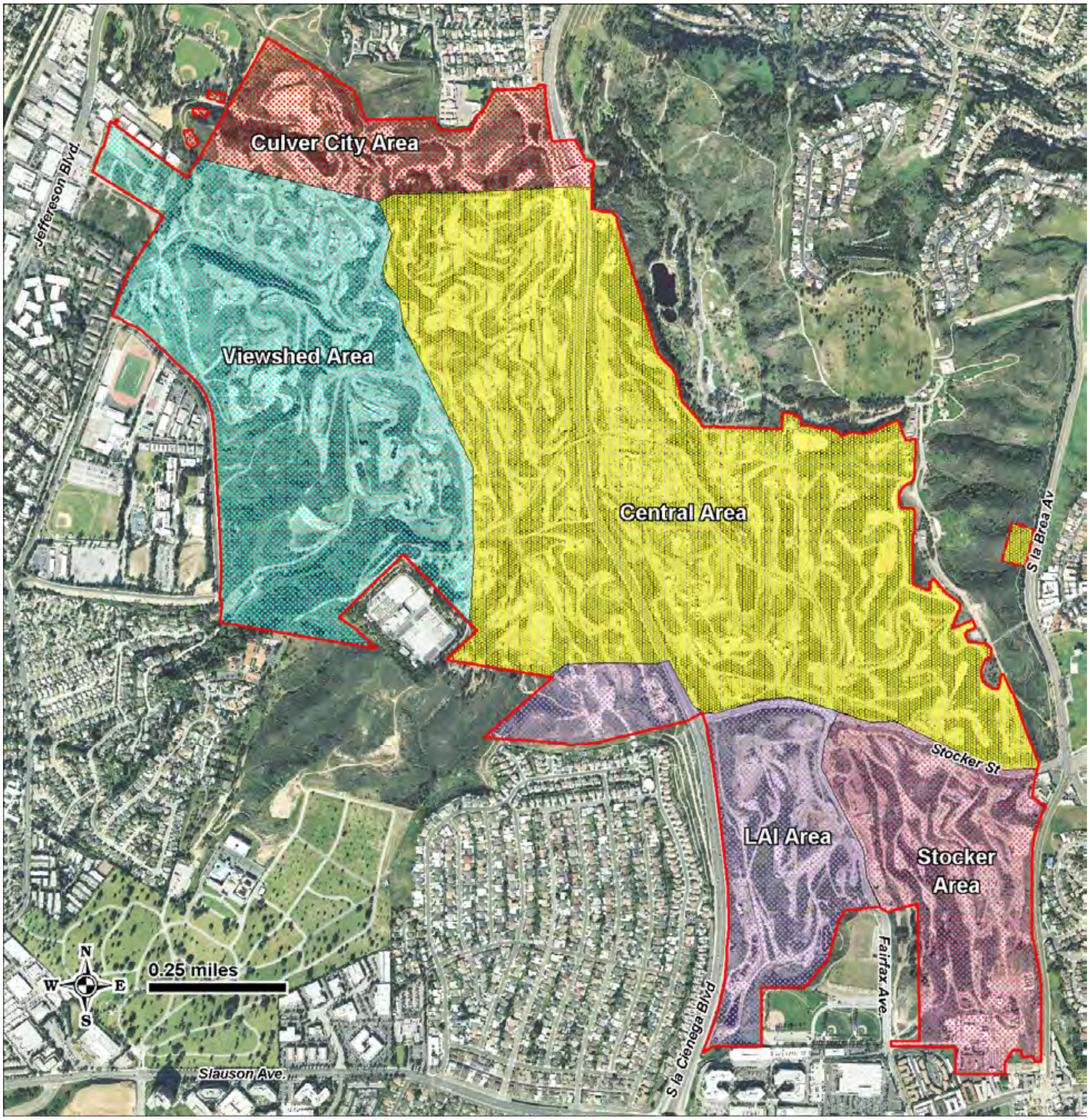
This section of the executive summary provides a potential future development scenario for the Inglewood Oil Field. The scenario was developed with input from PXP and covers a 20 year period. PXP has not applied to any agency for permits to conduct this development, and it is unknown what if any of this development will occur in the next 20 years.

Over the next 20 years, an average of approximately 53 wells per year could be drilled in the Inglewood Oil Field, for an average of 742 rig-days per year. While it is not possible to identify the exact location of each of these future wells, the well locations have been grouped into 5 drilling areas; Culver City area, located within Culver City; the Viewshed area where some of the areas are viewable from Culver City; the Central area located in the center of the field north of Stocker St. and east of La Cienega; the South LAI area located west of Fairfax Blvd. and south of Stocker St.; and the Stocker area located south of Stocker St. and east of Fairfax Blvd. Figure ES-5 shows the location of these five drilling areas.

During the peak year, as many as 85 wells could be drilled for a peak annual activity of 1,190 rig-days, and up to three new-well drill rigs could be operating at the oil field at any one time. The average number of drilling rigs at the site would be between one and two per year over the 20 year period.

Future drilling could increase the production of oil and gas from the field. Potential crude oil production is estimated to peak at about 21,000 bpd and gas production is estimated to peak at about 15,000 mscfd. Water produced and then re-injected is estimated to peak at about 720,000 bpd.

Figure ES-5 Drilling Areas



Source: PXP

The produced oil and gas from the future wells would be handled in much the same way as the current production at the oil field. Production from the wells would be separated into gas, oil and water streams. The oil would be processed to remove any remaining water, and then the dry oil would be stored in tanks and shipped via pipeline to local Los Angeles area refineries.

The produced water would be treated and then sent to injection wells, where the water would be injected back into the producing formation.

The produced gas would be sent to the existing gas plant where water, gas liquids (e.g., propane, butane, etc) and impurities would be removed. The gas would then be compressed, odorized and sold to the Southern California Gas Company or to a Los Angeles area refinery. The gas liquids would be fractionated into propane and butane+ (butane plus heavier gas liquids). The propane would be stored on site and then loaded into trucks for distribution throughout the Los Angeles basin. The butane+ would be blended back into the crude oil stream and shipped, along with the crude oil, to area refineries.

It is possible that the increase in oil production could require the construction and operation of a number of new facilities or modification of existing facilities, including:

- Well slot manifolds and automatic well test units;
- Oil cleaning plant;
- Water treating facility;
- Water injection wells; and a
- Vapor recovery skid.

PXP is considering implementing a steam drive development project in the future for a portion of the Inglewood Oil Field. The steam drive development project would involve the use of steam injected into portions of the field to enhance oil recovery. This would involve the installation of approximately 63 wells within the Stocker and South LAI areas of the field (see Figure ES-5). Forty-eight of these wells would be for the production of oil and gas, and the remaining 15 wells would be used for steam injection.

Equipment installations associated with the Steam Drive facilities would include the following:

- New wells and oil treatment plant;
- New gas treatment plant;
- New water treatment plant and water softening plant; and a
- New steam generation plant.

More information on the potential future oil field development can be found in Chapter 3 of the EIR.

E. Impacts Associated with Potential Future Oil Field Development

A majority of the Environmental Analysis is focused on identifying the possible environmental impacts associated with the potential future oil field development. The impact analysis looked at 16 different environmental issue areas such as noise, health risk, safety, geology, visual, etc.

Where needed, mitigation measures were developed that, if included as standards or requirements in the CSD, would serve to reduce the severity or eliminate the impact. The impact summary table (Table ES.1 located right after the Executive Summary) provides a list of all of the impacts that were identified in the EIR as well as the proposed mitigation measures. The remainder of this section of the Executive Summary provides a summary of some of the key impacts and associated mitigation measures.

The reader is referred to Chapter 4 of the EIR for a more detailed discussion of the impacts and mitigation measures.

Drilling Noise - During drilling of new wells, potential impacts are exacerbated because drilling continues day and night, 24-hours per day. Major noise sources associated with new well drilling include: internal combustion engines, metal-to-metal contact, electric motors, pumps, brakes on the drawworks, personnel voices (yelling instructions) and warning devices such as backup alarms on equipment.

A number of mitigation measures are included to mitigate the noise impacts to less than significant; they include not elevating noise levels at the property line of a neighboring use by more than 5 dBA of the existing baseline. This limit on noise will require the use of noise barriers that address specific sources including: the mast board and rig floor, mud works, drill rig motors, coil tubing unit, cutting conveyor and openings to the generator enclosure. In addition to noise barriers a number of other possible techniques that could be used by the oilfield operator to reduce noise from the drilling rig include: use of "critical" grade exhaust mufflers on all internal combustion engines; acoustical enclosure of the diesel generator; resilient pads on the drill floor, pipe storage area and V-door to reduce metal-to-metal noise; sound covers on the drawworks to reduce brake noise and use of visual signals and radios instead of back-up alarms, annunciators and shouted instructions. The noise output of new drilling rigs could be substantially reduced by use of a remote power generator, situated at the center of the oilfield and away from the sensitive uses at the perimeter, with electrical cables running out to the drill sites. Another possible solution to noise from drilling is the oilfield operator should provide sufficient distance between new well drilling sites and the oilfield perimeter. In addition, the oil field operator could implement a quiet mode of operation during night-time hours when background noise levels are at their lowest.

Other noise mitigation measures that have been identified in the EIR include, but are not limited to the following.

- Noise produced by oilfield operations shall include no pure tones when measured at a neighboring property.
- Deliveries to the oilfield shall be limited to between the hours of 7:00 A.M and 8:00 P.M., and 9:00 AM to 8:00 PM on Sundays and legal holidays.
- Deliveries to a site within 500 feet of a sensitive receptor shall be limited to between the hours of 7:00 A.M and 5:00 P.M., and 9:00 AM and 5:00 PM on Sundays and legal holidays.

- Backup alarms on all vehicles operating within the oil field shall be disabled between the hours of 8:00 P.M. and 8:00 AM. During periods when the backup alarms are disabled the oil field operator shall employ alternate, low-noise methods for ensuring worker safety during vehicle backup, such as the use of spotters.

- All drilling equipment shall be regularly serviced, maintained and repaired to minimize increases in noise output with time and to ensure that tonal noise from worn bearings, metal-on-metal contact, valves etc does not cause significant tonal noise at the oilfield perimeter.

- Existing and future Gas Plant well pumps shall be regularly serviced and repaired to ensure that tonal noise from worn bearings; metal-on-metal contact, etc. does not cause significant tonal noise at the oilfield perimeter.

- Locate all stationary noise-generating construction equipment as far as possible from sensitive land uses at the perimeter of the oilfield.

- The oil field operator shall install a new flare that is capable of handling the full volume of gas from the gas plant without elevating vibration levels or low-frequency ambient noise levels at the oil field perimeter. The oil field operator shall implement operating procedures that limits the amount of gas going to the flare to below that which causes vibration or low level airborne noise at offsite locations. These operating procedures shall be implemented until such time as the new flare is installed.

With the proper implementation of the above mentioned mitigation measures and others included within the Noise Section, 4.9, the impacts would be considered to be less than significant.

Air Toxics – Toxic emissions associated with future construction and operations would increase over the current emissions due to an increase in drilling, well workovers, crude oil throughput, fugitive emissions associated with new equipment, an increase in combustion associated with existing heaters and new heaters associated with steam generators. In addition, more construction would be taking place at the field, including grading, and new equipment installation. All of these construction activities utilize diesel engine power construction equipment, which emit toxic pollutants.

As per AB2588, health risk assessments are required for facilities that emit toxic pollutants above a threshold criteria level. Based on the annual emission reporting requirements of the SCAQMD, future operations at the Inglewood Oil Field would exceed the reporting threshold for a number of toxic pollutants. Overall, worst-case health risk associated with future operations exceeded applicable health risk criteria for individual cancer risk and acute non-cancer risk.

Several mitigation measures have been identified as part of the Air Quality Analysis and the health risk analysis that would serve to mitigate the air toxics emissions. The EIR provides for the installation of second generation heavy duty diesel catalysts Tier II diesel engines on all drill rigs. Finally, an additional mitigation was added requiring that when drilling new wells, a distance of at least 400 feet be maintained from all areas where public exposure could occur. This would generally equate to maintaining a buffer of 400 feet from all adjacent property boundaries where sensitive receptors could be located, or 300 feet if the rig generator can be placed at least 500 feet from the drill rig. Alternatively, new health risk assessment would have to be performed to determine if additional changes to the buffer zones are merited. A mitigation measure is provided to require the use of Tier II engines for all off road construction equipment. With the adoption of the above mentioned mitigation measures, health risk impacts would be considered to be less than significant.

Subsidence/Uplift – The maximum cumulative subsidence of any of the areas along the Newport-Inglewood Fault Zone is centered over the Inglewood Oil Field. Subsidence is often accompanied by large-scale earth cracking, and in some cases the earth cracking includes vertical movement, creating incipient or actual faulting. Surveying indicated that greater than two feet of subsidence-related, horizontal earth movement had occurred in the Baldwin Hills from 1934 to 1961, in the vicinity of the southeast active surface field boundary. By 1957, up to 10 feet of subsidence had occurred in other localized areas of the Baldwin Hills.

Surveying by the Los Angeles County, Department of Public Works indicated that subsidence had been abated, at least temporarily, by 1974. No survey data was available subsequent to 1974. However, more recently, researchers from the U.S. Geological Survey have indicated that portions of the Baldwin Hills are actually uplifting at a rate of 5 to 9 millimeters per year, as a result of secondary recovery-related, water injection operations. Since 1993, fluid injection has exceeded withdrawal in the Inglewood Oil Field, consistent with the observed uplift.

Therefore, the potential for subsidence/uplift related damage to overlying structures and/or infrastructure, as a result of continued oil withdrawal, is low but the impacts are still considered potentially significant. Given the fact that injection pressures are maintained below the fracture pressures of the injection zones the potential for induced earthquakes is low and impacts are considered less than significant.

A number of mitigation measures are provided in the EIR that require subsidence and uplift monitoring to be completed annually in the vicinity of the Inglewood Oil Field. Surveying for both vertical and horizontal ground movement should be completed in the vicinity of the Inglewood Oil Field, utilizing Global Positioning System technology. Accumulated subsidence or uplift (since post-Baldwin Hills Reservoir failure studies) should be measured in the vicinity of the Inglewood Oil Field, using repeat pass Differentially Interferometric Synthetic Aperture Radar technology.

In the event that Global Positioning System monitoring indicates that on-going subsidence or uplift is occurring in the Inglewood Oil Field, and is determined to be caused by the oil field operations, then adjustments would be made to the water injection and production rates at the oil field to stop the subsidence or uplift.

Oil Spill Risk – The potential development would increase the throughput of crude oil throughout the field including piping and tanks. There would also be additional piping from the added well heads and additional separation equipment associated with the oil cleaning plant and the water treatment plant that would be handling crude oil or emulsion.

These increased throughputs and additional equipment would increase the volume of spills if equipment were to leak or rupture, and would increase the frequency of spills at the field due to the increased amount of equipment. The maximum single-tank crude oil storage volumes at the field would not increase over current maximum single-tank volumes, although there could be an increase in the number of tanks. The new tanks would have lower failure rates than the existing crude oil storage tanks due to the new installation. However, most areas at the field are contained within secondary containment (berms) and retention basins and discharges to the environment are controlled with closed drain valves.

The retention basin drain valves could be left open during a draining and not closed during subsequent inspections. This would allow a spill to reach the areas outside the retention basins and potentially impact area creeks. Because of the use of drain valves and the inspections, the frequency of a release impacting the areas outside the field is low. With the added equipment, the frequency of rupture spills would increase to once every 5.7 years (from once every 6.0 years) and the frequency of spills that could affect the areas outside the field would increase to once about every 4,900 years (from once every 5,200 years). This assumes that all areas drain to a retention basin. A pipeline spill that occurred in March, 2008 entered a storm drain, thereby indicating that some areas of the field may not be protected by the retention basins or containment berms.

In order to mitigate this impact, the EIR includes mitigation measures requiring that all existing tank areas at the field and all new tank areas have secondary containment (berms and walls) that can contain at least 110% of the largest tank volume to prevent spills from entering the retention basin areas. In addition, the retention basins shall be adequately sited, inspected, maintained and operated to handle a 100-year storm event plus a potential spill of the volume of the largest tank that would drain into each basin. A survey would be conducted to ensure that all above ground pipelines at the field drains to a basin or a containment area.

Vibration – The major source of vibration at the oil field is associated with the gas plant flare. Under normal operating conditions, gas from the gas plant is shipped via pipeline into a Southern California Gas transmission pipeline. There are times when this transmission pipeline is shut-down without prior knowledge of the oil field operator. When this happens, the gas from the gas plant must be routed to the flare. This places a large volume of gas through the flare which produces low tonal vibrations that affect offsite areas, particularly in the Ladera Heights area. Given that these events are unplanned, it was not possible to measure the level of vibration. However, the vibration associated with flaring large volumes of gas would be considered significant, but mitigable.

In order to mitigate vibration impacts, the EIR recommends that mitigation measures be added that reduce vibration levels from drilling and operations to not exceed a velocity of 0.25 mm/s over the frequency range 1 to 100 Hz at the property line. In addition, the oil field operator shall install a new flare that is capable of handling the full volume of gas from the gas plant without producing low level vibration.

Odors – Odor events could increase due to the addition of equipment, increased operations at existing equipment and increased drilling. Added equipment would increase the number of components that could leak causing odors. Increased operations would increase the use of tanks, potentially leading to odor events. Increased drilling would increase the frequency of emissions from drilling muds during drilling operations. Some of these types of releases have caused Notice of Violations historically. These would be considered a significant impact.

A number of mitigation measures are provided in the EIR to reduce odor impacts and they include the following.

- The use of a portable flare as part of drilling operations for wells where there exists a potential for gas releases during drilling.
- The installation of a pressure monitoring system in the vapor space of all crude oil tanks. Possible upgrades to the tank vapor recovery system if hatches on the crude oil tanks are determined to lift and vent to atmosphere on a regular basis (more than once per quarter on any tank).
- Use of an odor suppressant when loading material into the bioremediation farms.
- Ensuring that all produced water and crude oil are contained within closed systems during production, processing, and storage.
- The installation of a meteorological monitoring station at the Inglewood Oil Field that meets the requirements of the U.S. EPA guidelines.

In addition, the air monitoring program has been included as a mitigation that would require for drilling operations and the gas plant. At all drill sites air would be monitored for total hydrocarbon vapors and hydrogen sulfide. If the total hydrocarbon vapors or hydrogen sulfide exceeded prescribed levels the operator would be required to take specific action up to and including shutting down the drilling operation. At the gas plant air would be monitored for total hydrocarbon vapors. If the total hydrocarbon vapors exceeded prescribed levels the operator would be required to take specific action up to and including shutting down the gas plant.

F. Analysis of the Proposed CSD

Section D of the PXP-proposed CSD provides the community-wide development standards. (A copy of the Applicant-proposed CSD is provided at the end of the Executive Summary). Table ES.2 provides a comparison of the community-wide standards in the Applicant-proposed CSD and the mitigation measures identified in the analysis of the Potential Inglewood Oil Field Development Scenario. Recommended modifications to the proposed CSD based on the analysis of the Applicant proposed CSD and the mitigation measures are discussed in Table ES.2.

Table 4.2.13 Electricity Generation Resource Mix and Greenhouse Gas Emissions

Area	United States	Western States (WECC)	California ISO	So Cal Edison Service Area*
Resource Mix, %				
Coal	50.2	34.2	1.2	1.7
Oil	3.0	0.5	1.2	0.9
Gas	17.4	26.3	51.1	41.9
Nuclear	20.0	9.9	16.8	38.0
Hydro	6.6	24.3	17.3	4.7
Biomass	1.4	1.3	3.2	2.9
Wind	0.3	0.9	2.4	3.8
Solar	0.0	0.1	0.3	0.8
Geo	0.3	2.0	5.5	4.1
Other Fossil	0.5	0.3	0.9	1.2
Other	0.1	0.0	0.0	0.0
Non-renewables	91.3	71.3	71.3	83.7
Renewables	8.7	28.7	28.7	16.3
Non-hydro Renewables	2.1	4.3	11.4	11.6
CO2 Rate, lb/MWh	1363	1107	687	613

Notes: Source is eGRID database with modifications and updates. *SCE Service area includes 75% of San Onofre, Geothermal in Nevada and hydro in Sierra Nevada, San Bernardino & LA. Mojave Coal Fired Power Plant not included in CalISO or So Cal Edison service area as it was shut down in 2005. Resource mix is the percentage of total mega-watt hours. Renewables are defined as hydro, biomass, wind, solar, geo and other.

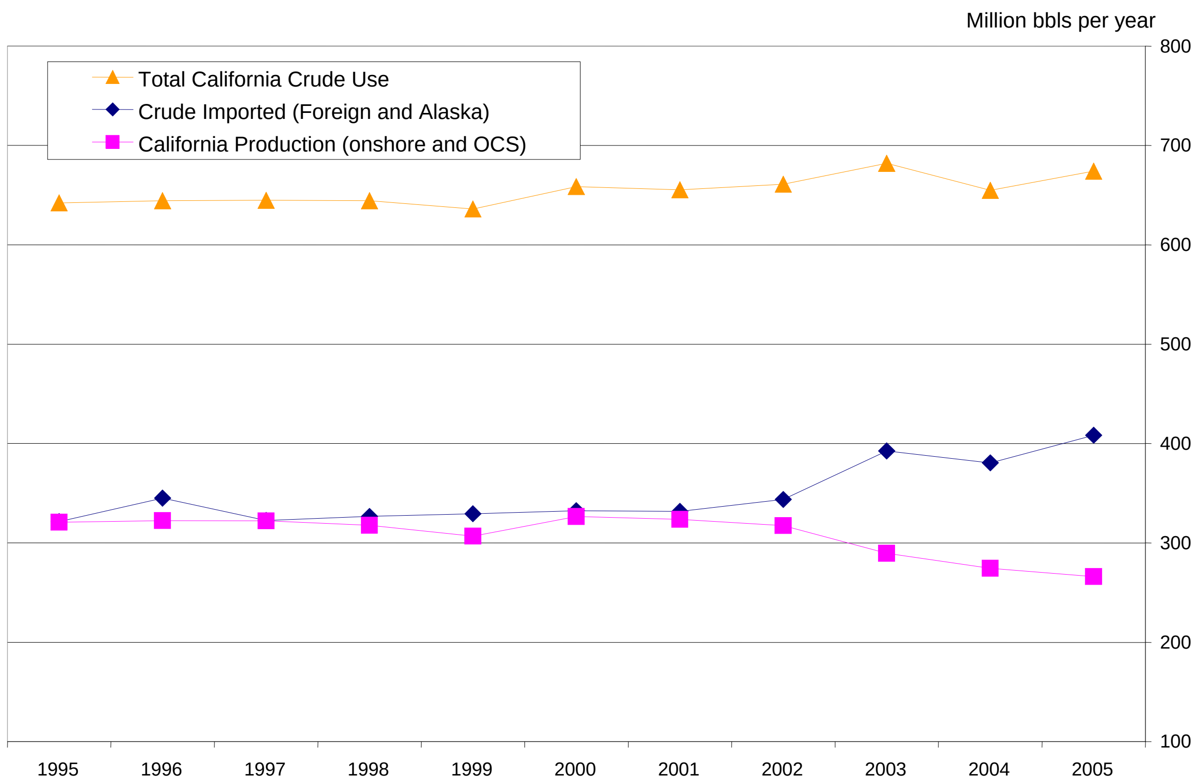
Crude Oil Transportation/Refining Lifecycle and Greenhouse Gas Emissions

One aspect of the “lifecycle” analysis of greenhouse gas emissions associated with the baseline and potential development is the dynamics of the crude oil markets in California. The supply of crude oil is driven by the demand for refined products (gasoline, diesel and jet fuel). Currently, the demand for refined products is met through supply to California refineries of crude oil from California domestic production, foreign imports of crude oil, imports of crude oil from Alaska, and imports of refined products. There are no crude oil pipelines which bring crude oil into California.

This means that the only sources of crude oil to meet refinery crude oil demand are from California production, Alaska production, or from foreign sources brought into ports by tanker ships.

California production of crude oil per year has been in decline since 1986, when production peaked at slightly over 400 million barrels. The decline has averaged about 1.7% per year since 1995. More recently, the decline has averaged over 3% annually since the year 2000. Figure 4.2-6 shows the total California crude oil use, California production, and the associated imports through California ports.

Figure 4.2-6 California Crude Oil Use, Production and Imports



Source: CEC and DOGGR databases online

The production of Alaska North Slope crude oil has experienced decline due to the age of the reservoirs. Alaska North Slope production has declined since its peak in 1989 of about 328 million barrels annually. The average rate of decline since 1995 has been above 4%.

At the same time that there has been declining California production and declining Alaska North Slope production, demand for crude oil in California has remained relatively flat, with an annual average increase since 1995 of only about 0.5%.

The combination of declining California and Alaska North Slope production along with a relatively constant, flat demand for crude oil in California equates to an increase in foreign crude oil imports. Foreign crude oil imports since 1995 have increased by an average of almost 38%. As seen in Figure 4.2-6, the increase in imports closely mirrors the decline in California production since about 2000.

The California Energy Commission (CEC) has produced a number of reports on the state of the California crude oil markets. They conclude the following:

- "Declining California production will be replaced with crude oil delivered by marine vessel" (CEC 2003);

- A "reduction in [gasoline] use with alternative fuels and efficiency improvements will reduce imports of [refined] products, not imports of crude oil" (CEC 2007);
- "Without increasing the fuel supply by importing additional crude oil and transportation fuels, California will not only continue to experience supply disruptions and price spikes, but also supply shortages and prolonged and elevated prices, for gasoline fuels"; (CEC 2003b); and
- "Supplies of crude oil from within California and from Alaska have been declining, requiring California to import an increasing proportion of its crude oil from foreign sources" (CEC 2003b).
- The CEC estimates that increases in imports of crude oil to California translates into "an additional 150 shipments of crude oil [into ports] received per year [by] 2015" (CEC 2005).

A component of the crude oil markets involve Los Angeles area refineries and their associated ability to process a range of different crude types, from the relatively sweet/light Alaska North Slope crude to the heavy San Joaquin Valley crudes. Increased installation of cracking units at refineries, which allow for the refining of heavier crude oils into gasoline and lighter products, in the last 5-10 years has increased the ability of refineries to process heavier crude oils as the supply of ANS crude and San Joaquin Valley light crude has diminished (SCAQMD CEQA Documents).

The three major regions of California crude oil production are Kern County, the Los Angeles Basin, and the Outer Continental Shelf. Oil from Kern County accounts for two-thirds of California's total crude oil production. Approximately 58 percent of the Kern County crude oil has an API of 18 degrees or less (heavy crude). The Los Angeles Basin's largest fields are the Wilmington and the Huntington Beach fields with average APIs of 17 to 19 degrees, respectively (heavy crude). The Outer Continental Shelf accounts for about 10 percent of the total California production. The quality of Outer Continental Shelf crude oil varies by field with API gravities ranging from 14 to 38 degrees (heavy to light crude). (CEC 2006). Alaska North Slope crude oil ranges from an API gravity of 22 to 40 degrees (light crude).

Oil imports delivered to California from foreign sources by ocean going tankers come from Saudi Arabia (35%), Ecuador (25%), Iraq (12%), Mexico (7%) and others. The Saudi crude oil API gravity ranges from 28 to 34 degrees (light crude) (CEC 2006).

The use of foreign crude oil is associated with substantial emissions associated with transportation as foreign crude oil needs to be transported from between 4,000 miles (Ecuador) and 13,000 miles (Saudi Arabia) one-way to get to California. Alaska North Slope crude travels about 2,500 miles from Alaska. This causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil.

Transportation of the majority of California crude oil is via pipeline, which requires energy to pump the crude oil to the refineries. This energy is generally a function of the type of crude oil, if heating is required, and the distance and terrain between the wells and the refinery.

Very little, if any, crude oil is exported from California. Since the beginning of 2001 through the end of November 2007, 1,367,000 barrels of crude has been exported from PADD 5 (California, Arizona, Nevada, Oregon, Washington, Alaska, and Hawaii). The majority of the exports were a shipment to China of 805,000 barrels in April 2004, 401,000 barrels to Canada in January 2006, and 57,000 barrels to Canada in October 2004 (EIA 2008). The remaining exports from PADD 5 (17 shipments) were to Canada and Mexico, and averaged approximately 6,000 barrels per shipment. Given the small size of most of these shipments, it is likely they were via truck and not marine tanker.

Therefore, if one assumes that all of the PADD 5 exports originated from California, which is highly unlikely, but the most conservative assumption, then at best there would have been two to four marine tanker trips for exporting crude over a seven year period. This compares with over 1,000 tanker trips that imported crude oil into California over the same seven year period.

Refining of crude oil into end-use products such as gasoline, diesel and jet fuel requires energy. Refinery energy requirements are a function of the refinery arrangements, the type of crude oil, the type of gasoline being produced (winter or summer blends), the level of sulfur removal required, etc. Efficiencies of refineries have been shown to range from 83 to 87% (GM, 2001), meaning that 13 to 17% of the product energy content is required to refine the product.

4.2.7.2 Affected Environment

National Greenhouse Gas Emissions

Fossil fuel combustion represents the vast majority of the nation's greenhouse gas emissions, with CO_2 being the primary greenhouse gas. The total U.S. greenhouse gas emissions were 7,260 million metric tons of carbon equivalents (MMTCE) in 2005, of which 84% was CO_2 emissions (EPA 2007). Figure 4.2-7 shows the breakdown of U.S. greenhouse gas emissions since 1990. Approximately 33% of greenhouse gas emissions were associated with transportation in 2005 and about 41% was associated with electricity generation.

Statewide Greenhouse Gas Emissions

California's greenhouse gas emissions are large in a world-scale context and growing over time. If California were considered an independent country, its emissions would rank at least 16th largest. In 2004, California produced 492 million metric tons of CO2 equivalent greenhouse gas emissions (CEC 2006). The transportation sector is the single largest category of California's greenhouse gas emissions, producing 41% of the state's total greenhouse gas emissions in 2004. Electrical generation produced 22% of greenhouse gas emissions. Most of California's emissions, 81%, are carbon dioxide produced from fossil fuel combustion (CEC 2006).

Excerpt of reference cited at footnote 10 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/6.0_gp_final-general-plan-ch6.pdf

Chapter 6: Land Use Element

I. Introduction

The Land Use Element provides strategies and planning tools to facilitate and guide future development and revitalization efforts. In accordance with the California Government Code, the Land Use Element designates the proposed general distribution and general location and extent of uses. The General Plan Land Use Policy Map and Land Use Legend serve as the “blueprint” for how land will be used to accommodate growth and change in the unincorporated areas.

II. Background

Land Uses

As shown in Table 6.1, more than half of the unincorporated area is designated for natural resources. The next largest is rural, which accounts for approximately 39 percent of the unincorporated areas, followed by residential, which accounts for approximately three percent of the unincorporated areas.

Table 6.1: General Land Use Categories, by Acreage

General Land Use Categories	Acres
Residential	51,480
Rural	641,321
Commercial	5,268
Industrial	7,304
Natural Resources*	844,224
Public and Semi-Public	79,920
Mixed Use	291
Specific Plan**	13,556
Other***	1,080
Total:	1,644,444

*Natural Resources includes all natural resource and categories (including natural areas, developed parks, waterways, golf courses, etc.), and military areas (San Clemente Island and Edwards AFB).

** Specific Plans include a combination of land uses.

** Some area and community plans have special categories that do not fit into the scheme of the Land Use Legend categories (such as "special use sites," parking areas, senior citizen density bonus areas, etc.)

General Plan Amendments and Implementation Tools

As the constitution for local development, the General Plan guides all activities that affect the physical environment.

The costs and liability associated with remediating brownfield sites, however, is a deterrent to redevelopment. The availability of technical assistance, financing and other programs is necessary to promote brownfields redevelopment.

Adaptive Reuse

Adaptive reuse can play a key role in revitalizing older, economically-distressed neighborhoods. Older and often historically significant buildings can be recycled and converted into other uses, such as multifamily residential developments, live and work units, mixed use developments, or commercial uses. However, preexisting conditions, such as building location, lack of onsite parking, footprint and size can add to the difficulty in meet current zoning regulations and development standards. Regulatory incentives, such as flexibility in zoning, are needed to encourage the adaptive reuse of older buildings.

2. The Impacts of Suburban Sprawl

Suburban sprawl is a land use pattern that extends urban infrastructure and residential development into undeveloped areas with limited or no infrastructure, such as roads, public utilities, and public transit. While well-designed development may occur in isolation, the impacts of suburban sprawl can be seen when there are no clear and defined growth boundaries and strong development restrictions, which results, over time, in the spread of the initial developed area into surrounding undeveloped areas. A suburban sprawl land use pattern puts the unincorporated areas at risk of losing resources, such as agricultural lands, and will contribute to the fragmentation and isolation of open space areas. Suburban sprawl also can potentially contribute to traffic congestion, air pollution, and greenhouse gas emissions.

3. Protecting Rural Communities

“Rural” is defined as a way of life characterized by living in a non-urban or agricultural environment at low densities without typical urban services. Urban services and facilities not normally found in rural areas, unless determined to be necessary for public safety, include curbs, gutters and sidewalks; street lighting, landscaping and traffic signalization; public solid waste disposal, integrated water and sewerage system; mass transit; and commercial facilities dependent upon large consumer volumes, such as regional shopping centers, sports stadiums and theaters.

4. Land Use Compatibility and Distribution

Land Use Compatibility

The placement, configuration, and distribution of land uses have a significant impact on a community’s quality of life. For example, in some cases, a residential use could be impacted by noise, traffic and odor from adjacent commercial or heavy industrial uses. The General Plan addresses land use compatibility by mapping and regulating uses and intensities, and including policies and programs that mitigate land use conflicts through design, such as the use of landscaping, walls, building orientation, and performance standards. The General Plan also encourages developments that are compatible with community identity and character and existing conditions, such as rural and natural environmental settings.

The General Plan encourages the protection of major facilities, such as landfills, solid waste disposal sites, energy facilities, natural gas storage facilities, oil and gas production and processing facilities, military installations, and airports from the encroachment of incompatible uses. For example, the County’s Airport Land Use Plan, which was adopted by the ALUC in 1991, addresses compatibility between airports and surrounding land uses by addressing noise, overflight, safety, and airspace

Employment Generating Uses	Policy LU 5.10: Encourage employment opportunities and housing to be developed in proximity to one another.
Goal LU 6: Protected rural communities characterized by living in a non-urban or agricultural environment at low densities without typical urban services.	
Topic	**Policy**
Rural Character	Policy LU 6.1: Protect rural communities from the encroachment of incompatible development that conflict with existing land use patterns and service standards.
	Policy LU 6.2: Encourage land uses and developments that are compatible with the natural environment and landscape.
	Policy LU 6.3: Encourage low density and low intensity development in rural areas that is compatible with rural community character, preserves open space, and conserves agricultural land.
Goal LU 7: Compatible land uses that complement neighborhood character and the natural environment.	
Topic	**Policy**
Land Use Compatibility	Policy LU 7.1: Reduce and mitigate the impacts of incompatible land uses, where feasible, using buffers, appropriate technology, building enclosure, and other design techniques.
	Policy LU 7.2: Protect industrial parks and districts from incompatible uses.
	Policy LU 7.3: Protect public and semi-public facilities, including but not limited to major landfills, natural gas storage facilities, and solid waste disposal sites from incompatible uses.
	Policy LU 7.4: Ensure land use compatibility in areas adjacent to military installations and where military operations, testing, and training activities occur.
	Policy LU 7.5: Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.
	Policy LU 7.6: Ensure that proposed land uses located within Airport Influence Areas are compatible with airport operations through compliance with airport land use compatibility plans.
	Policy LU 7.7: Review all proposed projects located within Airport Influence Areas for consistency with policies of the applicable airport land use compatibility plan.
	Policy LU 7.8: Promote environmental justice in the areas bearing disproportionate impacts from stationary pollution sources.
Goal LU 8: Land uses that are compatible with military operations and military readiness, and enhance safety for military personnel and persons on the ground.	
Topic	**Policy**
Military Compatible Uses	Policy LU 8.1: Facilitate the early exchange of project-related information that is pertinent to military operations with the military for proposed actions within MOAs, HRAIZs, and within 1,000 ft. of a military installation.

Excerpt of reference cited at footnote 11 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/9.0_gp_final-general-plan-ch9.pdf

Chapter 9: Conservation and Natural Resources Element

I. Introduction

The County's role in the protection, conservation and preservation of natural resources and open space areas is vital as most of the natural resources and open space areas in Los Angeles County are located within the unincorporated areas. The County must act as the steward for Los Angeles County's natural resources and available open space areas, and conserve and protect these lands and resources from inappropriate development patterns.

The Conservation and Natural Resources Element guides the long-term conservation of natural resources and preservation of available open space areas. The Conservation and Natural Resources Element addresses the following conservation areas: Open Space Resources; Biological Resources; Local Water Resources; Agricultural Resources; Mineral and Energy Resources; Scenic Resources; and Historic, Cultural and Paleontological Resources.

II. Open Space Resources

This section addresses open space and natural area resources, and provides policies for preserving and managing dedicated open space areas through preservation, acquisition, and easements.

Background

Open space resources consist of public and private lands and waters that are preserved in perpetuity or for long-term open space and recreational uses. Existing open spaces in the unincorporated areas include County parks and beaches, conservancy lands, state parklands, and federal lands, such as national forests. Open space resources include private lands, such as deed-restricted open space parcels and easements. Various stakeholders share a responsibility to manage and preserve the available open space resources in the unincorporated areas.

Open Space Resources

Table 9.1 shows a summary of open space resources areas, by acreage and category.

Table 9.1: Unincorporated Los Angeles County Open Space Resources, in Acres

Open Space Resource Category	Acres
Conservancy Lands	48,271.79
County Lands	16,834.24
Federal Lands	679,629.58
Private Open Space Lands	9,181.03
State Lands	50,893.72

Mineral Resource Zone Regulation and Conservation

The California Department of Conservation protects mineral resources to ensure adequate supplies for future production. The California Surface Mining and Reclamation Act of 1975 (SMARA) was adopted to encourage the production and conservation of mineral resources, prevent or minimize adverse effects to the environment, and protect public health and safety. An important component of SMARA requires that all surface mines be reclaimed to a productive second use upon the completion of mining (Public Resources Code, sub-sections 2712 (a), (b), and (c)).

In a joint regulatory effort, SMARA authorizes local governments to assist the State in issuing mining permits and monitoring site reclamation efforts. To manage mining resources, the County has incorporated mineral resource policies into the Conservation and Natural Resources Element. In addition to these policies, Title 22 of the County Code (Part 9 of Chapter 22.56) requires that applicants of surface mining projects submit a reclamation plan prior to receiving a permit to mine, which must describe how the excavated site will ultimately be reclaimed and transformed into another use.

Oil and Natural Gas

Mineral Resources include areas that are appropriate for the drilling for and production of oil and natural gas. Oil production still occurs in many parts of the unincorporated areas, including the Baldwin Hills and the Santa Clarita Valley and is regulated by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR). DOGGR retains exclusive jurisdiction over all subsurface oil and gas activities in California including well stimulation techniques such as hydraulic fracturing (“fracking”). The County may regulate zoning and land use to mitigate impacts from surface operations on surrounding communities. Jurisdiction for offshore oil and gas production falls to the State Lands Commission and the DOGGR for near-shore facilities on state leases and to the federal government for facilities farther offshore on federal leases. Adherence to the standards for the installation, operation, and abandonment of oil and gas production and storage facilities is important to protect public health and safety.

Energy Resources

Energy in California is produced from a variety of non-renewable and renewable natural resources, including oil, natural gas, and hydrologic, wind, and solar power. Although non-renewable energy resources (oil and natural gas) generate a majority of its energy, California has one of the most diverse portfolios of renewable energy resources in the country. Renewable energy is derived from resources that are regenerative and cannot be depleted, such as wind and solar power. For this reason, renewable energy sources are fundamentally different from fossil fuels, such as coal, oil, and natural gas, which are finite and also produce greenhouse gases and other pollutants. Aside from existing oil and natural gas deposits, California’s topography and climate lend themselves to the production of energy from wind, solar, and tidal power. There are significant opportunities for the County to produce energy from renewable sources. Information about solar energy can be found on the County’s web site at http://lacounty.solarmap.org.

Issues

1. Development of Mineral Resources

Mineral Resources include existing surface mining activities and known deposits of commercially-viable minerals and aggregate resources, as well as areas suitable for the drilling for and production of energy resources, including crude oil and natural gas. Many issues arise from the incompatible development of land near Mineral Resources. Mineral resource extraction and production, and activities related to the drilling for and production of oil and gas, can often garner community complaints due to perceived environmental threats and surface operations. The General Plan protects Mineral Resources, as well as the conservation and production of these resources, by encouraging compatible land uses in surrounding and adjacent areas.

It is also important to work with the State Mining and Geology Board and State Geologist in the permitting process, as well as to coordinate with different agencies to address mineral resources within regional efforts. This includes the prioritization of Mineral Land Classifications efforts of MRZ-3 and MRZ-4 lands adjacent to planned new or existing freight routes, or addressing mineral resources in the Sustainable Communities Strategy, per SB 375.

2. Energy Conservation

Energy demand for transportation and non-transportation uses, including gasoline, electricity, heating, and cooling will continue to increase as Los Angeles County grows. Energy consumption patterns demonstrate that residents consume proportionally more energy for transportation than the rest of California. Low-density, automobile-dependent communities place high demands on declining energy resources. The Mobility Element promotes rail, bus, carpool, bicycle, and pedestrian modes of transportation as alternatives to the single-occupant automobile, and the Land Use Element promotes the efficient development and use of land to reduce consumptive land use patterns.

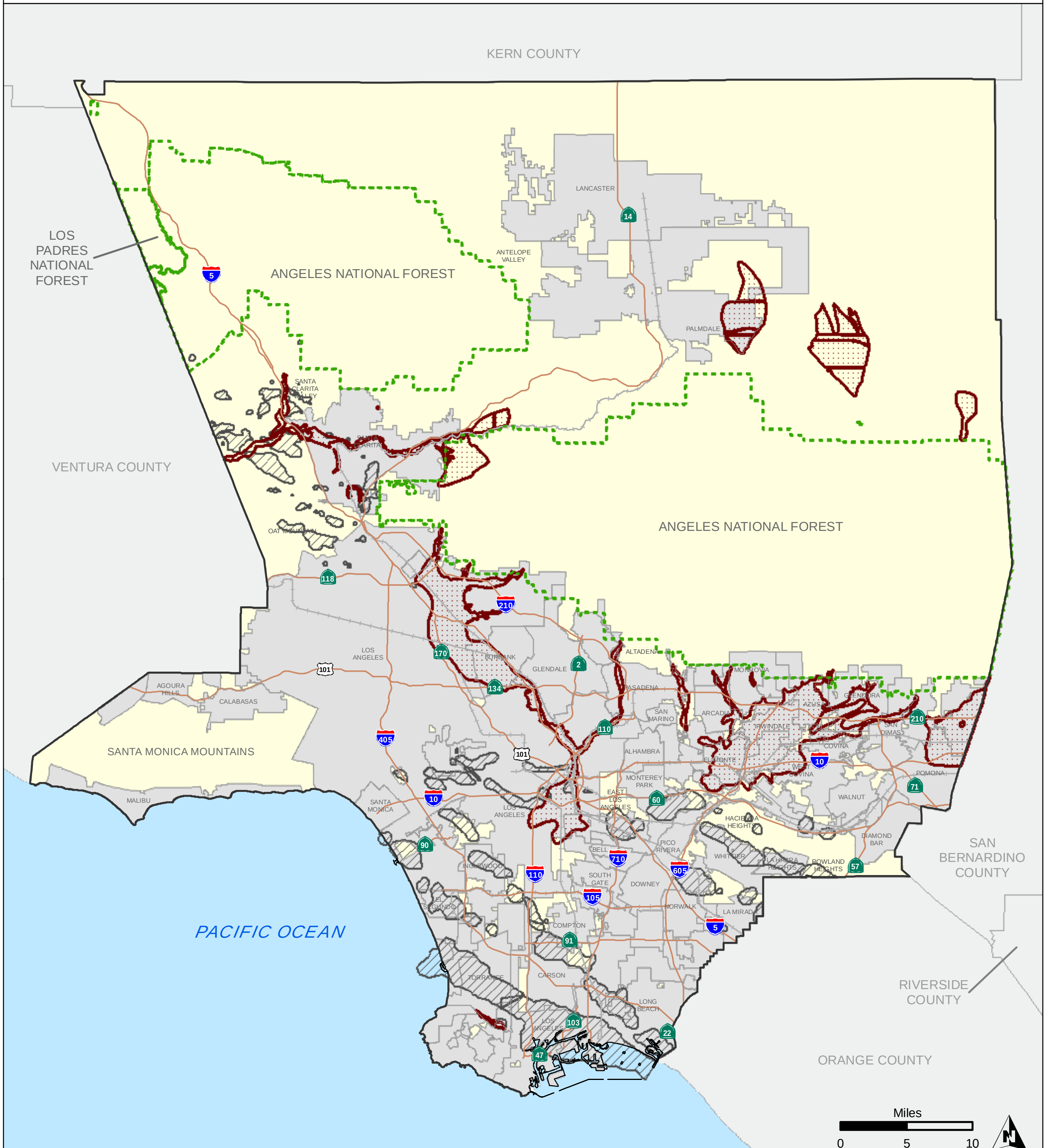
In addition, state and county building codes determine energy efficiency requirements for building construction. Changes to building codes over the years have resulted in substantial improvements in energy efficiency. This has translated into less energy required to light, cool, and heat buildings. In addition, green building techniques, such as the use of passive solar orientation, recycled building materials, improved insulation, energy star appliances, and onsite small-scale renewable energy generation have contributed to energy conservation. The Air Quality Element includes policies on energy conservation and promoting renewable energy to help the County meet its climate change goals.

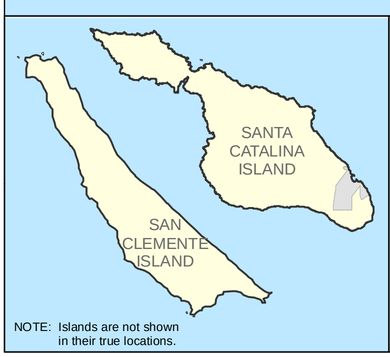
Excerpt of reference cited at footnote 12 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/9.1_Chapter9_Figures.pdf

Mineral Resources

Figure 9.6





- Mineral Resource Zones
- Oil and Gas Resources
- National Forest
- Unincorporated Areas
- Cities

Source: Department of Regional Planning, May, 2014. Additional Sources: California Energy Commission, California Department of Conservation

To: Los Angeles County Board of Supervisors

From: Center for Biological Diversity (852 supporters)

Re: Amend the Community Standards District to phase out oil drilling in the Inglewood Oil Field

First Name	Last Name	City	State	Zip	Subject
Elizabeth	Edinger	North Hollywoo	CA	91601	It's time to shut down the Inglewoo
Jean	Woodrov	San Pedro	CA	90732	It's time to shut down the Inglewoo
Beate	Nilsen	Malibu	CA	90265	20 years isn't fast enuf to shut dow
San	Butler	Los Angeles	CA	90045	It's time to shut down the Inglewoo
Anita	Emery	Los Angeles	CA	90016	It's time to shut down the Inglewoo
Rebecca	Wilson	Los Angeles	CA	90065	Time to shut down Inglewood Oil F
Frank	Angel	Malibu	CA	90265	It's time to shut down the Inglewoo
Kara	Masters	Topanga	CA	90290	Please shut down the Inglewood O
Melissa	Miller	West Covina	CA	91790	It's time to shut down the Inglewoo
Robert	Carr	Monterey Park	CA	91754	It's time to shut down the Inglewoo
Tracy	Elliott	North Hollywoo	CA	91602	It's time to shut down the Inglewoo
Joe	Galliani	Redondo Beac	CA	90277	It's WAY PAST time to shut down t
Ileene	Anderson	Los Angeles	CA	90046	It's NOW time to shut down the Ing
Edward	Simpson	South Pasaden	CA	91030	Inglewood Oil Field
Beatrice	Simpson	South Pasaden	CA	91030	Inglewood Oil Field
Elizabeth	Coomb	Culver City	CA	90230	It's time to shut down the Inglewoo
Nancy	Goldberg	Los Angeles	CA	90066	It's time to shut down the Inglewoo
William	Schoene	Santa Monica	CA	90405	Shut Down the Inglewood Oil Field
Paula	Dashiell	Los Angeles	CA	90066	It's time to shut down the Inglewoo
Genette	Foster	Pasadena	CA	91106	Long overdue: shut down the Inglev
Julie	Stein	Pacoima	CA	91331	It's time to shut down the Inglewoo
Laura	Okazaki	Los Angeles	CA	90034	It's past time to shut down the Ingle
Thomas	Canning	Calabasas	CA	91302	It's time to shut down the Inglewoo
Laura	Strom	Los Angeles	CA	90034	It's time to shut down the Inglewoo
Judy	Branfman	Santa Monica	CA	90401	Finally - please shut down the Ingle
Janis	Hatlestad	Woodland Hills	CA	91364	It's time to shut down the Inglewoo
Sandra	Cutuli	Los Angeles	CA	90035	CLOSE the Inglewood Oil Field
Christian	Kasperkovi	Tujunga	CA	91042	the Inglewood Oil Field is not our fu
James	Warren	South Pasaden	CA	91030	It's time to shut down the Inglewoo
Todd	Shuma	Tehachapi	CA	93561	It's time to shut down the Inglewoo
Ann	Grodin	Beverly Hills	CA	90210	It's time to shut down the Inglewoo
Norah	McIntire	Los Angeles	CA	90046	Close down the Inglewood Oil Fielc
Laura	Brody	Monrovia	CA	91016	Shut down the Inglewood Oil Field
Constance	Franklin	Los Angeles	CA	90026	It's time to shut down the Inglewoo

Tara	Ohta	North Hollywoo	CA	91602	It’s time to shut down the Inglewoo
Cindy	Loomis	Santa Monica	CA	90403	It’s time to shut down the Inglewoo
Alicia	Copeland	Covina	CA	91724	It’s time to shut down the Inglewoo
Christine	Tobey	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Gregory	Wright	Sherman Oak	CA	91423	It’s time to shut down the Inglewoo
Jessica	Rath	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Vivian	Ehresmar	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
Judith	McClure	Canyon Countr	CA	91387	RIGHT NOW! It’s time to shut dow
Linda	Love	Lake Hughes	CA	93532	It’s time to shut down the Inglewoo
Stephane	Ernoux	Redondo Beac	CA	90278	It’s time to shut down the Inglewoo
Anne M	Zerrien-Lee	Los Angeles	CA	90042	Protect children's health: shut dowr
Cathy	Thornburn	Los Angeles	CA	90041	It’s time to shut down the Inglewoo
Jerry	Tobe	Los Angeles	CA	90034	Shut down the Inglewood Oil Field,
Sarah	Dean-Gooc	North Hollywoo	CA	91602	It’s time to shut down the Inglewoo
Dominick	Falzone	Los Angeles	CA	90005	It’s time to shut down the Inglewoo
MATTHE	RUSCIGN	Los Angeles	CA	90028	Let’s shut down the Inglewood Oil F
Kae	Bender	Lancaster	CA	93536	It’s time to shut down the Inglewoo
John	Ulloth	Van Nuys	CA	91409	WE'RE DONE WITH INGLEWOOD
Kathy	Knight	Santa Monica	CA	90405	Please shut down the Inglewood O
Jim	Stewart	Lakewood	CA	90712	Please protect our health! Shut dov
Robert	Drummor	Los Angeles	CA	90007	It’s time to shut down the Inglewoo
jess	z	North Hollywoo	CA	91601	shut down Inglewood Oil Field
Kennor	Raines	Los Angeles	CA	90028	It’s time to shut down the Inglewoo
A	Downhowe	Arcadia	CA	91007	The Inglewood Oil Field
Kristy	Madder	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
Carolyn	Anders	Culver City	CA	90230	Please shut down the Inglewood O
Mox	Ruge	Sherman Oak	CA	91403	It’s time to shut down the Inglewoo
Yazmir	Gonzalez	Bellflower	CA	90706	It’s time to shut down the Inglewoo
Clare	Shome	Los Angeles	CA	90005	It’s time to shut down the Inglewoo
diana	waters	Torrance	CA	90503	It’s time to shut down the Inglewoo
Miguel	Oaks	Los Angeles	CA	90038	It’s time to shut down the Inglewoo
Aileen	Milliman	Long Beach	CA	90802	It’s time to shut down the Inglewoo
Fred	Granlund	North Hollywoo	CA	91601	It’s time to shut down the Inglewoo
Vickie	Miller	San Pedro	CA	90731	It’s time to shut down the Inglewoo
Nora	Artine	Pasadena	CA	91107	It’s time to shut down the Inglewoo
Heidi	Buech	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Seth	Laursen	Los Angeles	CA	90016	It’s time to shut down the Inglewoo
Linda	Ninomiya	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Eugene	Majerowicz	Los Angeles	CA	90008	It’s time to shut down the Inglewoo

Rebecca	Riley	Woodland Hills	CA	91367	It’s time to shut down the Inglewood
Janet	Laur	Van Nuys	CA	91405	It’s time to shut down the Inglewood
Yvonne	Fisher	Playa Del Rey	CA	90293	It’s time to shut down the Inglewood
Erica	SILVERMA	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Hilarey	Benda	Sherman Oak	CA	91423	It’s time to shut down the Inglewood
Mark	Gauthier	Los Angeles	CA	90045	It’s time to shut down the Inglewood
Angela	Gardner	Whittier	CA	90604	It’s time to shut down the Inglewood
Kathie	Kingett	La Habra	CA	90631	It’s time to shut down the Inglewood
Valerie	Lizarraga	Montebello	CA	90640	It’s time to shut down the Inglewood
Robert	Paquette	Pasadena	CA	91107	It’s time to shut down the Inglewood
Kathryn	Gibbons	Toluca Lake	CA	91610	It’s time to shut down the Inglewood
Audrey	Higbee	Long Beach	CA	90814	It’s time to shut down the Inglewood
Doug	Bender	Redondo Beac	CA	90277	It’s time to shut down the Inglewood
Joan	Murray	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Nancy	Gowan	Woodland Hills	CA	91367	It’s time to shut down the Inglewood
Maggie	Wineburgh-	Los Angeles	CA	90041	It’s time to shut down the Inglewood
Mary	McAuliffe	Los Angeles	CA	90028	It’s time to shut down the Inglewood
Marie E.	DiMassa	Long Beach	CA	90807	It’s time to shut down the Inglewood
Abbie	Bernstein	West Hollywood	CA	90069	It’s time to shut down the Inglewood
Jeffrey	Levicke	Valley Village	CA	91607	It’s time to shut down the Inglewood
Karen	Emanue	Tarzana	CA	91356	It’s time to shut down the Inglewood
Julie	du Bois	Canoga Park	CA	91304	It’s time to shut down the Inglewood
Ruth	Olafsdottir	Santa Monica	CA	90403	It’s time to shut down the Inglewood
Pamela	Gibberman	Panorama City	CA	91402	It’s time to shut down the Inglewood
Julie	Adelson	San Pedro	CA	90731	It’s time to shut down the Inglewood
Christopher	Hall	Glendale	CA	91203	It’s time to shut down the Inglewood
Probyn	Gregory	Tujunga	CA	91042	It’s time to shut down the Inglewood
Stephanie	Colet	Sherman Oak	CA	91423	It’s time to shut down the Inglewood
Brianna	Knickerboc	Reseda	CA	91335	It’s time to shut down the Inglewood
Deborah	Ebersold	Los Angeles	CA	90046	It’s time to shut down the Inglewood
Susie	Tortell	Santa Monica	CA	90405	It’s time to shut down the Inglewood
NANC	TUCKE	Altadena	CA	91001	It’s time to shut down the Inglewood
Michelle	Fox	Downey	CA	90241	It’s time to shut down the Inglewood
Rhys	Marsh	Los Angeles	CA	90077	It’s time to shut down the Inglewood
Jessica	Craven	Los Angeles	CA	90065	You have the chance to make a hu
Tom	Hughes	Pomon	CA	91767	It’s time to shut down the Inglewood
Eliot	Kaplan	Woodland Hills	CA	91364	It’s time to shut down the Inglewood
Christine	Borje	Los Angeles	CA	90039	It’s time to shut down the Inglewood
Marco M.	Khanlian	La Crescenta	CA	91214	It’s time to shut down the Inglewood

Alena	jorgensen	Temple City	CA	91780	It’s time to shut down the Inglewood
Linda	Trevillian	Alhambra	CA	91803	It’s time to shut down the Inglewood
Melvyn	Nefsky	Los Angeles	CA	90064	It’s time to shut down the Inglewood
Taryn	Braband	Agoura Hills	CA	91301	It’s time to shut down the Inglewood
Margaret	Tollner	Lakewood	CA	90713	It’s time to shut down the Inglewood
KAREN	SMITH	Studio City	CA	91604	It’s time to shut down the Inglewood
Blaise	Brockman	Arcadia	CA	91007	It’s time to shut down the Inglewood
Madeleine	Fisher Kerr	Los Angeles	CA	90036	It’s time to shut down the Inglewood
Alexander	Dunaev	Marina Del Rey	CA	90292	It’s time to shut down the Inglewood
Frank B.	Anderson	San Pedro	CA	90731	It’s time to shut down the Inglewood
Anthony	Castillo	Long Beach	CA	90805	It’s time to shut down the Inglewood
Stephen	Hutchinson	Glendale	CA	91202	It’s time to shut down the Inglewood
Scott	Rubel	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Pan	Wright	Pasadena	CA	91107	It’s time to shut down the Inglewood
Ramon	Coronado	Pasadena	CA	91106	It’s time to shut down the Inglewood
Timothy	Viselli	La Canada Flin	CA	91011	It’s time to shut down the Inglewood
Joseph	Dadgari	Los Angeles	CA	90049	It’s time to shut down the Inglewood
Sharon	Torrisi	Hermosa Beac	CA	90254	It’s time to shut down the Inglewood
Stephen	Markel	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Charles	B.	Tarzana	CA	91356	It’s time to shut down the Inglewood
Noah	Youngelson	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Mary	Nadler	Pacific Palisade	CA	90272	It’s time to shut down the Inglewood
Michael	Tullius	Encino	CA	91316	It’s time to shut down the Inglewood
Carmen	Carrasco	Studio City	CA	91604	It’s time to shut down the Inglewood
Alberto	Acosta	Burbank	CA	91505	It’s time to shut down the Inglewood
Terri	Gedo	Los Angeles	CA	90045	It’s time to shut down the Inglewood
Maria Teresa	Ferrero	Long Beach	CA	90803	It’s time to shut down the Inglewood
Christy	Bolle	Monrovia	CA	91017	It’s time to shut down the Inglewood
Blake	Viola	Long Beach	CA	90802	It’s time to shut down the Inglewood
Dana	Slawson	Los Angeles	CA	90019	It’s time to shut down the Inglewood
Jerry	Eckel	Granada Hills	CA	91344	It’s time to shut down the Inglewood
Erlinda	Cortez	Long Beach	CA	90807	It’s time to shut down the Inglewood
Catherine	Beaucham	Pasadena	CA	91103	It’s time to shut down the Inglewood
Kris	Gata	Redondo Beac	CA	90277	It’s time to shut down the Inglewood
Gina	Ortiz	Claremont	CA	91711	It’s time to shut down the Inglewood
Sherrell	Cuneo	Los Angeles	CA	90027	It’s time to shut down the Inglewood
Rebecca	Hoeschler	El Segundo	CA	90245	It’s time to shut down the Inglewood
Vanessa	Escamilla	West Hollywood	CA	90069	It’s time to shut down the Inglewood
Paula	Glaser	Pico Rivera	CA	90660	It’s time to shut down the Inglewood

Judi	Harris	Arcadia	CA	91007	It’s time to shut down the Inglewood
Soraya	Dosaj	Van Nuys	CA	91401	It’s time to shut down the Inglewood
Sarah	Wilkinson	Monrovia	CA	91016	It’s time to shut down the Inglewood
Henry	Schlinger	Glendale	CA	91201	It’s time to shut down the Inglewood
Thomas	Fukuma	Torrance	CA	90504	It’s time to shut down the Inglewood
Victoria	Kirschenba	Burbank	CA	91506	It’s time to shut down the Inglewood
Robert	Espinoza	Northridge	CA	91330	It’s time to shut down the Inglewood
CHRISTOPH	PARSON	Los Angeles	CA	90027	It’s time to shut down the Inglewood
Myra	Schegloff	Santa Monica	CA	90405	It’s time to shut down the Inglewood
Michael	Cavanaugh	Redondo Beac	CA	90278	It’s time to shut down the Inglewood
Margaret	Adachi	Glendale	CA	91205	It’s time to shut down the Inglewood
Anjanette	Caron	Alhambra	CA	91803	It’s time to shut down the Inglewood
Laurel	Brewer	West Hollywood	CA	90069	It’s time to shut down the Inglewood
GEEN	DURA	Monrovia	CA	91016	It’s time to shut down the Inglewood
Chris	Withrow	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Lou	Insprucker	La Canada Flin	CA	91011	It’s time to shut down the Inglewood
Rita	Thio	Walnut	CA	91789	It’s time to shut down the Inglewood
Kathy	Bilicke	West Hollywood	CA	90069	It’s time to shut down the Inglewood
Mark	Glasser	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Amelia	jones	Santa Monica	CA	90405	It’s time to shut down the Inglewood
Linda	Howie	West Hills	CA	91307	It’s time to shut down the Inglewood
Georgia	Brewer	Van Nuys	CA	91401	It’s time to shut down the Inglewood
Molly	Zbojniewicz	Manhattan Bea	CA	90266	It’s time to shut down the Inglewood
Candace	Rocha	Los Angeles	CA	90032	It’s time to shut down the Inglewood
Brenda	Haig	Long Beach	CA	90803	It’s time to shut down the Inglewood
Sandra	Christopher	Burbank	CA	91505	It’s time to shut down the Inglewood
Erika	Armin	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Sherry	O'Connor	Los Angeles	CA	90068	It’s time to shut down the Inglewood
Barbara	Lehman	Santa Clarita	CA	91350	It’s time to shut down the Inglewood
Alec	Taratula	Alhambra	CA	91801	It’s time to shut down the Inglewood
Lynne	Miller	Malibu	CA	90265	It’s time to shut down the Inglewood
Jeanne	Schuster	West Covina	CA	91791	It’s time to shut down the Inglewood
Natalie	Aharonian	North Hollywoo	CA	91605	It’s time to shut down the Inglewood
Judith	Davies	Santa Monica	CA	90405	It’s time to shut down the Inglewood
cathy	crum	Agoura Hills	CA	91301	It’s time to shut down the Inglewood
Luna	Gooding	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Virginia	Watson	Los Angeles	CA	90026	It’s time to shut down the Inglewood
Erica	Tyron	Claremont	CA	91711	It’s time to shut down the Inglewood
Jay	Eiser	Long Beach	CA	90803	It’s time to shut down the Inglewood

Kirstie	Palmer	Redondo Beac	CA	90277	It’s time to shut down the Inglewoo
Rev. Maria	Riter Wilso	San Dimas	CA	91773	It’s time to shut down the Inglewoo
Carolyn	Vaughar	Glendale	CA	91206	It’s time to shut down the Inglewoo
Adan	Tinkham	Pasaden	CA	91106	It’s time to shut down the Inglewoo
barbara	poland	La Crescenta	CA	91214	It’s time to shut down the Inglewoo
Ivan	Llata	Downe	CA	90242	It’s time to shut down the Inglewoo
Linda	Klein	El Segundo	CA	90245	It’s time to shut down the Inglewoo
Heather	Vaughar	Altadena	CA	91001	It’s time to shut down the Inglewoo
Steven	Standard	Bellflower	CA	90706	It’s time to shut down the Inglewoo
Georgia	Tattu	Hermosa Beac	CA	90254	It’s time to shut down the Inglewoo
Suzanne	Licht	San Pedro	CA	90731	It’s time to shut down the Inglewoo
Jessica Jean	Posner	Palmdale	CA	93551	It’s time to shut down the Inglewoo
Janet	Heinle	Santa Monica	CA	90403	It’s time to shut down the Inglewoo
Janet	Maker	Los Angeles	CA	90024	It’s time to shut down the Inglewoo
O	Lewis	Los Angeles	CA	90009	It’s time to shut down the Inglewoo
Erica	Munr			90028	It’s time to shut down the Inglewoo
Thoma	Tataranowi	Malibu	CA	90265	It’s time to shut down the Inglewoo
Sejon	Ding	Los Angeles	CA	90064	It’s time to shut down the Inglewoo
Lesley	Meyer	Los Angeles	CA	90042	It’s time to shut down the Inglewoo
tevet	tee	Los Angeles	CA	90065	It’s time to shut down the Inglewoo
Caterina	Janacua	Sherman Oak	CA	91423	It’s time to shut down the Inglewoo
Carol	Gordor	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Angel	Orona	Alhambra	CA	91803	It’s time to shut down the Inglewoo
Martin	Perlmutter	Burbank	CA	91506	It’s time to shut down the Inglewoo
Krister	Olsson	Los Angeles	CA	90013	It’s time to shut down the Inglewoo
sarah	suhich	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
Jessica	Wodinsky	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Darren	Spurr	Whittier	CA	90604	It’s time to shut down the Inglewoo
TIA	TRIPLET	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Tanya	Wilson	Glendale	CA	91202	It’s time to shut down the Inglewoo
Sara	Fogar	Valencia	CA	91385	It’s time to shut down the Inglewoo
Susar	Lea	North Hollywoo	CA	91605	It’s time to shut down the Inglewoo
Scott	Jung	South Pasaden	CA	91030	It’s time to shut down the Inglewoo
Robert	Meier	Los Angeles	CA	90042	It’s time to shut down the Inglewoo
Jennifer	Peterson	Los Angeles	CA	90065	It’s time to shut down the Inglewoo
Rosanne	Basu	Hermosa Beac	CA	90254	It’s time to shut down the Inglewoo
Nina	Berry	Van Nuys	CA	91405	It’s time to shut down the Inglewoo
Darrell	Clarke	Pasaden	CA	91103	It’s time to shut down the Inglewoo
Meera	P	Fremont	CA	94539	It’s time to shut down the Inglewoo

Rob	Seltzer	Malibu	CA	90265	It's time to shut down the Inglewood
Greg	Sweel	Santa Monica	CA	90405	It's time to shut down the Inglewood
Paul	Edelman	Woodland Hills	CA	91364	It's time to shut down the Inglewood
David	Gallardo	Alhambra	CA	91803	It's time to shut down the Inglewood
Frances	Alet	Calabasas	CA	91302	It's time to shut down the Inglewood
Jackie	Bear	Los Angeles	CA	90048	It's time to shut down the Inglewood
darynne	jessler	Valley Village	CA	91607	It's time to shut down the Inglewood
Isaac	Salazar	Los Angeles	CA	90036	It's time to shut down the Inglewood
Bradley	Colden	Whittier	CA	90602	It's time to shut down the Inglewood
Jennifer	Bravo	Los Angeles	CA	90066	It's time to shut down the Inglewood
Nick	McNaughto	Los Angeles	CA	90027	Save Clean Air for Inglewood - Shu
lynne	pateman	Los Angeles	CA	90068	It's time to shut down the Inglewood
Sarah	Frutig	Pacoima	CA	91331	It's time to shut down the Inglewood
Joanne	McBirney	La Crescenta	CA	91214	It's time to shut down the Inglewood
Charles	Wolfe	Sylmar	CA	91342	It's time to shut down the Inglewood
Donna	Cottrell	Long Beach	CA	90808	It's time to shut down the Inglewood
Diana	Kliche	Long Beach	CA	90804	It's time to shut down the Inglewood
Karen	McCay	Los Angeles	CA	90043	It's time to shut down the Inglewood
Craig	Galloway	Santa Monica	CA	90403	It's time to shut down the Inglewood
Florence	Hoffert	El Segundo	CA	90245	It's time to shut down the Inglewood
G.	Saffren	Los Angeles	CA	90025	It's time to shut down the Inglewood
Kira	Durbin	Van Nuys	CA	91411	It's time to shut down the Inglewood
Francesco	Masiello	Long Beach	CA	90804	It's time to shut down the Inglewood
Howard	Strauss	Culver City	CA	90232	It's time to shut down the Inglewood
Dara	Gorelick	Van Nuys	CA	91406	It's time to shut down the Inglewood
Robert	Burk	Los Angeles	CA	90024	It's time to shut down the Inglewood
Susan	Mathison	West Hollywood	CA	90069	It's time to shut down the Inglewood
Frank	Ortiz	Los Angeles	CA	90022	It's time to shut down the Inglewood
Ann	Bein	Los Angeles	CA	90064	It's time to shut down the Inglewood
Polly	O'Malley	Los Angeles	CA	90025	It's time to shut down the Inglewood
Jana	Harker	Arcadia	CA	91066	It's time to shut down the Inglewood
Shawn	Wilson	Tujunga	CA	91042	It's time to shut down the Inglewood
Mark	Betti	Sherman Oak	CA	91423	It's time to shut down the Inglewood
Ann	Cantrell	Long Beach	CA	90808	It's time to shut down the Inglewood
Eileen	Karzen	Los Angeles	CA	90064	It's time to shut down the Inglewood
Karen	Niles	Redondo Beac	CA	90278	It's time to shut down the Inglewood
Gerald	Shaia	Sun Valley	CA	91352	It's time to shut down the Inglewood
Erin	Garcia	Los Angeles	CA	90025	It's time to shut down the Inglewood
Sandra	Zaninovich	Los Angeles	CA	90024	It's time to shut down the Inglewood

Scott	Warwick	Altadena	CA	91001	It’s time to shut down the Inglewoo
Amrit	Khalsa	Redondo Beac	CA	90278	It’s time to shut down the Inglewoo
Wend	Monterrosa	Covina	CA	91722	It’s time to shut down the Inglewoo
Mary	Romane	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
Hoku	Janbazian	Monrovia	CA	91016	It’s time to shut down the Inglewoo
Neal	Steiner	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Rosemar	Graham-Ga	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Noel	Park	Rancho Palos V	CA	90275	It’s time to shut down the Inglewoo
nina	greenberg	Los Angeles	CA	90039	It’s time to shut down the Inglewoo
John	DesJardin	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Keenar	Sheedy	Los Angeles	CA	90065	It’s time to shut down the Inglewoo
Robert	Chirpin	Northridge	CA	91324	It’s time to shut down the Inglewoo
Karen	Profet	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Judith D	Radovsky	Pasadena	CA	91104	It’s time to shut down the Inglewoo
Twyla	Meyer	Pomon	CA	91767	It’s time to shut down the Inglewoo
Sue	Knight	Long Beach	CA	90804	It’s time to shut down the Inglewoo
Laurie	Barre	Altadena	CA	91001	It’s time to shut down the Inglewoo
Edward	Myers	Santa Monica	CA	90403	It’s time to shut down the Inglewoo
Alison	Dice	Lakewood	CA	90713	It’s time to shut down the Inglewoo
Susar	Perez	San Pedro	CA	90731	It’s time to shut down the Inglewoo
samuel	popailo	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Aixa	Fielder	Los Angeles	CA	90028	It’s time to shut down the Inglewoo
Linda	Monosmith	Hermosa Beac	CA	90254	It’s time to shut down the Inglewoo
Christen	Schilling	Glendale	CA	91202	It’s time to shut down the Inglewoo
Susar	Bogdanovic	San Pedro	CA	90732	It’s time to shut down the Inglewoo
Susar	Ryan	Los Angeles	CA	90019	It’s time to shut down the Inglewoo
Susar	Hanger	Topanga	CA	90290	It’s time to shut down the Inglewoo
Sally	Castiglia	Van Nuys	CA	91401	It’s time to shut down the Inglewoo
Diane	Smith	Sherman Oak	CA	91423	It’s time to shut down the Inglewoo
Jennifer	Bradley	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
Vic	Bostock	Altadena	CA	91001	It’s time to shut down the Inglewoo
Myron	Meisel	Los Angeles	CA	90064	It’s time to shut down the Inglewoo
Jason	Nolasco	Bellflower	CA	90706	It’s time to shut down the Inglewoo
Robin	Lande	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Kristina	Wunde	Topanga	CA	90290	It’s time to shut down the Inglewoo
Damo	Browr	Los Angeles	CA	90016	It’s time to shut down the Inglewoo
Brian	Fingeret	Woodland Hills	CA	91364	It’s time to shut down the Inglewoo
Pamela	Perrymar	South Pasaden	CA	91030	It’s time to shut down the Inglewoo
Mariam	Shah-rais	Los Angeles	CA	90035	It’s time to shut down the Inglewoo

Marguerite	Shuster	Sierra Madre	CA	91024	It’s time to shut down the Inglewoo
Sandra	Harris	La Puente	CA	91744	It’s time to shut down the Inglewoo
Dianne	Lynch			02295	It’s time to shut down the Inglewoo
Benjamin	Park	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
MARIA CELI	CORVAL	Redondo Beac	CA	90278	It’s time to shut down the Inglewoo
Martha	Jones	Santa Clarita	CA	91350	It’s time to shut down the Inglewoo
Gregory	Alper	Pacific Palisade	CA	90272	It’s time to shut down the Inglewoo
Kristina	Fukuda	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Robert	Johnson	El Segundo	CA	90245	It’s time to shut down the Inglewoo
Theodore	Bergmann	Los Angeles	CA	90064	It’s time to shut down the Inglewoo
Jan	Leath	Glendale	CA	91205	It’s time to shut down the Inglewoo
brian	rutkin	Culver City	CA	90230	It’s time to shut down the Inglewoo
georgia	goldfarb	Malibu	CA	90265	It’s time to shut down the Inglewoo
Cynthia	Vinney	Torrance	CA	90501	It’s time to shut down the Inglewoo
jesse	croxton	Venice	CA	90291	It’s time to shut down the Inglewoo
Caitlin	Wylde	Los Angeles	CA	90026	It’s time to shut down the Inglewoo
Ross	Heckman	Arcadia	CA	91006	It’s time to shut down the Inglewoo
Michael	Terry	Santa Monica	CA	90402	It’s time to shut down the Inglewoo
Maryfrances	Careccia	Los Angeles	CA	90048	It’s time to shut down the Inglewoo
Diane	Rosas	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Anita	Rodal	Manhattan Bea	CA	90267	It’s time to shut down the Inglewoo
Tiffany	Austin	Winnetka	CA	91306	It’s time to shut down the Inglewoo
Ken	Gilliland	Tujunga	CA	91042	It’s time to shut down the Inglewoo
Mary	Fitzpatrick	Pasadena	CA	91107	It’s time to shut down the Inglewoo
Perri	Glass			08081	It’s time to shut down the Inglewoo
Susi	Higgins	Glendale	CA	91203	It’s time to shut down the Inglewoo
Frida	Merzakhan	Burbank	CA	91501	It’s time to shut down the Inglewoo
Melinda	Cotton	Long Beach	CA	90803	It’s time to shut down the Inglewoo
Venetia	Large	Altadena	CA	91003	It’s time to shut down the Inglewoo
Mark	Yackley	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Erica	Fox	Studio City	CA	91604	It’s time to shut down the Inglewoo
Linc	Conard	Pasadena	CA	91107	It’s time to shut down the Inglewoo
Julie	Binchet	Los Angeles	CA	90067	It’s time to shut down the Inglewoo
Eileen	Eriksen	Torrance	CA	90505	It’s time to shut down the Inglewoo
Lisabeth	Ryder	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Guillemette	Epailly	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
Phyllis	Chavez	Santa Monica	CA	90405	It’s time to shut down the Inglewoo
Karla	Devine	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Jeff	Fromberg	Los Angeles	CA	90024	It’s time to shut down the Inglewoo

Raymon	Plasse	West Hills	CA	91307	It’s time to shut down the Inglewoo
Amy	Franz	La Habra	CA	90631	It’s time to shut down the Inglewoo
Lisa	Rembolc	Canoga Park	CA	91303	It’s time to shut down the Inglewoo
Jerry	Schneider	Los Angeles	CA	90065	It’s time to shut down the Inglewoo
Dennis	Trembly	Rancho Palos V	CA	90275	It’s time to shut down the Inglewoo
DAVID	SOTO	Santa Clarita	CA	91390	It’s time to shut down the Inglewoo
Patricia	Marlatt	Los Angeles	CA	90068	It’s time to shut down the Inglewoo
Joy	Fox	Valley Village	CA	91607	It’s time to shut down the Inglewoo
Jessica	Lacayo	Winnetka	CA	91306	It’s time to shut down the Inglewoo
Angela	Carter	San Pedro	CA	90731	It’s time to shut down the Inglewoo
Anne	DeVenzio	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Cindy	Koch	Long Beach	CA	90807	It’s time to shut down the Inglewoo
Katie	Yu	Walnut	CA	91789	It’s time to shut down the Inglewoo
Lynne	Weiske	Los Angeles	CA	90048	It’s time to shut down the Inglewoo
Kathy	Dorr	La Verne	CA	91750	It’s time to shut down the Inglewoo
Catherine	Corwin	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
Julie	May	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Ken	Roser	Beverly Hills	CA	90212	It’s time to shut down the Inglewoo
Anna	MacKenzie	Santa Monica	CA	90405	It’s time to shut down the Inglewoo
kathleen	Lavelle	Los Angeles	CA	90065	It’s time to shut down the Inglewoo
Alan	Gonzalez	Long Beach	CA	90808	It’s time to shut down the Inglewoo
Amand	Skerski	Marina Del Rey	CA	90292	It’s time to shut down the Inglewoo
Julie	Klabin	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Naom	Oren	Valley Village	CA	91607	It’s time to shut down the Inglewoo
Lonnie	Gordon	Malibu	CA	90265	It’s time to shut down the Inglewoo
Yolanda	Danor	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Joaquin	Duran	Glendora	CA	91740	It’s time to shut down the Inglewoo
Rebecca	Hanna	Long Beach	CA	90806	It’s time to shut down the Inglewoo
Nina	Wong	San Gabriel	CA	91776	It’s time to shut down the Inglewoo
Mujon	Baghai	Santa Monica	CA	90402	It’s time to shut down the Inglewoo
Kirsten	Milaney	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
karen	hobday	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Patricia	Strauss	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Gwendoline	Gansky	Culver City	CA	90232	It’s time to shut down the Inglewoo
Jacqueline	Cochrane	Redondo Beac	CA	90278	It’s time to shut down the Inglewoo
Jacqueline	Waddill	Pasadena	CA	91107	It’s time to shut down the Inglewoo
Dana	Markiewicz	Santa Cruz	CA	95060	It’s time to shut down the Inglewoo
Laura	Schuma	Los Angeles	CA	90077	It’s time to shut down the Inglewoo
Rina	Rubenstein	Los Angeles	CA	90018	It’s time to shut down the Inglewoo

Debbie	Bolsky	Santa Monica	CA	90403	It's time to shut down the Inglewoo
Danielle	Thoma	Santa Monica	CA	90405	It's time to shut down the Inglewoo
Barbara	Wasserma	Chatsworth	CA	91311	It's time to shut down the Inglewoo
Lizabeth	Flyer	Burbank	CA	91505	It's time to shut down the Inglewoo
Maureen	Toth	Studio City	CA	91604	It's time to shut down the Inglewoo
Deborah	Collodel	Malibu	CA	90265	It's time to shut down the Inglewoo
Dalia	Salgado	Los Angeles	CA	90017	It's time to shut down the Inglewoo
MARY ELLE	BRADE	Glendale	CA	91208	It's time to shut down the Inglewoo
Kathlyn	Powell	Woodland Hills	CA	91364	It's time to shut down the Inglewoo
Deborah	Fallender	Santa Monica	CA	90405	It's time to shut down the Inglewoo
Iuliia	Pozdina	Los Angeles	CA	90034	It's time to shut down the Inglewoo
Peter	Bodlaender	Los Angeles	CA	90039	It's time to shut down the Inglewoo
Alisha	Seaton	Los Angeles	CA	90066	It's time to shut down the Inglewoo
Susan	Haleblian	La Canada Flin	CA	91011	It's time to shut down the Inglewoo
BREND	RODRIGU	Mission Hills	CA	91345	It's time to shut down the Inglewoo
Donna	Harris	Signal Hill	CA	90755	It's time to shut down the Inglewoo
Daniel	Tiarks	Los Angeles	CA	90046	It's time to shut down the Inglewoo
Beth	Stein	Los Angeles	CA	90066	It's time to shut down the Inglewoo
Linda	Skorheim	Temple City	CA	91780	It's time to shut down the Inglewoo
Darren	Frale	Los Angeles	CA	90065	It's time to shut down the Inglewoo
Rita	Franco	Monrovia	CA	91016	It's time to shut down the Inglewoo
Schuyler	Kent	Los Angeles	CA	90020	It's time to shut down the Inglewoo
Reed	Fenton	Van Nuys	CA	91406	It's time to shut down the Inglewoo
jerry	persky	Santa Monica	CA	90403	It's time to shut down the Inglewoo
Ryan	Davis	Burbank	CA	91502	It's time to shut down the Inglewoo
Don	Bush	Los Angeles	CA	90066	It's time to shut down the Inglewoo
Terrence	Butler	Van Nuys	CA	91405	It's time to shut down the Inglewoo
Ellen	Davis	Los Angeles	CA	90025	It's time to shut down the Inglewoo
Margaret	Phelps	Los Angeles	CA	90024	It's time to shut down the Inglewoo
Henry	Morger	Los Angeles	CA	90019	It's time to shut down the Inglewoo
Jeffrey	Greif	Venice	CA	90291	It's time to shut down the Inglewoo
Sheila	Sperber	Los Angeles	CA	90025	It's time to shut down the Inglewoo
Mehry	Sepanlou	Beverly Hills	CA	90210	It's time to shut down the Inglewoo
Alexandra	Hopkins	La Crescenta	CA	91214	It's time to shut down the Inglewoo
Lorettta	Tiefen	Malibu	CA	90265	It's time to shut down the Inglewoo
Marilyn	Lavender	Los Angeles	CA	90016	It's time to shut down the Inglewoo
Susan	Suntree	Santa Monica	CA	90401	It's time to shut down the Inglewoo
Brenda	Lee	Lakewood	CA	90712	It's time to shut down the Inglewoo
geri	Johnston	Altadena	CA	91001	It's time to shut down the Inglewoo

Margarita	Perez	Sylmar	CA	91342	It’s time to shut down the Inglewood
Jane	Hunziker	Venice	CA	90291	It’s time to shut down the Inglewood
Amy	Wolfberg	Los Angeles	CA	90046	It’s time to shut down the Inglewood
Kara	Ford-Martin	Tujunga	CA	91042	It’s time to shut down the Inglewood
Kenneth	Lapointe	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Mark	Stannard	Los Angeles	CA	90056	It’s time to shut down the Inglewood
Mario E	Martinez	Torrance	CA	90504	It’s time to shut down the Inglewood
Mha Atma S	Khalsa	Los Angeles	CA	90035	It’s time to shut down the Inglewood
Alison	Taylor	West Hollywood	CA	90069	It’s time to shut down the Inglewood
ted	Hume	Los Angeles	CA	90011	It’s time to shut down the Inglewood
Shaun	Farber	Valley Village	CA	91607	It’s time to shut down the Inglewood
Stephaney	Lloyd	South Pasadena	CA	91030	It’s time to shut down the Inglewood
Ashley	Foulk	Long Beach	CA	90815	It’s time to shut down the Inglewood
Diana	Jones	Hacienda Heigh	CA	91745	It’s time to shut down the Inglewood
Schani	Nuripour	Los Angeles	CA	90027	It’s time to shut down the Inglewood
R. Leslie	Choi	Glendale	CA	91208	It’s time to shut down the Inglewood
Casee	Maxfield	Los Angeles	CA	90028	It’s time to shut down the Inglewood
Kenneth	Miller	Topanga	CA	90290	It’s time to shut down the Inglewood
Katherine	Aker	Tujunga	CA	91042	It’s time to shut down the Inglewood
Martha	Burr	Los Angeles	CA	90028	It’s time to shut down the Inglewood
Karen	Lull	Claremont	CA	91711	It’s time to shut down the Inglewood
M	Freedman	Tarzana	CA	91356	It’s time to shut down the Inglewood
Elizabeth	Reid-wains	Los Angeles	CA	90035	It’s time to shut down the Inglewood
Stephen	Vicuna	Monterey Park	CA	91754	It’s time to shut down the Inglewood
Eli	Saddler	Acton	CA	93510	It’s time to shut down the Inglewood
Doug	Flack	Astoria	NY	11103	It’s time to shut down the Inglewood
Linda	Babb	Torrance	CA	90502	It’s time to shut down the Inglewood
Fred	Tashima	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Michael W	Evans	Los Angeles	CA	90034	It’s time to shut down the Inglewood
Frederick	Cliver	Long Beach	CA	90815	Shut down the Inglewood Oil Field
FRAN	Burke	Los Angeles	CA	90045	It’s time to shut down the Inglewood
Rebecca	Clark	West Hills	CA	91307	It’s time to shut down the Inglewood
Melissa	Haddad	Los Angeles	CA	90064	It’s time to shut down the Inglewood
Sara	Lynn	Santa Monica	CA	90403	It’s time to shut down the Inglewood
Margie	Rosenblum	Los Angeles	CA	90039	It’s time to shut down the Inglewood
Deimile	Mockus	Los Angeles	CA	90004	It’s time to shut down the Inglewood
Erfin	Hartojo	Walnut	CA	91789	It’s time to shut down the Inglewood
Kay	Ward	Santa Monica	CA	90403	It’s time to shut down the Inglewood
Dudley	Campbell	Van Nuys	CA	91401	It’s time to shut down the Inglewood

Candace	Campbell	Van Nuys	CA	91401	It’s time to shut down the Inglewood
Prisca	Gloor	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Chris	Hernandez	Sun Valley	CA	91352	It’s time to shut down the Inglewood
Lynette K	Henderson	Chatsworth	CA	91311	It’s time to shut down the Inglewood
Carolina	Adler	Woodland Hills	CA	91367	It’s time to shut down the Inglewood
Karen	Brodkin	Venice	CA	90291	It’s time to shut down the Inglewood
Miranda	Stewart	Pasadena	CA	91106	It’s time to shut down the Inglewood
Ester	Gonzalez	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Carollynn	Bartosh	Rancho Palos V	CA	90275	It’s time to shut down the Inglewood
Carlos	Nunez	Reseda	CA	91335	It’s time to shut down the Inglewood
Bruce	Lee	Whittier	CA	90601	It’s time to shut down the Inglewood
Laurel	Cameron	Redondo Beac	CA	90277	It’s time to shut down the Inglewood
Jennifer	Yamamot	Manhattan Bea	CA	90266	It’s time to shut down the Inglewood
Theresa	Bucher	Tarzana	CA	91356	It’s time to shut down the Inglewood
J	Yudell	Santa Monica	CA	90409	It’s time to shut down the Inglewood
Vicki	Bingo	Los Angeles	CA	90036	It’s time to shut down the Inglewood
Charlotte	Vrooman	Los Angeles	CA	90034	It’s time to shut down the Inglewood
Patricia	Lewis	Los Angeles	CA	90064	It’s time to shut down the Inglewood
Ellen	Kaufman	Chatsworth	CA	91311	It’s time to shut down the Inglewood
Gloria	Albert	Santa Monica	CA	90403	It’s time to shut down the Inglewood
Phoebe	Rufener	Torrance	CA	90503	It’s time to shut down the Inglewood
Christa	Neuber	West Hollywood	CA	90069	It’s time to shut down the Inglewood
Yesenia	Fonseca	Fullerton	CA	92833	It’s time to shut down the Inglewood
Christina	Babst	West Hollywood	CA	90069	It’s time to shut down the Inglewood
Kathy	Fujimoto	Manhattan Bea	CA	90266	It’s time to shut down the Inglewood
Susanna	Knittel	Santa Monica	CA	90403	It’s time to shut down the Inglewood
Lisa	Gee	La Crescenta	CA	91224	It’s time to shut down the Inglewood
romani	b	Glendora	CA	91740	It’s time to shut down the Inglewood
Marc	Paez	Culver City	CA	90230	It’s time to shut down the Inglewood
Jane	McCullough	Pasadena	CA	91105	It’s time to shut down the Inglewood
Soraya	Barabi	Los Angeles	CA	90025	It’s time to shut down the Inglewood
Steven	Hoelke	Claremont	CA	91711	It’s time to shut down the Inglewood
Barbara	Mesney	Los Angeles	CA	90066	It’s time to shut down the Inglewood
Robert	Blackey	Claremont	CA	91711	It’s time to shut down the Inglewood
Sarah	Sismondo	Duarte	CA	91010	It’s time to shut down the Inglewood
Melony	Paulson	Diamond Bar	CA	91765	It’s time to shut down the Inglewood
tom	schwartz	Sunland	CA	91040	It’s time to shut down the Inglewood
Binh	Tang	Chatsworth	CA	91311	It’s time to shut down the Inglewood
F. R.	Eguren	Redondo Beac	CA	90277	It’s time to shut down the Inglewood

Marianne	Davis	Encino	CA	91436	It’s time to shut down the Inglewood
Marilyn	Perna	Los Angeles	CA	90065	It’s time to shut down the Inglewood
Thoma:	Zachary	La Crescenta	CA	91214	It’s time to shut down the Inglewood
Lisa	Laureta	Los Angeles	CA	90029	It’s time to shut down the Inglewood
Susar	Grant	Los Angeles	CA	90034	It’s time to shut down the Inglewood
Cipra	Nemetl	Los Angeles	CA	90048	It’s time to shut down the Inglewood
Patricia	Zeider	Pasadena	CA	91104	It’s time to shut down the Inglewood
Arthur	Delgadillo	Long Beach	CA	90813	It’s time to shut down the Inglewood
Anita	Wisch	Valencia	CA	91355	It’s time to shut down the Inglewood
Lara	Ingraham	Los Angeles	CA	90038	It’s time to shut down the Inglewood
Hristina	Jankovic	Beverly Hills	CA	90210	It’s time to shut down the Inglewood
Tamara	Lesser	Agoura Hills	CA	91301	It’s time to shut down the Inglewood
Tara	McKenne	Venice	CA	90291	It’s time to shut down the Inglewood
Donna	Poppe	Northridge	CA	91325	It’s time to shut down the Inglewood
Jacqueline	Broulard	Calabasas	CA	91302	It’s time to shut down the Inglewood
Rebecca	Prewitt	North Hollywoo	CA	91602	It’s time to shut down the Inglewood
Silvia	De Salles	West Hollywoo	CA	90069	It’s time to shut down the Inglewood
Susar	McCorry	Santa Monica	CA	90405	It’s time to shut down the Inglewood
John	Crahan	Los Angeles	CA	90045	It’s time to shut down the Inglewood
Amand	Mauceri	Los Angeles	CA	90043	It’s time to shut down the Inglewood
I-Ching	Lao	Los Angeles	CA	90029	It’s time to shut down the Inglewood
Charlotte	Innes	Los Angeles	CA	90026	It’s time to shut down the Inglewood
Nancy	Weeks	Sunland	CA	91040	It’s time to shut down the Inglewood
Tom	Atha	Alhambra	CA	91801	It’s time to shut down the Inglewood
Michael	Gross	Woodland Hills	CA	91367	It’s time to shut down the Inglewood
Karen	Hellwig	Los Angeles	CA	90056	It’s time to shut down the Inglewood
Varenka	Lorenzi	Long Beach	CA	90814	It’s time to shut down the Inglewood
Patricia	Kolchins	Calabasas	CA	91302	It’s time to shut down the Inglewood
Anne	Buttyan	Santa Monica	CA	90404	It’s time to shut down the Inglewood
al	shayne	Los Angeles	CA	90036	It’s time to shut down the Inglewood
Genevieve	Guzma	Studio City	CA	91604	It’s time to shut down the Inglewood
Alejandro	Artigas	Glendale	CA	91206	It’s time to shut down the Inglewood
Marc	Silverman	Los Angeles	CA	90068	It’s time to shut down the Inglewood
Shannor	Scrofano	Los Angeles	CA	90031	It’s time to shut down the Inglewood
Kae	Yates	Claremont	CA	91711	It’s time to shut down the Inglewood
Mike	Maynard	Pacific Palisade	CA	90272	It’s time to shut down the Inglewood
Merris	Webe	Los Angeles	CA	90006	It’s time to shut down the Inglewood
Renee	Klein	Marina Del Rey	CA	90292	It’s time to shut down the Inglewood
Barry	Koger	Long Beach	CA	90808	It’s time to shut down the Inglewood

Caleb	Ellis	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Carolyn	Davis	Westlake Villag	CA	91361	It’s time to shut down the Inglewoo
Jane	Nachazel-F	Los Angeles	CA	90026	It’s time to shut down the Inglewoo
Kathie	Fierro	Van Nuys	CA	91406	It’s time to shut down the Inglewoo
Susan	Curtiss	Los Angeles	CA	90005	It’s time to shut down the Inglewoo
Richard	Kornfeld	Pasadena	CA	91101	It’s time to shut down the Inglewoo
Patrick	Bonner	South Gate	CA	90280	It’s time to shut down the Inglewoo
Carol	Ng	Los Angeles	CA	90026	It’s time to shut down the Inglewoo
Vicki	Gallegos	Lancaster	CA	93534	It’s time to shut down the Inglewoo
Jeanna	Lax	Los Angeles	CA	90038	It’s time to shut down the Inglewoo
Timothy	Goodma	Cerritos	CA	90703	It’s time to shut down the Inglewoo
Riyaana	Hartley	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Tyson	Martin	Burbank	CA	91505	It’s time to shut down the Inglewoo
Blue	McRight	Venice	CA	90291	It’s time to shut down the Inglewoo
B.	Tepp	Beverly Hills	CA	90211	It’s time to shut down the Inglewoo
G	Devine	Altadena	CA	91001	It’s time to shut down the Inglewoo
Matthew	Gillespie	Redondo Beac	CA	90277	It’s time to shut down the Inglewoo
Eugenia	Ermacora	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Jessie	Medina	Palmdale	CA	93550	It’s time to shut down the Inglewoo
MJ	Cittadino	Redondo Beac	CA	90277	It’s time to shut down the Inglewoo
Susan	Brisby	Lancaster	CA	93536	It’s time to shut down the Inglewoo
Mary	Quimby	Arcadia	CA	91006	It’s time to shut down the Inglewoo
Frederique	Joly	Venice	CA	90291	It’s time to shut down the Inglewoo
Jim	Haley	Castaic	CA	91384	It’s time to shut down the Inglewoo
Priscilla	Klemic	Van Nuys	CA	91401	It’s past time to shut down the Ingle
Barry	Backer	Playa Del Rey	CA	90293	It’s time to shut down the Inglewoo
Daniel	Walter	Los Angeles	CA	90042	It’s time to shut down the Inglewoo
Wr	Briggs	Hermosa Beac	CA	90254	It’s time to shut down the Inglewoo
Nancy	Mattoon	West Hollywoo	CA	90069	It’s time to shut down the Inglewoo
Gabriella	Sidhu	Los Angeles	CA	90006	It’s time to shut down the Inglewoo
Martitia	Palmer	Winnetka	CA	91306	It’s time to shut down the Inglewoo
Hugh	Moore	Los Angeles	CA	90006	It’s time to shut down the Inglewoo
Veronica	Carrington	Los Angeles	CA	90039	It’s time to shut down the Inglewoo
Aida	Marina	South Pasaden	CA	91030	It’s time to shut down the Inglewoo
Richard	Wightman	Arcadia	CA	91006	It’s time to shut down the Inglewoo
Riley	Haythorn	Inglewood	CA	90302	It’s time to shut down the Inglewoo
Beth	Herndobler	Altadena	CA	91001	It’s time to shut down the Inglewoo
Bret	Polish	Reseda	CA	91335	It’s time to shut down the Inglewoo
Laura	Dutton	Los Angeles	CA	90004	It’s time to shut down the Inglewoo

Joan	Kaplan	Altadena	CA	91001	It’s time to shut down the Inglewoo
E.	Rodriguez	Los Angeles	CA	90067	It’s time to shut down the Inglewoo
Victoria	Yust	Venice	CA	90291	It’s time to shut down the Inglewoo
Daniel	Dakduk	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Diana	Davidson	Los Angeles	CA	90064	It’s time to shut down the Inglewoo
Meghan	Tracy	Long Beach	CA	90808	It’s time to shut down the Inglewoo
Matthew	Lubs	El Segundo	CA	90245	It’s time to shut down the Inglewoo
Rebecca	Wang	Alhambra	CA	91801	It’s time to shut down the Inglewoo
Kalpana	Pot	Dublin	OH	43016	It’s time to shut down the Inglewoo
Jayrill	Nutt	Diamond Bar	CA	91765	It’s time to shut down the Inglewoo
Nicole	C	Diamond Bar	CA	91765	It’s time to shut down the Inglewoo
Robert	Davenport	Lakewood	CA	90712	It’s time to shut down the Inglewoo
Alexandra	Nicole	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
Janna	Gelfand	Los Angeles	CA	90049	It’s time to shut down the Inglewoo
Stephanie	Corona	Downey	CA	90240	It’s time to shut down the Inglewoo
Melinda	Taylor	Long Beach	CA	90814	It’s time to shut down the Inglewoo
Kristin	Baker	Long Beach	CA	90808	It’s time to shut down the Inglewoo
Claudia	Stegall	Glendale	CA	91205	It’s time to shut down the Inglewoo
Beverly	Harris	Beverly Hills	CA	90212	It’s time to shut down the Inglewoo
Arnaud	Dunoyer	Venice	CA	90291	It’s time to shut down the Inglewoo
Kyle	Yaskin	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
Linda	Shilton	Los Angeles	CA	90064	It’s time to shut down the Inglewoo
Anita	Youabian	Los Angeles	CA	90024	It’s time to shut down the Inglewoo
Chris	Leverich	Playa Del Rey	CA	90293	It’s time to shut down the Inglewoo
Patricia	Rudner	Cypress	CA	90630	It’s time to shut down the Inglewoo
Penny	Weiss	Pasadena	CA	91104	It’s time to shut down the Inglewoo
Sharon	Carlson	Woodland Hills	CA	91364	It’s time to shut down the Inglewoo
Gary	Kuehn	Newhall	CA	91321	It’s time to shut down the Inglewoo
Linda	Penrose	Rancho Palos V	CA	90275	It’s time to shut down the Inglewoo
Christopher	Rossi	Redondo Beac	CA	90278	It’s time to shut down the Inglewoo
Susan P.	Walp	Pasadena	CA	91103	It’s time to shut down the Inglewoo
Kikei	Wong	Torrance	CA	90502	It’s time to shut down the Inglewoo
Tamara	Maloney	Los Angeles	CA	90035	It’s time to shut down the Inglewoo
Lorene	Milligan	Reseda	CA	91335	It’s time to shut down the Inglewoo
Marty	Bostic	Los Angeles	CA	90025	It’s time to shut down the Inglewoo
deborah y	chew	Lomita	CA	90717	It’s time to shut down the Inglewoo
Francine	Kubrin	Los Angeles	CA	90049	It’s time to shut down the Inglewoo
Artineh	Havar	North Hollywoo	CA	91606	It’s time to shut down the Inglewoo
Cayley	Jenner	Malibu	CA	90265	It’s time to shut down the Inglewoo

April	Kelley	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Catherine	Browr	Rowland Heigh	CA	91748	It’s time to shut down the Inglewoo
Melanie	Melzar	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Amie	Jordan	Los Angeles	CA	90032	It’s time to shut down the Inglewoo
Carla	Halle	Los Angeles	CA	90024	It’s time to shut down the Inglewoo
Kathy	Kelehan	Los Angeles	CA	90041	It’s time to shut down the Inglewoo
Carolyn	Pettis	Santa Clarita	CA	91350	It’s time to shut down the Inglewoo
Susar	Hathaway	Pico Rivera	CA	90660	It’s time to shut down the Inglewoo
Angela	Vanthaneey	Arcadia	CA	91006	It’s time to shut down the Inglewoo
Jordan	Paetsch	Los Angeles	CA	90015	It’s time to shut down the Inglewoo
Miriam	Cantor	Los Angeles	CA	90019	It’s time to shut down the Inglewoo
Ellen	Segal	La Crescenta	CA	91214	It’s time to shut down the Inglewoo
Chris	Heitkemper	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
Michelle	Alexander	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Thoma	Carlton	Culver City	CA	90232	It’s time to shut down the Inglewoo
Gregg	Oelker	Altadena	CA	91001	It’s time to shut down the Inglewoo
andrea	boyle	Kansas City	KS	66101	It’s time to shut down the Inglewoo
Denise	Dardarian	Los Angeles	CA	90046	It’s time to shut down the Inglewoo
John	Quigley	Woodland Hills	CA	91364	It’s time to shut down the Inglewoo
D.	Rowe	Santa Monica	CA	90403	It’s time to shut down the Inglewoo
Katje	Lehrmar	Culver City	CA	90231	It’s time to shut down the Inglewoo
Christine	Sneec	Pasadena	CA	91106	It’s time to shut down the Inglewoo
SueAnı	Schoonmak	Long Beach	CA	90814	It’s time to shut down the Inglewoo
Laurel	Cline	Whittier	CA	90601	It’s time to shut down the Inglewoo
Marilyn	Avila	Whittier	CA	90601	It’s time to shut down the Inglewoo
Kim	Hanser	Studio City	CA	91604	It’s time to shut down the Inglewoo
Claude	Duss	Calabasas	CA	91302	It’s time to shut down the Inglewoo
Alan	Goodsoı	Los Angeles	CA	90026	It’s time to shut down the Inglewoo
Kurt	Cruger	Long Beach	CA	90803	It’s time to shut down the Inglewoo
Laurel	Tucker	Claremont	CA	91711	It’s time to shut down the Inglewoo
Michelle	Fryback	Lomita	CA	90717	It’s time to shut down the Inglewoo
Sandy	Williams	Covina	CA	91723	It’s time to shut down the Inglewoo
Chris	Hernandez	Sun Valley	CA	91352	It’s time to shut down the Inglewoo
S	T	Los Angeles	CA	90025	It’s time to shut down the Inglewoo
Heidi	Miller	North Hills	CA	91343	It’s time to shut down the Inglewoo
Gina	Gosparini	Pasadena	CA	91106	It’s time to shut down the Inglewoo
Myrian	Monnet	Pasadena	CA	91101	It’s time to shut down the Inglewoo
Pamela	Haddac	Los Angeles	CA	90016	It’s time to shut down the Inglewoo
James	McKelvey	Santa Clarita	CA	91350	It’s time to shut down the Inglewoo

Lauren	Coher	Sherman Oak	CA	91403	It’s time to shut down the Inglewoo
Mario	Magpale	Palmdale	CA	93550	It’s time to shut down the Inglewoo
judith	villablanca	Malibu	CA	90265	It’s time to shut down the Inglewoo
Jollee	Saphier	Woodland Hills	CA	91367	It’s time to shut down the Inglewoo
Antonia	Powell	Venice	CA	90291	It’s time to shut down the Inglewoo
Mark	Giordani	Canoga Park	CA	91303	It’s time to shut down the Inglewoo
Charles	Lotstein	Long Beach	CA	90803	It’s time to shut down the Inglewoo
Jeffrey	Jenkins	Diamond Bar	CA	91765	It’s time to shut down the Inglewoo
Keith	Jewett	Valencia	CA	91355	It’s time to shut down the Inglewoo
E.	Wright	Encino	CA	91316	It’s time to shut down the Inglewoo
Andrea	Sher	Studio City	CA	91604	It’s time to shut down the Inglewoo
Daniel	Christopher	Los Angeles	CA	90039	It’s time to shut down the Inglewoo
Marilyn	Eng	Diamond Bar	CA	91765	It’s time to shut down the Inglewoo
Hannah	Bentley	San Pedro	CA	90731	It’s time to shut down the Inglewoo
chris	van hook	Pacific Palisade	CA	90272	It’s time to shut down the Inglewoo
Gregory	Perkins	Long Beach	CA	90814	It’s time to shut down the Inglewoo
Simone	Boudriot	Tujunga	CA	91042	It’s time to shut down the Inglewoo
Thomas	Conroy	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Patricia	Lauer	Signal Hill	CA	90755	It’s time to shut down the Inglewoo
Al	Cullen	Pasadena	CA	91107	It’s time to shut down the Inglewoo
Benjamin	Schlau	Los Angeles	CA	90026	It’s time to shut down the Inglewoo
Samue	Rosado	Long Beach	CA	90814	It’s time to shut down the Inglewoo
Debra	Lichstein	Agoura Hills	CA	91301	It’s time to shut down the Inglewoo
Gretchen	North	Valley Village	CA	91607	It’s time to shut down the Inglewoo
leslie	klein	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Karina	Hernandez	North Hollywoo	CA	91602	It’s time to shut down the Inglewoo
Vreni	Merriam	Venice	CA	90291	It’s time to shut down the Inglewoo
Erik	Loyer	Valencia	CA	91355	It’s time to shut down the Inglewoo
Jose	Sanchez	Hacienda Heigl	CA	91745	It’s time to shut down the Inglewoo
Maria	Molund	Los Angeles	CA	90019	It’s time to shut down the Inglewoo
Christopher	Geukens	North Hills	CA	91343	It’s time to shut down the Inglewoo
Cecilia	Canales	La Canada Flin	CA	91011	It’s time to shut down the Inglewoo
Candice	Barnett	Lancaster	CA	93536	It’s time to shut down the Inglewoo
Paige	Ziehlermart	Monrovia	CA	91016	It’s time to shut down the Inglewoo
Susannah	Baxendale	Culver City	CA	90232	It’s time to shut down the Inglewoo
Suzi	Beaton	Beverly Hills	CA	90210	It’s time to shut down the Inglewoo
Hannah	Zilke	Beverly Hills	CA	90210	It’s time to shut down the Inglewoo
Kathleen	Goldman	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Aarati	Joly	Venice	CA	90291	It’s time to shut down the Inglewoo

Carlos	Nunez	Reseda	CA	91335	It’s time to shut down the Inglewood
Christine	Sirias	Alhambra	CA	91801	It’s time to shut down the Inglewood
Cordi	Koga	Rancho Palos V	CA	90275	It’s time to shut down the Inglewood
Adam	Bernstein	Los Angeles	CA	90012	It’s time to shut down the Inglewood
Wendy	Lohman	Los Angeles	CA	90024	It’s time to shut down the Inglewood
Patricia	Burgos	Santa Monica	CA	90401	It’s time to shut down the Inglewood
dana	figus	North Hollywoo	CA	91602	It’s time to shut down the Inglewood
Adriana	Nunez	Van Nuys	CA	91405	It’s time to shut down the Inglewood
KT	Hale	La Canada Flin	CA	91011	It’s time to shut down the Inglewood
Rodolfo	Salcedo	Pomon	CA	91766	It’s time to shut down the Inglewood
Kyle	Pyo	Rancho Palos V	CA	90275	It’s time to shut down the Inglewood
Nunavik	Teal	Santa Monica	CA	90405	It’s time to shut down the Inglewood
Ian	Bixby	Long Beach	CA	90814	It’s time to shut down the Inglewood
Rollin	Blanton	Pasadena	CA	91104	It’s time to shut down the Inglewood
Steve	Tuttle	Monterey Park	CA	91754	It’s time to shut down the Inglewood
Gia	Mora	Sherman Oak	CA	91423	It’s time to shut down the Inglewood
George	Rothwell	Altadena	CA	91001	It’s time to shut down the Inglewood
Samue	Rosado	Long Beach	CA	90814	It’s time to shut down the Inglewood
Melinda	Gorder	Covina	CA	91722	It’s time to shut down the Inglewood
BRIAN	KESSLE	Sherman Oak	CA	91403	It’s time to shut down the Inglewood
Shirley	Shapiro	Agoura Hills	CA	91301	It’s time to shut down the Inglewood
Patricia	Neighmon	Los Angeles	CA	90046	It’s time to shut down the Inglewood
christopher	burdorf	Beverly Hills	CA	90212	It’s time to shut down the Inglewood
Julie	Holguin	Los Angeles	CA	90027	It’s time to shut down the Inglewood
Denise	LaChance	Winnetka	CA	91306	It’s time to shut down the Inglewood
I	Stanelun	Studio City	CA	91604	It’s time to shut down the Inglewood
Ann	Dorsey	Northridge	CA	91325	It’s time to shut down the Inglewood
Veena	Sud	La Crescenta	CA	91214	It’s time to shut down the Inglewood
Mel	Marcus	Long Beach	CA	90808	It’s time to shut down the Inglewood
carlyn	lampert	Valley Village	CA	91607	It’s time to shut down the Inglewood
Celia	de Blas	Los Angeles	CA	90045	It’s time to shut down the Inglewood
Heather	McLarty	Los Angeles	CA	90042	It’s time to shut down the Inglewood
John	Lindblad	Torrance	CA	90510	It’s time to shut down the Inglewood
J	Stanelun	Holiday	FL	34690	It’s time to shut down the Inglewood
Tom	Earnist	San Pedro	CA	90731	It’s time to shut down the Inglewood
Lucy	Hart	Encino	CA	91316	It’s time to shut down the Inglewood
Reanna	Flores	Los Angeles	CA	90032	It’s time to shut down the Inglewood
Rick	Scott	Marina Del Rey	CA	90292	It’s time to shut down the Inglewood
Gloria	Roth	Long Beach	CA	90803	It’s time to shut down the Inglewood

Tim	O'Brien	Los Angeles	CA	90042	It’s time to shut down the Inglewoo
FLOR	ROSA	Los Angeles	CA	90038	It’s time to shut down the Inglewoo
John	Gutmai	Pacific Palisade	CA	90272	It’s time to shut down the Inglewoo
Joselyn	Wilkinson	Los Angeles	CA	90045	It’s time to shut down the Inglewoo
Alex	Garcia	Alhambra	CA	91801	It’s time to shut down the Inglewoo
Michelle	Alexander	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Sarah	Leonard	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Frank	Selig	Hawthorne	CA	90250	It’s time to shut down the Inglewoo
Rosa	Strayer	Whittier	CA	90601	It’s time to shut down the Inglewoo
Alicia	Salazar	Los Angeles	CA	90032	It’s time to shut down the Inglewoo
Chelsey	Marsing	Santa Monica	CA	90404	It’s time to shut down the Inglewoo
A. Elizabeth	Johanser	Los Angeles	CA	90018	It’s time to shut down the Inglewoo
Robert	Frang	Santa Monica	CA	90403	It’s time to shut down the Inglewoo
stu	nichols	North Hollywoo	CA	91606	It’s time to shut down the Inglewoo
Jose	Franco	Long Beach	CA	90806	It’s time to shut down the Inglewoo
William	Harte	Long Beach	CA	90814	It’s time to shut down the Inglewoo
Michelle	Fox	Downey	CA	90241	It’s time to shut down the Inglewoo
Allisyn	Snyder	Van Nuys	CA	91405	It’s time to shut down the Inglewoo
William	Entz	Granada Hills	CA	91344	It’s time to shut down the Inglewoo
Oma	Farid	Palmdale	CA	93550	It’s time to shut down the Inglewoo
Ann	Ervin	Pasadena	CA	91105	It’s time to shut down the Inglewoo
Joyce	M Campbel	Torrance	CA	90505	It’s time to shut down the Inglewoo
Lindsey	Hirway	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Vivian	Parker	Burbank	CA	91506	It’s time to shut down the Inglewoo
Janet	Heyma	Los Angeles	CA	90045	It’s time to shut down the Inglewoo
cheryl	holyk	Los Angeles	CA	90031	It’s time to shut down the Inglewoo
Marilyn	Carney	North Hollywoo	CA	91606	It’s time to shut down the Inglewoo
Elsa	Knutson	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Robert	Beving	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
kimberly	valentine	Carson	CA	90745	It’s time to shut down the Inglewoo
Riccardo	Nasci	San Francisco	CA	94127	It’s time to shut down the Inglewoo
Victoria	Shepherc	Glendale	CA	91201	It’s time to shut down the Inglewoo
Lidia	Nasci	San Francisco	CA	94127	It’s time to shut down the Inglewoo
Angela	Limoni	San Francisco	CA	94127	It’s time to shut down the Inglewoo
Kathy	Rose	Los Angeles	CA	90063	It’s time to shut down the Inglewoo
Jennifer	Wilson	Valley Village	CA	91607	It’s time to shut down the Inglewoo
Liz	Barillas	Glendale	CA	91201	It’s time to shut down the Inglewoo
Stephanie	Proctor	Van Nuys	CA	91406	It’s time to shut down the Inglewoo
Patty	McCollim	Downey	CA	90241	It’s time to shut down the Inglewoo

Susar	Rudinger	Granada Hills	CA	91344	It’s time to shut down the Inglewoo
Teresa	Naglietti	San Francisco	CA	94127	It’s time to shut down the Inglewoo
Ana	Miranda	Valley Village	CA	91607	It’s time to shut down the Inglewoo
Ellen	Little	Studio City	CA	91604	It’s time to shut down the Inglewoo
Indee	Brooke	Sunland	CA	91040	It’s time to shut down the Inglewoo
Ianthe	Zevos	Los Angeles	CA	90026	let's get it done! shut down the Ingl
John	Wait	Los Angeles	CA	90028	It’s time to shut down the Inglewoo
JASO	NAKAGA	Los Angeles	CA	90066	It’s time to shut down the Inglewoo
Greg	Nelson	San Pedro	CA	90732	It’s time to shut down the Inglewoo
Mia	Mantini	Malibu	CA	90265	It’s time to shut down the Inglewoo
Sara	Morris	Whittier	CA	90604	It’s time to shut down the Inglewoo
Joyce	Thoma	Long Beach	CA	90802	It’s time to shut down the Inglewoo
Maria	Fraga	West Covina	CA	91790	It’s time to shut down the Inglewoo
Brooke	Bryant	Culver City	CA	90230	It’s time to shut down the Inglewoo
Tobias	Fairman	Glendora	CA	91740	It’s time to shut down the Inglewoo
Elijah	L	Huntington Par	CA	90255	It’s time to shut down the Inglewoo
Dennis	Landi	Bellflower	CA	90706	It’s time to shut down the Inglewoo
carla	halle	Los Angeles	CA	90036	It’s time to shut down the Inglewoo
Debra	Nichols	Palmdale	CA	93551	It’s time to shut down the Inglewoo
Susar	Wold	Granada Hills	CA	91344	It’s time to shut down the Inglewoo
Linda	howie	West Hills	CA	91307	It’s time to shut down the Inglewoo
Christopher	Correa	Rancho Palos V	CA	90275	It’s time to shut down the Inglewoo
Kelly	Woo	Pasadena	CA	91104	It’s time to shut down the Inglewoo
Sherry	LaMaison-S	Torrance	CA	90505	It’s time to shut down the Inglewoo
Alice	Neuhauser	Manhattan Bea	CA	90266	It’s time to shut down the Inglewoo
Anna	Kolovou	Woodside	NY	11377	It’s time to shut down the Inglewoo
KK	Seeberg	Indio	CA	92203	It’s time to shut down the Inglewoo
Sandra	Butler	Los Angeles	CA	90045	It’s time to shut down the Inglewoo
P. P.	Soucek	Van Nuys	CA	91401	It’s time to shut down the Inglewoo
Heather	Whitehead	Richmond	CA	94804	It’s time to shut down the Inglewoo
Laura	Deibel	Sherman Oak	CA	91423	It’s time to shut down the Inglewoo
Hilda	Velasquez-	Canoga Park	CA	91303	It’s time to shut down the Inglewoo
Jose	Rodriguez	Whittier	CA	90604	It’s time to shut down the Inglewoo
Judy	Schwartz	Los Angeles	CA	90025	It’s time to shut down the Inglewoo
Michelle	Mitchell	Claremont	CA	91711	It’s time to shut down the Inglewoo
Sarah	Stone	Chatsworth	CA	91311	It’s time to shut down the Inglewoo
Andrew	Russell	Encino	CA	91316	It’s time to shut down the Inglewoo
Jil	Van Cise	Los Angeles	CA	90057	It’s time to shut down the Inglewoo
Caroline	Blake	Arcadia	CA	91007	It’s time to shut down the Inglewoo

Laura	Hendor	Burbank	CA	91505	It’s time to shut down the Inglewoo
Donald	Sparks	Northridge	CA	91325	It’s time to shut down the Inglewoo
Lisa	Simor	Los Angeles	CA	90041	It’s time to shut down the Inglewoo
Ton	Pitman	Burbank	CA	91506	It’s time to shut down the Inglewoo
Valerie	Gallant	Beaumon	CA	92223	It’s time to shut down the Inglewoo
RHONI	HERBE	Tujunga	CA	91042	It’s time to shut down the Inglewoo
A	Yasmine	Canoga Park	CA	91304	It’s time to shut down the Inglewoo
Christine	Taylor	Sierra Madre	CA	91024	It’s time to shut down the Inglewoo
Kenneth	Hofmanı	Lancaster	CA	93536	It’s time to shut down the Inglewoo
Elizabeth	Carey	Torrance	CA	90504	It’s time to shut down the Inglewoo
C	Garcia	Torrance	CA	90504	It’s time to shut down the Inglewoo
Denise	De Stefano	Los Angeles	CA	90025	It’s time to shut down the Inglewoo
Cecelia	Lynch	Long Beach	CA	90807	It’s time to shut down the Inglewoo
Katie	Thibodeau	Santa Barbara	CA	93101	It’s time to shut down the Inglewoo
miriam	faugno	Playa Del Rey	CA	90293	It’s time to shut down the Inglewoo
Sylvie	Rokab	Santa Monica	CA	90405	It’s time to shut down the Inglewoo
Anne Marie	Zuckermar	Encino	CA	91316	It’s time to shut down the Inglewoo
Debra	Reynosc	Claremont	CA	91711	It’s time to shut down the Inglewoo
Richard	Yadley	South Pasaden	CA	91030	It’s time to shut down the Inglewoo
Thoma	Lane	Torrance	CA	90505	It’s time to shut down the Inglewoo
R	Wells	Los Angeles	CA	90020	It’s time to shut down the Inglewoo
Steve	Thompso	Los Angeles	CA	90034	It’s time to shut down the Inglewoo
Gloria	Aguirre	Castaic	CA	91384	It’s time to shut down the Inglewoo
Joan	Zierler	Culver City	CA	90230	It’s time to shut down the Inglewoo
Heather	Jennings	Los Angeles	CA	90045	It’s time to shut down the Inglewoo
EVA	ADAMY	Los Angeles	CA	90027	It’s time to shut down the Inglewoo
Robert	Drey	Pasadena	CA	91106	It’s time to shut down the Inglewoo
Gabriela	Sosa	San Diego	CA	92101	It’s time to shut down the Inglewoo
Carolina	Santana	Bell Gardens	CA	90201	It’s time to shut down the Inglewoo
Lucien	Plauzoless	Santa Monica	CA	90402	It’s time to shut down the Inglewoo
Bruce	Anders	Culver City	CA	90230	It’s time to shut down the Inglewoo
Michael	A Wilson	Los Angeles	CA	90024	It’s time to shut down the Inglewoo
Carole	Guidry	Encino	CA	91316	Shut down the Inglewood Oil Field
Gregory	Hohmann F	Long Beach	CA	90814	It’s time to shut down the Inglewoo

Commer	Date Submitted
I support amending the Commur	1/22/2024
I support amending the Commur	4/29/2024
The Carbon Tracker Initiative say	4/29/2024
I fully support the amendment to	4/29/2024
Please put the need to breathe c	1/22/2024
I hope you will do everything in y	1/22/2024
I urge an unreserved YES to the	1/22/2024
Please amend the Community S	1/22/2024
I support amending the Commur	1/22/2024
For more than 100 years, the oil	4/30/2024
Although I do not personally live	1/29/2024
I support amending the Commur	1/22/2024
I support amending the Commur	1/22/2024
I support amending the Commur	1/22/2024
I support amending the Commur	1/22/2024
Enough is enough. It is long past	1/22/2024
I support amending the Commur	4/29/2024
I support amending the Commur	4/29/2024
I support amending the Commur	1/22/2024
I support amending the Commur	4/29/2024
I am writing in support of amendi	1/22/2024
I support amending the Commur	4/29/2024
I am writing to express my suppo	4/29/2024
I support amending the Commur	1/22/2024
For over ten years I have suppor	1/22/2024
I support amending the Commur	1/22/2024
I urge you to amend the Commu	4/29/2024
there is every reason why Los Ar	1/22/2024
It is time to move away from foss	1/23/2024
As a property owner in L.A. Cour	4/29/2024
This is not fair for our neighbors	1/31/2024
As a healthcare provider who wo	1/22/2024
I support amending the Commur	4/29/2024
As a resident gravely concerned	4/29/2024

It’s terrible that oil drilling is going	1/23/2024
We already know fossil fule is ha	4/29/2024
I support amending the Commur	4/29/2024
I support amending the Commur	1/22/2024
SHUT IT DOWN ! I support ame	4/29/2024
As an environmental scientist in	1/22/2024
I support amending the Commur	1/22/2024
I UNCONDITIONALLY SUPPOR	1/22/2024
I support amending the Commur	1/22/2024
Here is where we are, not stated	4/30/2024
As a retired public school teache	1/22/2024
I support amending the Commur	4/29/2024
I support amending the Commur	1/24/2024
I am writing today to share my su	4/29/2024
I am registered to vote in Superv	5/5/2024
I support amending the Commur	4/29/2024
We should be ending ALL oil dril	1/23/2024
Amend the Community Standard	4/29/2024
I want to see us take good care o	4/29/2024
Please protect our health! Shut o	4/29/2024
I support amending the Commur	1/23/2024
I strongly support amending the	1/23/2024
I support amending the Commur	1/22/2024
I support amending the Commur	1/23/2024
People shouldn't have to live and	4/29/2024
You have this opportunity to mak	4/29/2024
I support amending the Commur	4/29/2024
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May 13, 2024

County of Los Angeles Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

Re: Comments on Proposed Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2); Board of Supervisors Meeting, Item No. 3, May 14, 2024

Dear Board of Supervisors:

On behalf of Sentinel Peak Resources California LLC, the operator of the Baldwin Hills oil field, we re-submit (1) a letter dated January 29, 2024 submitted in connection with the previously-scheduled hearing before the Board of Supervisors, and (2) a letter dated September 27, 2023, submitted to the Department of Regional Planning, both discussing the legal and factual reasons why the proposed amendment to the Baldwin Hills Community Standards District is improper and unnecessary.[1]

As explained previously in these letters, we urge the Board to reject the proposed amendment to the Baldwin Hills Community Standards District.

Sincerely,

Matt Wickersham

Attorney for Sentinel Peak Resources California LLC

Enclosures

[1] Given the file size constraints on submitting comments electronically, we have attached excerpts of the supporting materials cited in the attached letters. We request that the administrative record include complete versions of the cited references as available on the functioning website links provided in the attached comment letters.

SENTINEL PEAK
RESOURCES

5640 South Fairfax Avenue
Los Angeles, CA 90056

September 27, 2023

Los Angeles County Department of Regional Planning
320 West Temple Street, 13th Floor
Los Angeles, CA 90012
Attn: Edgar de la Torre
Comment@planning.lacounty.gov

RE: 2023 PROPOSED AMENDMENT
BALDWIN HILLS COMMUNITY STANDARDS DISTRICT
REGIONAL PLANNING COMMISSION, OCTOBER 4, 2023 AGENDA ITEM (PRJ2023-001628)

Dear Edgar,

The purpose of this Issue Paper is to address and provide the Los Angeles County Planning Commission with practical information concerning the Inglewood Oil Field (IOF) and its operation that may not have been adequately covered in the previous hearing or informational question and answer session.

The IOF produces and sells crude oil, natural gas, and propane. Produced water is filtered, treated, and reinjected back into the original formations. In general, an oil/water/gas mixture is pumped from oil-bearing formations and processed through a gas plant, various tank systems, and a water plant. These systems along with the oil production wells and water injector wells are all under vapor recovery to prevent emissions from escaping to the atmosphere.

Other supporting operations include the following:

- Use of maintenance and workover rigs to maintain existing injection and production wells. Each rig utilizes a diesel engine equipped with the most advanced Tier IV or V particulate exhaust filters.
- An emergency fire pump powered by diesel, and a heater for crude oil and a backup emergency generator to run pertinent equipment pieces in case of an electrical outage, both which utilize treated, clean natural gas for fuel.
- All other onsite process equipment is electrically powered to minimize onsite emissions.

Sentinel Peak Resources maintains its process equipment to consistently comply with local agency requirements through our air quality permits and onsite safety and risk management. This has been monitored and reported through independent health assessments and air quality studies with repeatedly proven and positive outcomes.

Health Studies

Since 2008, four health studies have been conducted specific to the IOF. As identified below, two were Health Risk Assessments (HRAs); one was an air quality study, which included HRA calculations; and one was a health assessment by LA County Dept of Public Health (DPH). DPH is also in the process of conducting an updated health assessment.

a. **2008 HRA.** This is the original baseline HRA. It is associated with and contained in the EIR and is posted on the Baldwin Hills CSD – LA County Planning website.[1]

b. **2011 DPH Health Study** "Inglewood Oil Field Communities Health Assessment (February 2011)": InglewoodOilField ReportCombinedwAppendix.pdf (lacounty.gov)

c. **2015 "Baldwin Hills Air Quality Study"** (113 pages) includes HRA calculations: Baldwin Hills Final Report (lacounty.gov).

d. **2020 HRA.** Inglewood Oil Field Health Risk Assessment Report: https://planning.lacounty.gov/wp-content/uploads/2022/10/bh health-risk-assessment-report.pdf

The table below provides the overall summary results for each completed HRA.

Criteria Description	Threshold Value	2008 HRA	2015 HRA[2]	2020 HRA
Cancer risk per million	10	8.18	6.7	5.2
Chronic risk, health index	1	0.021	<0.2	0.06
Acute risk, health risk	1	0.96	<1	0.48

All HRAs followed the most updated protocol(s) and guidance documents of the California Office of Health Hazard Assessment (OEHHA). Also, each was reviewed by the South Coast Air Quality Management District (SCAQMD) for comment and accuracy. All results for cancer, chronic, and acute health risks were below thresholds warranting no further assessment or measures to reduce risks. The 2015 and 2020 studies utilized two different methods (the first by direct measurement and the second by collected/reported data). Both had similar outcomes.

No HRA calculations were provided in the DPH 2011 health study; however, the report summary and conclusions indicated no significant differences were identified between the results of the four health parameters studied near the IOF and outside of the IOF. The four health parameters included: mortality, low-birth-weight births, birth defects, and cancer.

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[1] Select the "Background" tab on the main website (Baldwin Hills CSD - LA County Planning) and scroll down to "Final EIR Documents". Then click on "Baldwin Hill CSD Final EIR" and the "Baldwin Hill CSD Final EIR – Appendices." These links provide the zip files for download. After downloading, the "Inglewood Oil Field Baseline Health Risk Assessment," the HRA writeup is found in Section 4.3.1.4. Supporting calculations are provided in the second zip file, which are appendices b, c, and d.

[2] HRA calculations were conducted as part of the air study.

For comparative purposes, the results of the SCAQMD's Multiple Air Toxics Exposure Studies (MATES) are provided for the Los Angeles Basin and include total risk from all air pollution sources including mobile sources (i.e., not specific to any single source or industry). Cancer, chronic, and acute risks for each HRA are listed below together with corresponding State threshold levels. Levels above State thresholds are subject to regulatory measures to further minimize health risks; levels below State thresholds are not. For further details, please check the links to each HRA and MATES.

Criteria Description	Threshold Value	2008 MATES III	2015 MATES IV	2021 MATES V
Cancer risk per million	10	853	897	424
Chronic risk, health index	1	12.6	6.25	6.1
Acute risk, health risk	1	N/A	N/A	N/A

The cancer risk outcomes of the MATES study areas are provided on the enclosed exhibit. An outline of the IOF is imposed on the exhibit. Cancer risk outcomes per million range from 459-624 in the areas around the IOF. The contribution by the IOF was estimated to be 5.2 (or, approximately 1%) based on the most recent HRA. Because the IOF is operated nearly 100% by electricity, limited air emissions are produced. The IOF also has full time monitoring to immediately commence repairs to any detected leaks.

SCAQMD Permits and Rule Requirements

Based on the IOF's limited air emissions, it is not part of SCAQMD's or California Air Resources Board's (CARB) listed Air Toxics 'Hot Spots' Program (AB 2588). Also, because the IOF does not exceed the threshold for Green House Gas (GHG) emissions, we must only conduct and submit informal reporting to the SCAQMD and CARB.

The State of California has the strictest oil production-related health and safety standards in the nation. Over 20 government agencies oversee oil and gas operations in California and our company. SPR complies with a myriad of air quality requirements via the SCAQMD and CARB. Primary requirements have been established and enforced by the SCAQMD. The following is a short list of those requirements and a general means on how SPR complies, which further supports why air emissions are controlled and limited:

- **Facility Permit to Operate**. An extensive permit with conditions for operating more than 319 equipment pieces. Conditions include testing of tanks, diagnostic and source testing of process equipment. This includes monthly, quarterly, and annual monitoring reporting of emissions.

- **Leak Detection and Repair (LDAR)**. As required by SCAQMD Rules 1148.1, 1173, and 1176, SPR is required to monitor production wells and process equipment components such as valves, pipe connections, fittings, compressors and so forth, on a quarterly basis (at minimum) and report the findings to SCAQMD. Each rule is intended to control volatile organic compound (VOC) leaks from components. This is completed through a certified third-party contractor who utilizes toxic vapor analyzers (TVAs) as required. This comprises 88,419 different test points for the complete field that are again assessed and reported each quarter. On average, about 0.085% components may have to be addressed/repaired, which are typically corrected in less than one workday.

- **Tank Storage Integrity.** The purpose of SCAQMD Rule 463 is to reduce emissions of VOCs (including methane) from the storage of organic liquids including crude oil.

Gas Plant Process Safety and Risk Management

SPR's history shows that we have exceptional compliance with OSHA Process Safety Management (PSM), Risk Management Plan (RMP) and Cal-OHSA's Cal-AARP requirements as well as required PSM/RMP Process Hazards Analysis (PHAs) of the gas plant system. Audits by third-party Certified Safety Professionals (CSPs) are conducted every three to five years. An audit was conducted in just the past two months, showing that gas plant operations are in substantial compliance. As noted in the PSM/RMP report, "the auditors noted that the facility is at a very mature point in terms of compliance with PSM/RMP. Programs have been in place now for over twenty years.

Complaints

As required by the CSD, a 1-800 number is available for the public to call in complaints concerning odors, dust, noise, property damage, or other categories. Complaints are addressed in a systematic, structured manner for consistency and objectivity. SPR contacts the complainant within minutes, usually less than 10, after a complaint is called in. Quarterly summaries are provided to the Los Angeles County Dept of Regional Planning and reviewed at the monthly Community Advisory Panel (CAP) meetings. Since 2017 when SPR became the operator of the IOF, a total of 189 complaints have been received; of which a total of 14 were attributed to IOF (7 for odor and 7 for noise). All 14 issues were immediately addressed. The remaining complaints (93.7%) could not be related to oil field operations.

Geotechnical Concerns

The Inglewood-Newport fault line runs through midst of the IOF. SPR conducts extensive ground movement surveys and provides an annual report of ground movement and an evaluation of possible causes. The amount of movement observed in the IOF is small and not unique. Also, SPR operates a balanced waterflood meaning produced fluids and injected fluids are approximately equal.

As required by the CSD, the IOF maintains an accelerometer to determine ground accelerations because of any local seismic event and this is monitored on the USGS website anytime a regional seismic event occurs. If a ground acceleration exceeds 13 percent of gravity, and as specified in the CSD, SPR is to temporarily cease operations, inspect pertinent facility integrity, and notify the LA County DRP. Since SPR has been the operator, no ground acceleration exceedances have occurred.

In the event of a substantial earthquake or similar event, please note that the IOF has an updated Spill Prevention, Countermeasures, and Contingency (SPCC) Plan as certified by a third-party professional engineer. The IOF has sufficient secondary containment for tank systems and additionally has retention basins throughout the IOF to contain spills in addition to the secondary containment structures.

Public Outreach

Since the establishment of the CSD, the operator, and now SPR:

- Provides a 1-800 number (our Map Mobile system) to the community to call in complaints or concerns about noise, odors, dust, property damage, etc.

- Attends and participates in monthly CAP meetings. At the meetings, an operator update is provided, and we assist in addressing questions from the CAP members and public concerning periodic submittals or other events that will or may have transpired between CAP meetings.

- Attends and interfaces with the community at annual local community meetings typically held in October.

- Uploads to the IOF and BHCSD websites for all submitted documents including plans and reports and the complaint process for public access, as required by the CSD.

Hopefully, the information contained herein provides a better sense of the operations and the diligence and concern for public safety with which SPR operates the IOF. The proposed CSD amendment is not necessary and should be rejected.

Respectfully,

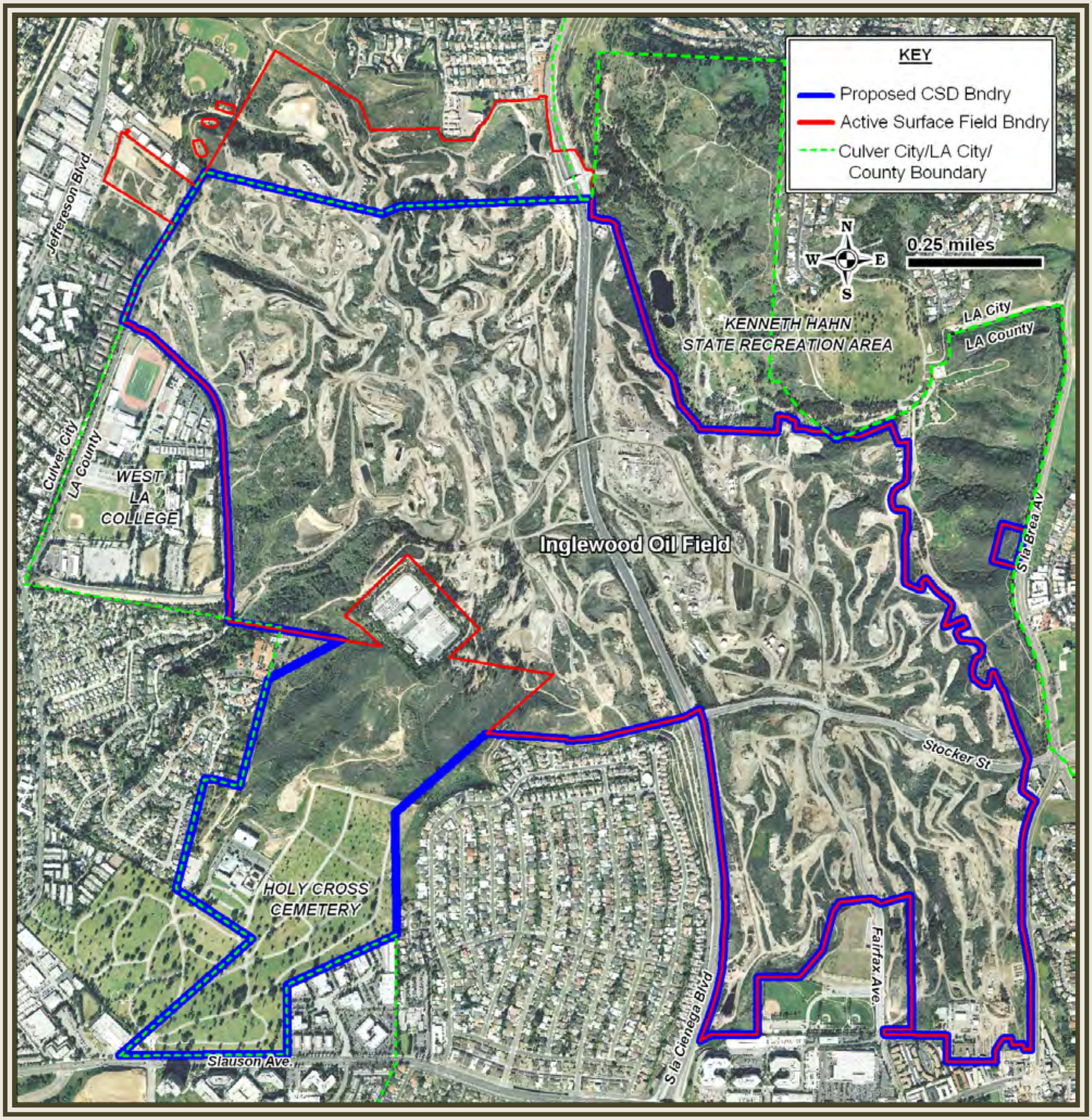
Daniel D. Taimuty
EH&S Manager
Sentinel Peak Resources California, LLC

Excerpt of reference cited at point a. and footnote 1 to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://case.planning.lacounty.gov/baldwinhills/background

Final Environmental Impact Report

Baldwin Hills Community Standards District



October 2008

SCH# 2007061133
County Project # R2007-00570
Environmental Case # RENVT2007-00048

Prepared For:
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Prepared By:
Marine Research Specialists

4.3 Public Health Risk

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The major sources of toxic emissions from the Inglewood Oil Field are airborne from the sources discussed above. The purpose of this public health analysis is to determine whether a significant health risk would result from public continued exposure to these fugitive emissions and combustion by-products as routinely emitted during project operations.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants, which have been addressed in the Air Quality Section (Section 4.2). This section of the EIR provides information on the baseline air toxic emissions from the Inglewood Oil Field and addresses the potential for increased air toxic emissions associated with the potential future development. Based upon the analysis of the potential future development, recommendations are made to enhance the proposed CSD.

4.3.1 Environmental Setting

The potential development is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which encompasses an area of 10,473 square miles (referred to hereafter as the district), consisting of the four county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin and the Mojave Desert Air Basin. The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air basin is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. Information on regional meteorological conditions is provided in Section 4.2.1.

4.3.1.1 Regional Health Risks from Toxic Air Contaminants

The Multiple Air Toxics Exposure Study III (MATES III) is a monitoring and evaluation study conducted in the South Coast Air Basin by the SCAQMD (2008). The MATES III Study consists of several elements. These include a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize risk across the South Coast Air Basin. The study focuses on the carcinogenic risk from exposure to air toxics. Excerpts from the MATES III study are included below to provide an overview of regional health risk assessment issues.

A network of 10 fixed sites was used to monitor toxic air contaminants once every three days for two years. The location of the sites was the same as in the previous MATES II Study to provide comparisons over time.

The initial scope of the monitoring was for a one-year period from April, 2004 through March, 2005. Due to the heavy rains in the South Coast Air Basin in the fall and winter of this period, there was concern that the measurements may not be reflective of typical meteorology. The study was thus extended for a second year from April, 2005 through March, 2006.

In addition to the fixed sites, five additional locations were monitored for periods of several months using moveable monitoring platforms. These microscale sites were chosen to determine if there were gradients between communities that would not be picked up by the fixed locations.

The study also included an update of the toxics emissions inventories for the South Coast Air Basin and computer modeling to estimate toxics levels throughout the basin. This allows estimates of air toxics risks in all areas of the South Coast Air Basin, as it is not feasible to conduct monitoring in all areas.

The monitored and modeled concentrations of air toxics were then used to estimate the carcinogenic risks from exposure. Annual average concentrations were used to estimate a lifetime risk from exposure to these levels, consistent with guidelines established by the Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency (EPA). The cancer risk is referred to as the excess cancer risk, or the risk associated with exposure to toxic air contaminants, and are generally a small fraction of the overall cancer risk from all contributing factors combined such as dietary exposure or hereditary factors.

The carcinogenic risk from air toxics in the South Coast Air Basin based on the average concentrations at the fixed monitoring sites is about 1,200 excess cancer cases per million. This risk refers to the expected number of additional cancers in a population of one million individuals that is exposed over a 70 year lifetime. The risk at the fixed sites ranged from 870 to 1,400 per million. For comparison purposes, the SCAQMD considers the risk of a project to be significant if the carcinogenic risk exceeds 10 excess cancer cases per million. Thus, the baseline carcinogenic risk resulting from routine exposure to air toxics in the South Coast Air Basin is substantial.

Compared to previous studies of air toxics in the South Coast Air Basin, this study found a decreasing risk for air toxics exposure, with the population weighted risk down by 17% from the analysis in MATES II. While there has been improvement in air quality regarding air toxics, the risks are still unacceptable and are higher near sources of emissions such as ports and transportation corridors.

Diesel particulate continues to dominate the risk from air toxics, and the portion of air toxic risk attributable to diesel exhaust is increased compared to the MATES II Study. The highest risks are found near the port area, an area near central Los Angeles, and near transportation corridors. The results from this study underscore that a continued focus on reduction of toxic emissions, particularly from diesel engines, is needed to reduce air toxics exposure.

The MATES III health risk assessment results are provided in Figure 4.3-1. The location of the Inglewood Oil Field is also shown as a point of reference. This figure indicated that the modeled baseline health risk in the vicinity of the Inglewood Oil Field is in the 600-800 excess cancer cases per million individuals exposed, which is considerably higher than levels that are considered acceptable, which are approximately 10 excess cancer cases per million individuals exposed. The relative risk from the Inglewood Oil Field, or what might be considered the contribution from this facility to the greater regional health risk, are summarized in Section 4.3.1.3.

4.3.1.2 Regional Toxic Air Contaminant Concentrations

A toxic air contaminant is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. Toxic air contaminants are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those toxic air contaminants that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

In 1987, the California legislature adopted the Air Toxics "Hot Spots" Information and Assessment Act (or AB 2588). AB 2588 requires facilities to submit an air-toxics-inventory report from which priority scores are calculated. Facilities with a priority score exceeding specific thresholds must provide health risk analysis. If the risk reported in the health risk analysis exceeds specific thresholds, then the facility is required to provide public notice to the affected community. In 1992, the California legislature added a risk reduction component, the Facility Air Toxic Contaminant Risk Audit and Reduction Plan (or SB 1731), which required the District to specify a significant risk level, above which risk reduction would be required. The District began to implement the AB 2588 program beginning in 1988.

Monitoring for toxic air contaminants is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. California Air Resources Board (CARB) conducts air monitoring for a number of toxic air contaminants various locations throughout California. The closest CARB toxic air contaminant monitoring location is the North Long Beach site. Table 4.3.1 presents the Annual Toxics Summary for North Long Beach, the maximum concentration data for volatile organic compounds, polycyclic aromatic hydrocarbons and inorganic compounds. The data for volatile organic compounds are for the year 2005; for polycyclic aromatic hydrocarbons the year is 2004; and for all inorganic compounds the data are for the year 2003 except for hexavalent chromium, which is from 2005, the most recent data available from CARB on toxic air contaminants.

Figure 4.3-1 SCAQMD MATES III Modeled Health Risk Assessment

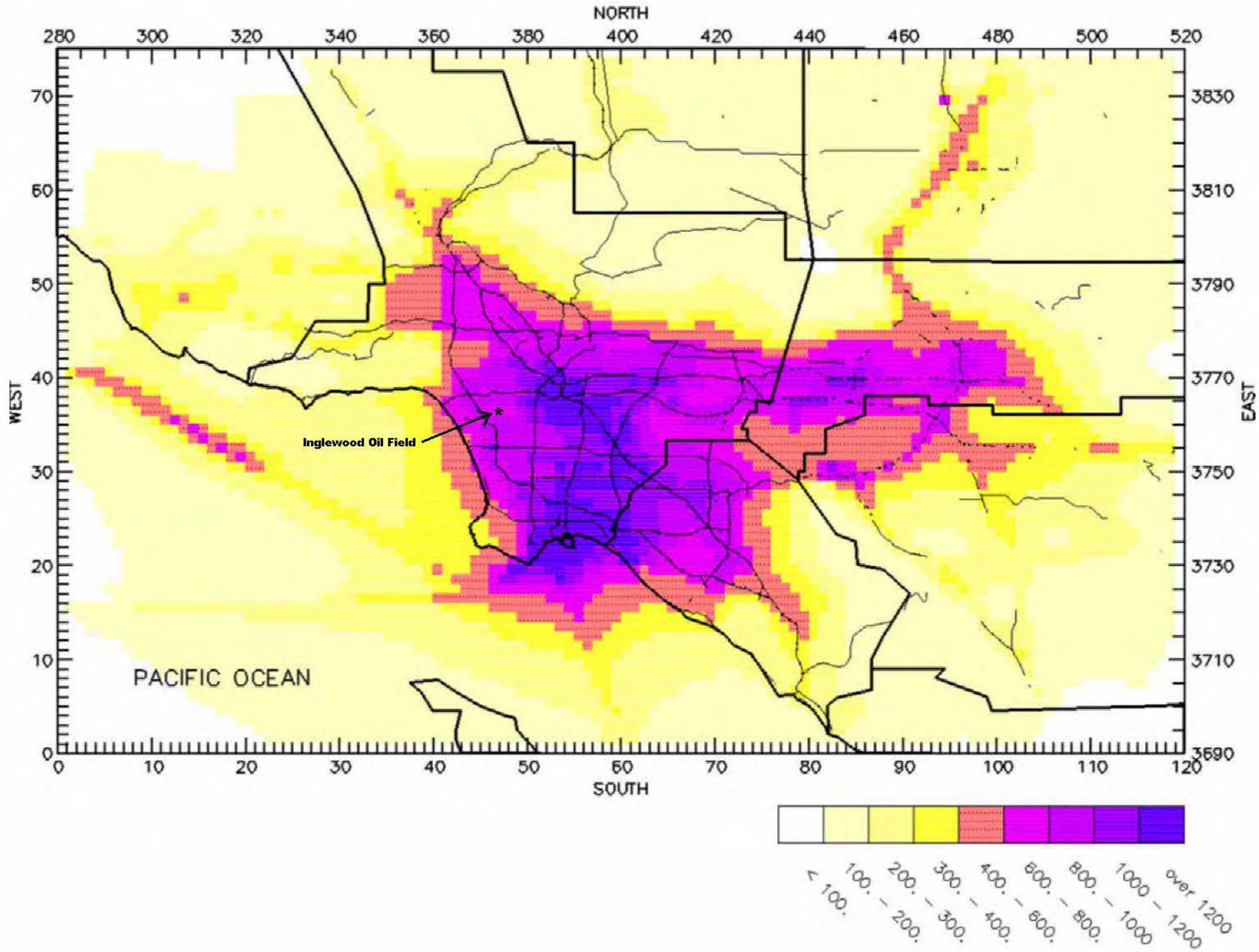


Table 4.3.1 Annual Toxics Summary for North Long Beach

Pollutant	Maximum Concentration	Pollutant	Maximum Concentration
Volatile Organic Compounds [1] (parts per billion by volume)			
Acetaldehyde	2.6	Ethyl Benzene	0.6
Acetone	20	Formaldehyde	6.1
Acetonitrile	2.3	Methyl Bromide	0.12
Acrolein	0.9	Methyl Chloroform	0.05
Acrylonitrile	0.9	Methyl Ethyl Ketone	0.2
Benzene	1.6	Methyl tertiary - Butyl Ether	*
1,3 – Butadiene	0.56	Methylene Chloride	2.4
Carbon Disulfide	1.1	Perchloroethylene	0.18
Carbon Tetrachloride	*	Styrene	0.7
Chloroform	0.06	Toluene	4.7
o – Dichlorobenzene	0.15	Trichloroethylene	0.18
p – Dichlorobenzene	0.15	meta/para – Xylene	2.4
cis – 1,3 – Dichloropropene	0.05	Ortho – Xylene	0.8
trans – 1,3 – Dichloropropene	0.05		
Polycyclic Aromatic Hydrocarbons (2) (nanograms per cubic meter)			
Benzo(a)pyrene	0.61	Benzo(k)fluoranthene	0.19
Benzo(b)fluoranthene	0.51	Dibenz(a,h)anthracene	0.18
Benzo(g,h,i)perylene	1.7	Indeno(1,2,3-cd)pyrene	0.64
Inorganic compounds (3) (nanograms per cubic meter)			
Aluminum	1700	Nickel	9
Antimony	3	Phosphorous	35
Barium	56	Potassium	890
Bromine	9	Rubidium	4
Calcium	2,300	Selenium	1
Chlorine	2,000	Silicon	5,600
Chromium	6	Strontium	24
Cobalt	7.5	Sulfur	1,300
Copper	36	Tin	2.5
Hexavalent Chromium [4]	0.12	Titanium	140
Iron	1,600	Uranium	1.5
Lead	12	Vanadium	23
Manganese	33	Yttrium	2
Mercury	1.5	Zinc	110
Molybdenum	1	Zirconium	7

Source: CARB website: http://www.arb.ca.gov/adam/toxics/sitesubstance.html

[1] Data for VOCs are for the year 2005.

[2] Data for PAHs are for the year 2004.

[3] Data for inorganic compounds are for the year 2003, except for hexavalent chromium.

[4] Data for hexavalent chromium are for the year 2005.

(*) Means there was insufficient or no data available to determine the value.

4.3.1.3 Inglewood Oil Field Toxic Emissions

Operational Emissions

Table 4.3.2 shows the toxic air contaminant emissions from the Inglewood Oil Field as reflected in the Annual Emissions Report (AER) documents submitted to the SCAQMD.

Toxic emissions of benzene are primarily associated with fugitive emissions from the tanks and components. Toxic emissions of the remaining pollutants are associated with combustion (the flare and the internal combustion engines).

The use of drilling and workover diesel engines also contributes to the facility toxic emissions. These emissions are a function of the number of wells drilled per year and the number of well workovers per year. Information of well drilling, pad grading and well workovers from the year 2007 were used in the analysis. Emissions associated with well drilling, pad grading and well workovers are shown in Table 4.3.2 also. The well drilling, grading and well workovers utilize diesel engines which contribute the majority of the toxic air contaminant metal emissions, polycyclic aromatic hydrocarbons, acetaldehydes and the diesel particulate to the field-wide toxic air contaminant emissions.

Soil Vapor Emissions

Between September 24 and October 26, 2007, GeoScience Analytical, Inc. personnel advanced ninety-four (94) soil probes to depths of 4.0’ at various locations throughout the Inglewood Oil Field. Figure E-1 in Appendix E shows the location of the 94 sampling locations. The majority of these sampling locations were in the vicinity of idled or abandoned wells.

Soil gases were extracted from each of the soil probes and transported to the laboratory for analyses of C1-C7 hydrocarbons and hydrogen sulfide. The analytical data for each of the sampling locations is provided in Appendix E, Table E.1.

Methane concentrations ranged from 1.0 ppmv (parts per million volume) to a high of 981,400 ppmv in the case of location #7, which was located near well LAI 1-130, which was an idled well. Given the high value for this location, additional soil gas vapor testing was done at 12 sites located around well LA-1-130. Figure E-2 shows the location of these additional sampling points (location #s 94-105). The results of this additional sampling indicated that the source of the gas was most likely well LA-1-130. After the testing program Plains Exploration & Production tested the well and determined that the casing was leaking gas. The well has since been abandoned to the current Division of Oil, Gas and Geothermal Resources (DOGGR) standards.

Heavier homologes of methane were generally present at low concentrations. The maximum ethane concentration was 1,253 ppmv in the case of location #7, which was the leaking abandoned well. The maximum propane reading was at location #61 with a concentration of 33.7 ppmv. This sample was taken in an area of known historical soil contamination. Hydrogen sulfide concentrations were below detection limits for all locations.

Table 4.3.2 Current Oil Field Operations Toxic Pollutant Emissions (lbs/year)

Pollutant Description	2005 – 2006 Operations	Drilling[1]	Total	Inventory Threshold for Reporting[2]
1,1,2,2-Tetrachloroethane	0.03	0	0.03	1
1,1,2-Trichloroethane {Vinyl trichloride}	0.02	0	0.02	50
1,2,4-Trimethylbenzene	14.0	15.0	29.0	5
1,2-Dichloropropane {Propylene dichloride}	0.02	0	0.02	20
1,3-Dichloropropene	0.02	0	0.02	10
Acetaldehyde	7.8	208.1	215.9	20
Acrolein	4.4	10.31	14.7	0.05
Ammonia	244.3	0	244.3	200
Arsenic and Compounds (inorganic)	0.0007	0.60	0.60	0.01
Benzene	284.3	56.6	341.0	2
Butadiene [1,3]	0.44	5.4	5.8	0.1
Cadmium	0.0007	4.8	4.8	0.01
Carbon tetrachloride	0.03	0	0.025379	1
Chloroform	0.02	0	0.01968	10
Chlorine	0	41.6	41.6	None
Chromium, hexavalent (and compounds)	0.00004	0	0.000044	0.0001
Copper	0.0018	3.02	3.02	0.1
Diesel exhaust particulates	15.2	1311.6	1326.9	10
Ethyl benzene	179.9	8.6	188.6	200
Ethylene dibromide {1,2-Dibromoethane}	0.03	0	0.03	0.5
Ethylene dichloride {1,2-Dichloroethane}	0.02	0	0.02	2
Formaldehyde	131.4	416.5	548.0	5
Hexane	242.9	4.4	247.4	200
Hydrochloric acid	0.08	0	0.08	20
Hydrogen selenide	0.0010	1.2	1.2	0.5
Hydrogen sulfide	0.27	0	0.27	5
Lead compounds (inorganic)	0.0037	5.1	5.1	0.5
Manganese	0.0014	4.8	4.8	0.1
Mercury	0.0009	3.6	3.6	1
Methyl ethyl ketone {2-Butanone}	0	41.8	41.8	None
Methanol	1.04	0.85	1.9	200
Methyl tert-butyl ether	65.7	0	65.7	200
Methylene chloride {Dichloromethane}	0.06	0	0.06	50
Nickel	0	15.3	15.3	0.1
Phosphorus	0.0017	2.30	2.3	None
Polycyclic Aromatic Hydrocarbons	3.5	13.4	16.9	0.2
Styrene	0.02	1.6	1.7	100
Toluene	196.1	41.7	237.8	200
Vinyl chloride	0.01	0	0.01	0.5
Xylene	106.1	29.5	135.5	200

Source: 2005-2006 Operations from SCAQMD AER (based on fiscal year),

1. Drilling emissions are calculated from 2005/2006 drilling activities and includes well drilling, workovers and well pad grading.
2. Thresholds from the SCAQMD Protocol for the development of toxic emission inventories, 2004. Each facility emitting a toxic air contaminant greater than or equal to the annual thresholds listed in this table is assessed an annual emissions fee as specified in SCAQMD Rule 301.

Various governmental agencies have mitigation threshold standards for methane in soil. The City of Los Angeles requires mitigation for all occupied structures within oil fields. Typically, methane concentrations in excess of 12,500 ppmv are considered significantly high requiring mitigation. All but two of the sample values were below this threshold.

The Inglewood Oil Field site was found to be relatively void of appreciable light hydrocarbons in the surficial soils, except for high hydrocarbon concentrations at two locations as discussed above. However, in order to conservatively evaluate potential offsite exposure to fugitive toxic air contaminant emissions from subsurface well casings, worst-case emissions were estimated for all abandoned wells. These emissions were based on the average emission factor for active wells, even though monitoring studies of abandoned wells and subsurface vapors indicated no emissions from almost all wells.

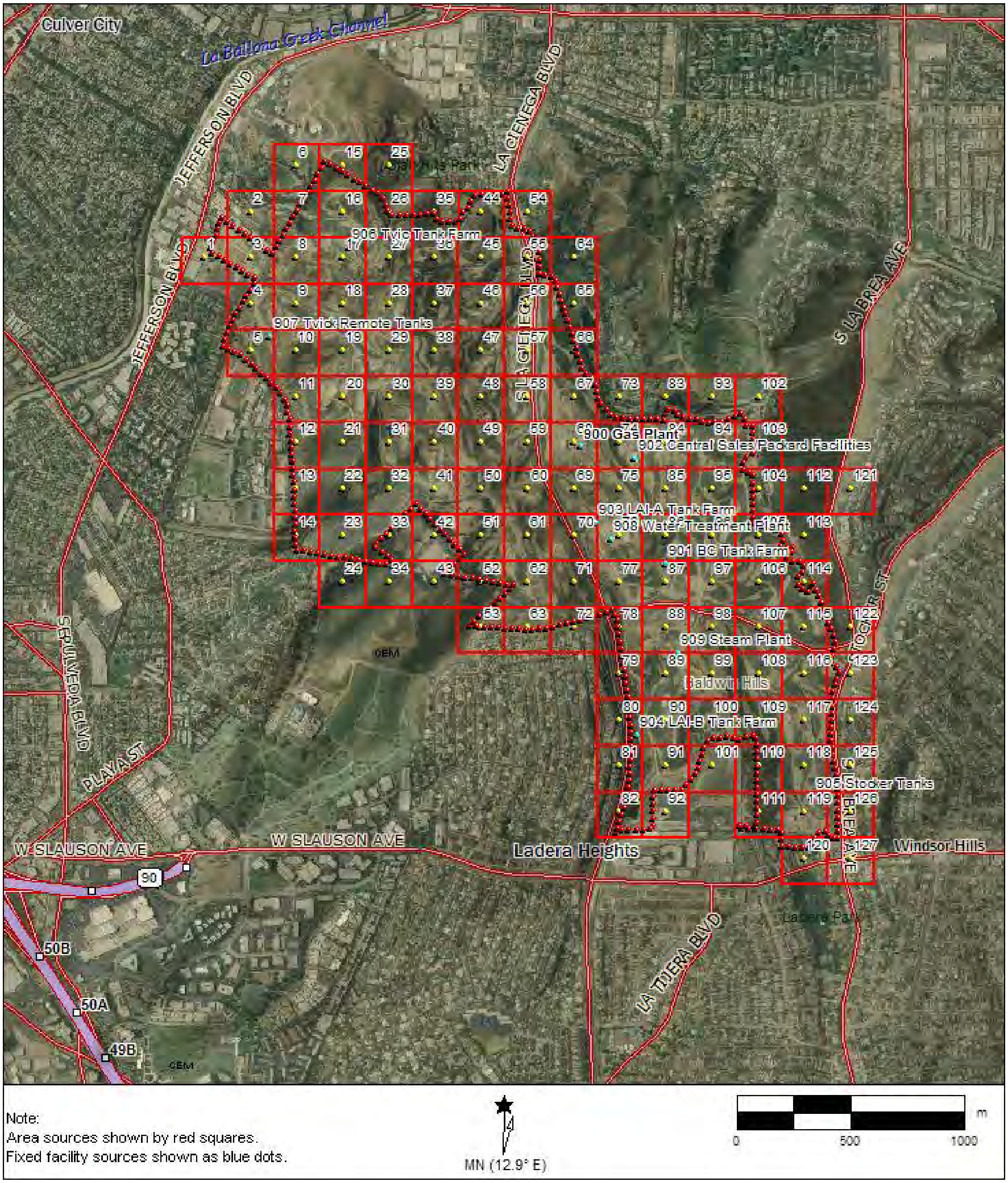
4.3.1.4 Inglewood Oil Field Baseline Health Risk Assessment

As per AB2588, health risk assessments are required for facilities that emit toxic pollutants above a threshold criteria level. Based on the annual emission reporting requirements of the SCAQMD, existing operations at the Inglewood Oil Field exceed the inventory reporting thresholds for a number of air toxic compounds (See Table 4.3.2).

As part of this analysis, a health risk assessment was conducted using the CARB Hotspots Analysis and Reporting Program (HARP) model. HARP is a computer software package that combines the tools of emission inventory database, facility prioritization, air dispersion modeling, and risk assessment analysis. All of these tools are tied to a single database allowing information to be shared and utilized. The HARP model provides the best available modeling methodologies to assess public health impacts associated with emissions of toxic air contaminants. The risk assessment methods and procedures outlined in the Office of Environmental Health Hazard Assessment's document Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2003).The inputs associated with the model are discussed below.

The sources of pollutants at the Inglewood Oil Field were addressed primarily as area sources. The field was divided up into approximately 100 grid cells of 10 acres each. The number of emission sources within each cell, including production wells, injection wells, abandoned wells (for fugitive emissions), fugitive emissions from tanks and components, were generated based on Geographic Information System maps and aerial photographs and component counts produced as part of the field-wide SCAQMD Rule 1173 requirements (The SCAQMD requirements for control of fugitive emissions from valves, flanges and other components). Toxic emissions generated from well workovers diesel engines were assessed based on an assumed well workover frequency of once per year per well. Source locations are shown in Figure 4.3-2.

Figure 4.3-2 Health Risk Assessment Source Locations



Receptor locations were established based on the field boundary, a regional receptor grid and the closest residences. The main receptor grid covered a 4km by 4km grid at 100 meter spacing. Receptors along the property boundary were spaces approximately 20 meters apart. Receptors are points within the modeling domain where concentrations of pollutants and potential health risks are estimated.

People may or may not necessarily reside at the receptor points; however, all receptors could represent at least transient public exposure. For the purposes of the analysis, it is assumed that an individual could reside at the receptor for a continuous 70-year exposure period. The receptor grid that was employed in the health risk assessment is shown in Figure 4.3-3. Sensitive receptors, such as hospitals, care facilities and schools, are shown in Figure 4.3-4.

The health risk assessment utilized two meteorological datasets. SCAQMD meteorological data from the West Los Angeles station for 1981, in conjunction with the HARP model five year (1985-1989) dataset from Los Angeles International Airport, were used in order to obtain worst-case health risk estimates. These meteorological datasets were utilized since they represent the most recent approved data for use in regulatory dispersion modeling. The SCAQMD West Los Angeles station is located at Wilshire and Sawtelle Boulevards, which is approximately six miles northwest of the Inglewood Oil Field. Los Angeles International Airport is located approximately four miles southwest of the Inglewood Oil Field.

Pursuant to SCAQMD Guidelines, terrain elevation heights were included in the modeling analysis. Digital Elevation Mapping data contained in the HARP modeling software were used to input elevation for all sources and receptors. Digital Elevation Mapping data from four US Geological Survey (USGS) quadrangles were required, which included Inglewood, Beverly Hills, Hollywood and Venice.

Since the Inglewood Oil Field has been in operations for over 80 years, it was assumed that all offsite individuals would experience a lifetime exposure (i.e., 70 years under the SCAQMD and OEHHA risk assessment guidelines).

The results of the HARP modeling are shown below in Table 4.3.3 and Figure 4.3-5. Overall, worst-case health risk associated with baseline operations are well below all applicable health risk criteria. The estimated baseline health risk also represents a relatively small fraction of the overall air toxic health risk in the region as identified in the MATES III study. The Inglewood Oil Field baseline cancer risk of 8.18 cancer cases per million represents 1.1 percent of the excess cancer risk of 730 in the vicinity of the project site, 0.58 percent of the excess cancer risk of 1,400 at the Central Los Angeles monitoring site, 0.68 percent of the excess cancer risk of 1,200 at the Compton monitoring site and 1.1 percent of the excess cancer risk of 750 at the North Long Beach monitoring site.

Figure 4.3-3 Health Risk Assessment Receptor Grid

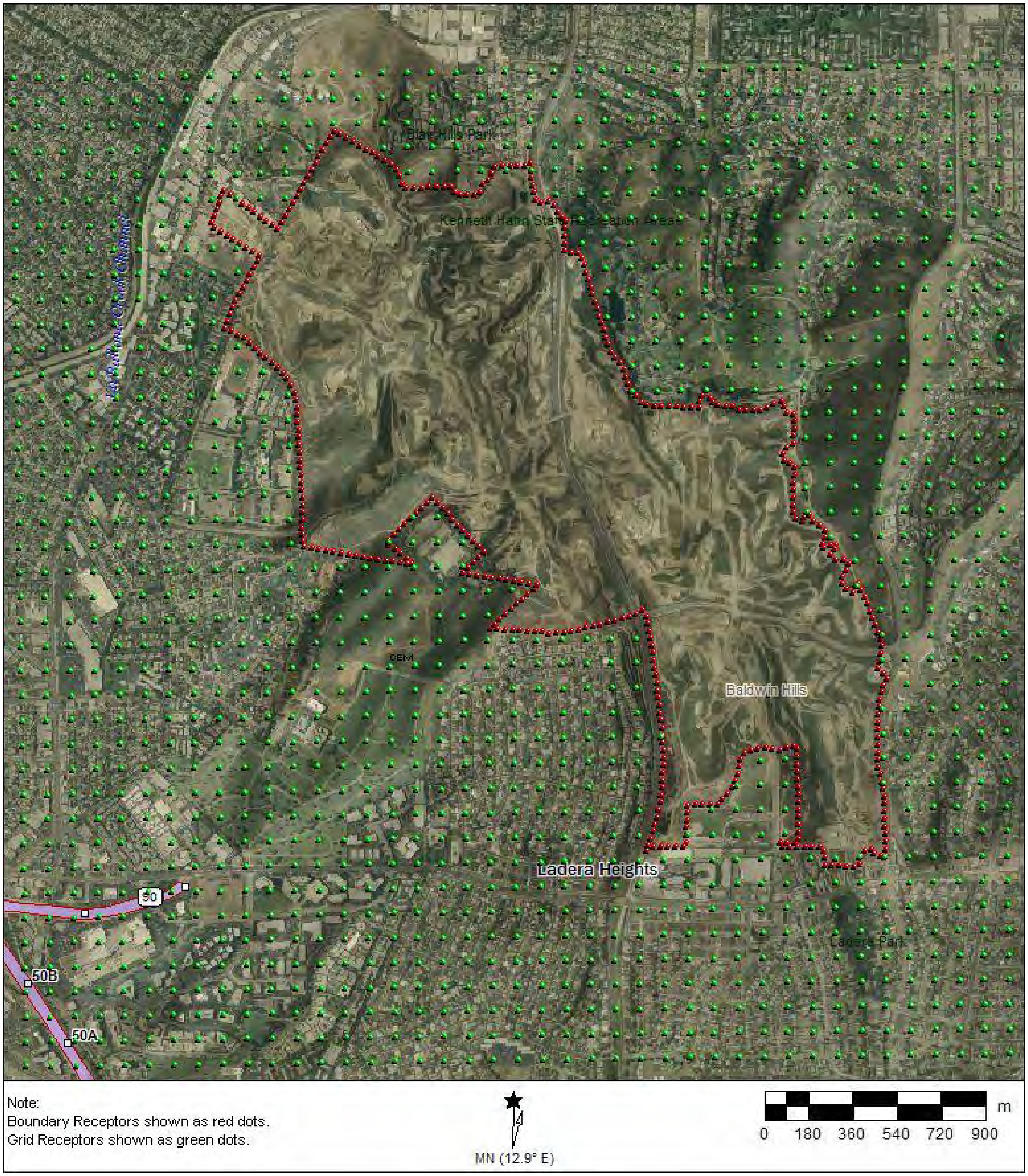


Figure 4.3-4 Sensitive Receptors

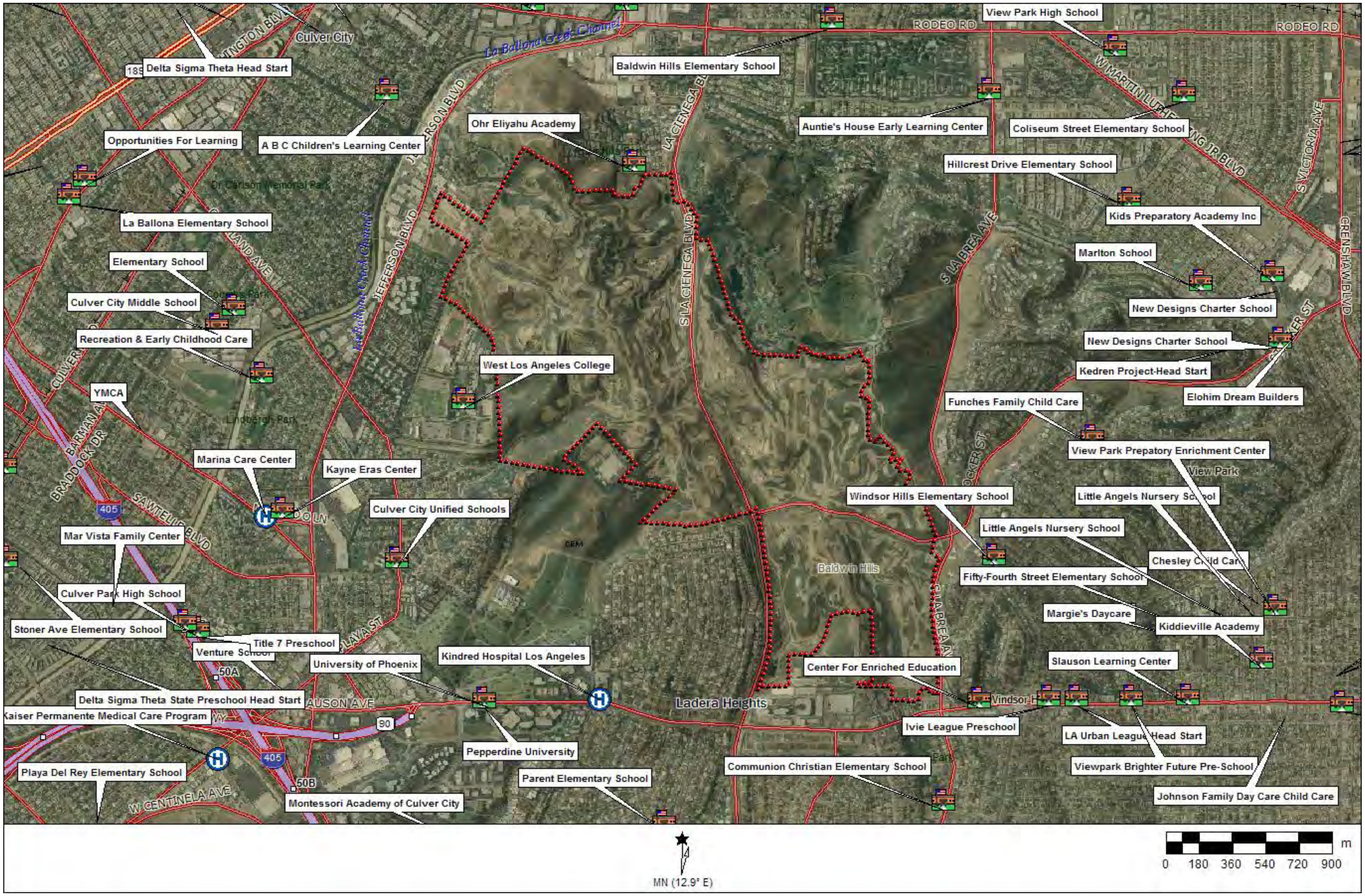


Figure 4.3-5 Inglewood Oil Field Baseline Excess Cancer Risk

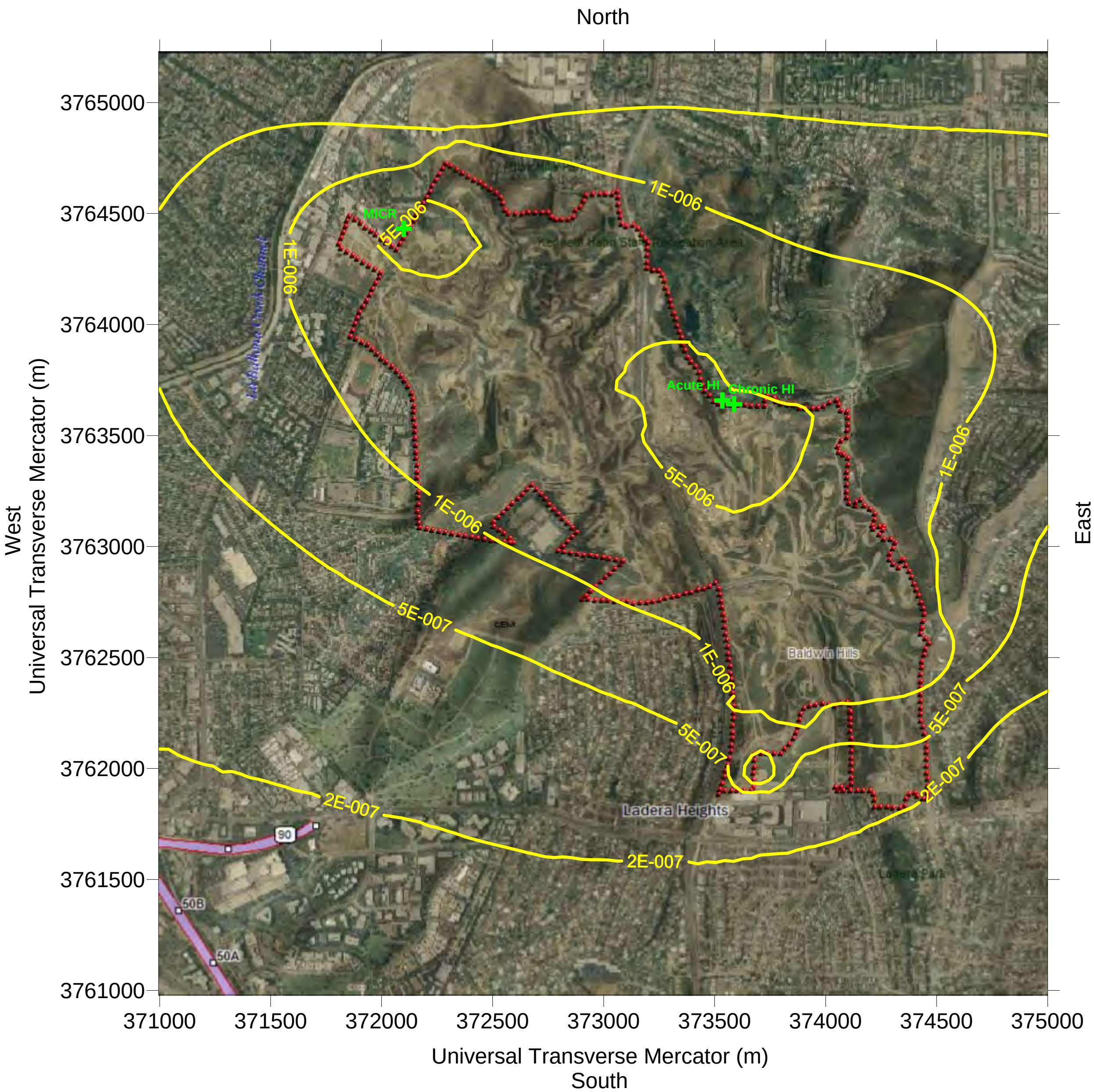


Table 4.3.3 Inglewood Oil Field Baseline Health Risk Assessment Results

Criteria Description	Health Risk Assessment Result	Threshold Value
Cancer risk, per million	8.18	10
Cancer Burden	0.005	0.5
Chronic risk, health index	0.021	1
Acute risk, health index (refined)	0.96	1

4.3.2 Regulatory Setting

Regulatory requirements covering the proposed oil field development project are summarized in Table 4.3.4 and discussed in the following sections.

4.3.2.1 Federal

The Clean Air Act of 1970 (42 U.S.C., § 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States EPA for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 and 2.5 micron or less (PM10 and PM2.5) and lead. The National Emission Standards for Hazardous Air Pollutants (NESHAPs) is a set of national emission standards for listed hazardous pollutants emitted from specific classes or categories of new and existing sources. These standards were implemented in the CAA Amendments of 1977.

4.3.2.2 State

California Health and Safety Code § 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the non-criteria pollutants. The California standards are listed together with the corresponding federal standards in the Air Quality section.

Excerpt of reference cited at point b. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://clkrep.lacity.org/onlinedocs/2017/17-0447_misc_14_07-29-2019.0001.pdf

Inglewood Oil Field Communities Health Assessment

Bureau of Toxicology and Environmental Assessment
Los Angeles County Department of Public Health
February 2011

Report Prepared by:
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EXECUTIVE SUMMARY

Methods

Mortality (Death)

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on mortality rates for the leading causes of death and premature death. The data for the assessment of mortality rates were obtained from information recorded on death certificates for Los Angeles County residents. Death certificates are registered using the Electronic Death Registration System (EDRS), which is maintained by the Los Angeles County Department of Public Health, Data Collection and Analysis Unit. In order to enable meaningful comparisons of mortality rates between residents of the Inglewood Oil Field communities and Los Angeles County as a whole, we present mortality rates adjusted for age and race/ethnicity.

Death certificate data represent an important endpoint in the spectrum of disease and help us to better understand the burden of disease in our communities. State law requires that death certificates be filed on all deaths and include information on age at death and causes of death. Since registration of death certificates is required by law, the reporting of deaths to EDRS is nearly 100 percent complete.

Low-Birth-Weight Births

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on rates of low-birth-weight births. The data for rates of low-birth-weight births were obtained from registered birth certificates entered into the Automated Vital Statistics System (AVSS) at the birth hospital or the office of the local registrar. Since registration of birth certificates is required by law, the data in the AVSS is nearly 100 percent complete. In order to address potential disparities in low birth weight births, we present rates of low birth weights by race/ethnicity and the overall rates adjusted for race/ethnicity.

Birth Defects

The California Birth Defects Monitoring Program (CBDMP) analyzed data on rates of birth defects for the communities near the Inglewood Oil Field compared to rates in Los Angeles County as a whole for all recent available data on birth defects reported in Los Angeles County starting in 1990. Due to budget constraints, not all of the birth defects were collected for all birth years. Vital statistics information on the total number of live births for the rate calculations was determined using the California Center for Health Statistics Office of Health Information and Research Vital Statistics data.

Cancer

The University of Southern California Cancer Surveillance Program (USC-CSP), the population-based cancer registry for Los Angeles County, analyzed data on cancer incidence for the communities near the Inglewood Oil Field compared to Los Angeles County as a whole. Data have been collected on all new cancer patients diagnosed in Los Angeles County since 1972. Since registration of cancer diagnoses is required by law, completeness of the reporting to the registry is over 95%. The expected and observed incidence of five blood-related cancers were examined since the risk of certain types of blood-related cancers has been linked to exposure to petroleum products such as benzene (Linet et al. 2006). The rates of the five blood-related cancers were compared between the census tracts near the Inglewood Oil Field and the general Los Angeles County population for the years 1972-2005. In order to address potential disparities in cancer incidence, rates of cancer are presented stratified by race/ethnicity. The time period was divided into two time periods, 1972-1999 and 2000-2005, in order to capture a better understanding of the most recent trends.

Results

Mortality

From 2000-2007, the mortality rate for all causes of death was 731.9 deaths per 100,000 persons in the Inglewood Oil Field communities and 751.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and the racial/ethnic distribution of the underlying populations. Although the mortality rate appears lower in the Inglewood Oil Field communities, there was no statistically significant difference in the mortality rates for all causes of death, after adjusting for age and race/ethnicity.

African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death compared to African Americans and Hispanics in Los Angeles County. From 2000-2007, mortality rates for all causes of death declined for all ethnic groups in the Inglewood Oil Field communities and in Los Angeles County.

After adjusting for race/ethnicity, there were no statistically significant differences in the mortality rates for any of the leading causes of death or premature death in the Inglewood Oil Field communities compared to Los Angeles County. Although there were no overall statistically significant differences in the mortality rates in the Inglewood Oil Field communities compared to Los Angeles County, the racial/ethnic disparities apparent in Los Angeles County are also reflected in the mortality rates found in these communities.

There were statistically significantly higher mortality rates for some of the leading causes of death and premature death in certain ethnic groups. In the Inglewood Oil Field communities and in Los Angeles County as a whole, African Americans had the highest mortality rates for all causes of death, colorectal cancer, coronary heart disease, diabetes, HIV, homicide, motor vehicle crashes, pancreatic cancer and stroke. Caucasians had the highest mortality rates for emphysema and chronic obstructive pulmonary diseases (COPD), while Hispanics had the highest mortality rates for chronic liver disease in both the Inglewood Oil Field communities and Los Angeles County.

For some of the leading causes of death and premature death, rates were statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for certain ethnic groups. African Americans in the Inglewood Oil Field communities had statistically significantly lower mortality rates for coronary heart disease, diabetes, emphysema/COPD, homicide, chronic liver disease, lung cancer and stroke than African Americans in Los Angeles County. On the other hand, African Americans in the Inglewood Oil Field communities had statistically significantly higher mortality rates for HIV than African Americans in Los Angeles County. Caucasians in the Inglewood Oil Field communities had statistically significantly higher mortality rates for pneumonia/influenza than Caucasians in Los Angeles County.

The differences in mortality rates for the leading causes of death and premature death do not appear to be related to the geographic location of the Inglewood Oil Field communities. Many of the differences observed within these communities are common in Los Angeles County and represent a significant public health challenge throughout the county. The disparities in mortality rates can best be addressed by targeting the underlying causes of these disparities.

Low-Birth-Weight Births

After adjusting race/ethnicity, the rate of low-birth-weight births was 7.2 per 100 live births in the Inglewood Oil Field communities and 7.0 per 100 live births in Los Angeles County. There was no statistical difference in the rates of low-birth-weight births in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for race/ethnicity. There were differences in rates of low-birth-weight births among racial/ethnic groups with African Americans having the highest rates of low-birth-weight births in the Inglewood Oil Field communities as well as in Los Angeles County. These disparities in low-birth-weight births represent another significant public health challenge throughout the county.

Birth Defects

For 28 of the 29 categories of birth defects, there was no statistically significant difference in the Inglewood Oil Field communities compared to Los Angeles County as a whole. Babies born in the Inglewood Oil Field communities between 1990 and 1997 were slightly more likely (1.2 times as likely) to be born with a limb defect compared to babies countywide. Limb defects are not known to be caused by exposure to benzene or other petroleum products. Since multiple comparisons were made, the increase may be explained by statistical chance.

Cancer

The analysis found no evidence of elevated rates of acute myelogenous leukemia (AML), the type of cancer most definitively linked to petroleum products (benzene) or three of the other types of blood-related cancer for any of the race/ethnic groups examined. There was an excess risk of chronic myelogenous leukemia (CML) in non-Hispanic whites based on the occurrence of two (2) cases above the expected number in 2000 to 2005. CML has not been consistently linked with exposure to petroleum products from oil fields or refineries. These two additional cases of CML may be explained by statistical chance, because the analysis examined multiple comparisons. Furthermore, in most of the studies examining this issue, occupational exposure to specific petroleum-based chemicals, such as benzene, was measured, rather than residential proximity to oil wells. Very few, if any, well-conducted published studies exist on health effects in communities due to proximity of oil wells.

Limitations of These Analyses

These analyses cannot confirm whether exposures to chemicals from oil drilling activities at the Inglewood Oil Field may be associated with a small increase in the risk of mortality, low-birth-weight births, birth defects, or cancer among specific individuals living nearby, because these analyses cannot detect small increases in risk. Epidemiological investigations can be relatively conclusive when large, population-based samples are involved. On the other hand, analyses of data from local areas, such as the communities surrounding the Inglewood Oil Field, are limited by small samples sizes. Analyses such as this can detect large differences in risk, but are not able to reliably detect small increases. In addition, these analyses do not take into account other important determinants of health such as behavioral risk factors (such as smoking and physical activity), social factors (such as community resilience, education, income, and access to health care) since these data were not available on the birth certificates, death records, or cancer registry records.

It is important to note that this type of analysis cannot establish causal relationships between emissions from oil drilling activities and specific causes of death because of the lack of information on the individual levels of exposure to emissions that could establish dose-response curves and temporal relationships as well as the multitude of other risk factors that influence these disease outcomes. For example, a high rate of mortality from asthma in the community adjacent to the Inglewood Oil Field would not prove that the oil field operations are causing asthma since there are many other potential causes, such as exposures to traffic-related air pollution, tobacco smoke, or adverse environmental conditions in the home. Alternatively, a normal or low rate of mortality from asthma would not prove that the oil field is safe, again because of the many other factors that influence the rate. Thus, these results should be interpreted with caution. Due to these limitations, the safety of the oil field would be more appropriately assessed by careful monitoring of the oil field operations to ensure compliance with regulations and standards.

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ANALYSIS OF MORTALITY (DEATH) RATES

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on mortality rates for the leading causes of death and premature death. The data for the assessment of mortality rates were obtained from information recorded on death certificates for Los Angeles County residents. Death certificates are registered using the Electronic Death Registration System (EDRS), which is maintained by the Los Angeles County Department of Public Health, Data Collection and Analysis Unit. In order to enable meaningful comparisons of mortality rates between residents of the Inglewood Oil Field communities and Los Angeles County as a whole, we present mortality rates adjusted for age and race/ethnicity.

Death certificate data represent an important endpoint in the spectrum of disease and help us to better understand the burden of disease in our communities. State law requires that death certificates be filed on all deaths and include information on age at death and causes of death. Since registration of death certificates is required by law, the reporting of deaths to EDRS is nearly 100 percent complete.

Methods

The area representing the Inglewood Oil Field communities used in the analyses included the census tracts within 1.5 miles from the perimeter of the Inglewood Oil Field. The census tracts for the year 2000 are: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01, 7025.02, 7026.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, and 7032.00. A map of the included census tracts is provided in Appendix A.

The mortality analysis was performed for overall mortality, the top ten leading causes of death, and premature death (death before age 75 years) during the period 2000-2007 for the communities near the Inglewood Oil Field compared to Los Angeles County as a whole (Fig. 1a). Mortality rates for asthma were also included even though it is not among the leading causes since residents expressed particular concerns about chronic respiratory diseases such as asthma. Information on the causes of death and premature death was obtained from death certificates for all Los Angeles County residents filed with the local registrar. Cause of death was determined by analyzing the underlying cause recorded in the medical portion of each death certificate. “Underlying cause of death” is defined as the disease or injury initiating the sequence of events leading directly to death.

Crude mortality rates are provided in Table 1 of Appendix A. Since crude rates are not suitable for comparisons among populations, the cumulative age-adjusted mortality rates were standardized to the population age distribution of the 2000 U.S. Census to eliminate differences in age as an explanation for differences in rates.

Fig. 1a: Ten leading causes of death and premature death for the Inglewood Oil Field communities in 2007

Leading causes of death		Leading causes of premature** death	
Rank	Cause of death	Rank	Cause of death
1	Coronary heart disease	1	Coronary heart disease
2	Lung cancer	2	Homicide
3	Stroke	3	Motor vehicle crash
4	Pneumonia/influenza	4	Lung cancer
5	Diabetes	5	HIV
6	Emphysema/COPD	6	Diabetes
7	Colorectal cancer	7	Colorectal cancer
8	Alzheimer's disease	8	Breast cancer
9	Breast cancer	9	Liver disease
10	Pancreatic cancer	10	Stroke

*Excludes infants less than 1 year of age and persons of unknown age
** Death before age 75 years

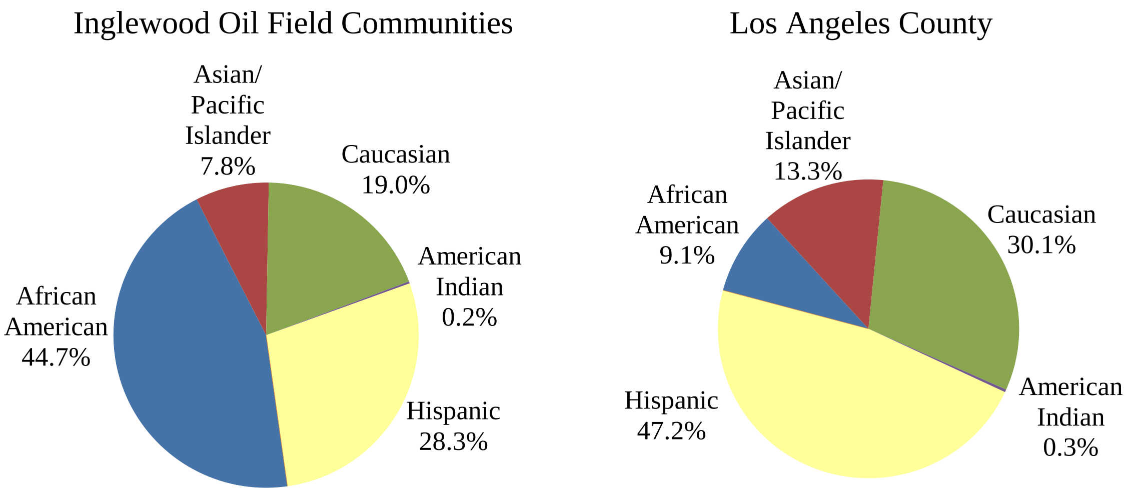
The data were analyzed for an eight year period, from 2000 to 2007, to increase the number of events available for analysis and thus increase the reliability of the findings and to assess trends. Rates based on small numbers of events can fluctuate widely from year to year for reasons other than a true change in the underlying frequency of occurrence of the event. Therefore, mortality rates were not reported when there were fewer than 20 deaths as this is too few to produce reliable rates.

Mortality rates for the Inglewood Oil Field communities and Los Angeles County were compared and a statistical test of the difference was done to determine if the rates were statistically different.[1] A p-value of less than 0.05 indicated that the two rates were statistically significantly different, while a p-value of greater than 0.05 indicated that the two rates were not statistically significantly different.

Since the racial/ethnic distribution of the underlying population in the Inglewood Oil Field communities differs from Los Angeles County, mortality rates were stratified to examine differences by racial/ethnic group for African Americans, Asian/Pacific Islanders, Caucasians and Hispanics (Fig. 1b). Mortality rates for American Indians/Alaska Natives were not reported since the numbers of deaths were too small to provide reliable rates. Age-adjusted mortality rates were additionally adjusted for race/ethnicity to account for the differences in the racial/ethnic distribution in the Inglewood Oil Field communities and Los Angeles County.

[1] Rothman KJ, Greenland S, Lash TL. Modern Epidemiology 3rd Ed. Philadelphia: Lippincott Williams & Wilkins; 2008 p.266-268.

Fig. 1b: Population distribution by race/ethnicity for the Inglewood Oil Field communities and Los Angeles County



Source: U.S. Bureau of the Census, Population Estimates Program (PEP), 2007

Results

Mortality from All Causes of Death:

There was no statistically significant difference in overall mortality rates for all causes of death in the Inglewood Oil Field communities compared to Los Angeles County as a whole, after adjusting for age and the racial/ethnic distributions of the underlying populations.

From 2000-2007, the mortality rate for all causes of death was 731.9 deaths per 100,000 persons in the Inglewood Oil Field communities and 751.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 1a). African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death than African Americans and Hispanics in Los Angeles County (Table 1b and Fig. 2a). From 2000-2007, mortality rates for all causes of death declined in both the Inglewood Oil Field communities and Los Angeles County for all ethnicities (Fig. 2b and 2c).

African Americans had the highest mortality rates for all causes of death in the Inglewood Oil Field communities and in Los Angeles County as a whole (Table 1b). There were proportionately more African Americans in the Inglewood Oil Field communities than in Los Angeles County (Fig. 1b) so there appeared to be a higher age-adjusted mortality rate for all causes of death in the Inglewood Oil Field communities (Table 1a), but after adjusting for race/ethnicity there was no statistically significant difference between the two populations.

Table 1a: Age- and race-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	731.9	476,493	751.7	NS

* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 1b: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	4,697	860.0	66,697	1,033.0	<0.001
Asian/Pacific Islander	427	465.5	43,862	474.2	NS
Caucasian	2,849	746.6	263,057	746.4	NS
Hispanic	709	499.1	101,176	570.5	0.002

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 2a: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

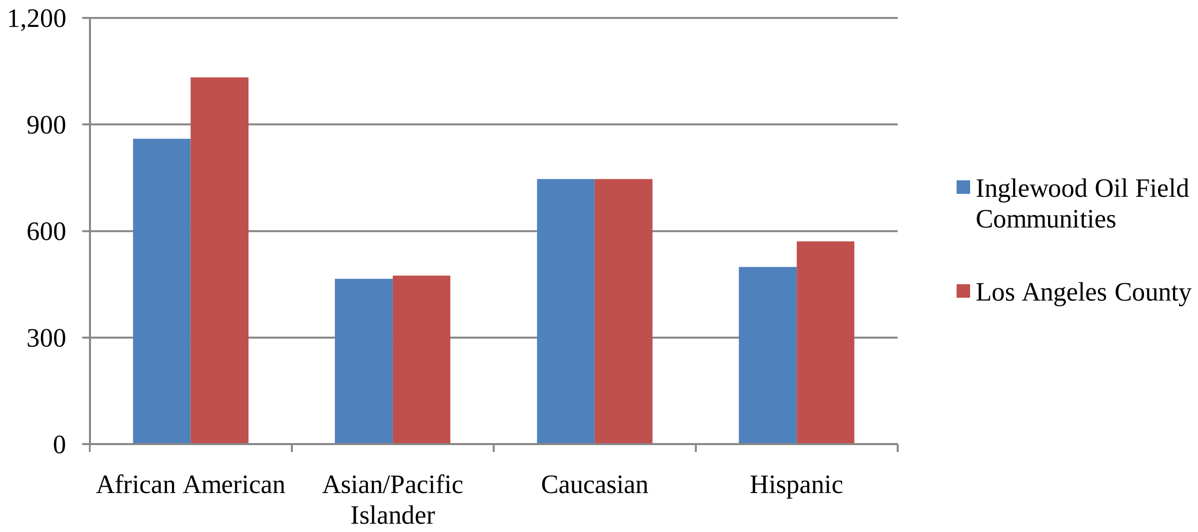
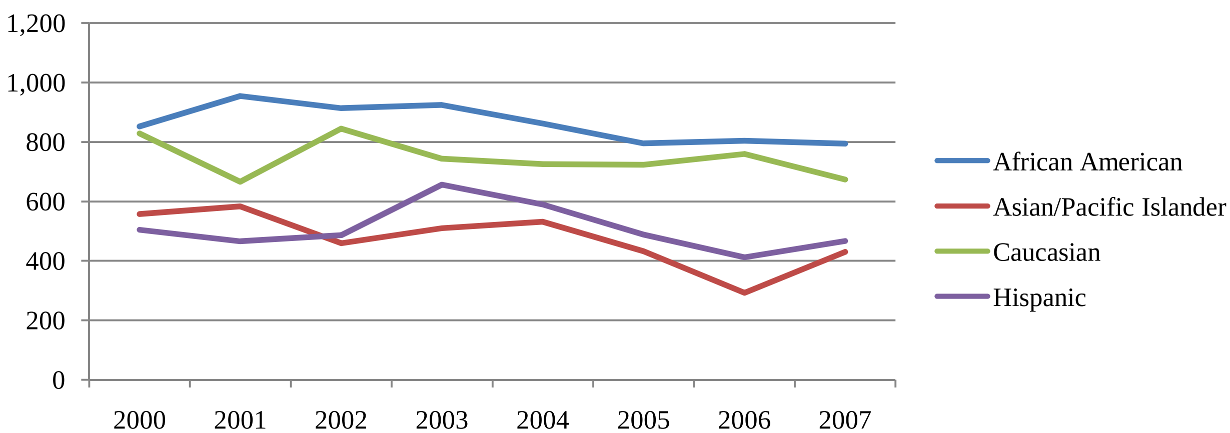
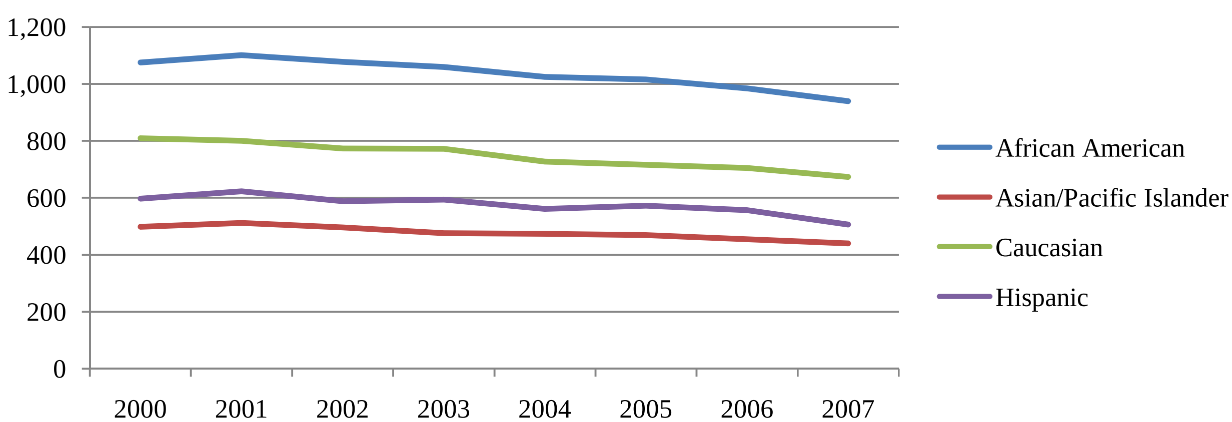


Fig. 2b: Age-adjusted mortality rates for all causes of death for the Inglewood Oil Field communities from 2000-2007, by race/ethnicity



Data Source for Fig. 2b: Table 2 in Appendix A

Fig. 2c: Age-adjusted mortality rates for all causes of death for Los Angeles County from 2000-2007, by race/ethnicity



Data Source for Fig. 2c: Table 2 in Appendix A

Results

Mortality from Specific Causes of Death:

There were no statistically significant differences in mortality rates for asthma or any of the leading causes of death and premature death in the Inglewood Oil Field communities compared to Los Angeles, after adjusting for age and race/ethnicity (Table 2b).

There appeared to be higher age-adjusted mortality rates in the Inglewood Oil Field communities compared to Los Angeles County for some causes of death (asthma, breast cancer, colorectal cancer, coronary heart disease, HIV, homicide, hypertension, cancers of the lung, bronchus and trachea, pneumonia and influenza, prostate cancer and stroke) and lower age-adjusted mortality rates for other causes of death (emphysema/chronic obstructive pulmonary diseases (COPD) and chronic liver disease) (Table 2a), however after adjusting for the differences in the racial/ethnic distributions of the two populations there were no statistically significant differences for any cause of death.

Table 2a: Age-adjusted mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	752.9	476,493	697.9	<0.001
Alzheimer’s	160	14.1	10,200	15.3	NS
Asthma	30	2.5	1,028	1.4	0.002
Breast Cancer (females)	186	26.7	8,774	12.7	<0.001
Colorectal Cancer	237	20.3	11,056	16.4	0.001
Coronary Heart Disease	2,251	196.2	125,526	187.6	0.035
Diabetes	310	26.8	16,890	25.2	NS
Emphysema/COPDŧ	322	28.5	21,484	32.8	0.012
HIV	96	7.6	3,804	4.9	<0.001
Homicide	202	17.3	8,352	10.0	<0.001
Liver Disease	103	8.5	8,600	11.9	<0.001
Lung Cancer£	501	43.6	24,654	37.2	<0.001
Motor Vehicle Crash	101	8.5	6,931	8.9	NS
Pancreatic Cancer	134	11.5	6,597	9.9	NS
Pneumonia/Influenza	373	32.8	18,883	28.4	0.006
Stroke	600	52.4	31,928	47.8	0.026

* Per 100,000 persons, age-adjusted and cumulative over years 2000-2007 ‡NS indicates not statistically significant at a p-value of 0.05
ŧ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

Table 2b: Age- and race-adjusted mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
All Causes	8,708	731.9	476,493	751.7	NS
Alzheimer's	160	9.4	10,200	18.0	NS
Asthma	30	1.4	1,028	1.5	NS
Breast Cancer (females)	186	28.6	8,774	26.1	NS
Colorectal Cancer	237	19.5	11,056	17.7	NS
Coronary Heart Disease	2,251	192.0	125,526	205.0	NS
Diabetes	310	22.0	16,890	21.8	NS
Emphysema/COPDŧ	322	36.7	21,484	39.6	NS
HIV	96	3.0	3,804	5.6	NS
Homicide	202	9.3	8,352	9.2	NS
Liver Disease	103	9.1	8,600	10.8	NS
Lung Cancer£	501	46.4	24,654	43.5	NS
Motor Vehicle Crash	101	6.2	6,931	9.5	NS
Pancreatic Cancer	134	9.2	6,597	10.5	NS
Pneumonia/Influenza	373	33.7	18,883	29.3	NS
Stroke	600	48.4	31,928	48.3	NS

* Per 100,000 persons, age/race-adjusted and cumulative over years 2000-2007 ‡NS indicates not statistically significant at a p-value of 0.05
ŧ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

For each of the top ten causes of death and premature death, mortality rates stratified by race/ethnicity are presented for the Inglewood Oil Field communities and Los Angeles County.

Alzheimer's Disease

There was no statistically significant difference in overall mortality rates for Alzheimer's disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Alzheimer's disease is the eighth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for Alzheimer's was 9.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 18.0 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 3a). The mortality rates for Alzheimer's were not statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for any ethnicity (Table 3b and Fig. 3). Caucasians had the highest mortality rates for Alzheimer's in the Inglewood Oil Field communities as well as in Los Angeles County as a whole.

Table 3a: Age- and race-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Alzheimer's	160	9.4	10,200	18.0	NS

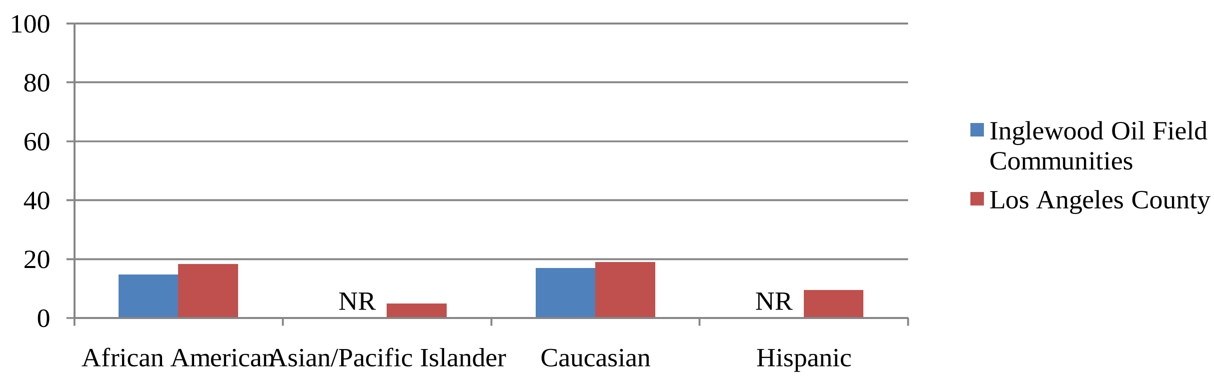
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 3b: Age-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	73	14.6	1,036	18.2	NS
Asian/Pacific Islander	<20	NR	407	4.9	-----
Caucasian	75	16.8	7,558	19.0	NS
Hispanic	<20	NR	1,178	9.5	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 3: Age-adjusted mortality rates for Alzheimer's disease for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Alzheimer’s Disease:

Risk factors for Alzheimer’s disease include age and family history of the disease. Scientists are exploring possible connections between Alzheimer’s disease and high cholesterol, high blood pressure, physical inactivity and serious head injury.

Individual opportunities for prevention:

- Maintain good overall health by staying physically active, and controlling high blood pressure and cholesterol
- Keep the brain active by playing puzzle games, reading and other mentally stimulating activities
- Slow the progression of symptoms through early diagnosis and treatment of Alzheimer’s disease symptoms

Community opportunities for intervention:

- Develop community support networks for caregivers
- Assist persons with early Alzheimer’s disease to plan for their future needs

Breast Cancer (Females)

There was no statistical difference in overall mortality rates for breast cancer among women in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Breast cancer is the ninth leading cause of death and eight leading cause of premature death among women in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for breast cancer was 28.6 deaths per 100,000 women in the Inglewood Oil Field communities and 26.1 deaths per 100,000 women in Los Angeles County, after adjusting for age and race/ethnicity (Table 4a). The mortality rates for breast cancer were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 4b and Fig. 4). African Americans had the highest mortality rates for breast cancer in the Inglewood Oil Field communities as well as in Los Angeles County.

Table 4a: Age- and race-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Breast Cancer	186	28.6	8,774	26.1	NS

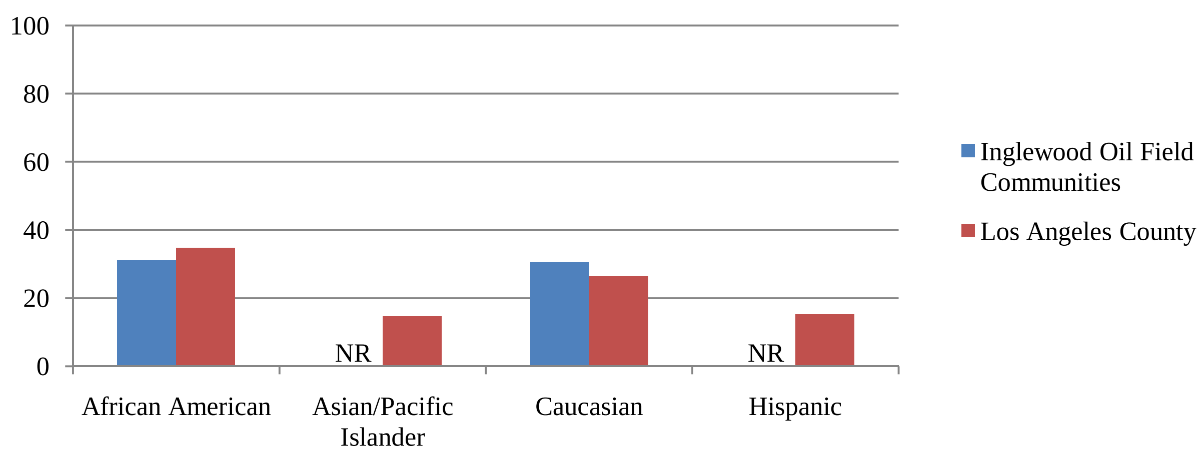
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 4b: Age-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	111	31.0	1,375	34.8	NS
Asian/Pacific Islander	<20	NR	867	14.7	-----
Caucasian	59	30.5	4,781	26.4	NS
Hispanic	<20	NR	1,731	15.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 4: Age-adjusted mortality rates for breast cancer among women for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Breast Cancer:

Risk factors for breast cancer include age, family history of breast cancer, previous breast cancer, race, early radiation treatment to the chest area, menstruation before age 12 or menopause after age 55, genetic mutation linked to breast cancer, treatment with the drug diethylstilbestrol, not having children, excessive alcohol consumption, being overweight, physical inactivity and prolonged postmenopausal hormone therapy.

Individual opportunities for prevention:

- Follow recommended breast cancer screening and follow-up guidelines
- Limit alcohol consumption
- Maintain a healthy weight
- Stay physically active

Community opportunities for intervention:

- Promote the availability of low-cost breast cancer screening and follow-up
- Provide education on the importance of receiving on-schedule breast cancer screening
- Promote physical activity by providing access to safe places like parks to walk, play and exercise

Colorectal Cancer

There was no statistically significant difference in overall mortality rates for colorectal cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Colorectal cancer is the seventh leading cause of death and premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for colorectal cancer was 19.5 deaths per 100,000 persons in the Inglewood Oil Field communities and 17.7 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 5a). The mortality rates for colorectal cancer were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 5b and Fig. 5). African Americans had the highest mortality rates for colorectal cancer in the Inglewood Oil Field communities as well as Los Angeles County.

Table 5a: Age- and race-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Colorectal Cancer	237	19.5	11,056	17.7	NS

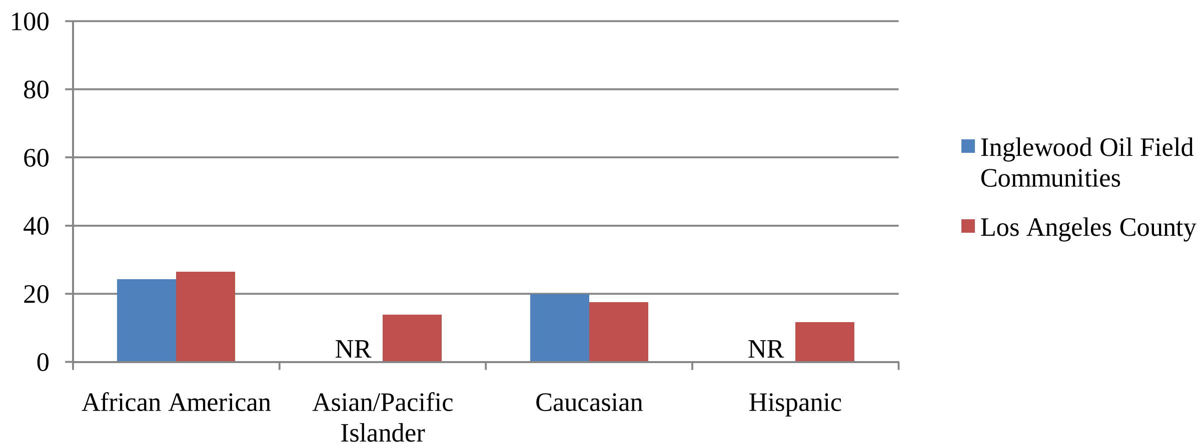
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 5b: Age-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	137	24.2	1,688	26.4	NS
Asian/Pacific Islander	<20	NR	1,340	13.9	-----
Caucasian	73	19.9	6,068	17.5	NS
Hispanic	<20	NR	1,924	11.6	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 5: Age-adjusted mortality rates for colorectal cancer for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Colorectal Cancer:

Risk factors for colorectal cancer include age, previous colorectal cancer or polyps, family history of colorectal cancer, inflammatory bowl disease, physical inactivity, being overweight, alcohol abuse, diets high in red and processed meats, cooking meats at very high temperature, tobacco smoking and type 2 diabetes.

Individual opportunities for prevention:

- Obtain routine medical care to detect and remove precancerous colorectal polyps
- Follow recommended screening guidelines for stool tests and special medical exams to detect colon cancer
- Eat plenty of fruits, vegetables and whole grain foods
- Stay physically active

Community opportunities for intervention:

- Promote the availability of low-cost colorectal cancer screening and follow-up
- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Increase the availability of affordable, nutritious foods

Coronary Heart Disease

There was no statistically significant difference in overall mortality rates for coronary heart disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Coronary heart disease is the number one cause of death and premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for coronary heart disease was 192 deaths per 100,000 persons in the Inglewood Oil Field communities and 205 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 6a). African Americans had the highest mortality rates for coronary heart disease in the Inglewood Oil Field communities and Los Angeles County (Table 6b and Fig. 6). African Americans in the Inglewood Oil Field communities however, had a statistically significant lower mortality rate for coronary heart disease than African Americans in Los Angeles County.

Table 6a: Age- and race-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Coronary Heart Disease	2,251	192.0	125,526	205.0	NS

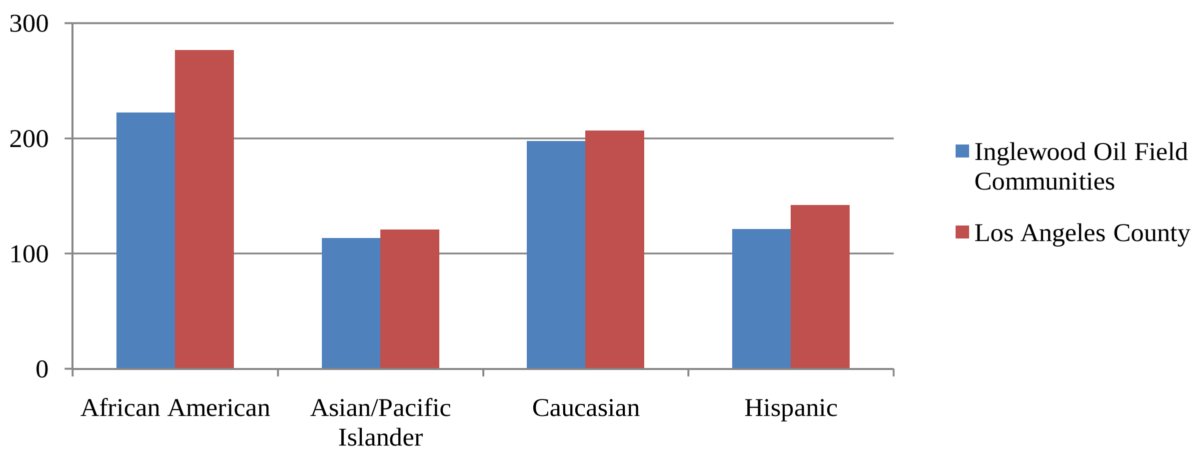
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 6b: Age-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	1,201	222.3	17,219	276.3	<0.001
Asian/Pacific Islander	105	113.3	10,788	120.9	NS
Caucasian	805	197.6	76,414	206.4	NS
Hispanic	134	121.5	20,721	142.3	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 6: Age-adjusted mortality rates for coronary heart disease for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Coronary Heart Disease:

Risk factors for coronary heart disease include age, male gender, race, tobacco smoking, high cholesterol, high blood pressure, being overweight, excessive alcohol consumption, previous heart attack or angina and family history of early heart disease.

Individual opportunities for prevention:

- Eat a heart-healthy diet
- Consult with your physician about increasing physical activity
- Stop smoking
- Control blood pressure, cholesterol, and diabetes
- Reduce stress
- Get regular medical check-ups

Community opportunities for intervention:

- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Restrict smoking in public places and worksites
- Provide access to smoking cessation programs
- Encourage people to quit smoking through media campaigns
- Increase the availability of nutrient-rich foods which have vitamins, minerals, fiber and other nutrients but are lower in calories

Diabetes

There was no statistically significant difference in overall mortality rates for diabetes in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Diabetes is the fifth leading cause of death and sixth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for diabetes was 22 deaths per 100,000 persons in the Inglewood Oil Field communities and 21.8 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 7a). African Americans had the highest mortality rates for diabetes in the Inglewood Oil Field communities as well as in Los Angeles County (Table 7b and Fig. 7). African Americans in the Inglewood Oil Field communities however, had statistically significant lower mortality rates for diabetes than African Americans in Los Angeles County.

Table 7a: Age- and race-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Diabetes	310	22.0	16,890	21.8	NS

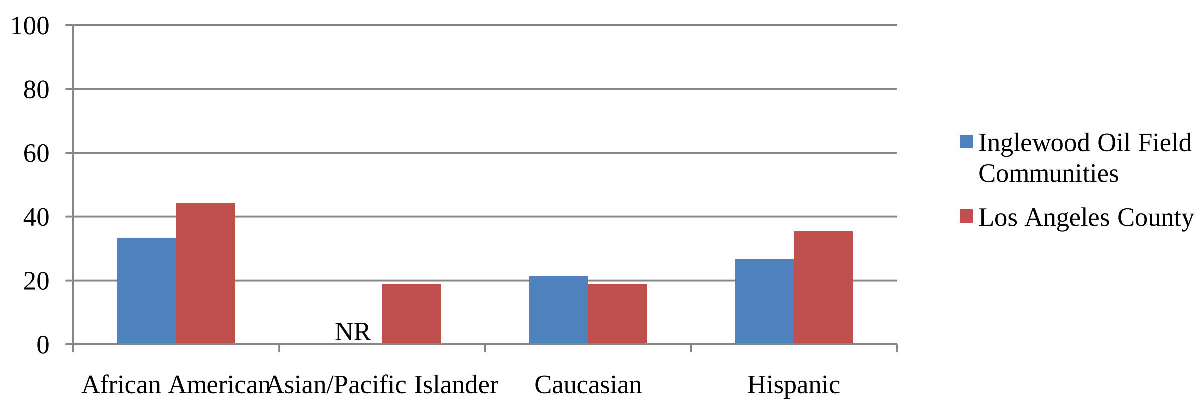
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 7b: Age-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	185	33.2	2,837	44.3	<0.001
Asian/Pacific Islander	<20	NR	1,745	19.0	-----
Caucasian	77	21.2	6,564	19.0	NS
Hispanic	34	26.6	5,657	35.4	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 7: Age-adjusted mortality rates for diabetes for the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Risk Factors for Diabetes:

Risk factors for diabetes include being overweight, physical inactivity, age, pre-diabetes, family history of diabetes or history of gestational diabetes mellitus.

Individual opportunities for prevention:

- Maintain a healthy weight
- Stay physically active
- Eat plenty of fruits, vegetables and whole grain foods, while limiting consumption of high-fat foods
- Follow recommended screening and treatment guidelines
- Control blood pressure and high cholesterol
- Limit the intake of salt and sugar

Community opportunities for intervention:

- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Promote medical screening for diabetes for individuals with high blood pressure
- Increase the availability of affordable, nutritious foods
- Enforce state physical education requirements and nutrition education as part of a comprehensive school health curriculum

Emphysema and Chronic Obstructive Pulmonary Diseases (COPD)

There was no statistically significant difference in overall mortality rates for emphysema/COPD in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Emphysema/COPD is the sixth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for emphysema/COPD was 36.7 deaths per 100,000 persons in the Inglewood Oil Field communities and 39.6 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 8a). Caucasians had the highest mortality rates for emphysema/COPD in the Inglewood Oil Field communities and Los Angeles County (Table 8b and Fig. 8). African Americans had statistically significant lower mortality rates for emphysema/COPD than African Americans in Los Angeles County.

Table 8a: Age- and race-adjusted mortality rates for emphysema/COPDƗ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Emphysema/COPDƗ	322	36.7	21,484	39.6	NS

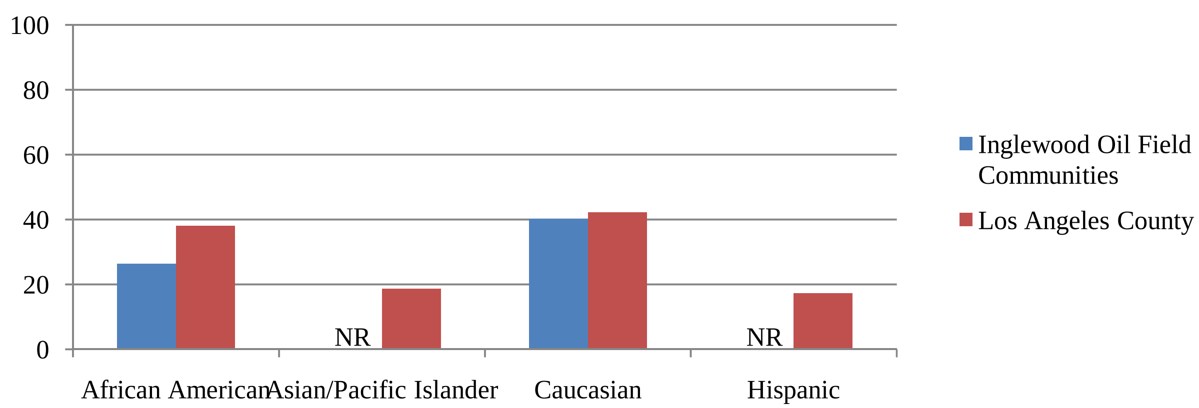
Ɨ COPD includes chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 8b: Age-adjusted mortality rates for emphysema/COPDƗ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	141	26.4	2,346	38.1	<0.001
Asian/Pacific Islander	<20	NR	1,614	18.7	-----
Caucasian	156	40.3	15,094	42.2	NS
Hispanic	<20	NR	2,346	17.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 8: Age-adjusted mortality rates for emphysema/COPD for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Emphysema/COPD:

Risk factors for emphysema/COPD include tobacco smoking and breathing the smoke of others, occupational exposure to certain industrial pollutants.

Individual opportunities for prevention:

- Stop smoking
- Avoid being near people who are smoking
- If you don’t smoke, don’t start

Community opportunities for intervention:

- Increase the availability of effective smoking cessation services
- Limit smoking, and decrease exposure to indoor and outdoor secondhand smoke through effective anti-smoking policies and enforcement
- Support an increase in the tobacco tax

Human Immunodeficiency Virus (HIV)

There was no statistically significant difference in overall mortality rates for HIV in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. HIV is the fifth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for HIV was 3 deaths per 100,000 persons in the Inglewood Oil Field communities and 5.6 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 9a). African Americans had higher mortality rates for HIV in the Inglewood Oil Field communities and in Los Angeles County (Table 9b and Fig. 9). African Americans in the Inglewood Oil Field communities had statistically significant higher mortality rates for HIV than males and African Americans in Los Angeles County.

Table 9a: Age- and race-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
HIV	96	3.0	3,804	5.6	NS

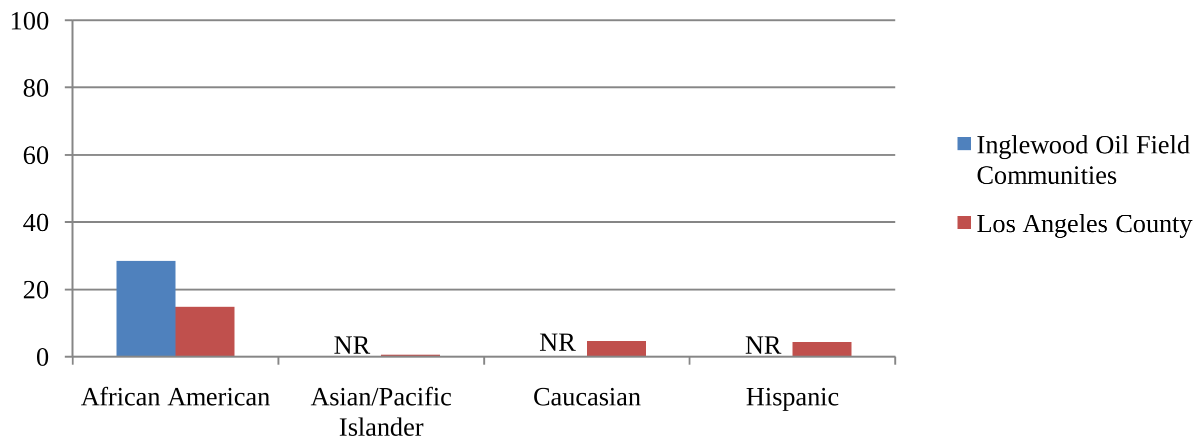
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 9b: Age-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	78	28.5	1,113	14.9	<0.001
Asian/Pacific Islander	<20	NR	73	0.6	-----
Caucasian	<20	NR	1,287	4.6	-----
Hispanic	<20	NR	1,300	4.3	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 9: Age-adjusted mortality rates for HIV for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for HIV:

Risk factors for HIV include having unprotected sex with an HIV-infected person or a person whose HIV status is unknown, sharing drug needles and syringes.

Individual opportunities for prevention:

- Use latex condoms consistently and correctly with HIV-infected sexual partners or those whose HIV status is unknown
- Do not share drug needles and syringes
- Learn your HIV status by getting tested for antibodies to HIV. An estimated 60,000 persons are living with HIV/AIDS in Los Angeles County, many of whom may be unaware of their infection.

Community opportunities for intervention:

- Educate the community about how HIV is transmitted and how to avoid getting infected
- Provide HIV counseling and testing
- Provide access to drug treatment programs and sexually transmitted disease testing and treatment
- Screen pregnant women for HIV infection and use drug therapies to reduce the transmission of HIV from mother to baby

Homicide

There was no statistically significant difference in overall mortality rates for homicide in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Homicide is the second leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for homicide was 9.3 deaths per 100,000 persons in the Inglewood Oil Field communities and 9.2 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 10a). African Americans had the highest mortality rates for homicide in the Inglewood Oil Field communities and Los Angeles County (Table 10b and Fig. 10). African Americans in the Inglewood Oil Field communities had a statistically significant lower mortality rate for homicide than African Americans in Los Angeles County.

Table 10a: Age- and race-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Homicide	202	9.3	8,352	9.2	NS

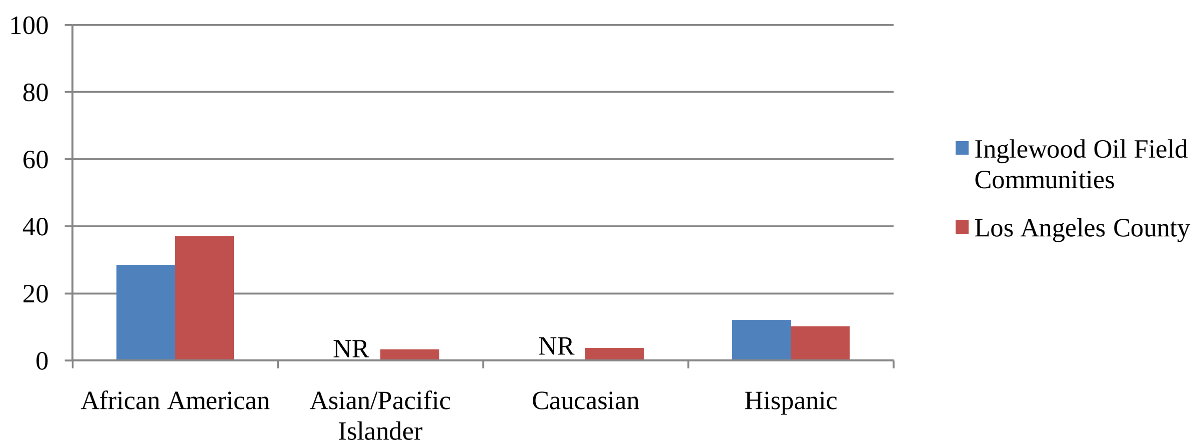
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 10b: Age-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	146	28.5	2,832	37.0	0.003
Asian/Pacific Islander	<20	NR	345	3.2	-----
Caucasian	<20	NR	916	3.7	-----
Hispanic	46	12.1	4,220	10.1	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 10: Age-adjusted mortality rates for homicide for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Homicide:

Risk factors for homicide include intimate partner violence, poor access to quality education, lack of employment opportunities, youths with excessive unstructured free time, gang affiliation, alcohol and substance abuse, witnessing and experiencing violence and access to firearms.

Individual opportunities for prevention:

- Maintain respectful relationships with family and friends
- Pursue a good education
- Seek help for substance abuse
- Recognize that easy access to firearms is a risk for homicide
- If firearms are kept in the home, store them unloaded and locked with the ammunition locked separately.

Community opportunities for intervention:

- Create social norms that promote healthy relationships
- Develop after-school programs for children and adolescents
- Support nurse home-visitation programs for teenage parents
- Support community policing
- Make substance abuse treatment services widely available
- Build communities that discourage street violence with well-lit streets and plenty of pedestrian traffic

Liver Disease

There was no statistically significant difference in overall mortality rates for chronic liver disease in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Chronic liver disease is the ninth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for chronic liver disease was 9.1 deaths per 100,000 persons in the Inglewood Oil Field communities and 10.8 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 11a). Hispanics had the highest mortality rates for chronic liver disease in the Inglewood Oil Field communities and in Los Angeles County (Table 11b and Fig. 11). African Americans in the Inglewood Oil Field communities had statistically significant lower morality rates for chronic liver disease than African Americans in Los Angeles County.

Table 11a: Age- and race-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Liver Disease	103	9.1	8,600	10.8	NS

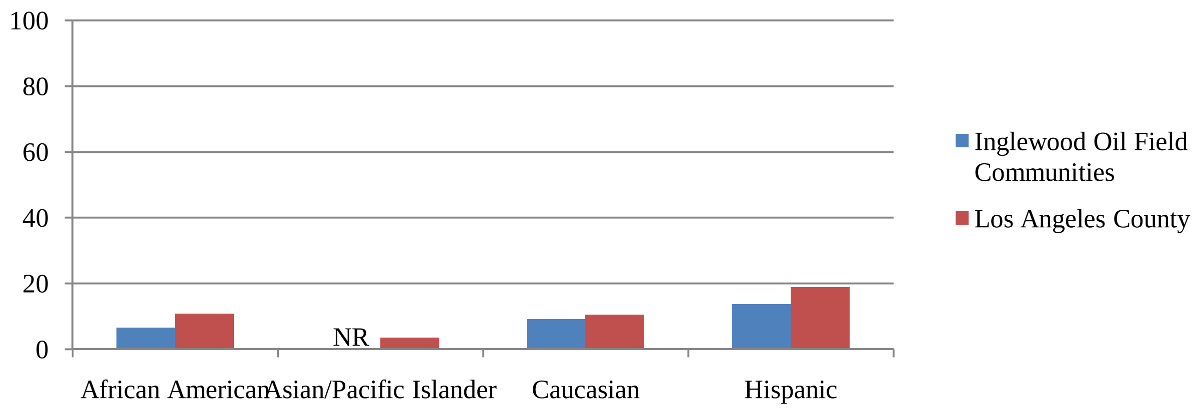
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 11b: Age-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	38	6.6	775	10.9	0.003
Asian/Pacific Islander	<20	NR	357	3.5	-----
Caucasian	28	9.1	3,319	10.6	NS
Hispanic	27	13.7	4,058	18.8	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 11: Age-adjusted mortality rates for chronic liver disease for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Chronic Liver Disease:

Risk factors for chronic liver disease include excessive alcohol consumption, viral hepatitis infection and prolonged exposure to certain chemicals and medications.

Individual opportunities for prevention:

- Limit alcohol intake
- Follow manufacturer's instructions when using household and industrial chemicals
- Follow doctor's instructions when taking prescription and over-the-counter drugs
- Avoid behaviors that promote transmission of hepatitis B and hepatitis C, such as injection drug use and unprotected sex

Community opportunities for intervention:

- Provide access to alcohol treatment programs
- Promote hepatitis B vaccination for groups at high risk
- Promote screening for hepatitis C for groups at high risk including users of injection drugs, hemodialysis patients and recipients of transfusions or organs

Lung Cancer

There was no statistically significant difference in overall mortality rates for lung cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Lung cancer is the second leading cause of death and fourth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for lung cancer was 46.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 43.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 12a). African Americans had the highest mortality rates for lung cancer in the Inglewood Oil Field communities and in Los Angeles County (Table 12b and Fig. 12). African Americans in the Inglewood Oil Field communities had a statistically significant lower mortality rate for lung cancer than African Americans in Los Angeles County.

Table 12a: Age- and race-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Lung Cancer£	501	46.4	24,654	43.5	NS

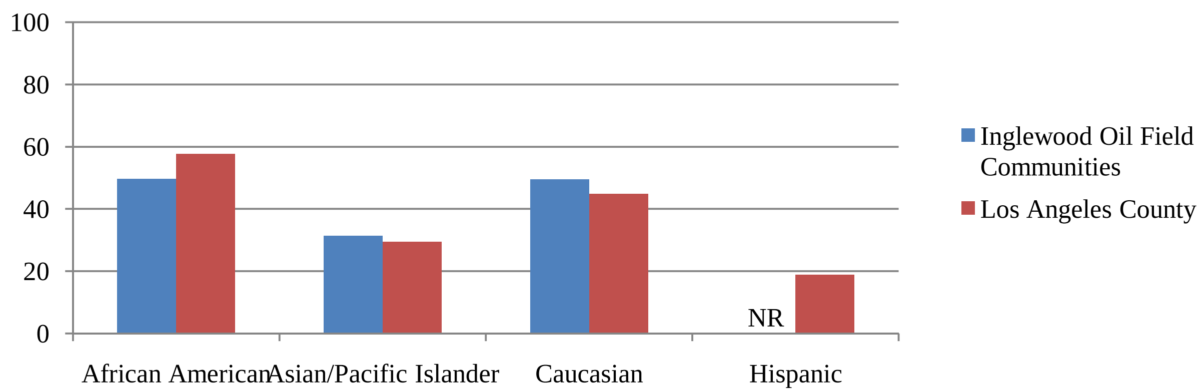
£Lung cancer includes cancers of the lung, bronchus and trachea
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 12b: Age-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	280	49.6	3,717	57.6	0.018
Asian/Pacific Islander	30	31.3	2,821	29.4	NS
Caucasian	174	49.5	15,092	44.7	NS
Hispanic	<20	NR	2,951	18.8	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 12: Age-adjusted mortality rates for lung cancer£ for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Lung Cancer:

Risk factors for cancers of the lung, bronchus and trachea include tobacco smoking and breathing the smoke of others, prior lung cancer and exposure to cancer-causing substances including radon, asbestos, uranium and arsenic.

Individual opportunities for prevention:

- Stop smoking
- Avoid being near people who are smoking
- Reduce exposure to cancer-causing substances
- If you don't smoke, don't start

Community opportunities for intervention:

- Increase the availability of effective smoking cessation services
- Limit smoking, and decrease exposure to indoor and outdoor secondhand smoke through effective anti-smoking policies and enforcement
- Support an increase in the tobacco tax

Motor Vehicle Crashes

There was no statistically significant difference in overall mortality rates for motor vehicle crashes in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Motor vehicle crashes are the third leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for motor vehicle crashes was 6.2 deaths per 100,000 persons in the Inglewood Oil Field communities and 9.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 13a). The mortality rates for motor vehicle crashes were not statistically significantly different in the Inglewood Oil Field communities and Los Angeles County for African Americans (Table 13b and Fig. 13). The numbers of deaths were too few to compare rates for the other ethnicities. African Americans had the highest morality rates for motor vehicle crashes in the Inglewood Oil Field communities and in Los Angeles County.

Table 13a: Age- and race-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Motor Vehicle Crash	101	6.2	6,931	9.5	NS

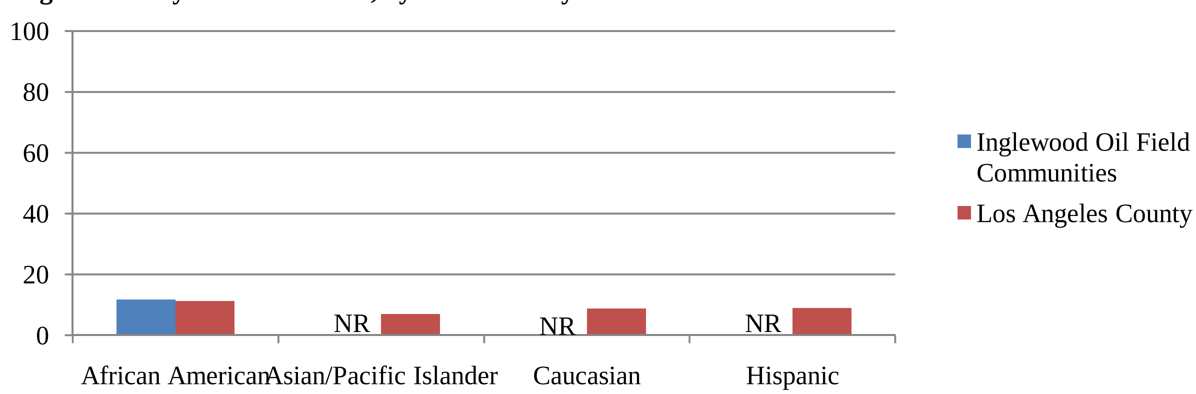
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 13b: Age-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	63	11.7	840	11.3	NS
Asian/Pacific Islander	<20	NR	722	7.0	-----
Caucasian	<20	NR	2,342	8.9	-----
Hispanic	<20	NR	2,993	9.0	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 13: Age-adjusted mortality rates for motor vehicle crashes for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Motor Vehicle Crashes:

Risk factors for motor vehicle crashes include driving under the influence of alcohol or drugs (illicit, prescription, or over-the-counter), driving recklessly, driving while distracted, disobeying traffic laws, lack of driving experience, younger or older age, hazardous road conditions, neglecting routine car maintenance. Risk factors for injury after a crash include not using seat belts or other passenger safety restraints such as child safety seats, unsafe car design.

Individual opportunities for prevention:

- Do not drive while impaired by alcohol or drugs
- Always wear seat belts, even for short trips
- Place young children in an age-appropriate, properly installed child safety or booster seat
- Have children younger than 12 years of age ride in the back seat
- Do not drive while distracted

Community opportunities for intervention:

- Actively enforce all traffic laws, including laws addressing seat belt use and child passenger safety
- Use media campaigns to reduce alcohol-impaired driving
- Comply with the graduated licensing system for teenage drivers
- Support national efforts for safe car design with safety features such as antilock brakes or electronic stability control systems

Pancreatic Cancer

There was no statistically significant difference in overall mortality rates for pancreatic cancer in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Pancreatic cancer is the tenth leading cause of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for pancreatic cancer was 9.2 deaths per 100,000 persons in the Inglewood Oil Field communities and 10.5 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 14a). There was no statistically significant difference in mortality rates for pancreatic cancer in the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 14b and Fig. 14). African Americans had the highest mortality rates for pancreatic cancer in the Inglewood Oil Field communities as well as in Los Angeles County as a whole.

Table 14a: Age- and race-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Pancreatic Cancer	134	9.2	6,597	10.5	NS

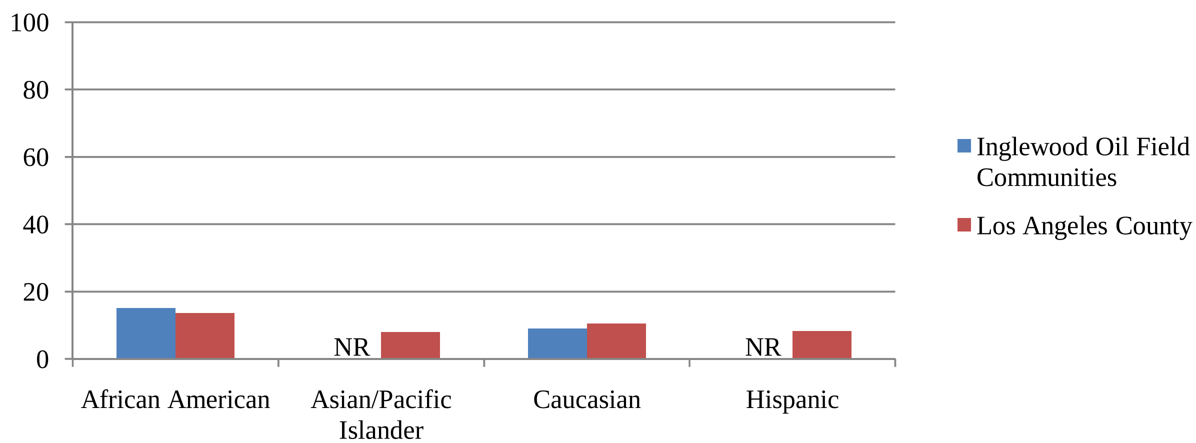
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 14b: Age-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	84	15.0	864	13.6	NS
Asian/Pacific Islander	<20	NR	767	8.0	-----
Caucasian	31	9.0	3,617	10.5	NS
Hispanic	<20	NR	1,331	8.3 (7.9-8.8)	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 14: Age-adjusted mortality rates for pancreatic cancer for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Pancreatic Cancer:

Risk factors for pancreatic cancer include age, tobacco smoking, family history of pancreatic cancer, being overweight or obese, H.pylori bacterial infection, pancreatitis and diabetes.

Individual opportunities for prevention:

- Stop smoking
- Maintain a healthy weight

Community opportunities for intervention:

- Restrict smoking in public places and worksites
- Increase the availability of effective smoking cessation services
- Support an increase in the tobacco tax

Pneumonia and Influenza

There was no statistically significant difference in overall mortality rates for pneumonia/influenza in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Pneumonia and influenza are the fourth leading causes of death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for pneumonia/influenza was 33.7 deaths per 100,000 persons in the Inglewood Oil Field communities and 29.3 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 15a). Caucasians had the highest mortality rates for pneumonia/influenza in the Inglewood Oil Field communities (Table 15b and Fig. 15). Caucasians in the Inglewood Oil Field communities had a statistically significant higher mortality rate for pneumonia/influenza than Caucasians in Los Angeles County as a whole.

Table 15a: Age- and race-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Pneumonia/Influenza	373	33.7	18,883	29.3	NS

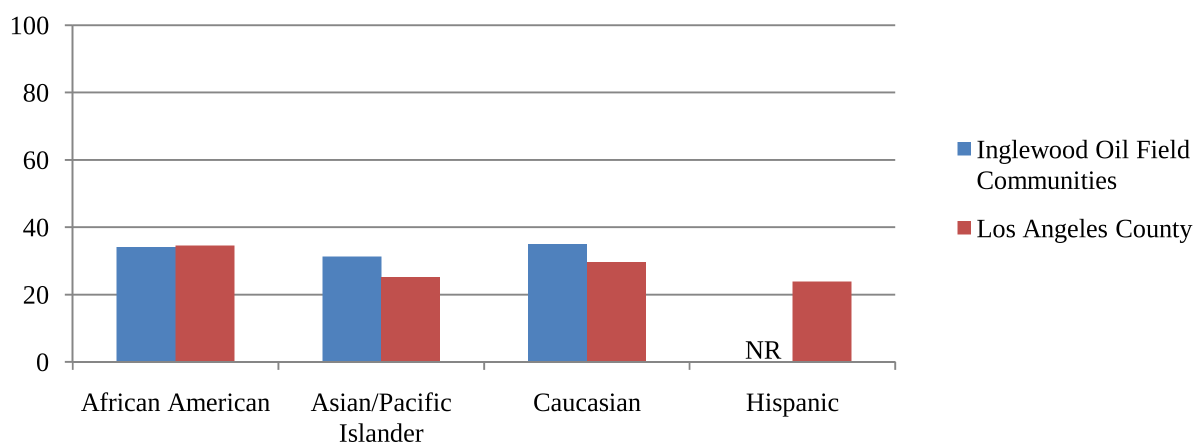
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 15b: Age-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	179	34.0	2,065	34.6	NS
Asian/Pacific Islander	28	31.3	2,138	25.2	NS
Caucasian	148	35.0	11,346	29.6	0.049
Hispanic	<20	NR	3,261	23.9	-----

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05
NR indicates rate not reported due to small numbers

Fig. 15: Age-adjusted mortality rates for pneumonia/influenza for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Pneumonia/Influenza:

Risk factors for pneumonia/influenza include age (young and old), smoking, and underlying chronic medical conditions such as diabetes and asthma.

Individual opportunities for prevention:

- Follow recommended guidelines for influenza and pneumococcal pneumonia vaccination
- Wash your hands frequently with soap and water
- Stop smoking
- Stay away from people who are sick
- Avoid touching your eyes, nose or mouth

Community opportunities for intervention:

- Education the community about the recommendations for influenza and pneumococcal pneumonia vaccination
- Provide information about the availability of low-cost or no-cost vaccinations for certain individuals
- Encourage everyone with respiratory illness (fever, cough, runny nose) to stay home to avoid spreading the illness to others

Stroke

There was no statistically significant difference in overall mortality rates for stroke in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Stroke is the third leading cause of death and tenth leading cause of premature death in the Inglewood Oil Field communities. From 2000-2007, the mortality rate for stroke was 48.4 deaths per 100,000 persons in the Inglewood Oil Field communities and 48.3 deaths per 100,000 persons in Los Angeles County, after adjusting for age and race/ethnicity (Table 16a). African Americans had the highest mortality rates for stroke in the Inglewood Oil Field communities as well as Los Angeles County (Table 16b and Fig. 16). African Americans in the Inglewood Oil Field communities however, had a statistically significant lower mortality rate for stroke than African Americans in Los Angeles County as a whole.

Table 16a: Age- and race-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County		
Cause of Death	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
Stroke	600	48.4	31,928	48.3	NS

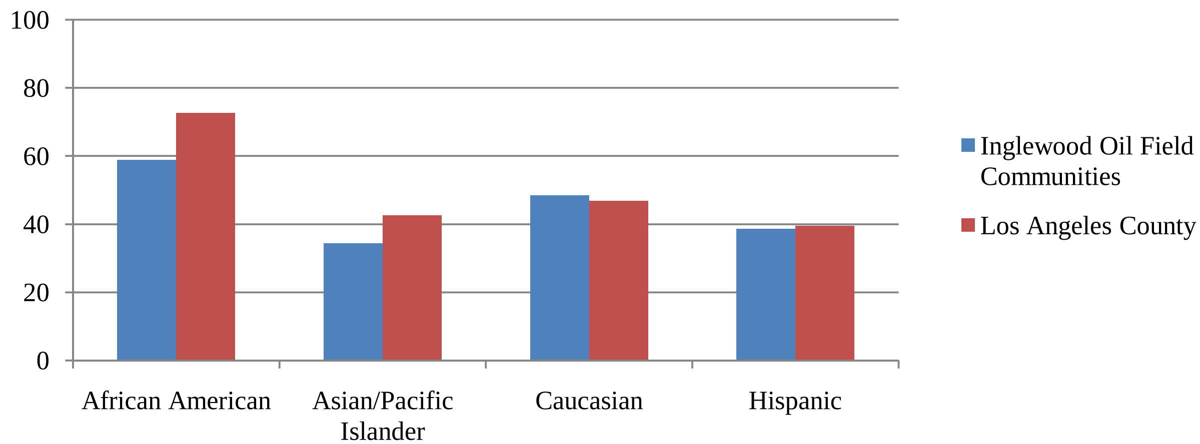
* Rate per 100,000 persons, age/race-adjusted, cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Table 16b: Age-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of deaths	Rate*	No. of deaths	Rate*	p-value‡
African American	316	58.9	4,495	72.6	<0.001
Asian/Pacific Islander	31	34.3	3,865	42.6	NS
Caucasian	201	48.5	17,505	46.8	NS
Hispanic	46	38.6	5,979	39.5	NS

* Rate per 100,000 persons, age-adjusted and cumulative over years 2000-2007, ‡NS indicates not statistically significant at a p-value of 0.05

Fig. 16: Age-adjusted mortality rates for stroke for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity



Risk Factors for Stroke:

Risk factors for stroke include high blood pressure, tobacco smoking, diabetes, high cholesterol, being overweight, physical inactivity, excessive alcohol consumption, age, family history of stroke, and prior stroke or heart attack.

Individual opportunities for prevention:

- Control high blood pressure
- Stop smoking
- Manage diabetes
- Maintain a healthy weight
- Consult with your physician about increasing physical activity
- Eat a diet low in fat and salt
- Learn the stroke warning signs

Community opportunities for intervention:

- Promote access to blood pressure screening and treatment for high blood pressure
- Promote physical activity by providing access to safe places like parks to walk, play and exercise
- Restrict smoking in public places and worksites
- Provide access to smoking cessation programs
- Encourage people to quit smoking through media campaigns

Conclusion

There were no statistically significant difference in overall mortality rates for all causes of death in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. African Americans and Hispanics in the Inglewood Oil Field communities had statistically significantly lower mortality rates for all causes of death compared to African Americans and Hispanics in Los Angeles County.

There were no statistically significant differences in the mortality rates for any of the leading causes of death or premature death in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for age and race/ethnicity. Although there were no statistically significant differences in the overall mortality rates, the racial/ethnic disparities existing in Los Angeles County are also reflected in the mortality rates found in the Inglewood Oil Field communities.

There were statistically significantly higher mortality rates for some of the leading causes of death and premature death in certain ethnic groups. In the Inglewood Oil Field communities and in Los Angeles County as a whole, African Americans had the highest mortality rates for all causes of death, colorectal cancer, coronary heart disease, diabetes, HIV, homicide, motor vehicle crashes, pancreatic cancer and stroke. Caucasians had the highest mortality rates for emphysema and chronic obstructive pulmonary diseases, while Hispanics had the highest mortality rates for chronic liver disease in both the Inglewood Oil Field communities and Los Angeles County. African Americans and Caucasians had higher rates of Alzheimer's disease, breast cancer (among females), lung cancer and pneumonia/influenza than other ethnicities in both the Inglewood Oil Field communities and Los Angeles County.

For some of the leading causes of death and premature death, rates were statistically significantly different in the Inglewood Oil Field communities compared to Los Angeles County for certain ethnic groups. African Americans in the Inglewood Oil Field communities had statistically significantly lower mortality rates for coronary heart disease, diabetes, emphysema/COPD, homicide, chronic liver disease, lung cancer and stroke than African Americans in Los Angeles County. On the other hand, African Americans in the Inglewood Oil Field communities had statistically significantly higher mortality rates for HIV than African Americans in Los Angeles County. Caucasians in the Inglewood Oil Field communities had statistically significantly higher mortality rates for pneumonia/influenza than Caucasians in Los Angeles County.

The differences in mortality rates for the leading causes of death and premature death do not appear to be related to the geographic location of the Inglewood Oil Field communities. Many of the differences observed within these communities are common in Los Angeles County and represent a significant public health challenge throughout the county. The disparities in mortality rates can best be addressed by targeting the underlying causes of these disparities.

ANALYSIS OF RATES OF LOW-BIRTH-WEIGHT BIRTHS

The Toxics Epidemiology Program in the Bureau of Toxicology & Environmental Assessment obtained data on rates of low-birth-weight births in response to community concerns regarding potential adverse health effects for residents living near the Inglewood Oil Field. The data for rates of low-birth-weight births were obtained from registered birth certificates entered into the Automated Vital Statistics System (AVSS) at the birth hospital or the office of the local registrar. Since registration of birth certificates is required by law, the data in the AVSS is nearly 100 percent complete.

Methods

The low-birth-weight births analysis was performed with data on live births during the period 2000-2007. The analysis included births among women living in the area identified in the Inglewood Oil Field communities and Los Angeles County as a whole. Low birth weight was defined as a birth weight less than 2500 grams (5.5 pounds). The area representing the Inglewood Oil Field communities used in the analyses for low-birth-weight births included the census tracts within 1.5 miles from the perimeter of the Inglewood Oil Field. The census tracts for the year 2000 are: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01, 7025.02, 7026.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, and 7032.00. A map of the included census tracts is provided in Appendix A.

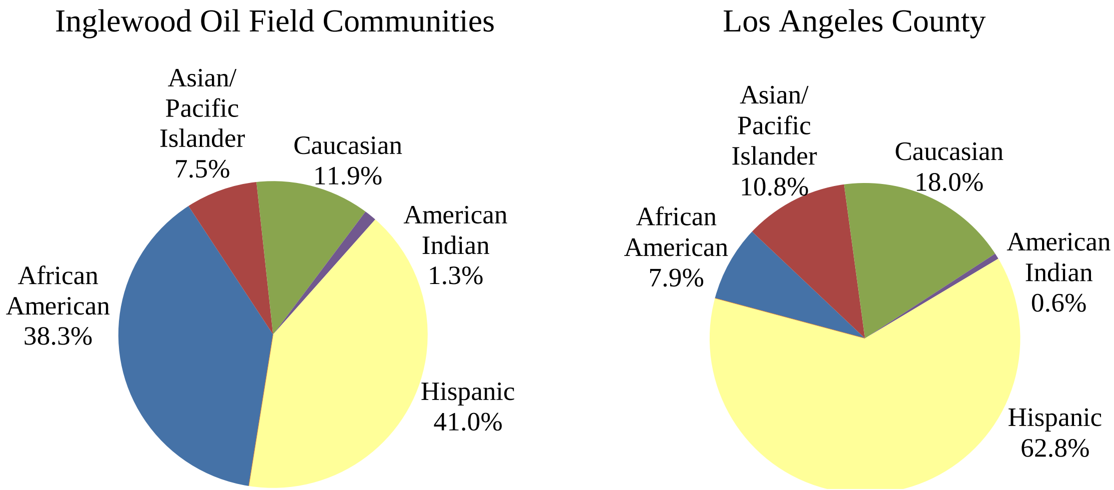
The data were analyzed for an eight year period to increase the reliability of the findings and to assess trends. Rates based on small numbers of events can fluctuate widely from year to year for reasons other than a true change in the underlying frequency of occurrence of the event. Therefore, when the number of low-birth-weight births was less than 20 in any single year, the rates of low-birth-weight births are not reported.

Rates of low-birth-weight births for the Inglewood Oil Field communities and Los Angeles County were compared and a statistical test of the difference was done to determine if the rates were statistically different.[2] A p-value of less than 0.05 indicated that the two rates were statistically significantly different, while a p-value of greater than 0.05 indicated that the two rates were not statistically significantly different.

Since the racial/ethnic distribution of the underlying population in the Inglewood Oil Field communities differs from Los Angeles County, rates were stratified to examine differences by racial/ethnic group for African Americans, Asian/Pacific Islanders, Caucasians and Hispanics (Fig. 1). Rates of low-birth-weight births were not reported for American Indians/Alaska Natives since the numbers of low-birth-weight births were too small to provide reliable rates. Overall rates of low-birth-weight births were adjusted for race/ethnicity to account for the differences in the racial/ethnic distribution in the Inglewood Oil Field communities and Los Angeles County. Cumulative race-adjusted rates were standardized to the racial/ethnic distribution of the Los Angeles County population for the year 2000.

[2] Rothman KJ, Greenland S, Lash TL. Modern Epidemiology 3rd Ed. Philadelphia: Lippincott Williams & Wilkins; 2008 p.266-268.

Fig. 1: Number of live births in the Inglewood Oil Field communities and Los Angeles County, by race/ethnicity



Source: California Department of Public Health, Center for Health Statistics, 2000-2007

Results

The rate of low-birth-weight births was 7.2 per 100 live births in the Inglewood Oil Field communities and 7.0 per 100 live births in Los Angeles County, after adjusting for the differences in racial/ethnic distribution of births (Table 2). The rates of low-birth-weight births were not statistically significantly different between the Inglewood Oil Field communities and Los Angeles County for any ethnicity (Table 1).

In both the Inglewood Oil Field communities and Los Angeles County, African Americans had the highest rates of low-birth-weight births. Since there were proportionately more African American births in the Inglewood Oil Field communities than in Los Angeles County (Fig. 1), when rates were adjusted for the differences in racial/ethnic distribution, there were no statistically significant differences in rates of low-birth-weight births (Table 2).

From 2000-2007, the rates of low-birth-weight births were consistently higher in African Americans than in other ethnicities in Los Angeles County (Fig. 2). There appears to be a slight increasing trend in rates of low-birth-weight births in the Inglewood Oil Field communities as well as in Los Angeles County for all ethnicities.

Table 1: Number of low birth weight births and rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, by race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
Race/Ethnicity	No. of LBW	LBW Rate*	No. of LBW	LBW Rate*	p-value‡
All Races	1,246	8.7	85,370	7.0	<0.001
African American	651	11.9	11,957	12.5	NS
Asian/Pacific Islander	86	8.1	9,496	7.2	NS
Caucasian	101	5.9	14,924	6.8	NS
Hispanic	399	6.8	48,245	6.3	NS

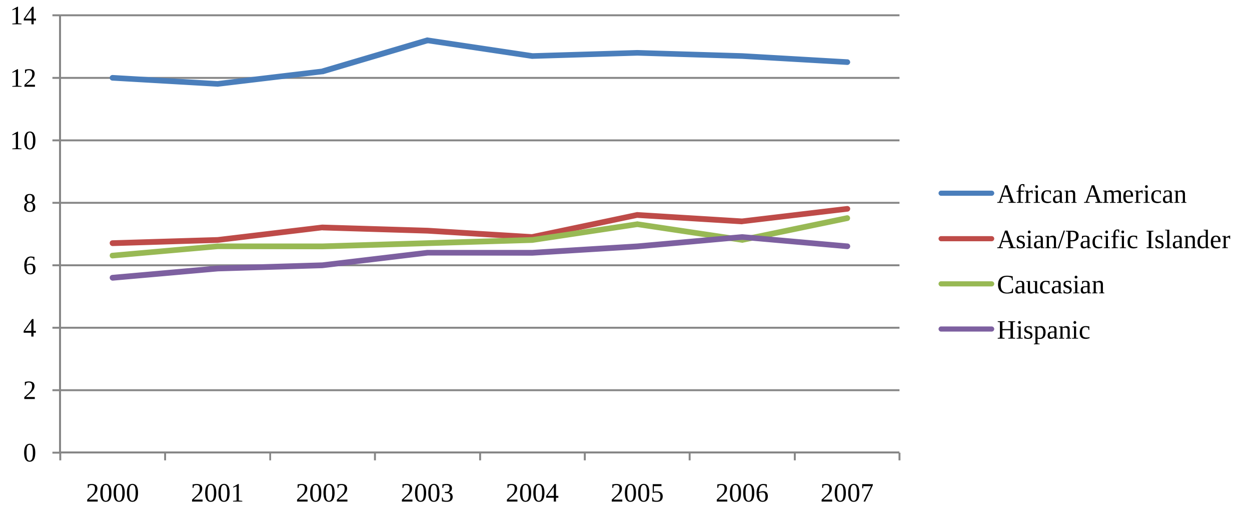
* LBW rate is the number of low birth weight live births per 100 live births, cumulative over years 2000-2007
‡NS indicates not statistically significant at a p-value of 0.05
Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007

Table 2: Number of low birth weight births and rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007, adjusted for race/ethnicity

	Inglewood Oil Field Communities		Los Angeles County		
	No. of LBW	LBW Rate*	No. of LBW	LBW Rate*	p-value‡
Low Birth Weight Births	1,246	7.2	85,370	7.0	NS

* LBW rate is the number of low birth weight live births per 100 live births, race-adjusted and cumulative over years 2000-2007
‡NS indicates not statistically significant at a p-value of 0.05
Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007

Fig. 2: Low-birth-weight birth rates for Los Angeles County from 2000-2007 by race/ethnicity



Data Source for Fig. 2: Table 3 in Appendix A

Conclusion

There was no statistically significant difference in the rates of low-birth-weight births in the Inglewood Oil Field communities compared to Los Angeles County, after adjusting for race/ethnicity. These results should be interpreted with caution given the lack of information on other factors (such as smoking) that could influence birth weights.

The differences in rates of low-birth-weight births among racial and ethnic groups that exist countywide are reflected in the rates observed in the Inglewood Oil Field communities. These disparities in low-birth-weight births represent a significant public health challenge throughout the county.

Request Title:

Baldwin Hills Community Standards and Los Angeles County

REQUEST NUMBER: ID 1150

DATE: DECEMBER 22, 2010

DATA SOURCE:

THE CALIFORNIA BIRTH DEFECTS MONITORING PROGRAM

Maternal, Child and Adolescent Health Division
Center for Family Health
California Department of Public Health
1615 Capitol Avenue, MS 8304
Sacramento, CA 95814

PREPARED FOR:

CARRIE TAYOUR

(EPIDEMIOLOGIST, LA COUNTY DEPT OF PUBLIC HEALTH)

DEFINITIONS AND ABBREVIATIONS

Term	Meaning
CBDMP	California Birth Defects Monitoring Program
CDPH	California Department of Public Health
DCS	Data Collection Specialist
MCAH	Maternal, Child and Adolescent Health Division
CFH	Center for Family Health
Registry	CBDMP's database of clinical data related to birth defect cases identified in CBDMP surveillance regions
Precision	Code used to allow for the assessment of the accuracy of the diagnosis
BPA	British Pediatric Association; diagnostic coding system used by CBDMP to classify birth defects
IUFD	Intrauterine fetal death
TAB	Therapeutic abortion

1. CBDMP Program Information

In 1982, California established a groundbreaking program for birth defects monitoring. Recognizing that birth defects are a public health problem about which too little is known, the State Legislature created the California Birth Defects Monitoring Program (CBDMP). From 1982-1990, seven pieces of legislation were passed and enacted, mandating the CBDMP to: 1) Maintain an ongoing program of birth defects monitoring statewide; 2) Track birth defects rates and trends; 3) Evaluate whether environmental hazards are associated with birth defects; 4) Investigate other possible birth defects causes; 5) Develop birth defects prevention strategies; 6) Conduct interview studies about causes; and 7) May operate by contract with a qualified entity.

CBDMP monitors birth defects in California as a means to ensure the safety of the public. Through active medical chart review and data collection, the CBDMP maintains a Registry of birth defects. CBDMP uses information in the Registry to perform surveillance, to monitor trends in occurrence of birth defects, and to help in planning intervention and prevention strategies. In addition, CBDMP provides data to scientific researchers.

1.1 Program Mission and Goals

Program Mission: The California Birth Defects Monitoring Program (CBDMP) collects and analyzes data to identify opportunities for preventing birth defects and improving the health of babies.

Program Goals:

- Increase the quality and quantity of California-based birth defect data available for purposes of public health monitoring and investigator-led research
- Increase communication of birth defects information
- Monitor public health and safety concerns relating to birth defects

1.2 Data Collection Methods

CBDMP uses a systematic approach to collect data that are used for the purposes of surveillance, epidemiologic research, and cluster investigations. To identify cases (live births, fetal deaths, and terminations) with birth defects, highly trained data collection staff visit health facilities in select Registry counties. Data collection is limited to in-patient facilities, genetic offices and cytogenetic laboratories. Data collection staff visit health facilities and review all relevant logs, such as obstetrics, nursery, and newborn intensive care unit, as well as discharge diagnoses indices. All potential cases are identified and the medical records are reviewed. Detailed identifying information and diagnostic information are abstracted into a standard format. For each diagnosis a confirmation code signifies how the diagnosis was made; a sub-specialist code signifies what type of physician or clinician made the diagnosis; and a precision code allows for the assessment of the accuracy of the diagnosis. A CBDMP data expert or geneticist reviews abstracts of children who have multiple diagnoses to determine if the children also have previously unrecognized syndromes.

2. REQUEST

In response to health concerns voiced by residents in communities near the Baldwin Hills Community Standards District (CSD), the Los Angeles County Department of Public Health is conducting a community health assessment. The assessment will provide a profile of the health of the population near the CSD. They are requesting an analysis examining the rates of birth defects for a selected group of zip codes--90008, 90016, 90043, 90056, 90230, 90232, 90302--compared to all recent available data on birth defects reported in Los Angeles County starting in 1990. The results of the analysis will be used to examine the rates of birth defects in this geographical area compared to rates in LA County as a whole as part of a snapshot of health in this area.

3. METHODS

The analysis performed identified birth defect cases in the registry collected over a span of eight years or more (DOB: 7/1/1990-12/31/2002, excluding DOB 1998) for Los Angeles County and zip codes that contain the Baldwin Hills Community (90008, 90016, 90043, 90056, 90230, 90232, and 90302). Rates were calculated per 1,000 live births and fetal deaths with 95% confidence intervals for each defect or defect group. Not all defects requested were collected by CBDMP for all years.

Vital statistics information on the total number of live births and fetal deaths (denominator value) for rate calculations was determined using the California Center for Health Statistics Office of Health Information and Research Vital Statistics data.

3.1 Data Selection Criteria

Congenital anomalies were identified using British Pediatric Association (BPA). Criteria used for inclusion is listed in Table 4 of Appendix A. Births in military hospitals were excluded. Birth year 1998 excluded due to incomplete data collection.

3.2 Statistical Methods

Birth defect rates and confidence intervals (Baldwin Hills and Los Angeles County) are displayed in this report. Rates represent cases per 1,000 live births and fetal deaths. 95% confidence intervals were calculated using Poisson distribution. The Relative risk (RR) was also calculated between groups for each deformity and reported, with respective 95% confidence intervals.

The confidence intervals indicate that there is a 95% probability that the actual statistic falls somewhere between the lower and the upper limit. When looking at the relative risk, if the 95% confidence interval includes 1, it is determined that there is not a statistical difference between the two rates.

4. RESULTS

4.1 Birth defect rates with 95% confidence intervals for Los Angeles County & Baldwin Hills

Zip codes containing and surrounding the Baldwin Hills Community (90008, 90016, 90043, 90056, 90230, 90232, and 90302) and Los Angeles County from July 1, 1990-December 31, 2002 (excluding births occurring in 1998) per 1,000 live births and fetal deaths.

Type of Birth Defect	Baldwin Hills Community Zip Codes*	Los Angeles County	Relative Risk
Anencephaly	0.20 (0.09-0.40)	0.34 (0.32-0.37)	0.59 (0.30 – 1.18)
Spina Bifida	0.38 (0.21-0.62)	0.38 (0.35-0.41)	0.99 (0.6 – 1.66)
EncephaloceleŦ	0.03 (0.00-0.16)	0.11 (0.10-0.13)	0.26 (0.04 – 1.86)
MicrocephalusŦ	0.97 (0.67-1.37)	0.91 0.86-0.95)	1.08 (0.76 – 1.52)
HydrocephalusŦ	0.71 (0.45-1.05)	0.52 (0.48-0.55)	1.37 (0.91 – 2.06)
Other Nervous System AnomaliesŦ	1.86 (1.43-2.38)	1.55 (1.49-1.61)	1.20 (0.93 – 1.54)
Eye Anomalies§	3.29 (2.65-4.04)	3.15 (3.06-3.25)	1.05 (0.85 – 1.29)
Ear Anomalies§	5.21 (4.40-6.13)	5.09 (4.97-5.21)	1.02 (0.87 – 1.21)
Cardiac Septal Closure AnomaliesŦ	3.19 (2.61-3.85)	3.45 (3.36-3.54)	0.92 (0.76 – 1.12)
Transposition of Great Vessels	0.28 (0.14-0.49)	0.46 (0.43-0.49)	0.71 (0.39 – 1.29)
Tetralogy of Fallot	0.40 (0.23-0.65)	0.35 (0.33-0.38)	1.13 (0.69 – 1.86)
Other Heart AnomaliesŦ	2.33 (1.85-2.90)	2.53 (2.45-2.60)	0.92 (0.74 – 1.15)

Type of Birth Defect	Baldwin Hills Community Zip Codes*	Los Angeles County	Relative Risk
Other Circulatory System AnomaliesŦ	1.56 (1.17-2.05)	1.85 (1.79-1.91)	0.85 (0.64 – 1.11)
Respiratory System Anomalies§	3.76 (3.08-4.56)	3.42 (3.32-3.52)	1.1 (0.91 – 1.34)
Cleft palate and/or cleft lip	1.20 (0.89-1.60)	1.52 (1.47-1.58)	.79 (0.59 – 1.05)
TE/Fistula§	0.22 (0.08-0.47)	0.25 (0.22-0.27)	0.88 (0.39 – 1.98)
Pyloric Stenosis§	1.12 (0.76-1.59)	1.55 (1.48-1.62)	0.72 (0.51 – 1.03)
Small Intestinal Atresia§	0.65 (0.39-1.03)	0.41 (0.38-0.45)	1.57 (0.98 – 2.52)
Large Intestinal Atresia§	0.47 (0.25-0.80)	0.44 (0.41-0.48)	1.07 (0.62 – 1.84)
Hirschsprung	0.18 (0.06-0.39)	0.13 (0.11-0.14)	1.40 (0.63 – 3.15)
Genital Anomalies§	2.89 (2.30-3.60)	2.95 (2.86-3.04)	0.98 (0.79 – 1.22)
Urinary System Anomalies§	2.32 (1.78-2.96)	2.29 (2.21-2.37)	1.01 (0.79 – 1.30)
Musculo-skeletal§	3.47 (2.81-4.24)	3.26 (3.16-3.35)	1.07 (0.87 – 1.31)
Limbs§	5.72 (4.86-6.68)	4.80 (4.68-4.91)	1.19₤ (1.02 – 1.39)
Other Musculoskeletal Anomalies§	4.70 (3.93-5.58)	4.11 (4.00-4.22)	1.14 (0.96 – 1.36)
Anomalies of the Integument§	4.85 (4.06-5.74)	4.24 (4.14-4.35)	1.13 (0.95 – 1.34)
Down SyndromeŦ	1.68 (1.27-2.18)	1.67 (1.61-1.73)	1.01 (0.78 – 1.31)
Other Chromosomal Anomalies§	1.23 (0.85-1.72)	1.22 (1.16-1.28)	1.01 (0.72 – 1.42)
Other Congenital Disorders§	0.98 (0.64-1.42)	1.20 (1.14-1.26)	0.82 (0.56 – 1.19)

* Baldwin Hills Community zip codes include 90008, 90016, 90043, 90056, 90230, 90232, and 90302

Ŧ California Birth Defect Monitoring Program reported data from the years 1990-2000, excluding 1998 because of incomplete data collected for that year

§ California Birth Defect Monitoring Program reported data from the years 1990-1997

₤ p < .05

5. DISCUSSION

The table included in Section 5.1 of this report shows the rates of birth defects with corresponding 95% confidence intervals for the zip codes that contain and surround the Baldwin Hills Community and for all of Los Angeles County. The Relative risk associated with each rate comparison is also calculated along with the corresponding 95% confidence intervals. In calculating rates for the zip codes that contain and surround Baldwin Hills Community, wide confidence intervals mean that the estimates of the rates are very imprecise due to the small sample sizes of pregnant women and the small numbers of children born with birth defects.

The only rate estimates for birth defects in the zip codes that contain and surround Baldwin Hills that were statistically significantly different when compared to Los Angeles County as a whole was for limb defects, with RR 1.19 (95% CI 1.02 – 1.39). Babies born in the Baldwin Hills area were 1.2 times more likely to be born with a limb defect than those in the remaining Los Angeles area for the birth years 1990 thru 1997.

Epidemiological investigations are relatively conclusive when large, population-based samples are involved. Conversely, analyses of data from local areas, such as the communities surrounding the Baldwin Hills Community, are limited by small sample sizes. In addition, these analyses cannot take into account the multitude of factors associated with the development of birth defects. Thus, these results should be interpreted with caution.

5.1 LIMITATIONS

Due to budget constraints, not all of the defects were collected for all birth years. Data collection for the 1998 birth year was incomplete and, therefore, not included in this analysis.

This investigation cannot rule out that living in close proximity to Baldwin Hills may be associated with a small increase in the risk of developing birth defects in some individuals. Scientific detection of such small increases in risk is beyond the scope of this investigation, due to small sample sizes in the Baldwin Hills area and other methodological limitations.

6. TERMS OF USE

The table and data in this report and results pertaining to the request are confidential. The data will not be used for purposes other than those stated in the agreement. Requester must adhere to strict guidance of HIPAA rules in regards to storing and providing privacy protections for health-related data. The data may be used for epidemiologic and public health monitoring and planning purposes only. Data may be presented in aggregate form only. No personal level data may be released. The requester will not sell or distribute the data or permit others to do so. The requester will not link or match, or let others link or match, the data to any other unaggregated dataset and/or other individual information unless such link or match was identified in the research proposal and the proposal was approved by the State of California Health and Human Services Agency (CHHSA) and Committee for the Protection of Human Subjects (CPHS). No subject contact is permitted without written approval. The requester will not use or permit others to use the data to learn about the identity of a program client or a survey participant.

USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

Keck School of Medicine
University of Southern California

Cancer Surveillance Program

Department of
Preventive Medicine

<u>Assessment of Cancer Incidence in Baldwin Hills, Baldwin Hills Adjacent and Ladera Heights</u>

Report prepared by
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The University of Southern California Cancer Surveillance Program (USC-CSP) is the population-based cancer registry for Los Angeles County that was begun in 1972. By law, all cancers diagnosed in California since January 1, 1988 are reported to one of the regional registries that form the California Cancer Registry (CCR), the legally mandated cancer reporting system of California. The USC-CSP serves as Region 9 of the CCR, and is also one of the registries participating in the National Cancer Institute's Surveillance, Epidemiology, and End-Results Program (SEER). The California Department of Public Health, the Centers for Disease Control and Prevention, and the National Cancer Institute fund cancer surveillance conducted by USC-CSP. Data is collected on all new cancer patients diagnosed in Los Angeles County since 1972 and includes information on age, race/ethnicity, patient's address at diagnosis, gender and specific type of cancer. All invasive cancers, excluding non-melanoma skin cancers, are reported, along with in situ breast and bladder cancer, and benign brain tumors. Completeness of the reporting to the registry is estimated at over 95%.

This report is in response to a request from the Los Angeles County Board of Supervisors as communicated to Dr. Cozen by Carrie Nagy, Epidemiologist, Los Angeles County Department of Health Services, for the risk of cancer types related to exposure to oil wells located at the La Cienega oil field. Because risk of certain types of hematopoietic cancers has been linked to exposure to petroleum products such as benzene1, we examined the expected and observed incidence of these cancers in the area of concern. We divided the time period into 1972-1999 and 2000-2005 in order to capture a better understanding of the most recent trends. The aggregated census tracts examined were: 220100, 235100, 236000, 236202, 236400, 269901, 276100, 600911, 601301, 601303, 702400, 702501, 702502, 702600, 702700, 703001, 703002, 703100, and 703200.

Results:

The type of cancer that has been most definitively linked to benzene (petroleum product) is acute myelogenous leukemia. There was no excess occurrence of this type of leukemia in the census tracts examined (Table 1). All other hematopoietic cancer incidence was similarly within the range of that expected except for chronic myelogenous leukemia among non-Hispanic whites in the most recent time period examined; there were two additional cases over that expected (Table 1.) We could not examine the risk of acute lymphocytic leukemia which occurs mainly in children under 5 years old, because there were too few cases in the area. We did not examine Hodgkin lymphoma because it has not been associated with benzene or petroleum exposures 1.

Table 1. Observed and expected numbers of selected hematopoietic cancers in census tracts 220100, 235100, 236000, 236202, 236400, 269901, 276100, 600911, 601301, 601303, 702400, 702501, 702502, 702600, 702700, 703001, 703002, 703100, 703200 from 1972-2005, based on the USC SEER Cancer Surveillance Program.

	1972-1999		2000-2005	
	Cases Observed[1]	Cases Expected[2]	Cases Observed[1]	Cases Expected[2]
Acute myelogenous leukemia[3]				
African-American	17	14-34	7	3-16
Non-Hispanic White	47	32-59	4	2-13
Hispanic White	-	-	-	-
Asian/Other	4	0-8	-	-
Chronic myelogenous leukemia[4]				
African-American	11	9-27	4	0-9
Non-Hispanic White	11	12-32	9*	0-7
Hispanic White	-	-	-	-
Asian/Other	-	-	-	-
Chronic lymphocytic leukemia[5]				
African-American	28	17-39	13	3-17
Non-Hispanic White	54	39-69	14	4-18
Hispanic White	-	-	-	-
Asian/Other	-	-	-	-
Non-Hodgkin lymphoma[6]				
African-American	106	80-120	41	32-59
Non-Hispanic White	198	175-232	50	30-56
Hispanic White	13	7-24	9	2-14
Asian/Other	15	6-21	12	2-14
Multiple myeloma[7]				
African-American	97	68-105	37	22-46
Non-Hispanic White	52	43-74	11	4-18
Hispanic White	5	0-10	-	-
Asian/Other	4	0-7	-	-

[1]Number of cases observed in census tracts
[2]Expected range of 95% confidence interval based on population of named census tracts
[3]Acute myelogenous leukemia, SEER Site 35021
[4]Chronic myelogenous leukemia, SEER Site 35022
[5]Chronic lymphocytic leukemia, SEER Site 35012
[6]Non-Hodgkin lymphoma, SEER Sites 33041-33042
[7]Multiple myeloma, SEER Site 34000

Discussion:

There was an excess risk of chronic myelogenous leukemia (CML) in non-Hispanic whites based on two cases, in the census tracts examined. The link between this type leukemia and petroleum products is not as consistently found as that with acute myelogenous leukemia, but there are some reports of an association1. Because we examined 27 comparisons (by race/ethnicity and cancer type), chance is still a possible explanation for the occurrence of 2 additional cases. Furthermore, in most of the studies examining this issue, occupational exposure to specific petroleum-based chemicals, such as benzene, was measured, rather than residential proximity to oil wells. Very few, if any, well-conducted published studies exist on health effects in communities due to proximity of oil wells.

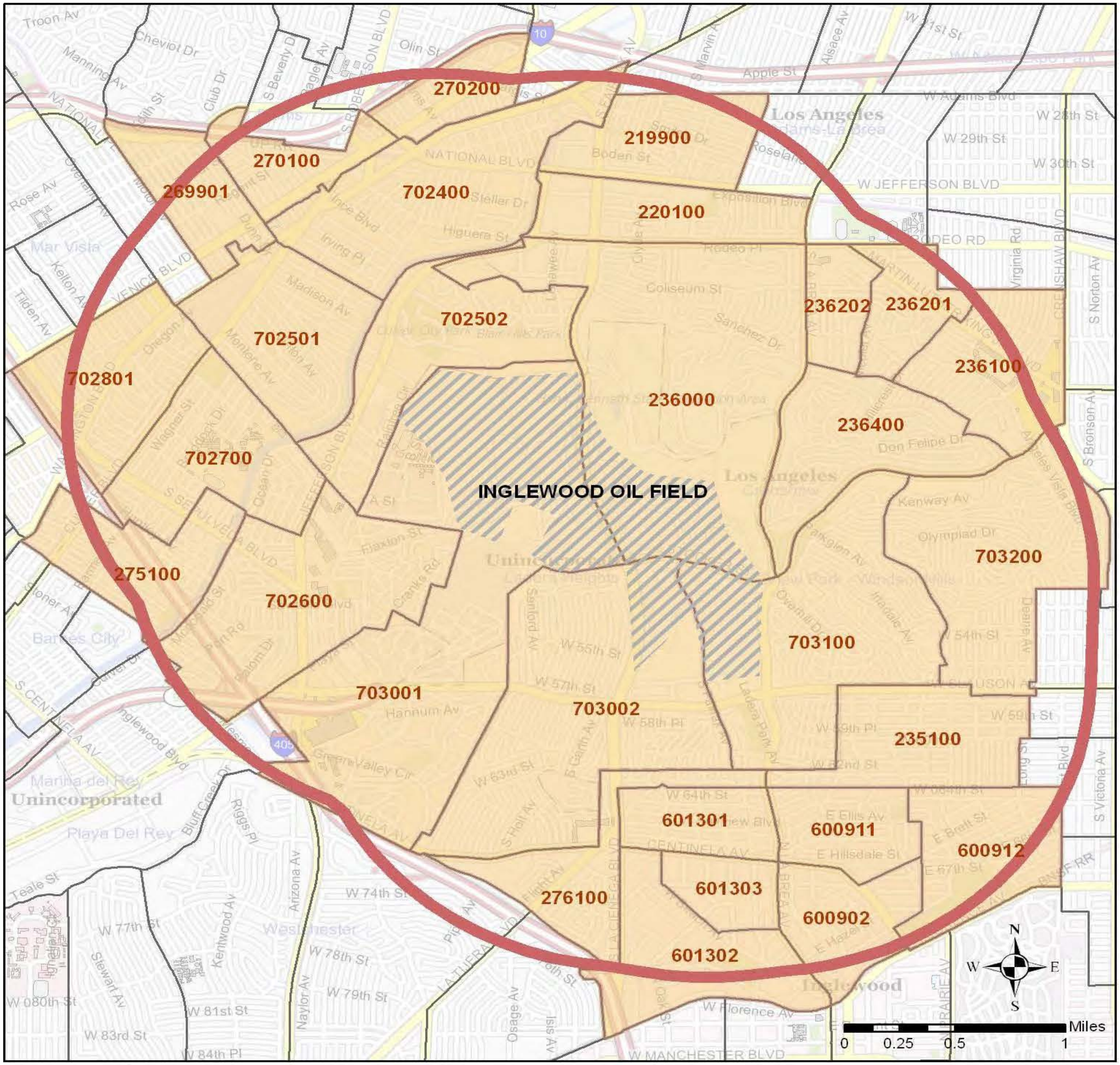
The additional two cases of CML may or may not be related to the proximity of the oil wells and prediction about future leukemia risk related to an expansion of oil wells should not be made on this basis. Rather, risk assessment should be based on estimated exposure of the community to carcinogenic substances associated with oil wells.

References

1. Linet MS, Devesa SS, Morgan GJ. The Leukemias. In Schottenfeld D and Fraumeni JF, Jr. Cancer Epidemiology and Prevention. Third Edition. Oxford University Press, New York, New York, 2006.

Cc: Dennis Deapen, Dr. PH., Thomas M. Mack, M.D., M.P.H., Jonathan Samet M.D., M.S., Kurt Snipes, Ph.D., Janet Bates, M.D., M.P.H. and Margaret McCusker, M.D., M.S.

APPENDIX A



Census tracts within proximity of Inglewood Oil Field perimeter

Legend

- study area
- 1.5 mile buffer
- selected census tracts

Estimated population:

PEPS 2007 = 152,035
Census 2000 = 146,461

Prepared by LA County Department of Public Health, Office of Health Assessment and Epidemiology, 12/2010

Table 1: Crude mortality rates for the Inglewood Oil Field communities and Los Angeles County from 2000-2007

	Inglewood Oil Field Communities		Los Angeles County	
Cause of Death	No. of deaths	Rate*	deaths	Rate*
All Causes	8,708	724	476,493	594.3
Alzheimer's	160	13.3	10,200	12.7
Asthma	30	2.5	1,028	1.3
Breast Cancer (females)	186	28.9	8,774	21.6
Colorectal Cancer	237	19.7	11,056	13.8
Coronary Heart Disease	2,251	187.2	125,526	156.6
Diabetes	310	25.8	16,890	21.1
Emphysema/COPDƚ	322	26.8	21,484	26.8
HIV	96	6.4	3,804	4.7
Homicide	202	16.8	8,352	10.4
Liver Disease	103	8.6	8,600	10.7
Lung Cancer£	501	41.7	24,654	30.7
Motor Vehicle Crash	101	8.4	6,931	8.6
Pancreatic Cancer	134	11.1	6,597	8.2
Pneumonia/Influenza	373	31	18,883	23.6
Stroke	600	49.9	31,928	39.8

* Per 100,000 persons, cumulative over years 2000-2007
ƚ Chronic obstructive pulmonary diseases (COPD) include chronic lower respiratory diseases such as chronic bronchitis, bronchiectasis, and other chronic obstructive pulmonary diseases
£Lung cancer includes cancers of the lung, bronchus and trachea
Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit
Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008

Table 2: Numbers of deaths from all causes of death and age-adjusted rates of mortality for the Inglewood Oil Field communites§ and Los Angeles County, by race/ethnicity for the years 2000-2007

	2000		2001		2002		2003		2004		2005		2006		2007	
	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*	No. of deaths	Death rate*
Inglewood Oil Field Communities	1,071	787.9	1,056	779.9	1,145	824.5	1,136	795.8	1,120	754.9	1,062	708.6	1,060	699.3	1,058	685.1
African American	547	851.4	603	954.6	593	914	631	924.6	607	861.6	570	794.1	577	802.8	569	793.4
Asian / Pacific Islander	52	557.1	59	583	50	459.5	55	509.5	58	531.6	53	432.8	38	292.5	62	430.7
Caucasian	395	828.1	312	666.2	416	844.6	350	743.6	345	724.8	354	723.6	357	759.2	320	673.3
Hispanic	77	504.1	79	465.1	84	486.1	97	656.6	104	589.2	81	488.7	85	411.5	102	446.9
Los Angeles County	59,032	753.7	59,774	756.0	59,586	726.1	61,026	721.3	59,153	682.2	60,145	678.6	59,461	660.6	58,316	624.3
African American	8,256	1,074.8	8,447	1,100.9	8,481	1,077	8,517	1,059	8,372	1,025	8,410	1,016	8,185	984.8	8,023	939.8
Asian / Pacific Islander	4,787	498.2	5,084	511.3	5,255	495.8	5,352	475.7	5,591	472.8	5,820	468.4	5,884	454.2	6,087	439.6
Caucasian	34,688	809.3	34,182	800.7	33,668	772.9	34,100	772	32,320	726.7	32,097	716.3	31,375	704.8	30,590	673.3
Hispanic	11,102	597	11,874	622.4	11,966	587.9	12,801	593.9	12,631	560.9	13,567	572.6	13,783	556.4	13,429	506.2

§2000 Census Tracts: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01,7025.02, 7060.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, 7032.00

* Age-adjusted rate per 100,000 person-years; 'NR' rate not reported due to small numbers

Source: Linked Death Files 2000-2007, Los Angeles County Department of Health Services, Data Collection and Analysis Unit

Population: July 1, 2007 population estimates prepared by WRMA for Urban Research, Los Angeles County ISD, released June 27, 2008.

Table 3: Numbers of low-birth-weight live births and rates of low-birth-weight births for the Inglewood Oil Field communites§ and Los Angeles County, by race/ethnicity for the years 2000-2007

	2000		2001		2002		2003		2004		2005		2006		2007	
	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*	No. of LBW	LBW rate*
Inglewood Oil Field Communities	187	10.3	129	7.5	139	8.2	129	7.5	138	8.0	182	9.9	176	9.3	166	9.0
African American	120	15.7	60	8.8	69	10.1	67	10.4	66	10.7	89	12.9	98	13.7	82	12.5
Asian / Pacific Islander	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR
Caucasian	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR	<20	NR
Hispanic	46	6.2	50	7.2	50	7.4	40	5.4	52	7.4	57	7.7	51	6.8	53	6.7
Los Angeles County	10,080	6.4	10,213	6.7	10,222	6.8	10,794	7.1	10,717	7.1	10,984	7.3	11,196	7.4	11,186	7.4
African American	1,616	12.0	1,489	11.8	1,456	12.2	1,559	13.2	1,478	12.7	1,456	12.8	1,456	12.7	1,429	12.5
Asian / Pacific Islander	1,095	6.7	1,061	6.8	1,151	7.2	1,165	7.1	1,151	6.9	1,244	7.6	1,239	7.4	1,390	7.8
Caucasian	1,827	6.3	1,860	6.6	1,832	6.6	1,883	6.7	1,878	6.8	1,932	7.3	1,775	6.8	1,939	7.5
Hispanic	5,478	5.6	5,714	5.9	5,700	6.0	6,084	6.4	6,111	6.4	6,232	6.6	6,628	6.9	6,298	6.6

§2000 Census Tracts: 2199.00, 2201.00, 2351.00, 2360.00, 2361.00, 2362.01, 2362.02, 2364.00, 2699.01, 2701.00, 2702.00, 2751.00, 2761.00, 6009.02, 6009.11, 6009.12, 6013.01, 6013.02, 6013.03, 7024.00, 7025.01,7025.02, 7060.00, 7027.00, 7028.01, 7030.01, 7030.02, 7031.00, 7032.00

Note: Low birth weight is defined as weight less than 2,500 grams at birth. Numbers in the male and female categories may not add up to the total due to live births designated as unknown gender.

* LBW Rate is defined as the number of low birth weight live births per 100 live births; 'NR' rate not reported due to small numbers

Source: California Department of Public Health, Center for Health Statistics, OHIR Vital Statistics Section, 2000-2007.

Table 4: California Birth Defects Monitoring Program's criteria used for inclusion of birth defect data

Type of Birth Defect	British Pediatric Association (BPA) Code	Continued & Specific Instrucitons
Anencephaly	740.000-740.199	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Spina Bifida Excludes spina bifida if anencephaly (704.000-741.000) present	741.000-741.999	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
EncephaloceleŦ	742.000-742.090	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
MicrocephalusŦ	742.100	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
HydrocephalusŦ Excludes hydrocephaly if spina bifida (741.000-741.999) present	742.300-742.390	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Nervous System AnomaliesŦ Excludes encephalocele (742.000-742.090), microcephalus (742.100), hydrocephaly (742.300-742.390)	742.200-742.299; 742.400-742.999	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Eye Anomalies§	743.000-743.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Ear Anomalies§ Includes anomalies of ear, face & neck	744.000-744.910	DOB 7/1/1990-1997: Continued=any, Specific=any
Cardiac Septal Closure AnomaliesŦ	745.400-745.900	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Transposition of Great Vessels Includes DORV (745.150); only d-TGA; collected for DOB 2001-2003	745.100-745.190	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Tetralogy of Fallot	745.200, 745.210, 747.310	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Other Heart AnomaliesŦ Excludes tetraology of fallot (745.200, 747.310), septal closure defects (745.400-745.900), transposition of great vessels (745.100-745.190)	745.000-745.020; 745.300-745.305; 746.000-746.990	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Circulatory System AnomaliesŦ	747.100-747.900	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Respiratory System Anomalies§	748.000-748.904	DOB 7/1/1990-1997: Continued=any, Specific=any

Cleft palate and/or cleft lip	749.000-749.294	DOB 7/1/1990-1997, 1999-2002: Continued=any, Specific=any
Tracheoesophageal (TEF)/Fistula§ Includes esophageal atresia +/- TEF; excludes esophageal stenosis	750.300-750.320	DOB 7/1/1990-1997: Continued=any, Specific=any
Pyloric Stenosis§	750.510	DOB 7/1/1990-1997: Continued=any, Specific=any
Small Intestinal Atresia§ Excludes stenosis of duodenum (751.130), jejunum (751.140), ilieum (751.150), stenosis small intestine NOS with fistula (751.185), stenosis small intestine NOS without fistula (751.180) and duodenal web (751.160)	751.100-751.120; 751.190-751.195	DOB 7/1/1990-1997: Continued=any, Specific=any
Large Intestinal Atresia§ Excludes stenosis of large intestine (751.206), stenosis rectum with fistula (751.215) , stenosis rectum without fistula (751.225), stenosis anus with fistula (751.236), stenosis anus without fistula (751.246)	751.200, 751.210, 751.220, 751.235 751.237, 751.239, 751.245, 751.247, 751.249	DOB 7/1/1990-1997: Continued=any, Specific=any
Hirschsprung	751.300-751.340	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Genital Anomalies§	752.000-752.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Urinary System Anomalies§	753.000-753.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Musculo-skeletal§	754.000-754.884	DOB 7/1/1990-1997: Continued=any, Specific=any
Limbs§	755.000-755.904	DOB 7/1/1990-1997: Continued=any, Specific=any
Other Musculoskeletal Anomalies§	756.000-756.994	DOB 7/1/1990-1997: Continued=any, Specific=any
Anomalies of the Integument§	757.000-757.990	DOB 7/1/1990-1997: Continued=any, Specific=any
Down SyndromeŦ	758.000-758.099	DOB 7/1/1990-1997, 1999-2000: Continued=any, Specific=any
Other Chromosomal Anomalies§	758.100-758.999	DOB 7/1/1990-1997: Continued=any, Specific=any
Other Congenital Disorders§	759.000-759.999	DOB 7/1/1990-1997: Continued=any, Specific=any

Ŧ CBDMP reported data for DOB 1990-2000, excludes 1998 incomplete data collected for that year

§ CBDMP reported data for DOB 1990-1997

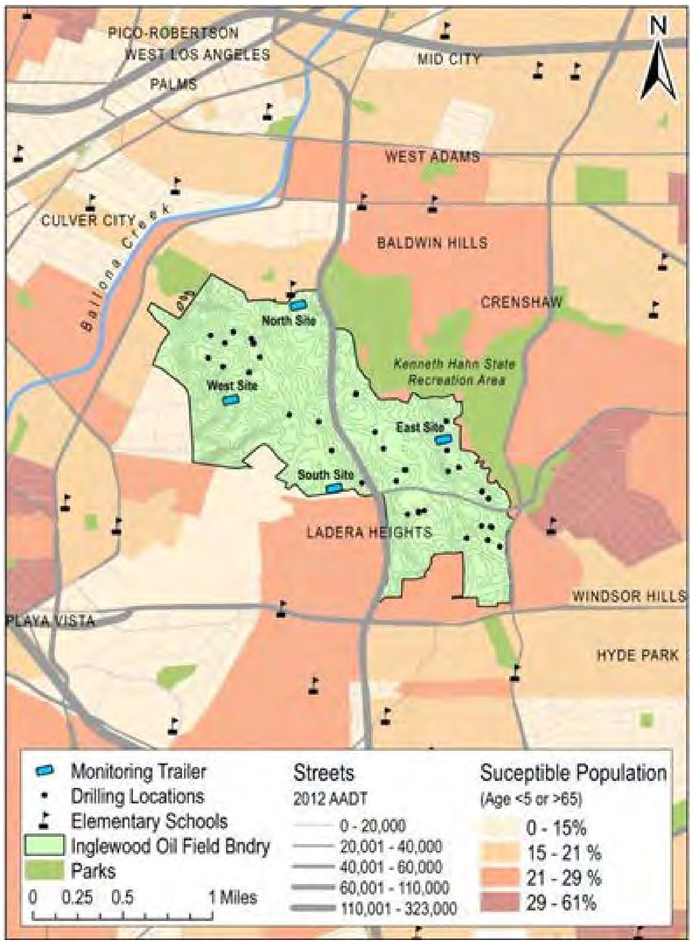
* Data for chromosome defects & birth defects with abnormal chromosomes differs over time

Excerpt of reference cited at point c. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://case.planning.lacounty.gov/assets/upl/project/bh_air-quality-study.pdf

Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

Baldwin Hills Air Quality Study



Final Report prepared for

Los Angeles County
Los Angeles, California

February 2015

Baldwin Hills Air Quality Study

Final Report

STI-912024-5924-FR

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Executive Summary

Overview

The Inglewood Oil Field operates within the Baldwin Hills Community Standards District (CSD) of Los Angeles County. The County commissioned the Baldwin Hills Air Quality Study as part of an agreement settling legal challenges to an Environmental Impact Report (EIR; Marine Research Specialists, 2008) concerning development at the Oil Field. Multiple community groups around the Oil Field were concerned with potential pollutant impacts due to Oil Field activities. Sonoma Technology, Inc. (STI) developed and conducted the Baldwin Hills Air Quality Study.

The Baldwin Hills Air Quality Study focused on two primary and two secondary objectives set forth by the settlement agreement.

- Primary project objectives
  - Quantify the air toxics emissions from the Inglewood Oil Field (referred to as Oil Field throughout this document) operations, including drilling and well workovers.
  - Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.
- Secondary project objectives
  - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.
  - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

The Inglewood Oil Field is one of many sources of air pollution within the South Coast Air Basin (Basin). The Basin is a highly urbanized area of over 17 million people. Emissions sources in the Basin include about 11 million motor vehicles and many industrial and commercial operations. The Inglewood Oil Field is located in the western, urbanized portion of the Basin surrounded by major freeways and bisected by La Cienega Boulevard, a busy arterial road. Major industrial emissions sources mostly lie to the south and southeast, and Los Angeles International Airport is about 4 miles to the south-southwest.

Methods

STI considered the 37 air toxics emitted from the Oil Field and performed a hazard identification to prioritize the air toxics of greatest concern. STI used emissions values from the EIR to compare the pollutants' relative toxicities by weighting these emissions in relation to acute and chronic health benchmark levels from the California Office of Environmental Health Hazard Assessment (OEHHA). Chronic cancer potency risk factors and chronic and acute Reference Exposure Levels (RELs) were obtained from the OEHHA (California Environmental Protection Agency, 2011, 2014) http://www.oehha.ca.gov/air/allrels.html. Acute RELs can be either 1-hr, 8-hr, or 24-hr values; the lowest REL was chosen to provide a conservative estimate of acute toxicities. From this weighting of emissions rates, the pollutants were rank-ordered to prioritize the list. Key pollutants identified for characterization included diesel particulate matter

(DPM), cadmium, benzene, nickel, formaldehyde, mercury, manganese, acrolein, arsenic, and lead.

Four types of monitoring were used: (1) Aethalometers to measure black carbon (as a proxy for DPM); (2) X-ray fluorescence spectrometer (XRF) for metals; (3) Proton Transfer Reaction Time of Flight Mass Spectrometry (PTR-TOFMS) for VOCs; and (4) meteorological sensors to help assess the wind patterns, temperature, and humidity that might influence pollutant concentrations.

The field study began in November 2012 and ended in November 2013. **Table ES-1** shows the sampling durations and windows of operation for black carbon (BC), metals, and VOCs. A map of the monitoring locations is shown in **Figure ES-1**.

Table ES-1. The four monitoring sites at the Inglewood Oil Field, with corresponding windows of operations and sampling durations for BC (as a surrogate for DPM), metals, and VOCs.

Site Name	Window of Operation and Duration		
	BC	Metals	VOCs
North (N)	11/15/12–11/15/13 1 year	–	–
South (S)	11/15/12–11/15/13 1 year	–	–
East (E)	11/15/12–11/15/13 1 year	11/15/12 – 2/1/13 2.5 months	7/3/13–7/17/13 2 weeks
West (W)	11/15/12–11/15/13 1 year	–	–

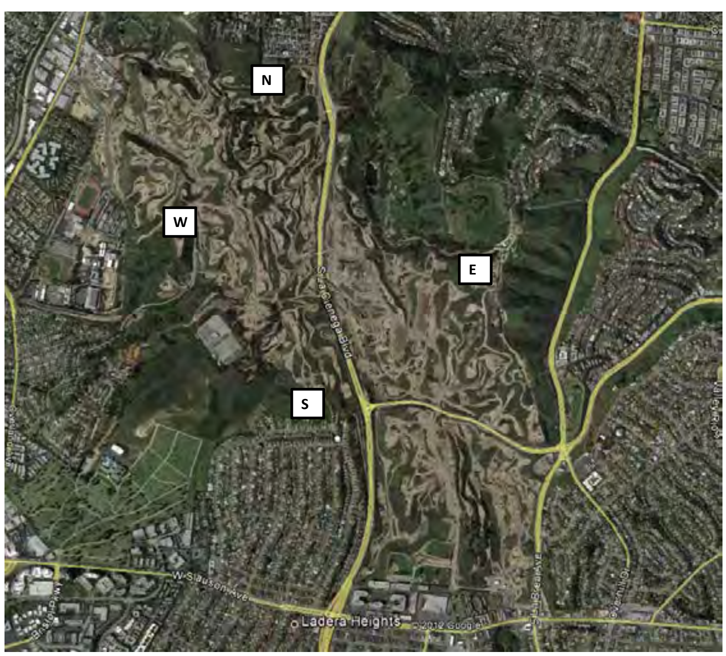


Figure ES-1. Aerial view of the Inglewood Oil Field, showing the locations of the four monitoring sites: North (N), East (E), South (S), and West (W).

Results

Primary Objective 1 – Quantify the air toxics emissions from the Inglewood Oil Field operations, including drilling and well workovers.

STI determined that there were statistically significant increases in concentrations of DPM that are associated with Oil Field operations when winds are from the west-southwest. Black carbon (BC) concentrations increased by 0.036 to 0.056 µg/m^3 on average when winds originated from the west-southwest, compared to annual mean BC concentrations of approximately 0.67 µg/m^3. West-southwest winds occurred 53% of the time during the study, primarily during daytime hours. BC concentrations across the Oil Field were higher during daytime and weekdays, which correlates with the timing of well workover and maintenance activities, and traffic patterns. BC concentrations declined across the Oil Field when winds were from the east-northeast, which occurred 25% of the time, primarily during nighttime hours. Winds from the north-northwest occurred only 7.8% of the time and were not associated with statistically significant changes in downwind concentrations. Winds from the south-southeast occurred 13.1% of the time and were associated with downwind increases of 0.01 to 0.03 µg/m^3. In summary, the largest potential for increased exposures from Oil Field operations is found east-northeast of the Oil Field. Diesel emissions from the Oil Field represent a relatively small fraction of the overall health risk from air toxics (both for pollutants measured in this study and for those identified in the LA Basin MATES IV study). Diesel emissions from all sources translate into approximately 250 excess cancer risk per million, of which 6.7 per million are from the Oil Field operations.

Regarding excess cancer risk, the OEHHA states, “For chemicals that are listed as causing cancer, the "no significant risk level” is defined as the level of exposure that would result in not more than one excess case of cancer in 100,000 individuals exposed to the chemical over a 70-year lifetime. In other words, a person exposed to the chemical at the “no significant risk level” for 70 years would not have more than a “one in 100,000” chance of developing cancer as a result of that exposure.”[1] Therefore, 6.7 excess cancer risk per million is less than the OEHHA’s “no significant risk level.”

STI determined that Oil Field operations were associated with potential increases in nickel and manganese concentrations. Case study analysis showed that both of these pollutants were potentially associated with Oil Field operations. Contributions of the Oil Field were not quantified for nickel and manganese because the concentrations were well below dose-response levels of concern.

STI determined that Oil Field operations were associated with transient increases in concentrations of toluene, benzene, and acetaldehyde. These transient concentration increases were not large enough to be statistically quantifiable because of the infrequent occurrences during the course of the two-week deployment of the PTR-TOFMS.

[1] See “Proposition 65 in Plain Language” at http://www.oehha.ca.gov/prop65/background/p65plain.html.

Primary Objective 2 – Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.

Figure ES-2 shows that estimated diesel particulate matter concentrations in the area constitute the dominant contribution to excess cancer risk from ambient air. The relative contribution from the Oil Field is a small fraction of the total risk. Total risk estimates for each of the air toxics are in reasonable agreement with SCAQMD MATES IV draft estimates of excess cancer risk across the Los Angeles Basin, with the notable exception of cadmium. However, cadmium concentrations are over 50 times higher than the averages reported in MATES IV.

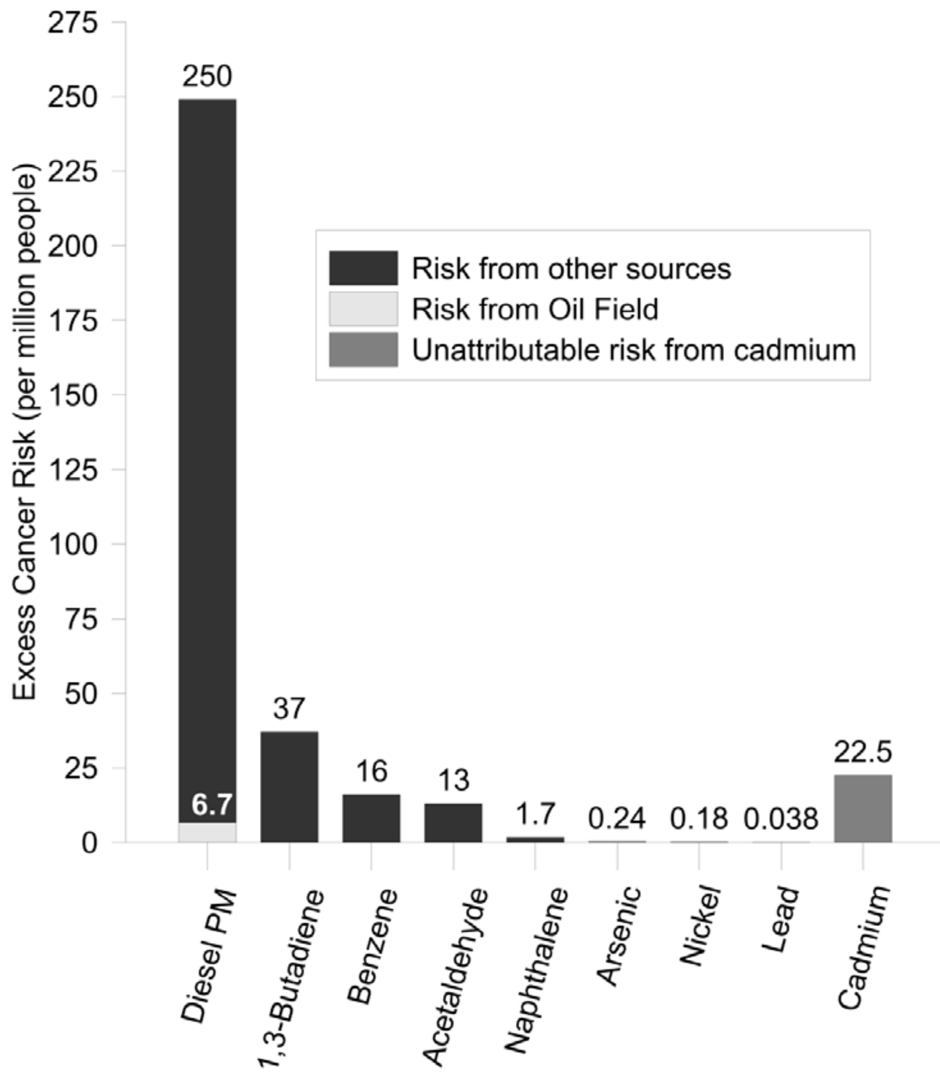


Figure ES-2. Individual pollutant contributions to total excess cancer risk (per million people) at the Baldwin Hills Air Quality Study. The graph shows total risk from ambient air and the incremental contribution of the Oil Field. Cadmium risk could not be attributed and should be verified by measurement intercomparisons.

For DPM, STI used black carbon (BC) as a proxy for DPM concentrations. We converted BC concentrations to DPM concentrations using a BC:EC conversion ratio of 1.5 and the EC:DPM conversion ratio of 0.82 from MATES IV. Cancer risk from DPM on the east side of the Oil Field was estimated to be 6.7 to 11.3 excess cancer cases per million as a result of Oil Field operations and roadway traffic. The lower estimate that does not include the possible influence of La Cienega Blvd. is 6.7-per-million excess cancer cases as a result of Oil Field operations. The Oil Field operations had no measurable impact for DPM on residents living west and south of the Oil Field, and an impact of less than 1-per-million excess cancer risk to residents living north of the Oil Field.

No other pollutants had strong statistical evidence of chronic or acute risk resulting from Oil Field operations. We found no evidence of contributions to other key species such as benzene, acetaldehyde, acrolein, or 1,3-butadiene. It is possible that the Oil Field operations could contribute significantly to some of these species, but we have no compelling evidence to suggest it does, based on the two weeks of VOC monitoring. Additionally, the concentrations observed at the Oil Field are generally consistent with concentrations observed in other parts of the Los Angeles Basin, suggesting that any possible contributions of the Oil Field are incremental or marginal, rather than a dominant local source. However, there is indirect and case-study evidence of potential chronic risk from Oil Field operations for other pollutants. These are quantified below.

- Cadmium – Cadmium concentrations were not attributable to the Oil Field or other sources. First, the average concentration of cadmium was below the analytical method's method detection limit (MDL) of ~5.7 ng/m^3, which indicates that the concentration is relatively uncertain for the 2.5-month monitoring period; 64% of all hourly values were below the MDL. Second, cadmium concentrations were not statistically associated with Oil Field operations (wind direction, time-of-day, or day-of-week). However, concentrations of cadmium were much higher than those measured in the SCAQMD's Multiple Air Toxics Exposure Study (MATES) III and draft MATES IV results,[2] which may indicate a local Oil Field contribution. If we assume the entire excess compared to the Los Angeles Basin background found in MATES IV is attributable to the Oil Field, about 5 ng/m^3 would be from the Oil Field. It is also possible that methodological issues with the analytical technique may be yielding spuriously high concentrations. We note that internal calibrations of cadmium against a cadmium standard did not reveal any problems. Additional comparison of the XACT 625 XRF cadmium concentrations with concentrations using the methods from MATES IV should be performed to verify the reported concentrations.
- As mentioned above, cadmium concentrations measured at the Oil Field were higher than those reported in MATES III and IV. Given that the cadmium concentrations are about 50 times higher than those measured throughout the Los Angeles Basin in MATES IV's preliminary results, we suspect that the analytical methods employed in the two studies may not be comparable. The potential additional cancer risk from cadmium exposures is as much as an additional 22-per-million cancer risk. Note that this is a very conservative upper estimate that does not make any adjustments for seasonality or potential measurement uncertainty.

[2] http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv.

- Nickel – Oil Field operations may contribute to higher average nickel concentrations. However, average nickel concentrations were below the dose-response screening level for chronic cancer risk (1-in-a-million) and noncancer hazard (0.1 hazard index). Thus, total concentrations were not high enough to warrant further analysis. We also note that a single 1-hr average concentration of nickel exceeded the acute REL. Case study analysis showed that the winds associated with this hourly value were from the northeast and did not originate from the Oil Field.
- Manganese - Oil Field operations may contribute to higher average manganese concentrations. However, average manganese concentrations were below the dose-response screening level for noncancer hazard (0.1 hazard index). Thus, total concentrations were not high enough to warrant further analysis.

Figure ES-3 shows chronic noncancer hazard quotients for pollutants measured at the Oil Field. A hazard quotient less than a value of one indicates that no adverse health effects are expected as a result of exposure. Only acrolein is near a value of one, and its contributions were not deemed to be originating from Oil Field sources. All other pollutants had hazard quotient values well below the threshold of adverse health effects.

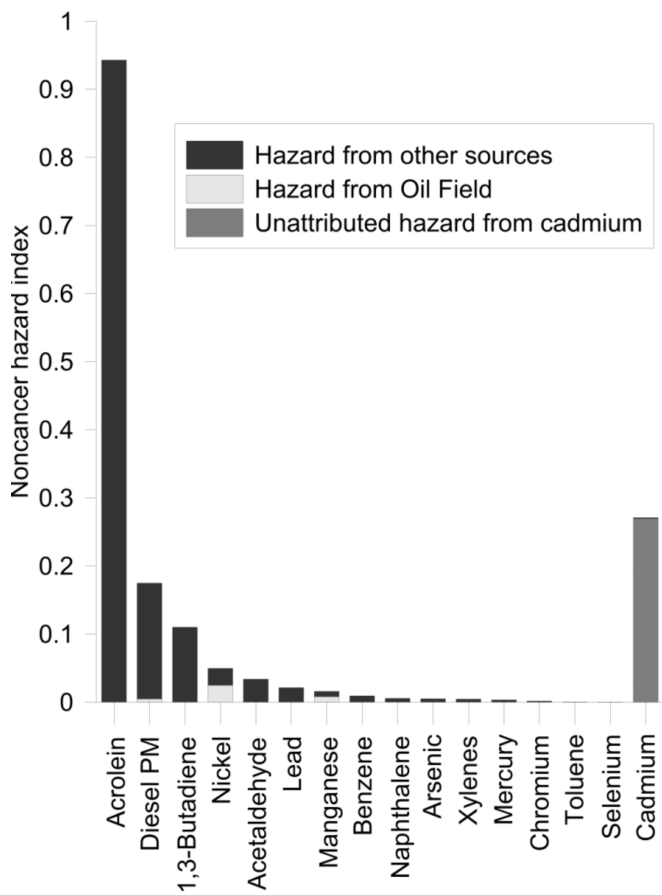


Figure ES-3. Relative contributions to the chronic noncancer hazard index for the Baldwin Hills Air Quality Study. This graph shows total chronic noncancer hazard from ambient air and the incremental contribution of the Oil Field. If the noncancer hazard index is below a value of one, then no adverse effects are expected.

Secondary Objective 1 - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.

The major sources of air toxics emissions within the areas including the Oil Field were expected to be Oil Field operations and traffic on La Cienega Blvd. Differential analysis of BC concentrations when winds were from the west-southwest showed that concentrations across the Oil Field and La Cienega Blvd. were higher, on average (East minus South pair), than those at the site pair that crossed the Oil Field and not La Cienega Blvd. (North minus West pair). The average difference between the two was 0.02 μg/m^3 of BC, which is equivalent to a 4.7-per-million cancer risk increase from the traffic on La Cienega. The total BC contribution from the Oil Field was 0.036 μg/m^3 when winds were from the west-southwest. When averaged across the yearly wind pattern climatology, this equates to a 6.7-per-million cancer risk increase (because winds were from west-southwest only 53% of the time). Oil Field BC contributions were higher on weekdays than weekends, and higher during the daytime hours than at night. This temporal pattern of higher daytime and weekday BC concentration differentials is consistent with the timing of the operation of Oil Field maintenance and workover rigs. Up to eight rigs were available, and they only operate Monday through Friday from 7:00 a.m. to 5:00 p.m. LST. This diurnal and weekday-weekend pattern is also consistent with heavy-duty truck traffic on surface streets on La Cienega Blvd. and Stocker St. Thus, the East minus South site comparison has an additional increment of diesel PM attributable to onroad vehicle emissions.

In addition to the quantifiable contributions of the Oil Field operations and traffic on La Cienega, case study analysis and receptor model source apportionment studies identified a few cases of transient high concentrations associated with individual operations of the Oil Field. For example, high concentrations of BC, acetaldehyde, acrolein, benzene, and toluene were associated with drilling operations near the East site on July 10 and 11, 2013. High manganese and nickel concentrations were sometimes associated with winds from the Oil Field, although no drilling operations were pinpointed that could be associated with them.

It was not feasible to distinguish other major sources of toxic air emissions in the areas surrounding the Oil Field with the available monitoring resources.

Secondary Objective 2 - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

The total chronic health risk of all major pollutants targeted and quantified in the study is shown in Figures ES-2 and ES-3 for cancer risk and noncancer hazard, respectively.

Total cancer risk from the measured pollutants summed to 340-per-million people. 74% of the cancer risk was attributable to measured DPM concentrations. An estimate of the Oil Field operations is a contribution of about 6.7-per-million of the total additional cancer risk for residents on the east side of the Oil Field. Note that this incremental risk is likely an upper estimate of the risk for residents, since the DPM will be further diluted and dispersed as it is transported toward the communities east of the Oil Field.

The total chronic noncancer hazard for all major pollutants is shown in Figure ES-3. A noncancer hazard of 1.0 is considered the "health reference level" and is expected to be below the level at which adverse human health effects would occur. Thus, acrolein, which has the highest noncancer hazard index at 0.94, is expected to have no adverse health impacts. However, we note that for most of the toxics shown in Figure ES-3, there is some additional uncertainty associated with the shorter sampling periods (2.5 months for metals, 2 weeks for VOCs); these values do not necessarily represent true annual mean concentrations. Additionally, we are considering each pollutant's effect individually; these pollutants may have additive or synergistic effects that would lead to higher estimated cumulative risks than the estimates shown below.

The sum of noncancer hazard effects summed across all pollutants is 1.65. The noncancer hazard potentially attributable to Oil Field operations is 0.0047 from DPM, less than 0.05 from nickel, and less than 0.016 from manganese. The total across all pollutants potentially associated with Oil Field operations is less than 0.2, which is below the expected level at which adverse chronic health effects would occur. Cadmium contributes an additional 0.27 noncancer hazard, but its source was not attributed. Nonetheless, it is also below the levels at which adverse chronic health effects would occur.

Finally, we found no evidence of acute concentrations exceeding the REL that were associated with Oil Field operations. The single 1-hr concentration of nickel that was above the 1-hr REL was associated with winds originating from outside of the Oil Field.

1. Introduction

The Inglewood Oil Field operates within the Baldwin Hills Community Standards District (CSD) of Los Angeles County. The County commissioned the Baldwin Hills Air Quality Study as part of an agreement settling legal challenges to an Environmental Impact Report (Marine Research Specialists, 2008) concerning development at the Oil Field. Multiple community groups around the Oil Field were concerned with potential pollutant impacts due to Oil Field activities. Sonoma Technology, Inc. (STI) developed and conducted the Baldwin Hills Air Quality Study.

1.1 Objectives

The Baldwin Hills Air Quality Study focused on two primary and two secondary objectives.

- Primary project objectives
  - Quantify the air toxics emissions from the Inglewood Oil Field (referred to as Oil Field throughout this document) operations, including drilling and well workovers.
  - Assess the health risk of both acute and chronic exposure to air toxics emitted from Oil Field operations.
- Secondary project objectives
  - To the extent feasible, determine and distinguish the major sources of toxic air emission within the areas surrounding the Oil Field.
  - To the extent feasible, assess the Oil Field's contribution to the overall acute and chronic health risk in the areas surrounding the Oil Field.

As summarized in the Baldwin Hills Community Standard's District Environmental Impact Report (EIR) (Marine Research Specialists, 2008), there are a number of air toxics of concern, including diesel particulate matter (DPM), trace metals, and gaseous volatile organic compounds (VOCs). These different pollutants cannot be measured with a single device, so multiple monitoring and analytical methods were needed. To quantify air toxics emissions from the Oil Field and to assess acute risk from the air toxics of concern, short duration samples were needed. To assess chronic risk, long-term averages that are representative of annual concentrations were needed. Characterizing both short- and long-term concentrations across the large number of air toxics emitted from the Oil Field required that we prioritize the air toxics of greatest concern. We also had to account for hourly and seasonal variations in meteorological patterns, which influence the dispersion and transport of Oil Field emissions to the surrounding community. The challenge of requiring multiple measurement methodologies and short sampling durations, while accounting for variable meteorology, is a common but difficult one.

1.2 Hazard Identification

STI considered 37 of the most important air toxics emitted from the Oil Field and performed a hazard identification to prioritize the air toxics of greatest concern. STI used emissions values from the EIR to compare the pollutants' relative toxicities by weighting these emissions in relation to acute and chronic health benchmark levels from the California Office of Environmental Health Hazard Assessment (OEHHA). Chronic cancer potency risk factors and chronic and acute Reference Exposure Levels (RELs) were obtained from the OEHHA (California Environmental Protection Agency, 2011, 2014) www.oehha.ca.gov/air/allrels.html. Acute RELs can be either 1-hr, 8-hr, or 24-hr values; the lowest REL was chosen to provide a conservative estimate of acute toxicities. From this weighting of emissions rates, the pollutants were rank-ordered to prioritize the list. **Table 1-1** shows the final result from this weighting scheme, with the top 13 pollutants listed. Note that this weighting was performed in early 2012, and RELs and cancer potency factors for some of the pollutants have changed since that time. See Section 2, Table 2-4 for the 2014 dose-response factors that are used in the final risk assessment.

For chronic cancer risk, DPM from the diesel generators is the most significant pollutant. This is consistent with the findings from the Multiple Air Toxics Exposure Study (MATES) III and IV, conducted by South Coast Air Quality Management District (SCAQMD), which found DPM (based on proxy measurements of elemental carbon) to be the most important toxic pollutant contributing to risk in the Los Angeles Basin (South Coast Air Quality Management District, 2008). In our analysis, the only other pollutants with cancer risks of 1% or more of the risk from DPM were cadmium (5%), benzene (2%), nickel (1%), and formaldehyde (1%). The cumulative risk from emissions of all other (non-DPM) pollutants was approximately 10% of the estimated risk from emissions of DPM.

For chronic noncancer risks, many pollutants were of similar importance. Nickel presented the highest risk, followed by DPM (86% of nickel), cadmium (78%), chlorine (67%), mercury (39%), formaldehyde (20%), manganese (17%), acrolein (14%), arsenic (13%), and lead (11%). These noncancer risks can be reproductive, respiratory, or neurological, or they may involve a host of other effects. The similar ranking across pollutants indicates that there is no single driver of chronic health impacts based on the emissions and that a number of pollutants may be important to monitor.

For acute noncancer risks, formaldehyde was the most important pollutant, followed by manganese (46% of formaldehyde). Mercury (10%), acrolein (10%), arsenic (5%), and nickel (4%) were also on the list but are of less importance. Acute effects occur on time scales shorter than one day.

The comparison of emissions from the 2005-2006 inventory shows that the key pollutant to measure from a toxicity standpoint is DPM. Unfortunately, no direct measurement method of DPM is possible (as discussed by MATES III), so a proxy was used to estimate DPM concentrations. After DPM, the key pollutants to measure included nickel, cadmium, benzene, formaldehyde, manganese, arsenic, acrolein, and mercury. However, the chemical and physical characteristics of these different pollutants required multiple measurement methodologies. Key pollutants other than DPM can be categorized as metals (nickel, arsenic, lead, manganese, and cadmium), hydrocarbons (benzene), and carbonyls (formaldehyde, acrolein). The results of the hazard identification and dose-response assessment drove our study methodology choices to focus on the key pollutants of concern from a health standpoint.

Table 1-1. List of key pollutants and their relative risk-weighted emissions toxicities based on the 2005-2006 EIR emissions and OEHHA dose-response factors from 2011.

Pollutant	Total Lbs/Year	Fraction from Drilling and Well Workovers	Cancer 1-in-a-Million Level[1] (µg/m³)	Acute REL (µg/m³)	Chronic REL (µg/m³)	Cancer Risk Relative to DPM	Chronic REL Relative to Nickel	Acute REL Relative to Formaldehyde	Cancer Rank	Chronic REL Rank	Acute REL Rank
Diesel Exhaust PM	1326.8	0.99	3.3×10^{-3}	–	5	1.00	0.86	–	1	2	–
Cadmium	4.8	1.00	2.4×10^{-4}	–	0.02	0.05	0.78	–	2	3	–
Formaldehyde	547.9	0.76	1.7×10^{-1}	9	9	0.01	0.20	1.00	5	6	1
Nickel	15.3	1.00	3.8×10^{-3}	6	0.05	0.01	1.00	0.04	4	1	6
Chlorine	41.6	1.00	–	210	0.2	–	0.67	0.00	–	4	9
Manganese	4.8	1.00	–	0.17	0.09	–	0.17	0.46	–	7	2
Mercury	3.6	1.00	–	0.6	0.03	–	0.39	0.10	–	5	3
Acrolein	14.7	0.70	–	2.5	0.35	–	0.14	0.10	–	8	4
Lead	5.1	1.00	8.3×10^{-2}	–	0.15	0.00	0.11	–	–	10	–
Arsenic	0.6	1.00	3.0×10^{-4}	0.2	0.015	0.00	0.13	0.05	6	9	5
Benzene	340.9	0.17	3.4×10^{-2}	1300	60	0.02	0.02	0.00	3	11	8
PAHs	16.9	0.79	9.1×10^{-5}	–	–	0.00	–	–	7	–	–
Acetaldehyde	215.9	0.96	3.7×10^{-1}	470	140	0.00	0.01	0.01	8	12	7

PM: Particulate matter

PAHs: Polycyclic aromatic hydrocarbons

Cancer 1-in-a-million level: Concentration in µg/m³ at which a 70-year exposure would result in one excess cancer case among 1 million people

1.3 Report Overview

- Section 2 of this report describes the study methodology, monitoring, timeline, and analysis methods used to address these complex issues.
- Section 3 describes the results of the study. The results are separated into sections based on the monitoring technology used to measure them; a final section describes the Oil Field's quantitative contribution to health risk.
- Section 4 discusses the study results and compares them to the project objectives.
- Section 5 lists the references used for the study.
- Appendix A provides additional well data, and Appendix B provides additional traffic data. Appendix C provides plots for all measured metals species, and Appendix D shows additional results from comparing VOC measurement methods.

2. Methods

2.1 Overview

In designing a monitoring plan that would yield high-quality data useful for evaluating the Oil Field's contribution to air toxics concentrations in surrounding communities, STI considered the influences of meteorology, topography, land area, and background concentrations from other sources. In addition, we considered the types and timing of Oil Field activities that generate different pollutants and the most appropriate monitoring methods for each pollutant. All these factors affected the frequency of sampling, the duration of sampling, and the placement of the monitors.

STI used a combination of monitoring methods to cover the primary pollutants that are likely to be emitted from the Inglewood Oil Field and have an adverse impact on human health.

1. Choose the best available monitoring methods applicable to the selected species for cost, reliability, detection limits, and overall data quality.
2. Select the monitoring locations, and determine the frequency, duration, and type of sampling to occur at each location. This includes evaluation of diurnal and seasonal meteorological patterns (primarily wind speed and wind direction), local topography, and the spatial distribution of wells, storage tanks, drilling locations, and other potential sources within the Oil Field.
3. Plan the sampling logistics (e.g., power availability, accessibility, and communications) and implement the monitoring.
4. Establish routine protocols with the Oil Field operators and Los Angeles County to maintain an up-to-date log of Oil Field activities that will be used, in conjunction with collected data, to assess Oil Field contributions.

This section describes the monitoring locations (Section 2.2), timeline (Section 2.3), analytical methods (Section 2.4), the health risk assessment approach (Section 2.5), and the data analysis approach (Section 2.6) used to complete the project.

2.2 Locations

In determining the best locations for monitoring sites, STI considered the impact of meteorological patterns on the dispersion and transport of air toxics, as well as potential emissions from nearby roadways and other regional sources. Available meteorological data from the existing meteorological tower within the Oil Field, as well as data from the SCAQMD stations at LAX and at West Los Angeles, were evaluated for diurnal and seasonal wind patterns, and the placement of the monitors was based upon these documented wind flows. Local topography and existing obstructions that might influence wind patterns were also considered so that measurements would be made upwind and downwind of the Oil Field, whether the winds were from the west-southwest (onshore) or from the east-northeast (offshore).

Onsite inspections within the Oil Field were made to identify potential areas for monitoring that considered wind patterns, were accessible, and had or could have electrical power available. The decision on the number and placement of the monitors was based upon all the above factors, as well as official siting criteria for air quality monitoring established by the U.S. EPA (U.S. Environmental Protection Agency, 2006).

Four sites were chosen to conduct the continuous monitoring. **Figure 2-1** is an aerial view of the Inglewood Oil Field and neighboring communities. The four sites are shown in this figure, labeled North (N), East (E), South (S), and West (W). Each of these sites was equipped with cellular modems allowing sub-hourly data retrieval and remote access to instrumentation for diagnostics and troubleshooting.

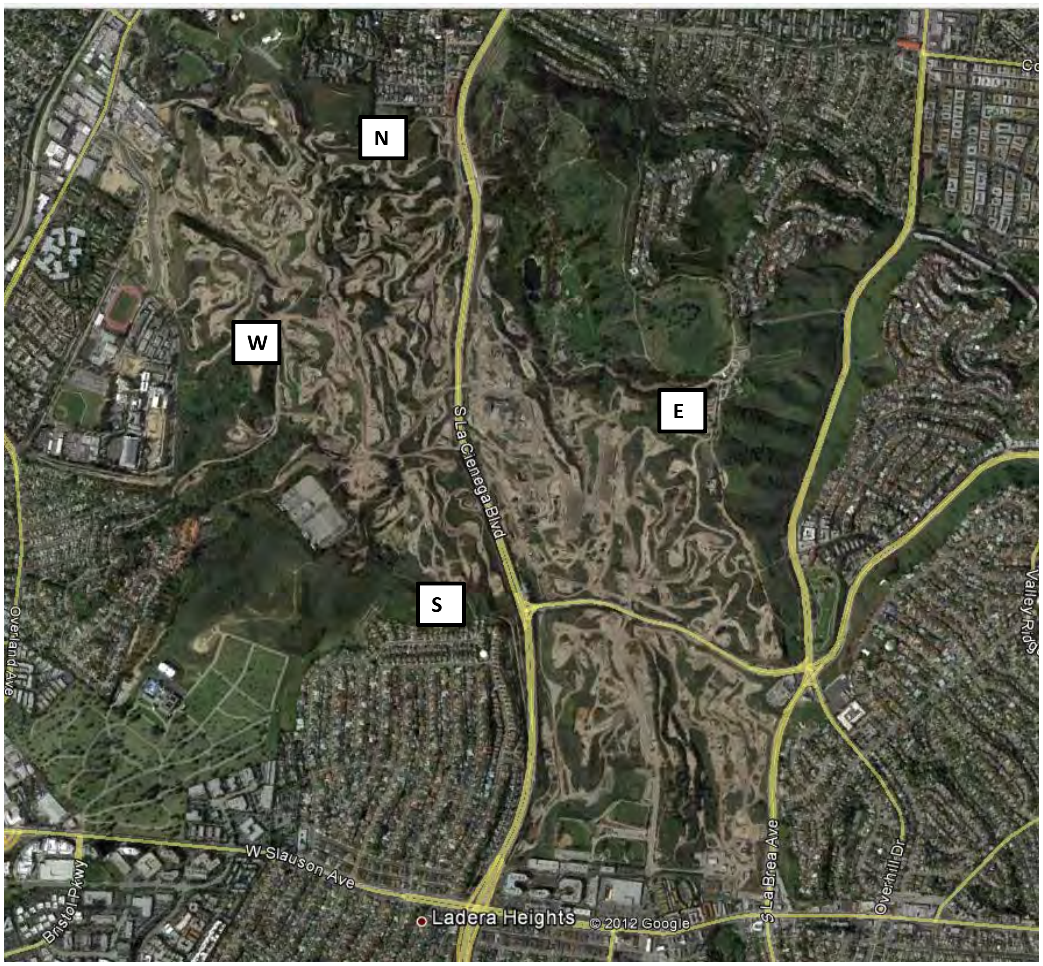


Figure 2-1. Aerial view of the Inglewood Oil Field, showing the locations of the four monitoring sites: North (N), East (E), South (S), and West (W).

The primary monitoring site (Site E) was a small trailer that housed a Teledyne-API Model 633 Aethalometer for BC, the XACT 625 semi-continuous XRF spectrometer for metals during its deployment, and the PTR-TOFMS for VOCs during its deployment; the site also hosted a tower with a full complement of meteorological instrumentation. This main monitoring station's site was chosen to reflect concentrations during both onshore and offshore wind flow conditions.

Besides the main site, three additional sites (N, S, and W) were established to support the semi-continuous Aethalometer measurements of BC. Their placement made it possible to obtain data from both upwind and downwind locations during both onshore and offshore wind flow conditions. **Table 2-1** lists the locations of all monitoring sites and measurements for the study.

Table 2-1. Names, locations, and elevations of the four monitoring sites at the Inglewood Oil Field.

Site Name	Location[a] (Lat/Lon)	Elevation (ft)	Pollutants Monitored
North (N)	34° 00' 48" N 118° 22' 37" W	271	BC for 1 year
South (S)	33° 59' 55" N 118° 22' 23" W	375	BC for 1 year
East (E)	34° 00' 18" N 118° 21' 51" W	503	BC for 1 year Metals[b] for 2.5 months VOCs for 2 weeks
West (W)	34° 00' 20" N 118° 22' 53" W	402	BC for 1 year

[a] Latitude and longitude are given to the nearest minute
[b] The plan was to operate a minimum of one month during active drilling operations at each of Sites S and E; however, it was apparent that the South site was rarely downwind of the Oil Field, so the metals monitor was left at the East site where it was frequently downwind of the Oil Field.

2.3 Timeline

The field study began in November 2012 and ended in November 2013. **Table 2-2** shows the sampling durations and windows of operation for BC, metals, and VOCs. Details of the analytical methods are provided in Section 2.4.

2.4 Analytical Methods

Four types of monitoring were used: (1) Aethalometers to measure black carbon (as a proxy for DPM); (2) X-ray fluorescence spectrometer (XRF) for metals; (3) Proton Transfer Reaction Time of Flight Mass Spectrometry (PTR-TOFMS) for VOCs; and (4) meteorological sensors.

Table 2-2. The four monitoring sites at the Inglewood Oil Field, with corresponding windows of operations and sampling durations for BC (as a surrogate for DPM), metals, and VOCs.

Site Name	Window of Operation and Duration		
	BC	Metals	VOCs
North (N)	11/15/12–11/15/13 1 year	–	–
South (S)	11/15/12–11/15/13 1 year	–	–
East (E)	11/15/12–11/15/13 1 year	11/15/12 – 2/1/13 2.5 months	7/3/13–7/16/13 2 weeks
West (W)	11/15/12–11/15/13 1 year	–	–

2.4.1 Aethalometer (Black Carbon)

DPM emissions ranked highest among the air toxics of concern associated with activities at the Oil Field. We studied DPM by measuring its surrogate, black carbon (BC) at the four monitoring sites for one year. This amount of continuous (hourly) BC data is enough to represent seasonal variability in DPM concentrations, differences between workdays and non-workdays, and upwind/downwind differences under various meteorological conditions.

Teledyne-API Model 633 dual wavelength Aethalometers were deployed in enclosures at the monitoring sites. These instruments measure the light transmittance through a collection spot on a reel-to-reel filter tape and report data at 5-minute intervals. The aerosol is collected on an area of quartz fiber filter at a moderate face velocity. The sample air stream is drawn through the filter by a continuously operating pump. The optical attenuation of the aerosol deposit on the filter is measured by detecting the intensity of light transmitted through the spot on the filter. Measurements are corrected for optical saturation by using two collection spots where data are collected at different flow rates. Quality control protocols for the Aethalometer BC measurements rely on review of raw data, remotely, on a daily or more frequent basis, as well as routine field maintenance procedures and associated record-keeping.

An integral part of the monitoring study was a web-based data retrieval system to allow routine viewing of real-time BC (and meteorological) data. Data were retrieved from each BC monitoring site frequently (typically, every 10 minutes) by cell phone modem and transferred to STI's web server; the data then underwent auto-screening quality assurance procedures and were posted in graphical format to a password-protected web page for viewing by authorized personnel.

Regularly scheduled site visits were made for routine maintenance, including tape changes (the filter tape that collects BC samples), inlet cleaning, flow checks with a certified reference flow meter, and troubleshooting.

The hourly BC data was further quality-assured by a visual inspection of minimum and maximum data values, stuck values, and baseline shift, as well as by direct comparison with other concurrently measured air quality and meteorological data. The validated BC data were compared to activity logs of the Oil Field for qualitative evaluation of potential sources.

2.4.2 X-Ray Fluorescence Spectrometer (Metals)

To determine the impact of metal emissions from the Oil Field on the surrounding community, we used a specialized instrument, the XACT 625 semi-continuous X-ray fluorescence spectrometer (XRF). The instrument quantified a suite of 24 metals on an hourly basis for a period of about 2.5 months.

The XACT 625 automated multi-metals monitor is based on reel-to-reel filter tape sampling followed by nondestructive XRF analysis of metals in the resulting particulate matter (PM) deposit (Yadav et al., 2009; Caudill, 2012). The XACT can simultaneously measure up to 24 elements with an atomic number between potassium and uranium. Ambient air is sampled through a PM size-selective inlet and drawn through a filter tape. The resulting PM deposit is then automatically advanced and analyzed by XRF for selected metals while the next sample is being collected. Sampling and analysis is performed continuously and simultaneously, except for the time required to advance the tape (about 20 seconds) and the time required for daily automated quality assurance checks, which were typically performed around midnight each day.

The monitoring plan for metals focused on a 2.5-month period instead of an entire year because the XACT 625 is costly to operate. However, it offered a viable alternative to longer-term 24-hr filter-based sampling and revealed detailed information on the contribution of the Oil Field to this group of elements.

Dr. Rick Peltier of the University of Massachusetts at Amherst was primarily responsible for setting up the XACT 625 spectrometer, overseeing operations, and ensuring daily quality control . He had remote access to the XACT data and most instrument functions on a daily basis. Field support, when needed, was available from STI staff.

The instrument followed a regular protocol of quality assurance by checking energy levels (based on a measurement of pure palladium) during each hourly sample run. Once per day, a more comprehensive QA protocol ran by sequentially quantifying four pure standardized reference materials (Pd, Cr, Cd, Pb) for approximately 7 minutes each (“Upscale Calibration”). These data were reported and reviewed each day to ensure that data were reported accurately and there were no short-term instrument malfunctions or long-term instrument degradation. Sample flow rates were measured by an independent set of flow monitors, each of which has been calibrated against a NIST-traceable primary standard.

2.4.3 PTR-TOFMS (Volatile Organic Compounds)

VOCs are on the list of air toxics of concern (see Section 1.2), with benzene, formaldehyde, acetaldehyde, and acrolein. Additional species, including 1,3-butadiene, gas-phase naphthalene, toluene, and xylenes were targeted because, although they are lower priority, they potentially represent specific sources among the pollutants ranking fairly high on the list. A Proton Transfer Reaction Time of Flight Mass Spectrometer (PTR-TOFMS), which offers low detection limits and high time resolution, was deployed to measure these key species.

The Ionicon PTR-TOFMS 8000 is based on whole air sampling through a standard Teflon inlet tube followed by ionization of analytes by proton transfer from H_3O^+ to all compounds with a higher proton affinity than water (Jordan et al., 2009). This includes aromatics, most alkenes, aldehydes, ketones, and some longer chain alkanes. Molecular ionization is "soft," causing minimal fragmentation of molecules. After ionization, molecular ions are pulsed into a time-of-flight mass spectrometer capable of measuring the mass of the parent ion at a resolution of 5000 m/Δm (0.02 mass units at a mass of 100 atomic mass units).

The PTR-TOFMS can simultaneously measure dozens of compounds. Sampling and analysis were performed continuously except for the time required for intermittent background checks and calibrations. Background checks were conducted by passing ambient air through a catalytic converter removing all VOCs, and calibrations were done by sending a commercial calibration mixture of aromatic compounds to the instrument at various dilution ratios.

Dr. Shane Murphy of the University of Wyoming deployed and operated the PTR-TOFMS to measure VOC pollutants at 10-second intervals for two weeks. The deployment was brief because the PTR-TOFMS instrument is costly to operate. However, the PTR-TOFMS measurement methodology has the advantages of very high time resolution, more sensitive measurement capabilities, more data (approximately 4,000 measurements over two weeks), and a larger set of compounds (25 target species) compared to other methods. **Table 2-3** lists the pollutants that were measured and some typical sources. This list includes many of the VOCs that we expected to find in the study location, as well as other VOCs that can be used to identify emissions signatures of other sources that might impact the monitoring site. Uncertainties were set as 20% of the measured value. Values for each species are provided in arbitrary units unique to the PTR-TOFMS. In addition, seven species had calibrations performed to provide data in ppb: butadiene, acrolein, benzene, toluene, xylenes, naphthalene, and acetaldehyde.

Table 2-3. List of pollutants targeted during this study and their typical sources.

Compound	Sources
Formaldehyde	Photo-oxidation, vehicle emissions, diesel generators
Acetaldehyde	Photo-oxidation, vehicle emissions, diesel generators
Acrolein	Butadiene photo-oxidation, vehicle emissions, diesel generators
Benzene	Vehicle emissions, oil and gas extraction, gas stations, industrial
Toluene	Vehicle emissions, oil and gas extraction, gas stations, industrial
Xylenes and ethylbenzene (isomers)	Vehicle emissions, oil and gas extraction, gas stations, industrial
1,3-Butadiene	Vehicle emissions, industrial, diesel generators
Methyl ethyl ketone	Photo-oxidation
Naphthalene	Vehicle emissions

Five pairs of 24-hr air samples were collected during the two-week monitoring period and were analyzed by GC-FID (TO-14; University of Wyoming) and GC-MS (TO-15; SCAQMD). For the PTR-TOFMS, although some isomeric compounds such as ethylbenzene and the xylenes are indistinguishable, they can be measured as a sum of species. The PTR-TOFMS data for these five days were averaged to match the 24-hr samples and the results were compared. The PTR-TOFMS average concentrations were similar to both the University of Wyoming and SCAQMD results for most species. Overall, these results suggest that the PTR-TOFMS measurements are similar to more regulatory methods, but yield higher-time-resolution data. Appendix D shows the results for these comparisons.

2.4.4 Meteorological Variables

A 10-meter meteorological tower was erected next to the trailer at the East site. The tower was equipped with the following RM Young sensors:

- 05305V Wind monitor (wind speed/wind direction)
- 41382VC Temperature and RH sensor
- 41342VC Platinum temperature probes at 2 heights (for Delta-T, a measure of atmospheric mixing)
- 61302V Barometric pressure sensor
- 70201 Solar radiation sensor

All of these sensors collected at 1-minute average duration.

2.5 Health Risk Assessment

Health risk assessment comprises four steps, as described by the National Research Council and adopted by the California Office of Health Hazard Assessment (OEHHA) (National Research Council, 1983; California Environmental Protection Agency, 2001):

1. **Hazard identification.** Identify pollutants of potential concern and their associated health impacts.
2. **Dose-response assessment.** Use quantitative benchmark levels to assess risk.
3. **Exposure assessment.** Assess how people are exposed to a pollutant, at what levels, and for how long.
4. **Risk characterization.** Synthesizing the three previous steps, quantitatively evaluate a pollutant's potential to cause illness or disease in the population.

STI followed the health risk assessment protocol to characterize the risk from the ambient air around the Oil Field. Concentration contributions of the Oil Field were determined through the data analyses described in Section 3. These contributions are compared to background Los Angeles Basin levels to assess the relative level of cancer risk and noncancer hazard from the Oil Field compared to other sources in the area.

2.5.1 Hazard Identification

For the hazard identification, STI used the 2005-2006 Oil Field emissions used in the Baldwin Hills Community Standards District Environmental Impact Report (Marine Research Specialists, 2008). The EIR lists all toxic air contaminant emissions in pounds per year reported to the SCAQMD.

2.5.2 Dose-Response Assessment

STI used dose-response factors recommended by California OEHHA. Measured pollutant dose-response factors are listed in **Table 2-4**. Chronic risk factors and RELs consider a person's lifetime exposure to the pollutant, while acute RELs consider average exposures for 1 hour or 8 hours.

Table 2-4. Dose-response factors for target pollutants measured in this study from OEHHA (March 2014).

Pollutant	Cancer (µg/m^3 for 1-in-a-million risk)	Acute REL (µg/m^3)	Chronic REL (µg/m^3)
1,3-butadiene	5.88×10^{-3}	9	2
Acetaldehyde	3.70×10^{-1}	470	140
Acrolein		2.5	0.35
Arsenic	3.03×10^{-4}	0.015	0.015
Benzene	3.45×10^{-2}	1300	60
Cadmium	2.38×10^{-4}		0.02
Diesel exhaust PM	3.33×10^{-3}		5
Formaldehyde	1.67×10^{-1}	9	9
Lead	8.33×10^{-2}		0.15
Manganese		0.17	0.09
Mercury		0.06	0.03
Naphthalene	2.94×10^{-2}		9
Nickel	3.85×10^{-3}	0.2	0.06
Toluene		37000	300
Xylenes		22000	700

2.5.3 Exposure Assessment

In this step of the health risk assessment, STI assessed pathways of exposure, such as inhalation, soil contamination, groundwater, sediment, or contamination of the food chain, to residents of the Baldwin Hills area. Most of the pollutants of interest are transported primarily through the air, and the exposure route of concern is outdoor and indoor inhalation. However, for a subset of the toxic air pollutants, it is plausible that other pathways of exposure may contribute significantly to total risk; we did not evaluate these other pathways.

For the inhalation exposure, we calculated the mean concentrations and maximum 1-hr concentrations for each pollutant with chronic or acute dose-response factors. In addition, average and maximum contributions from the Oil Field were calculated for each target pollutant. These were used to estimate the average and maximum Oil Field contribution to total risk for each pollutant.

2.5.4 Risk Characterization

Risk characterization is a synthesis of the hazard identification, dose-response assessment, and exposure assessment tasks. For the primary risk assessment, we multiplied the observed mean concentrations and maximum observed concentrations calculated per Section 2.5.3 against dose-response factors from Table 2-4. We then used the estimated contributions by pollutant to quantify the absolute and percentage contribution of the Oil Field.

2.6 Data Analysis

Analysis methods for ascertaining the Oil Field's contribution to overall ambient concentrations include (1) diurnal pattern analysis (2) EPA Positive Matrix Factorization (PMF), (3) pollution roses, (4) differential comparisons, and (5) case studies. These methods are briefly described below.

2.6.1 Diurnal Pattern Analysis

Diurnal patterns are characterized using box plots to determine whether concentrations are higher during certain hours of the day. Some pollutants associated with Oil Field activities, such as drilling or well workovers, are associated with daytime hours. Diurnal patterns of each pollutant will be compared to the diurnal patterns listed in McCarthy et al. (2007) and used to categorize possible activities that may be associated with Oil Field operations.

2.6.2 Positive Matrix Factorization

EPA PMF is a freely available multivariate factor analysis tool developed by STI and the EPA (Norris et al., 2008). The tool assigns observed pollutant concentrations to the most likely source types and quantifies the relative contributions of the air pollution sources to ambient air quality. The tool decomposes a matrix of speciated sample data into two matrices—factor contributions and factor profiles—and an analyst then examines the results while considering source-specific tracer species, wind direction, and proximity and direction of local sources to interpret what source types are represented.

PMF uses the variation of each species (by wind direction or by season, for example) and the relative uncertainty across species to determine "factors," or groups of species, that might be analogous to sources such as vehicle exhaust. These factors are mathematically determined from the variation of individual species over time and with each other. For example, if several species vary together since they are all components of dust emitted from soil disturbances, they are likely to be grouped together as a factor.

Factor profiles are unique ratios of the pollutants. The factor contributions indicate the relative amount of that factor that was apportioned for a given sample.

2.6.3 Pollution Roses

Pollution roses illustrate the correlation of pollutant concentrations with wind direction, thus helping analysts identify the wind directions from which concentrations are highest and the direction of likely sources. Petals of the pollution rose point toward the direction from which the wind originates, and their length shows how often the wind comes from that direction.

2.6.4 Differential Comparisons

Black carbon concentrations are measured at four sites across the Oil Field. When segregated by wind direction, concentrations at sites upwind as air enters the Oil Field and downwind along the direction of the wind can be treated as a differential. Concentrations at the upwind site are subtracted from the concentrations at the downwind site to assess the contribution of the Oil Field. Since there are four sites, two comparisons are available for each of the two predominant wind directions (winds from west-southwest and from east-northeast).

2.6.5 Case Study Analysis

The case study analysis looks at specific cases where a given pollutant was high. Analysts examine wind direction and Oil Field activity to see if there is a correlation between the high concentrations and activity.

2.7 Supplementary Emissions Activity Analysis

The Oil Field contribution to DPM is complicated by diesel traffic on La Cienega Boulevard and Stocker Street and by traffic and emissions from diesel engines on drill and workover rigs within the Oil Field itself. Marine Research Specialists provided improved emissions activity data to help STI better identify whether emissions were originating from the Oil Field or other sources (see **Appendices A and B**). Emission inventory activity information included:

- A week of daily and diurnal traffic activity data with vehicle classification by axle length. Vehicles were classified into heavy-duty and light-duty vehicles. Data for three street links were provided:
  - La Cienega Blvd. south of Stocker St.
  - La Cienega Blvd. north of Stocker St.
  - Stocker St.
- A week of gate activity for vehicles entering the Oil Field, classified by heavy-duty and light-duty vehicles. The onfield speed limit is 15 MPH, but no additional activity (e.g., mileage, idling) was available. Gate activity was provided at two gates:
  - Stocker
  - Fairfax

- Onfield operational emissions activity information for drill rigs, workover rigs, and maintenance rigs classified by their distance from the East and North monitoring sites.
  - *One drill rig* – operated 24 hours a day, 7 days of week when drilling, with a diesel particulate filter achieving 90% reduction in PM emissions.
  - *Up to eight (average of six) workover and maintenance rigs* – operated 7:00 a.m. to 5:00 p.m. Monday through Friday. Diesel particulate filters (DPF) were not routinely available on these rigs, but most had Tier 3 or Tier 4 standard on-road diesel engines. **Table 2-5** provides a complete list of rigs, but individual rig activities or locations on the Oil Field are not available.

Table 2-5. Workover and maintenance rigs operated on weekdays from 7:00 a.m. to 5:00 p.m.

Rig No.	Standard	DPF/Catalyst
Rig 1011	Tier 3	
Rig 1061	Tier 3	
Rig 0358	Tier 3	
Rig 1068	Tier 3	With DPF and Catalyst
Rig 1069	Tier 3	With DPF and Catalyst
Rig 30	Tier 3	
Rig 36	Tier 3	
Rig 83	Tier 3	With DPF and Catalyst
Rig 94	Tier 4	
Rig 95	Tier 4	
Rig 96	Tier 4	
Rig 1	Tier 3	
Rig 2	Tier 3	
Rig 4	Tier 3	
Rig 5	Tier 3	
Rig 6	Tier 3	
Rig 7	Tier 4	
Rig 8	Tier 2	
Rig 9	Tier 4	

STI used this emissions activity information by time-of-day and day-of-week to clarify refined calculations of the relative contribution of Oil Field sources to DPM air concentrations. STI also refined calculations of the cancer risk from DPM and revised the Study final report to describe this additional data and the resulting calculations and results.

3. Results

Analysis results are segregated by monitoring method and then by the risk characterization. First, we discuss Aethalometer BC measurements (proxy for DPM), then XRF trace metals, and then PTR-TOFMS VOCs. Lastly, we discuss the risks and hazards associated with each of our target pollutants and the contribution of the Oil Field operations to those risks.

3.1 Aethalometer Black Carbon (Proxy for DPM)

3.1.1 BC Diurnal Patterns by Season

Measurements of BC were examined for diurnal and seasonal patterns that can be associated with emissions activities. **Figure 3-1** shows the notched box whisker plots for the months of December, March, June, and September at the East site. These four months were used to represent the four seasons – data for other months during each season were similar. Box whisker plots show the average concentration (red dot), the median concentration (center of the notch), the interquartile range (end of the boxes), 1.5 times the interquartile range (error bars), and outliers (asterisks and circles).

In all months, mean concentrations have a peak in the morning hours (0800 to 1000 LST; local standard time), which is likely associated with rush hour emissions in the Los Angeles Basin and weak morning wind speeds. In December and other winter months, there is also a peak in overnight concentrations. In the other seasons, the concentrations overnight are not as high as the rush hour peak. In all seasons, concentrations drop off after the rush hour peak through an early evening minimum concentration at about 1800 LST. On average, wintertime concentrations are highest and summer concentrations are lowest. All other sites (North, West, and South) had very similar diurnal and seasonal profiles.

Statistics for all hours across all sites are summarized in **Table 3-1**. Average concentrations at each site were between 0.64 and 0.724 µg/m^3, with narrow confidence intervals. Median, 10th, and 90th percentile concentrations were also quite similar at all sites, although the West site did have somewhat higher average, median, and 90th percentile BC concentration values than the others.

3.1.2 Pollution Roses

Pollution roses display the directions from which the wind originates and the distribution of concentrations associated with that direction. These plots can be used to identify directions associated with higher concentrations of a given pollutant; further analysis can be used to assess if a particular emissions source is associated with that direction.

Figure 3-2 shows pollution roses for BC at the East site for the months of December, March, June, and September. Wind petals indicate the direction from which winds originate. Winds in the winter months are almost evenly distributed between west-southwest and east-northeast. In other months, winds come predominantly from the west-southwest as a result of

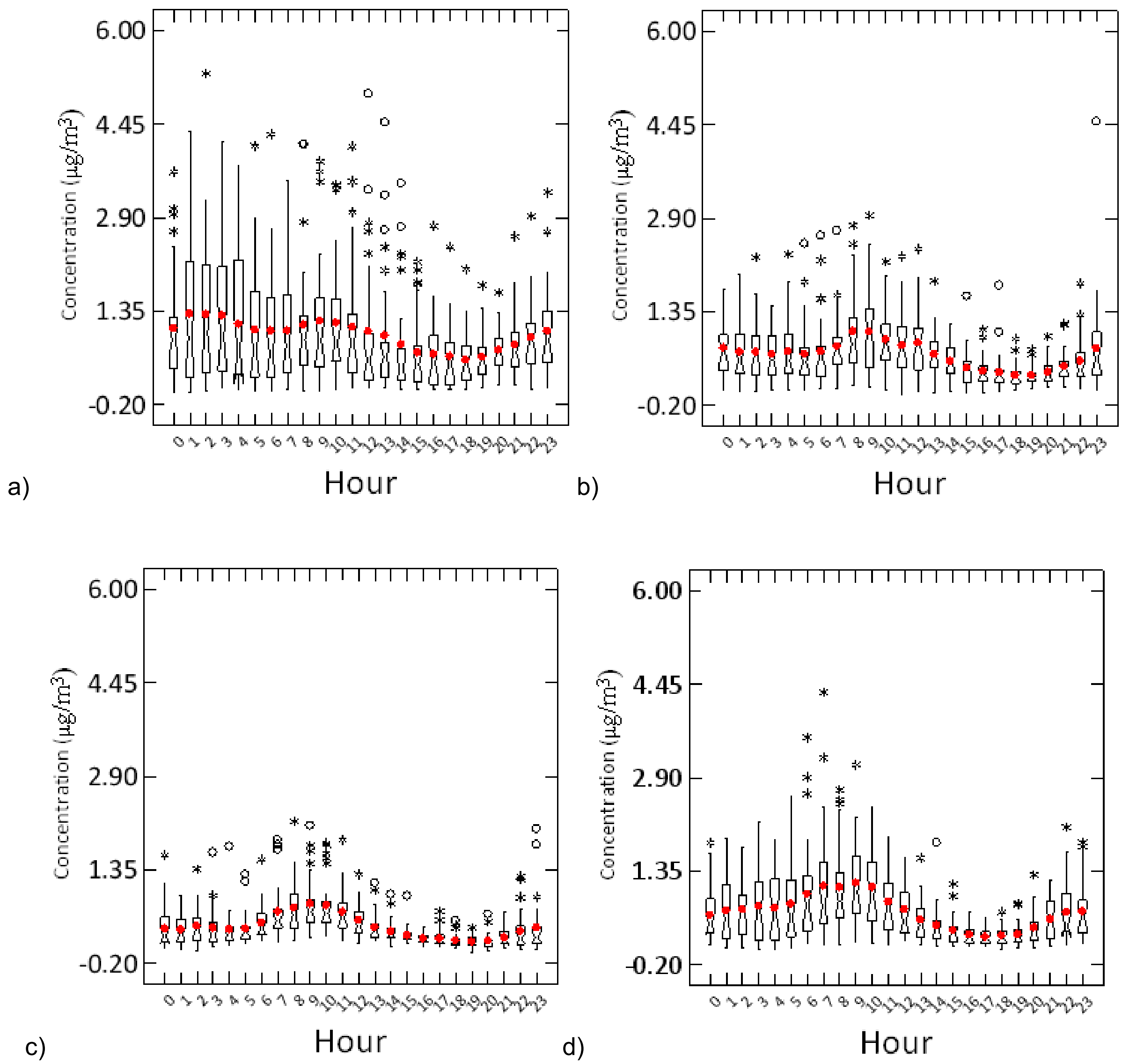


Figure 3-1. Box-notch whisker plots of the diurnal profile of BC concentrations (µg/m^3) at the East site in (a) December, (b) March, (c) June, and (d) September.

Table 3-1. Summary of statistics for BC concentrations (µg/m^3) at each site for the entire monitoring period.

Site	Count of Valid Hours	Average (µg/m^3)	Median (µg/m^3)	10th Percentile (µg/m^3)	90th Percentile (µg/m^3)	Maximum (µg/m^3)	95% Confidence Interval (µg/m^3)
East	8748	0.676	0.474	0.144	1.467	6.328	0.013
South	7945	0.641	0.423	0.128	1.434	7.761	0.015
West	8405	0.724	0.491	0.143	1.611	8.355	0.015
North	8588	0.672	0.455	0.132	1.474	9.286	0.015

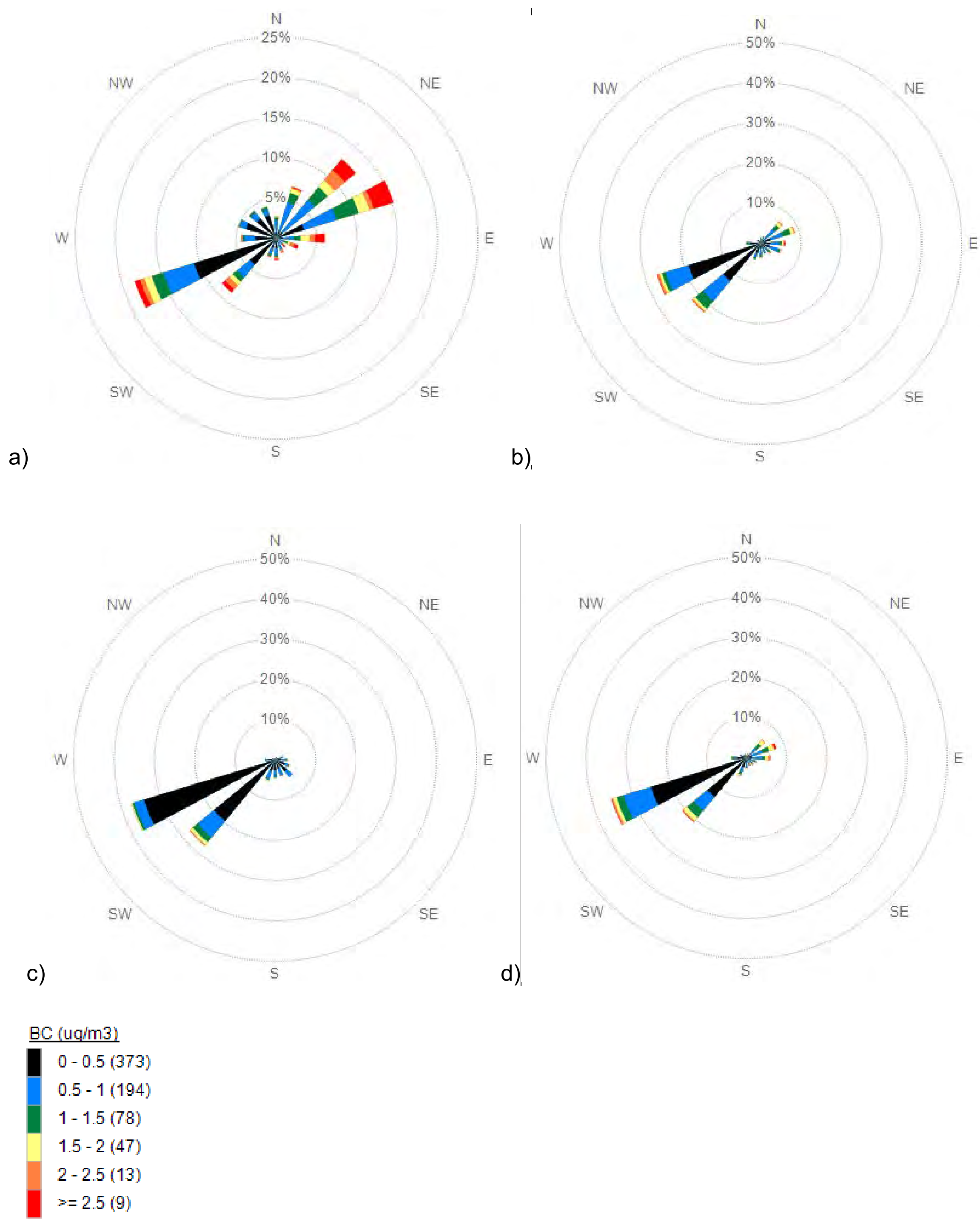


Figure 3-2. Pollution roses for BC (μg/m^3) at the East site for the months of (a) December, (b) March, (c) June, and (d) September. The legend shows the concentration bins of BC, which are the same across all months; the numbers in parentheses indicate the number of hourly observations in each bin for the month of September.

onshore flow. Of most interest, the offshore flows from the east-northeast include higher BC concentrations on average than the west-southwest winds coming from the coast. This is not unexpected, as winds originating inland represent emissions for the majority of the Los Angeles area.

Additionally, the offshore flow during the winter months typically occurs overnight, when concentrations at the East site are highest (as shown in Figure 3-1). Concentrations are also slightly higher when the wind is from the southwest rather than the west-southwest; however, southwesterly winds occur about half as often as winds occur from the west-southwest.

3.1.3 Differential Comparisons

Concentration gradients segregated by wind directions were used to assess the potential contribution of the Oil Field to BC concentrations on a seasonal and diurnal basis. Based on the pollution roses analysis, winds were segregated into two categories. In both cases, winds at the two pairs of sites were used to represent upwind and downwind BC concentrations. The upwind site concentration was subtracted from the downwind site concentration as listed below for both wind bins and site pairs.

- West-southwest – winds originating between 210° and 300°
  - Pair 1: East minus South
  - Pair 2: North minus West
- East-northeast – winds originating between 30° and 120°
  - Pair 1: South minus East
  - Pair 2: West minus North

Results are shown for the seasonal averages (DJF, MAM, JJA, SON) and with diurnal patterns to assess contributions as a function of season and time of day. **Figure 3-3** shows the seasonal patterns for the East minus South pair. In each plot, the average concentration differential during the overnight hours is typically centered on a value of 0 $\mu g/m^3$, indicating no difference between the upwind and downwind sites. During the daytime hours, the average concentration differential is above 0.1 $\mu g/m^3$ for a significant portion of the hours from 0800 to 1200, with declining values thereafter. This differential indicates that daytime concentrations across the Oil Field are higher, likely as a result of Oil Field operations and traffic on La Cienega Blvd.

Figure 3-4 shows the same set of figures for the North minus West pair differentials. The overall pattern for the concentrations is similar, with higher concentrations across the Oil Field during the daytime hours and small or no concentration gradients overnight. Overall, the differential is slightly smaller for the North minus West pair than the East minus South pair. One plausible explanation is that traffic on La Cienega Blvd. is contributing to the differential at the East minus South pair; this road does not influence the North minus West pair differentials because it is not between those two sites.

Figure 3-5 shows the concentration differential for east-northeast winds in the winter and spring at the South minus East pair and in the winter and autumn at the West minus North pair. First, it is important to note that the frequency of east-northeast winds is much lower than the frequency of west-southwest winds, leading to wider confidence intervals around the mean concentration differential (i.e., less certainty). Secondly, some daytime hours in the spring and fall had no east-northeast winds, leaving gaps in the diurnal patterns. Third, the summer months had very few east-northeast winds and are thus not shown. Overall, the overnight concentration differentials for both site pairs are centered on a value slightly below zero (-0.03 µg/m^3), indicating that the upwind sites were similar, but slightly higher in concentration than the downwind sites under easterly flow. Daytime concentrations are more uncertain because of less frequent easterly winds. At the South minus East pair, daytime concentrations were significantly more negative than overnight concentrations, indicating lower downwind concentrations during the day. At the West minus North pair, daytime concentrations were about the same at both sites in the winter, and were insignificantly negative during the fall.

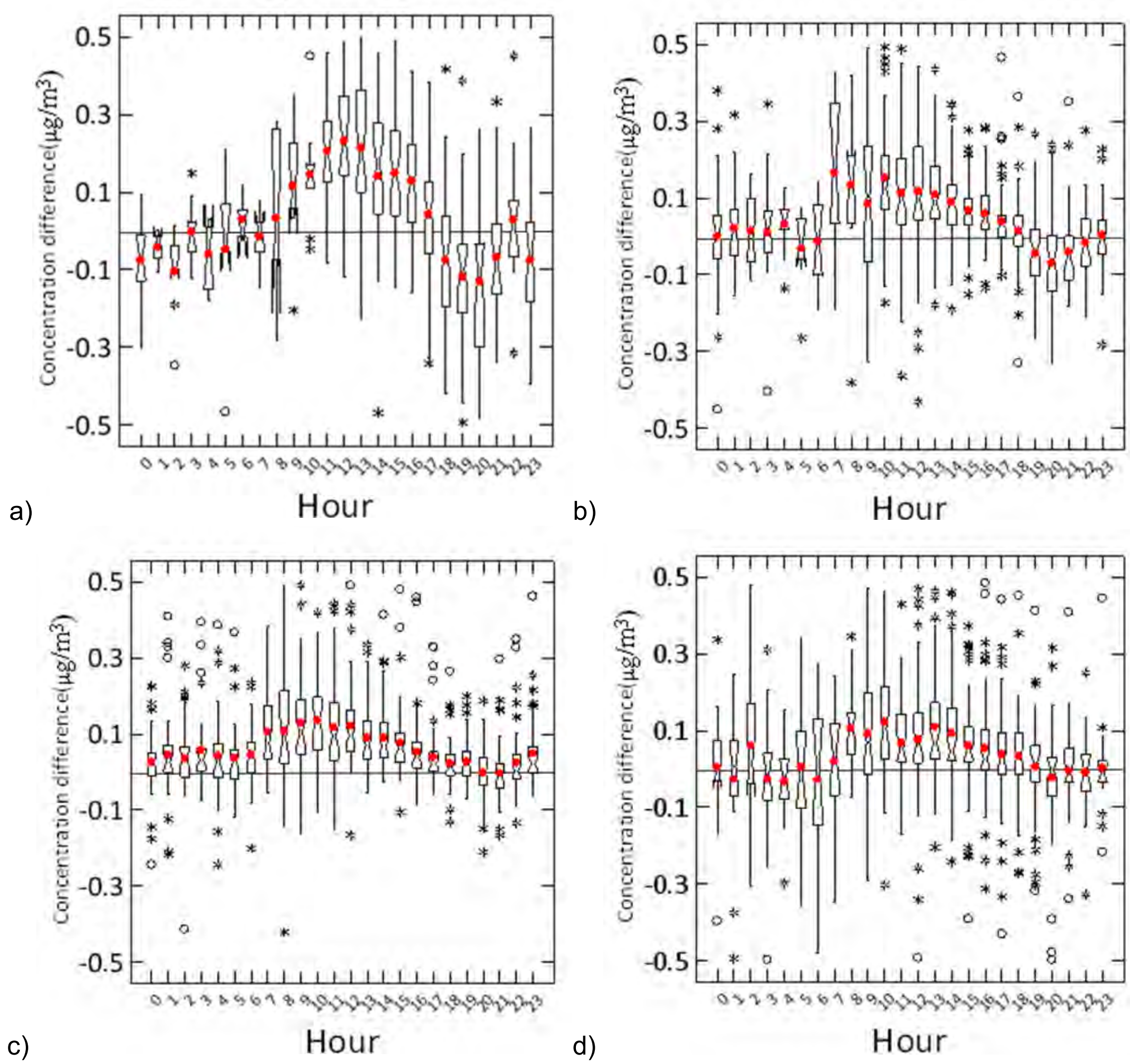


Figure 3-3. Diurnal differential analysis plots showing relative BC concentrations (µg/m^3) at the East minus South pair under west-southwest conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb.; (b) March, April, May; (c) June, July, Aug.; and (d) Sept., Oct., Nov. Positive concentrations indicate higher concentrations at the downwind site across the Oil Field.

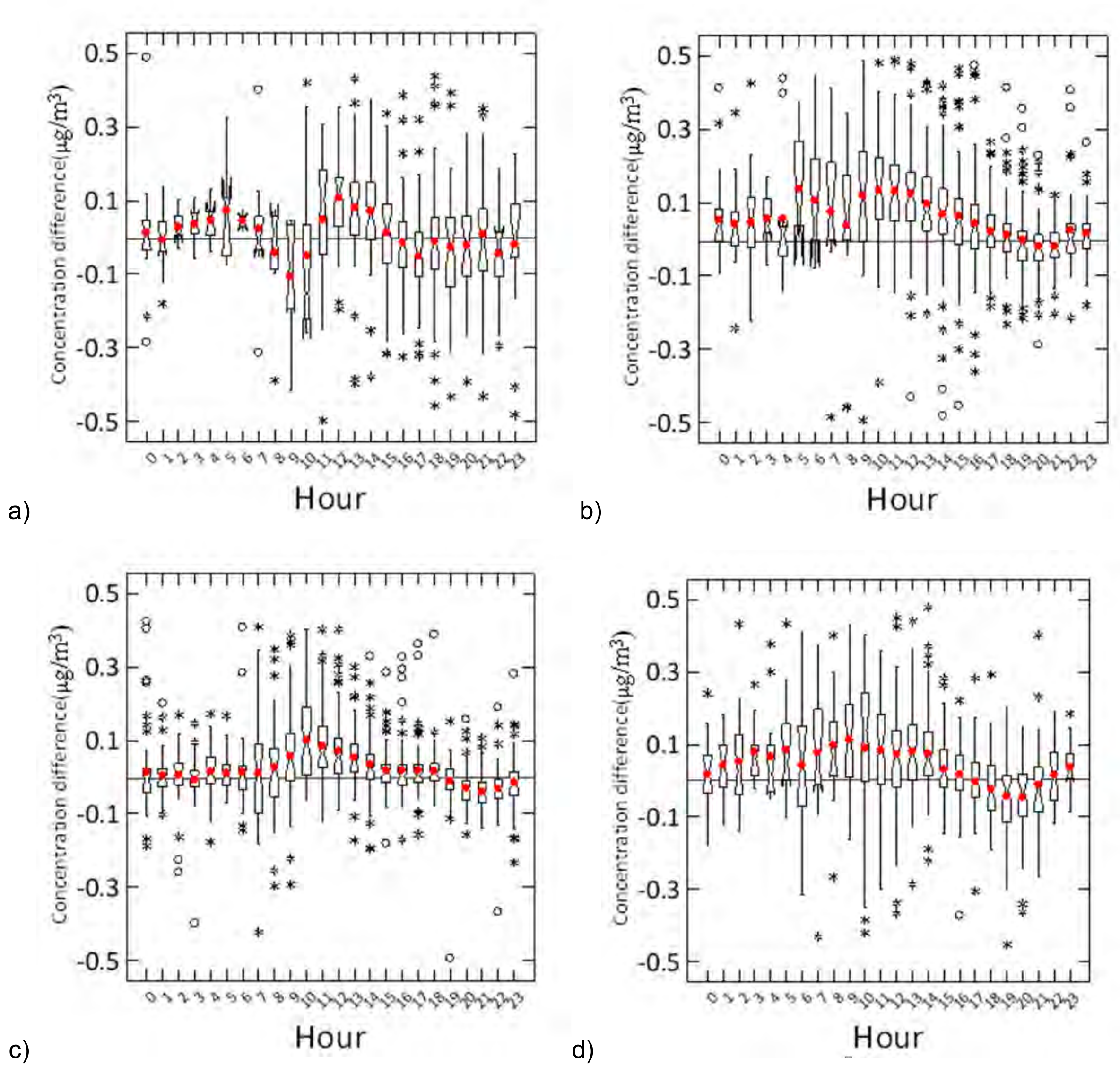


Figure 3-4. Diurnal differential analysis plots showing relative BC concentrations (μg/m^3) at the West minus North pair under west-southwest conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb.; (b) March, April, May; (c) June, July, Aug.; and (d) Sept., Oct., Nov. Positive concentrations indicate higher concentrations at the downwind site across the Oil Field.

The differential analysis plots provide evidence that is consistent with the hypothesis that Oil Field operations are contributing to overall BC concentrations during daytime hours when the winds are from the west-southwest. Overnight concentration differentials show no evidence of Oil Field contributions regardless of wind directions. Winds from the east-northeast do not consistently indicate Oil Field impacts downwind during the daytime hours.

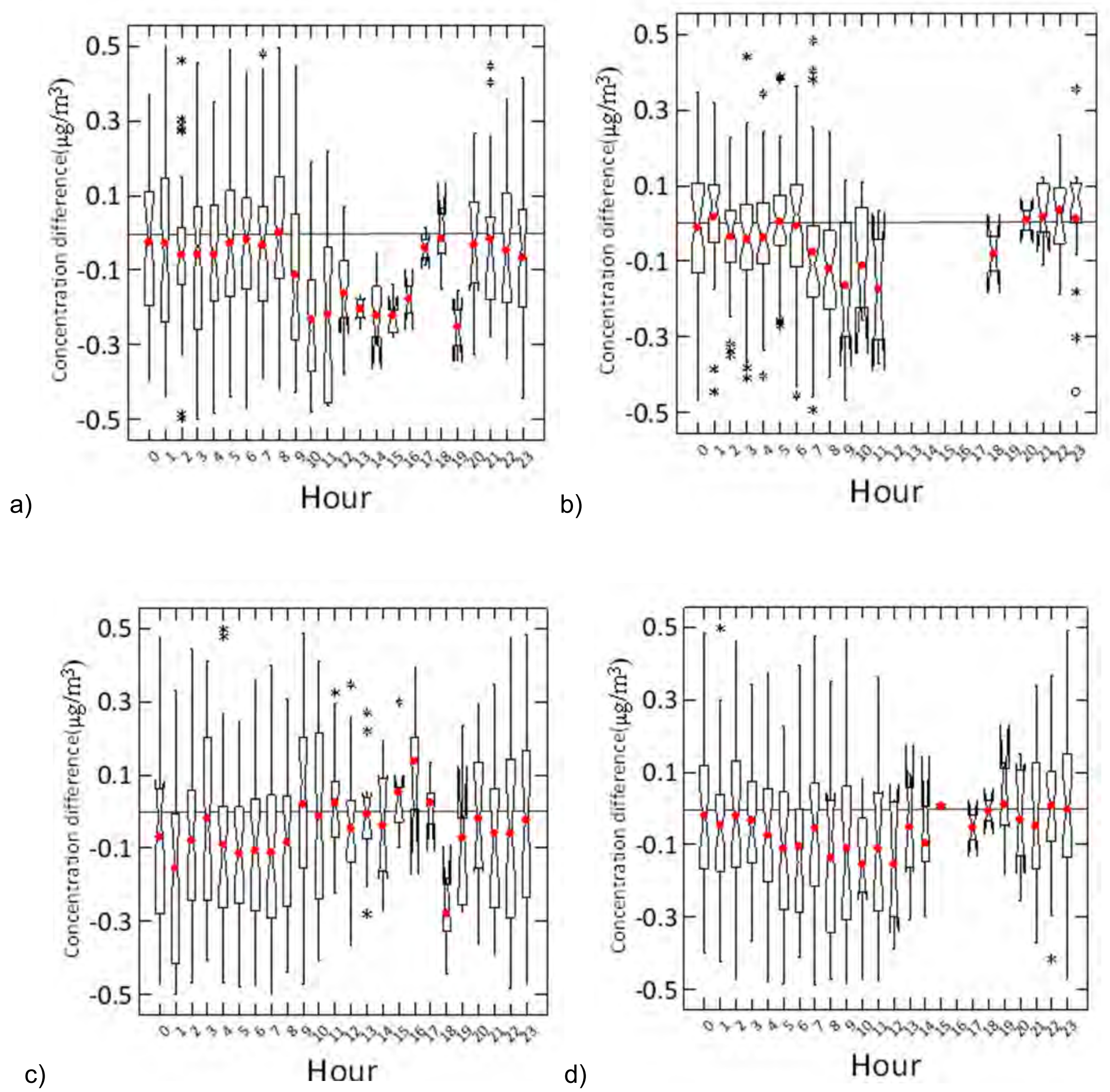


Figure 3-5. Diurnal differential analysis plots showing relative BC concentrations (µg/m^3) at the South minus East pair under east-northeast conditions (winds between 210° and 300°) for the seasons of (a) Dec., Jan., Feb. and (b) March, April, May; and at the West minus North pair for the seasons of (c) Dec., Jan., Feb. and (d) Sept., Oct., Nov. Negative concentrations indicate lower concentrations at the downwind site across the Oil Field.

Winds from the south-southeast (13.1%) and north-northwest (7.8%) were far less frequent than winds from the west-southwest (53%) and east-northeast (25%). As a result, the ability to assess diurnal and seasonal patterns in gradients is reduced. For these two wind directions, we aggregated all winds from all seasons and calculated the differential BC concentrations for the entire monitoring period. Site pairs and wind bins for these less common directions are:

- South-southeast – winds originating between 120° and 210°
  - Pair 1: West minus South
  - Pair 2: North minus East
- North-northwest – winds originating between 300° and 30°
  - Pair 1: South minus West
  - Pair 2: East minus North

The resulting differential comparisons are shown in **Figure 3-6.** When winds are from the north-northwest, the east-north site pair has a negative contribution, while the south-west pair has a slightly positive contribution from the Oil Field. The confidence interval across the south-west site pair (the notch in the box) encompasses the zero line, indicating that the contribution is not statistically significantly different from zero at the 95% level of confidence. In contrast, the more frequent south-southeast winds have tighter confidence intervals, are both statistically significantly greater than zero, and both site pairs show a positive contribution from the Oil Field. This contribution is 0.01 to 0.03 µg/m^3. This total contribution of BC is lower than that estimated when the winds are from the west-southwest.

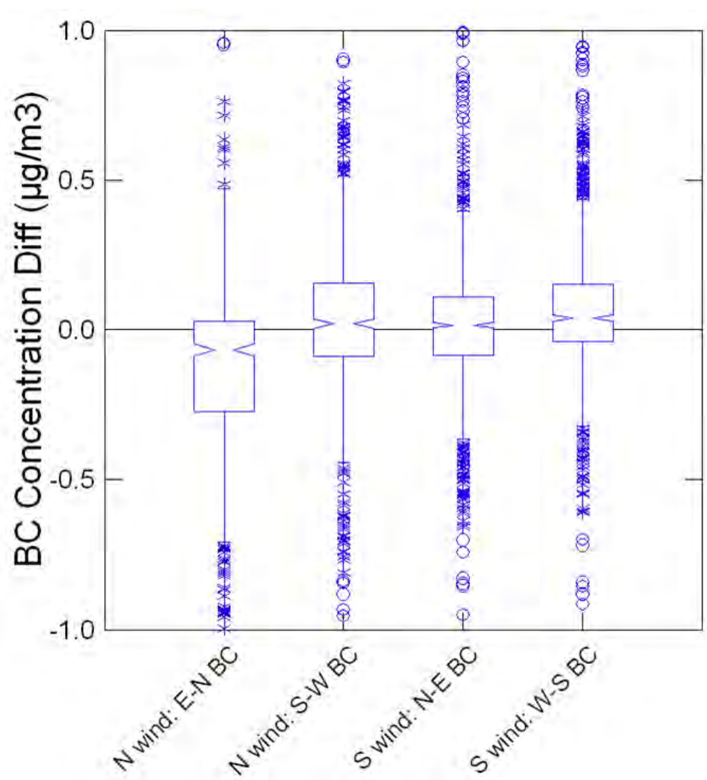


Figure 3-6. Differential analysis results for the entire monitoring period for winds from the north-northwest (N wind) and winds from the south-southeast (S wind) directions.

In a supplemental analysis, we also looked at weekday-weekend differences in concentrations of BC across the Oil Field. Some Oil Field operations are consistent regardless of the day of the week, such as drilling operations and gate traffic. Other operations are constrained to business hours, such as operating maintenance and workover rigs, which occurs during weekdays from 7:00 a.m. to 5:00 p.m. **Figure 3-7** shows the differential analysis for weekday and weekend for the North minus West pair during daytime hours when winds are from the west-southwest. Weekday concentration gradients are higher than weekend concentration gradients, which is consistent with Oil Field rig activity.

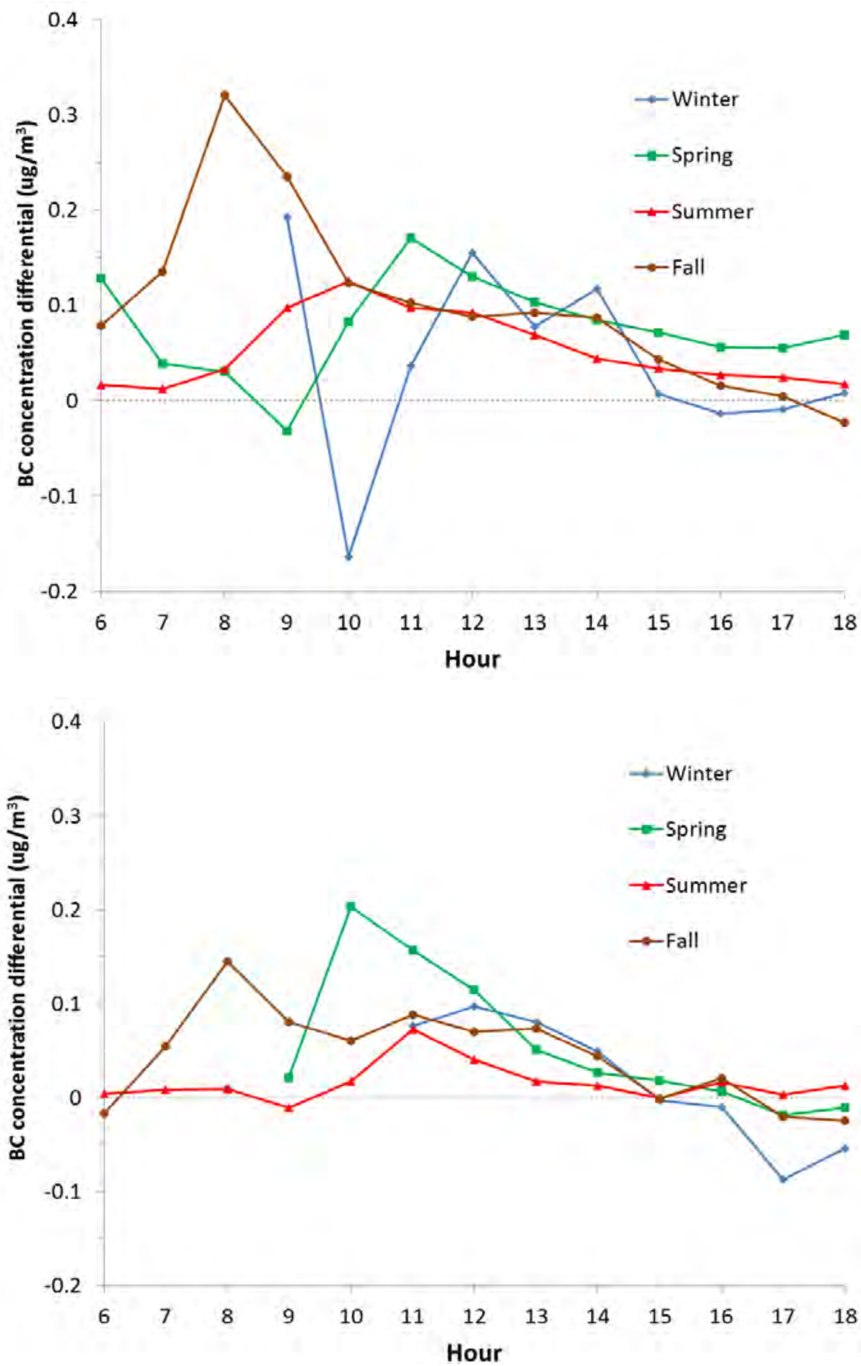


Figure 3-7. Daytime comparisons of BC differential concentrations (µg/m^3) at the North minus West pair for (top) weekday and (bottom) weekend by meteorological season.

3.1.4 Case Study Analysis

STI examined time series of BC concentrations at all four sites to look for Oil Field activity operations that corresponded with peaks in concentrations at individual sites during the intense operating periods (IOP) when the XACT 625 or PTR-TOFMS were deployed. The best example we found of Oil Field operations potentially causing localized spikes in BC concentrations was during the PTR-TOFMS July IOP. The time series of the BC concentrations during the PTR-TOFMS deployment are shown in **Figure 3-8**. BC concentrations at the East site spike a bit higher than other sites starting on July 9, 10, and 11 before settling into a pattern that matches the other sites.

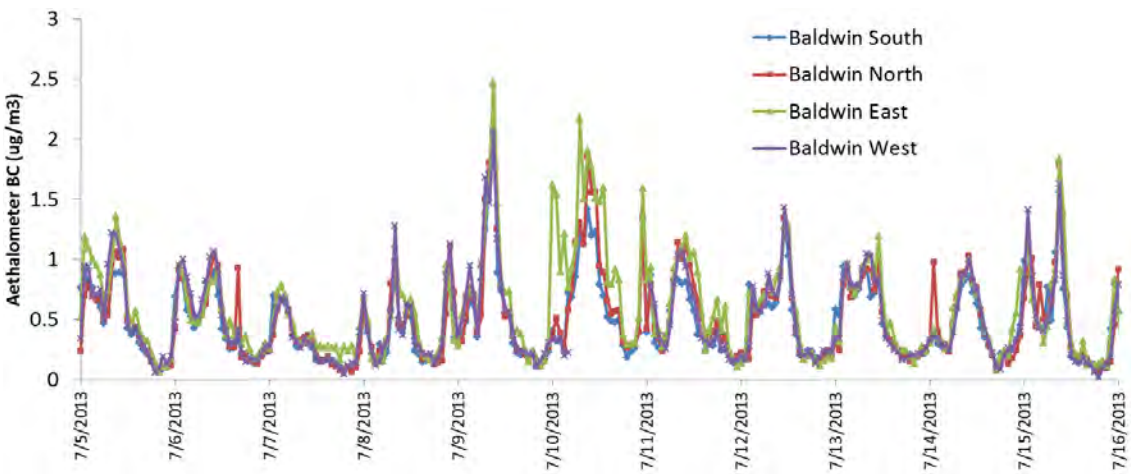


Figure 3-8. Time series of BC concentrations (μg/m^3) at all four study sites for the July 5–16 time period. Concentrations are significantly higher at the East site than at other sites on July 10 and July 11.

Figure 3-9 shows the wind direction and speed for July 8-13. The winds are light and variable very early on July 10; later in the day, they come mostly from the south.

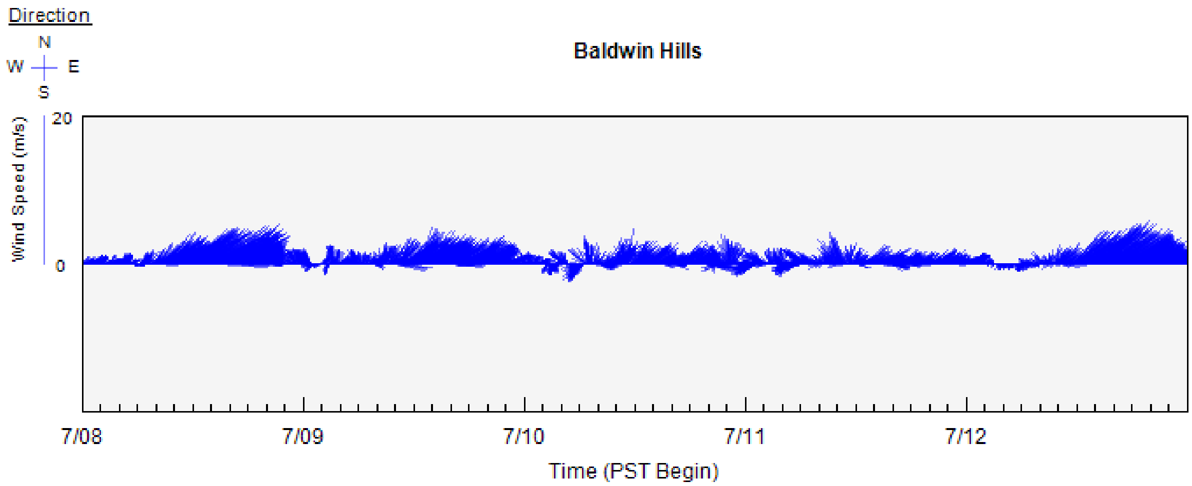


Figure 3-9. Wind bristle plot showing the direction the wind is blowing. On the morning of July 10, the winds were light and variable before settling into winds from the south.

Oil field operational notes for the July 3-16, 2013, period are provided in **Table 3-2**. On July 10, a rig was moved to location BC 6533; the rig operated at that location until July 16, when it was moved. Well location BC 6533 was located almost directly south of the East site, as shown in **Figure 3-10**.

Table 3-2. Oil Field operational reports during the PTR-TOFMS intense operating period. Comments are from the Oil Field operator.

Well Name	AM Report Date	Drill Start	Drill End	Comments
BC LAI1 5473 (BC STK1 5473)	7/3/2013			Summary, HSM, Load out move off BC 6522. HSM, Move in rig up on BC-LAI1 5473. NOTE: Mike Fernandez gave AQMD 24 hr notice f/ spud. Shut down for night.
BC LAI1 5473 (BC STK1 5473)	7/8/2013		Least 2573'	Cont, Run Platform Express Open Hole log, RD Loggers, RIH t/2573', Circulate clean, L/D drill string, HSM w H&H Casing crew R/U and ran 67jts 9-5/8" 40# K-55 LTC casing. Landed Shoe @ 2561 , F/C @ 2481.8', Flag Joints @ 1956" & 1221.7', Circulate, HSM. With 9-5/8" 36# K-55 Shoe landed @ 2561' & Float Collar @ 2481'.
BC 6533	7/10/2013			Rig down & Move rig f/BC LAI 5473 t/ BC 6533. Rig up on BC 6533, Spot sub-structure, Set back end equipment, Raise derrick, Set pipe racks, Shut down for night. Continue rig up in the morning.
BC 6533	7/11/2013	52'	473'	Completed R/U of Ensign rig 516 on BC 6533. Install riser & sound blankets in derrick. Transfer mud to pit & load walk w/directional tools. Spud well @ 1250 hrs on 07/10/2013. M/U directional tools & scribe MWD. Directional drill 14 3/4" hole f/52' to 473'. Wipe hole to shoe @ 52'. Circ hole clean. POOH & L/D directional tools. Run 10 3/4" surface casing w/shoe @ 468' & insert float @ 419'. R/U cementing head & circ hole clean. Cement 10-3/4" 40.5# K55 STC Casing, Shoe at 468' and insert float at 419'. Cement casing in place w/25 bbl cement to surface, Bumped plug t/900 psi, Insert float held, WOC.
BC 6533	7/12/2013			RIH t/ 419'. Test BOPE w/ CDOGGR. 24 Hour Forecast: Finish BOP testing. Drill out float equipment & cement. Directional drill 9 7/8" hole towards TD @ 2454'.
BC 6533	7/16/2013			R/D and tear out rig, Remove sound walls, Replaced drill line, Load out third party mud equipment, Mud docks, Prep for move t/LAI1 5473. Directional drill 9 7/8" hole towards TD @ 2454'.

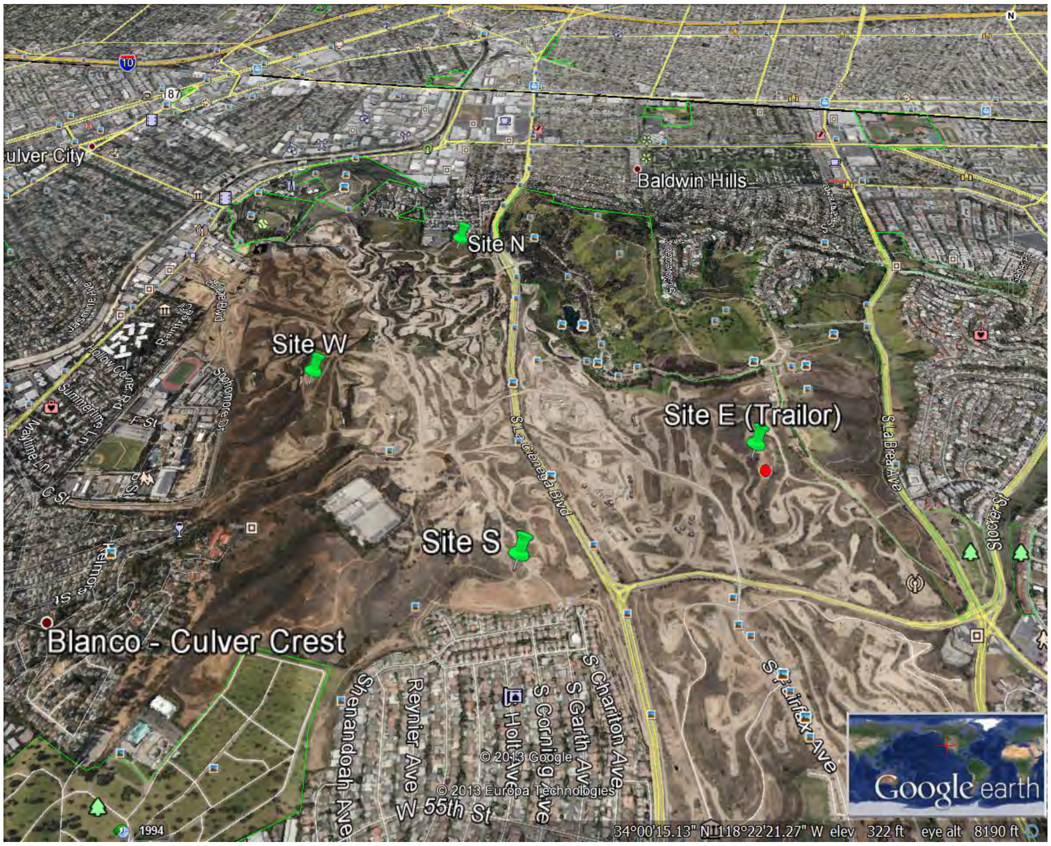


Figure 3-10. Map of the Inglewood Oil Field, site locations, and well number 6533 (red dot). Well number 6533 was the location of a drill rig on July 10–16.

This set of wind patterns, the location of a drill rig, and operational activities are consistent with a small enhancement in local BC concentrations for a two-day period attributable to Oil Field activities. However, our examination of the December and January period, during the metals operational period, revealed little in the way of Oil Field drilling operations that could be correlated with high BC concentrations. During the December and January time period, most operations occurred in the general vicinity of the South site, but were not as close to the South site as well number 6533 was to the East site.

3.2 XRF Metals

3.2.1 Metals Temporal Variability

We developed box plots to examine diurnal patterns and weekday-versus-weekend differences for metals concentrations, using hourly measurements during the 2.5-month sampling period from November 12, 2012, to January 29, 2013, at the East monitoring site.

Figure 3-11 presents diurnal box plots for each of the measured metal elements targeted for risk characterization; the interquartile range and median of hourly metals concentrations are shown in a box for each hour of day, with the extent of the hourly concentrations shown by whiskers, stars, and circles. Box plots for all measured elements are presented in **Appendix C**. Diurnal profiles were different for many of the species. Note that species such as cadmium, nickel, and selenium were often at or below the MDL for the species. For those species, care should be taken in examining absolute concentrations, because they are often below the method's ability to resolve them. In contrast, copper, manganese, and lead all show characteristic diurnal profiles that indicate potential emissions activity profiles during the morning hours. For some metal elements, such as chromium and mercury, a majority of concentration data (over 80%) was below MDL and the box plot therefore showed no specific diurnal profiles.

We also developed box plots for weekday and weekend average hourly concentrations. As shown in **Figure 3-12**, average hourly concentrations were higher on weekdays, when Oil Field operations occurred, for copper, lead, manganese, and selenium. Concentrations for cadmium and nickel were not distinguishable between weekdays and weekends.

3.2.2 Pollution Roses

Pollution roses were developed for measured metal concentrations to examine how pollution correlates with wind directions. At the East monitoring site, prevailing wind directions are west-southwest (onshore) or east-northeast (offshore). If a significantly large percentage of high pollutant concentrations is associated with any particular wind direction, it would indicate more pollution activities upwind of the monitoring site in that direction.

Figure 3-13 presents pollution roses for the six selected metal elements, which summarize hourly metal concentrations according to 16 sectors of wind direction during the sampling time period. Pollution roses were not presented for chromium and mercury, because most of their concentration data were below MDL. Pollution roses for all elements are shown in Appendix C. The Oil Field is southwest of the East site. In general, no significantly large percentage of high pollutant concentrations was particularly associated with the southwest wind direction, when the Oil Field was upwind of the East site. Across the six selected metal elements, higher concentrations (red wedges in the plots) were more likely to occur with winds from the east-northeast (12–17% of the time) than from the Oil Field to the west-southwest (3–11% of the time).

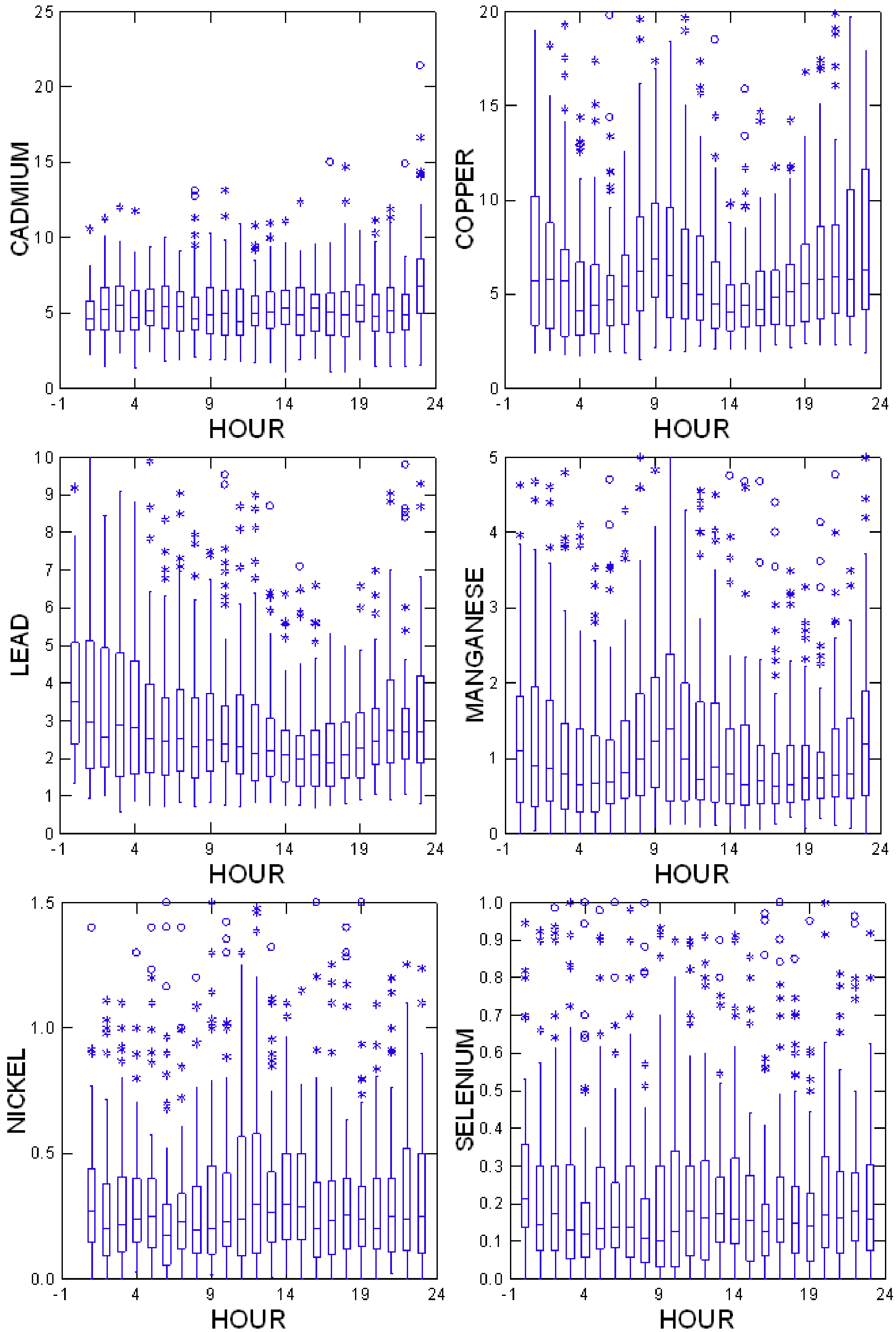


Figure 3-11. Box plots of hourly metals concentrations (ng/m^3) during the 2.5-month sample period. Whiskers represent data within 1.5 times of interquartile range; stars represent data within 3 times of interquartile range; circles represent potential outliers.

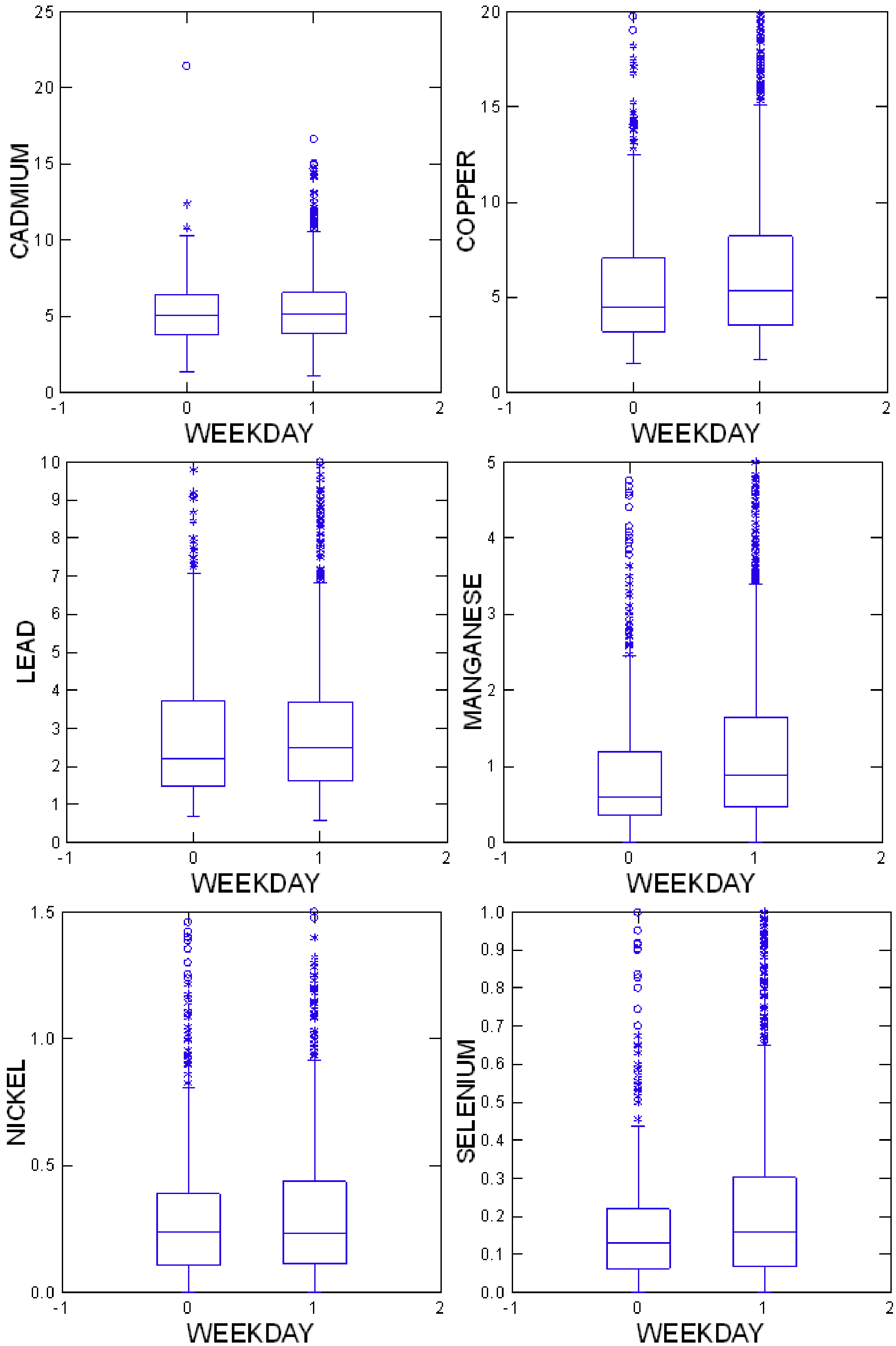


Figure 3-12. Box plots of average hourly metals concentrations (ng/m^3) during weekdays ("1") and weekends ("0"). Whiskers represent data within 1.5 times of interquartile range; stars represent data within 3 times of interquartile range; circles represent potential outliers.

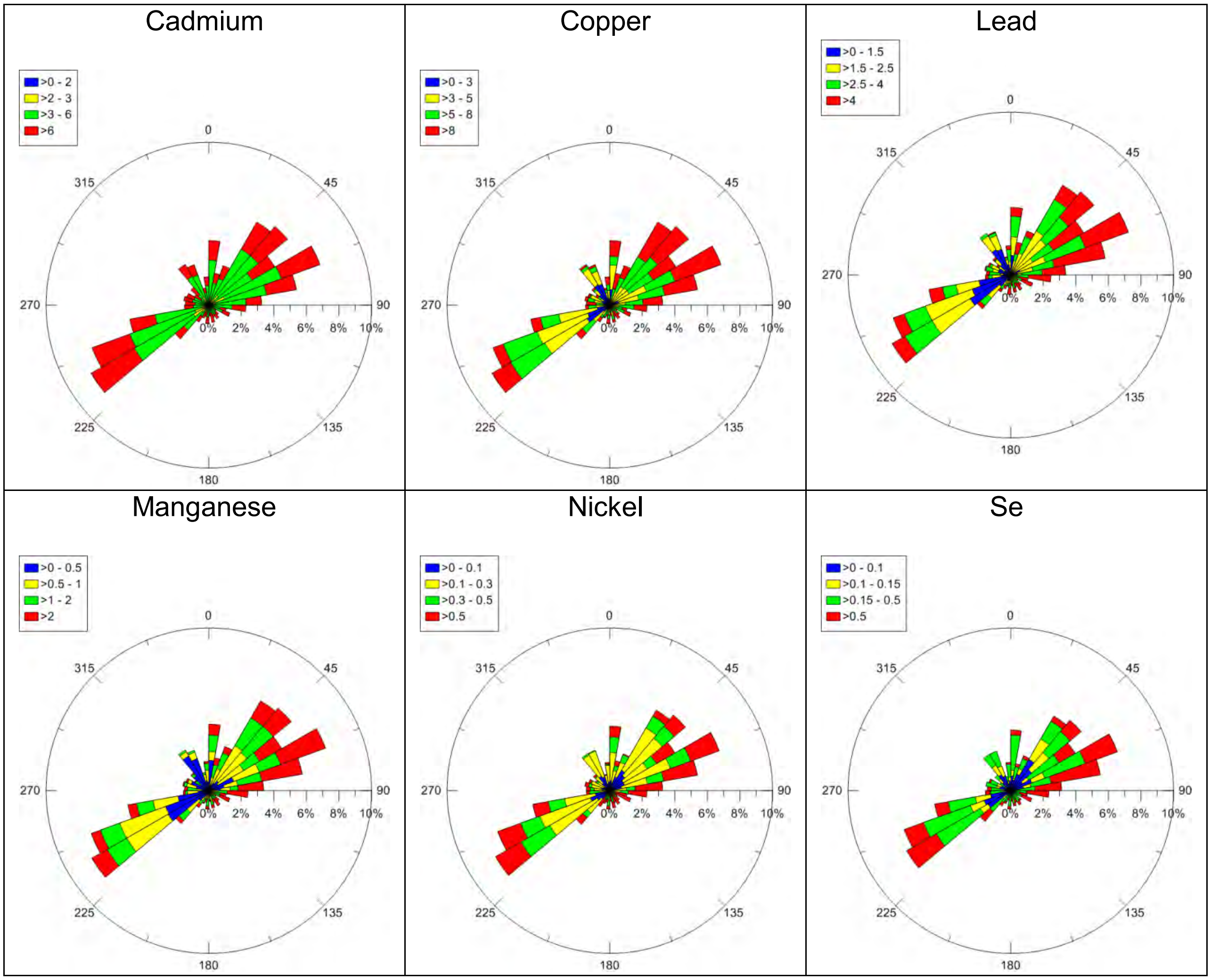


Figure 3-13. Pollution roses for hourly metals concentrations (ng/m^3) measured at the East site.

3.2.3 PMF Factor Analysis

Positive matrix factorization was applied to examine potential factors that contribute to observed metal concentrations at the East site. Among 24 metal elements with concentration measurements, 10 elements were excluded from PMF runs because of their low signal-to-noise ratios (see **Table 3-3**). Two potential outliers with very high Ca, Mn, Ni, Zn, and Cu concentrations, corresponding to sampling hours 11/17/12 20:00 and 11/29/12 4:00, were identified on the basis of Dixon's Q-test and were excluded from PMF runs. Samples with missing metal observations were also excluded from PMF runs.

Table 3-3. Summary of metal concentration measurements.

Pollutant	Used in PMF?	Signal-to-Noise Ratio	MDL (ng/m³)	Min (ng/m³)	25th (ng/m³)	Median (ng/m³)	75th (ng/m³)	Max (ng/m³)
Sulfur	Yes	2.99	4.00	68.2	125.3	162.7	262.0	4235
Potassium	Yes	2.99	2.37	44.4	71.0	86.5	112.5	1825
Iron	Yes	2.99	0.76	0.7	28.1	60.2	112.8	485.7
Copper	Yes	2.97	0.27	1.5	3.4	5.3	8.1	323.8
Lead	Yes	2.90	0.22	0.6	1.6	2.4	3.9	27.9
Zinc	Yes	2.85	0.23	0.0	2.1	4.8	10.1	256.0
Bromine	Yes	2.81	0.19	0.0	1.3	2.2	4.8	74.6
Calcium	Yes	2.54	0.90	0.0	3.6	10.8	24.3	1924.0
Titanium	Yes	2.52	0.38	0.0	1.3	2.7	5.5	44.6
Manganese	Yes	2.02	0.28	0.0	0.4	0.8	1.7	30.2
Strontium	Yes	1.91	0.45	0.2	0.7	1.0	1.4	36.9
Barium	Yes	1.67	0.95	0.0	0.8	2.2	4.8	96.0
Selenium	Yes	1.22	0.14	0.0	0.1	0.2	0.4	29.3
Nickel	Yes	1.08	0.23	0.0	0.1	0.2	0.5	248.4
Germanium	No	0.89	0.12	0.0	0.1	0.1	0.2	0.7
Cadmium	No	0.65	5.75	1.1	3.9	5.1	6.5	21.4
Silver	No	0.59	4.33	0.0	2.0	3.2	5.0	23.9
Vanadium	No	0.43	0.29	0.0	0.0	0.0	0.2	4.6
Chromium	No	0.29	0.29	0.0	0.0	0.0	0.1	25.4
Rubidium	No	0.26	0.34	0.0	0.0	0.1	0.3	2.4
Scandium	No	0.10	0.55	0.0	0.1	0.2	0.3	1.2
Arsenic	No	0.06	0.11	0.0	0.0	0.0	0.0	2.1
Cobalt	No	0.02	0.32	0.0	0.0	0.0	0.0	12.4
Mercury	No	0.01	0.19	0.0	0.0	0.0	0.0	0.3

As shown in **Table 3-4**, the PMF analysis suggested seven reasonably defined factors associated with 14 metal elements. The identification of these factors was based on their profiles: the concentration of each metal element apportioned to a factor's total concentration (see **Figure 3-14**), diurnal patterns, and changes of factor contributions in relation to wind directions. Time series of PMF factor contributions were also developed and are shown in **Figure 3-15**. These factor profiles and time series do not indicate significant impacts from the Oil Field.

Table 3-4. Summary of metal PMF factors.

PMF Factor	Potential Sources	Element/Species	Diurnal Pattern
Se	Coal combustion	Selenium	No clear diurnal pattern.
K/Sr	Wood-burning stove and fireplace	Potassium Strontium	Strong evening peak; high contributions during holiday nights.
S/Br	Marine vessels	Bromine Sulfur	Highly variable time series.
Ti/Fe/Cu/Ba	Crustal materials and industry plants	Barium Copper Iron Titanium	Highly variable time series.
Mn/Ni	Oil operations	Manganese Nickel	Highly variable time series; relatively low contributions during holidays.
Lead/Zinc	General aviation airports or tire wear	Lead Zinc	Highly variable time series.
Calcium	Soil and blowing dust	Calcium	No clear diurnal pattern.

3.2.4 Case Study Analysis

The XRF metals analysis, based on examinations of temporal variability, pollution roses, and PMF modeling results, showed no significant impacts from the Oil Field on metal concentrations measured at the East site. We also conducted a few brief case studies to further assess specific patterns of concentrations for several metal elements.

Manganese and Nickel

Manganese and nickel were likely related to oil operations and were reasonably identified in the PMF analysis. A factor contribution rose (**Figure 3-16**) showed that a small percentage of higher oil factor contributions could occur with the southwest wind direction (when the East monitoring site is downwind of the Oil Field) This is consistent with the findings from pollution roses presented in Section 3.2.2 (e.g., for nickel). In addition, relatively low factor contributions were found during holidays (e.g., Christmas and New Year), when oil operations were limited (see **Figure 3-17**). However, case study analysis indicated that none of the five highest manganese-nickel hourly concentrations during the monitoring period were associated with drilling operations within 1500 feet of the East site.

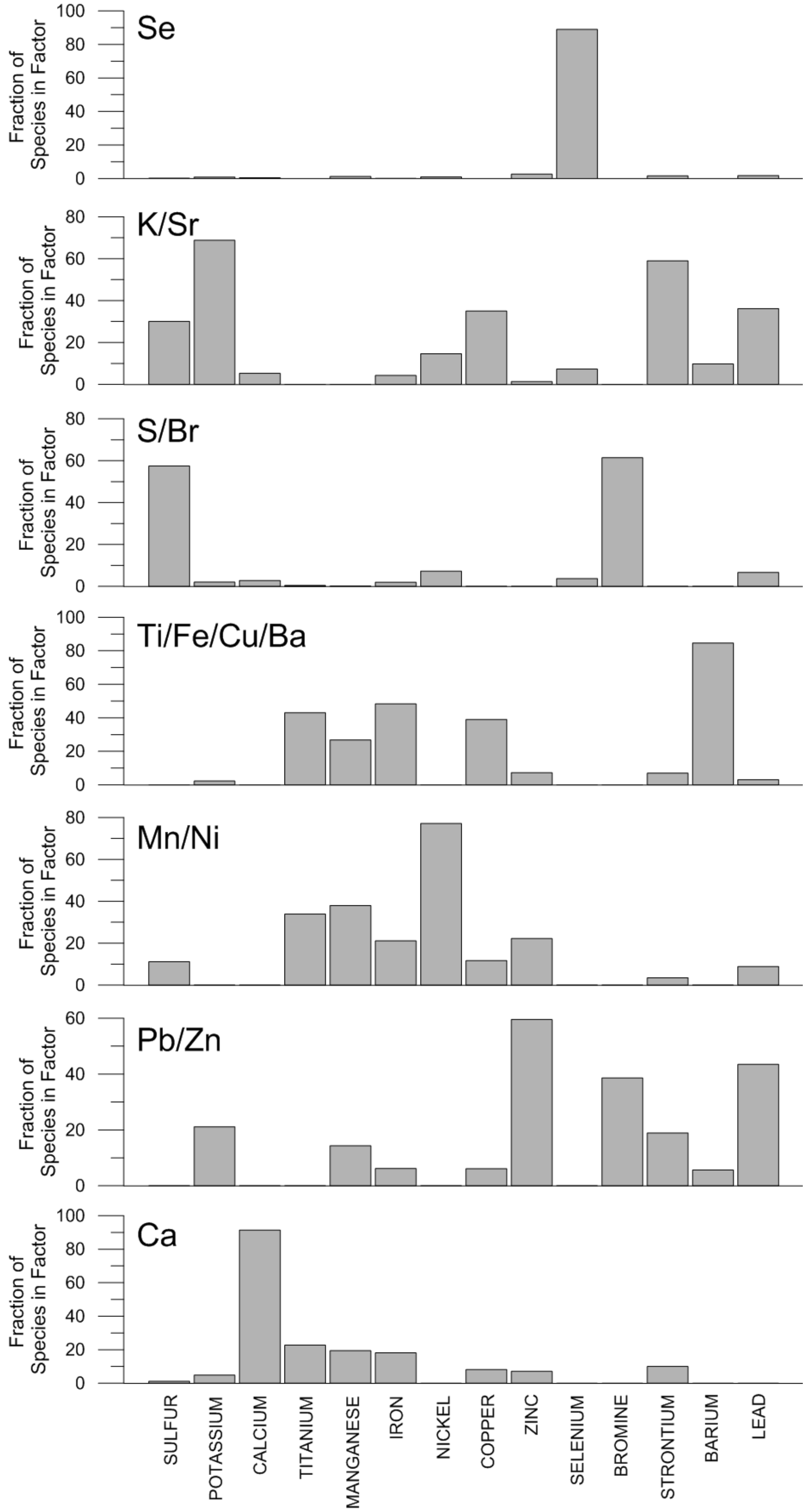


Figure 3-14. PMF factor profiles for metal elements.

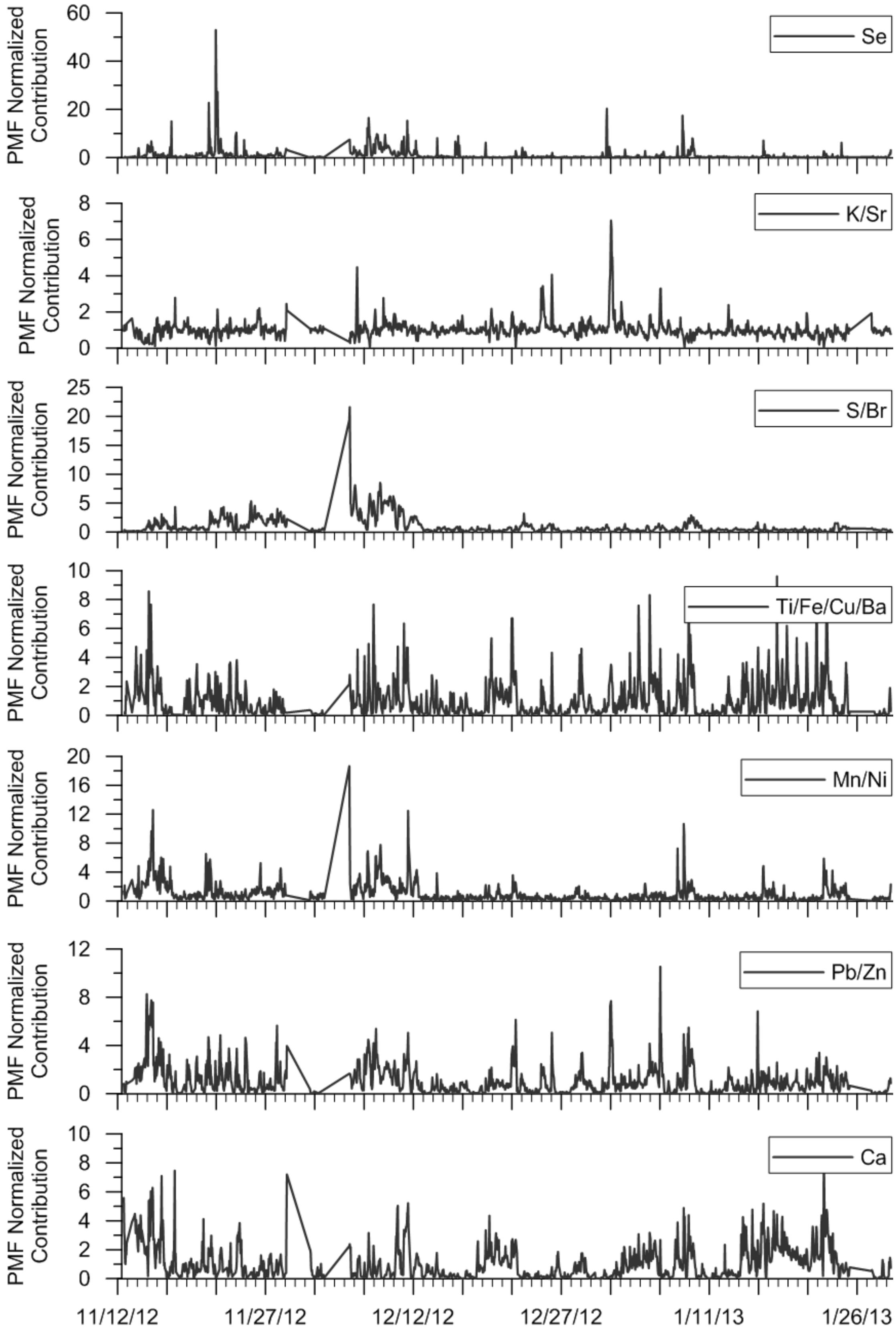


Figure 3-15. Time series of PMF metal factor normalized contributions.

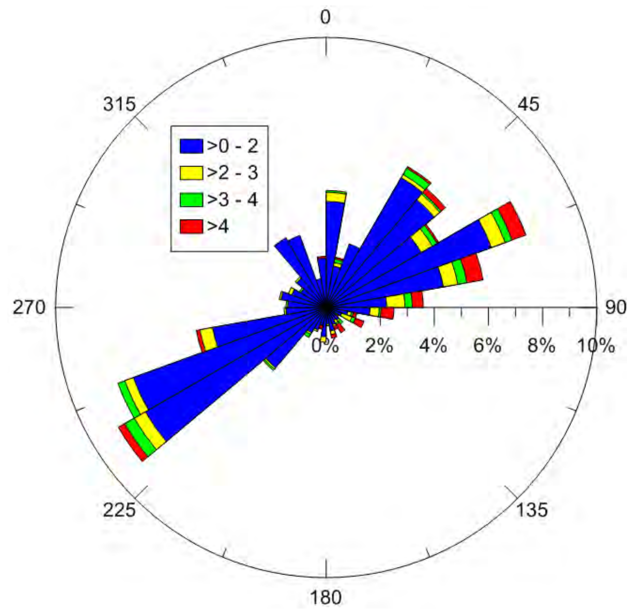


Figure 3-16. Contribution rose for the Oil factor (mainly related to Mn and Ni) in the PMF analysis.

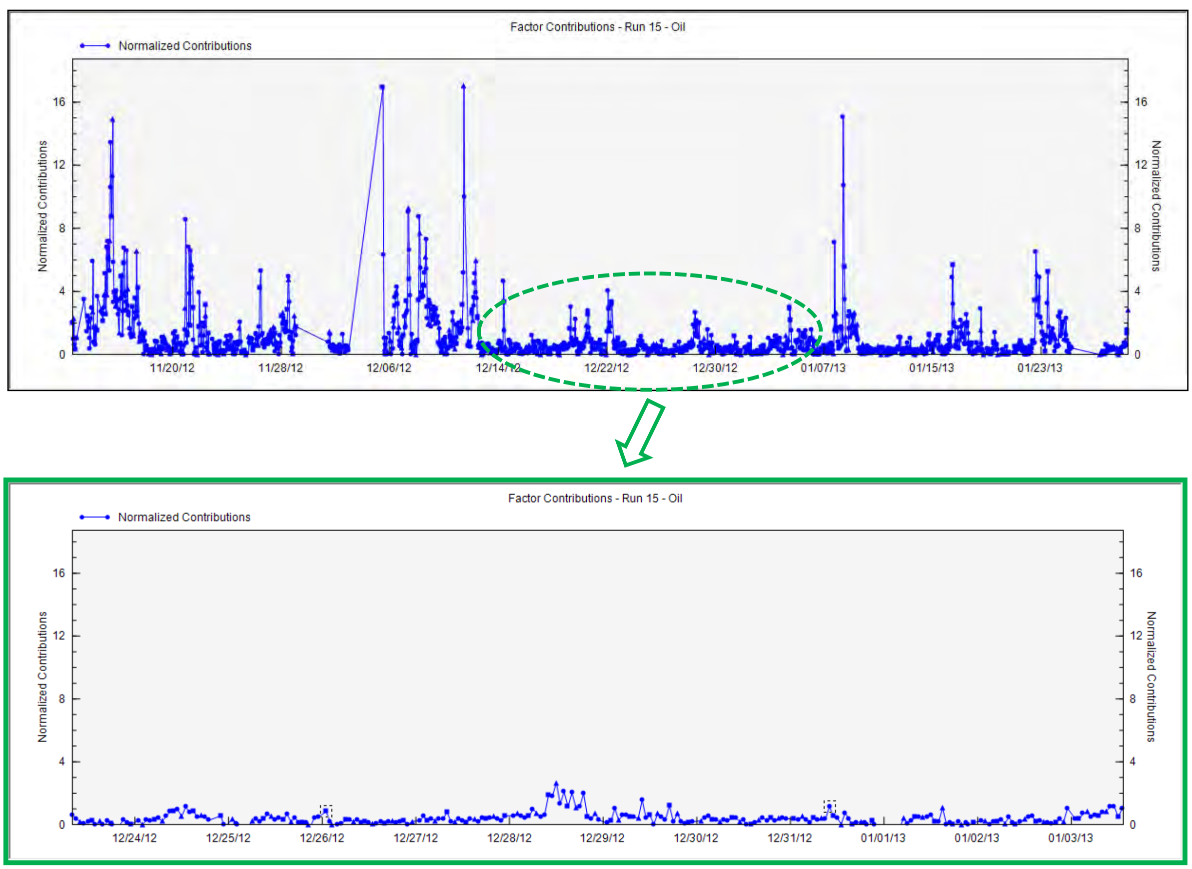


Figure 3-17. Time series of relatively low normalized contributions associated with the PMF Oil factor.

Potassium

Potassium was related to the wood burning factor identified in the PMF analysis. As shown in **Figure 3-18**, higher potassium concentrations and wood burning factor contributions were observed during holiday nights (e.g., Christmas and New Year), when a lot of wood burning activities likely occurred.

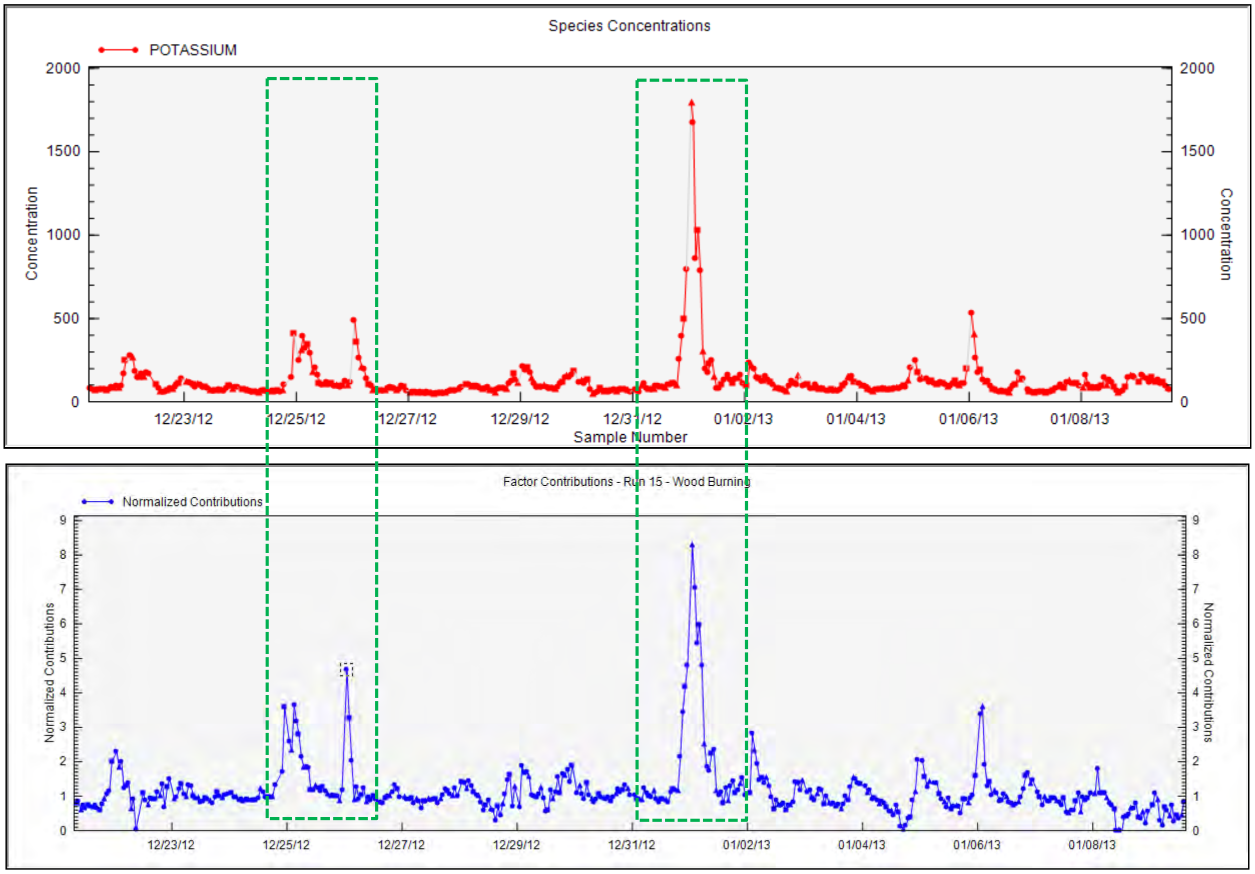


Figure 3-18. Time series of high potassium concentrations (ng/m^3) and normalized contributions associated with the PMF wood burning factor.

Lead and Zinc

Time series of lead and zinc concentrations were developed and compared with wind directions. As shown in **Figure 3-19**, higher lead or zinc concentrations were associated with various wind directions, suggesting that major impacts on concentrations of these metal elements were not likely from a single source in a particular direction near the monitoring site.

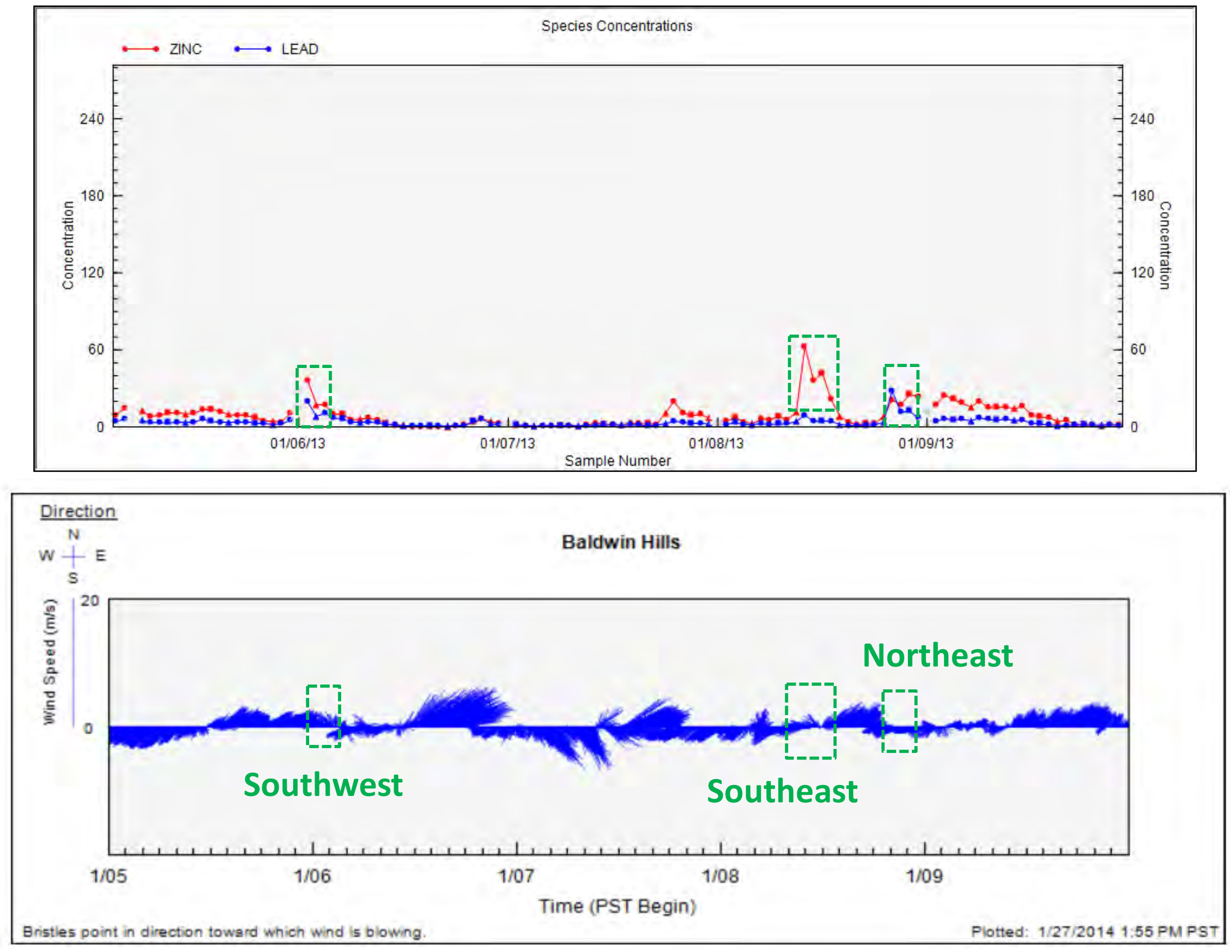


Figure 3-19. Time series of high lead and zinc concentrations (ng/m^3) and wind directions.

Cadmium

Given the observation of some high concentration measurements and the toxicity of cadmium, we further examined cadmium concentrations to assess its potential patterns and relationship with oil operation activities. During the sampling time period, mean and median cadmium concentrations were 5.35 ng/m^3 and 5.10 ng/m^3, respectively; however, 64% of cadmium samples were below the MDL (5.75 ng/m^3). Scatter plots showed no correlation between cadmium and other metal elements. Additionally, no correlation was found between cadmium and BC concentration differences for the East minus South pair, used to evaluate potential impacts from oil operational activities.

The time series of cadmium concentrations show no diurnal pattern and high variability through the entire sampling period. There was high variability during holiday weeks (approximately 12/21/12 to 1/8/13, during the Christmas and New Year holidays), when oil operation activities were very limited. We further assessed the top 20 highest cadmium concentrations, and found that these concentrations occurred under various wind directions; only four of these 20 samples occurred during the day. In particular, three of the 20 highest cadmium concentrations were observed under west-southwest wind direction (when the Oil Field is upwind of the sampling East site), but they were all during evening hours.

In PMF runs (see Section 3.2.3), cadmium was excluded because of a low signal-to-noise ratio. To further evaluate how cadmium may interact with other metal elements in factor contribution analysis, we conducted an extra PMF run to include cadmium as a strong species. The PMF results showed that cadmium was pulled into a factor with potassium and strontium, which is likely related to evening activities such as wood smokes. Cadmium was not shown to have significant contributions to the manganese and nickel factor, which is more likely from oil operational activities.

The case study analyses for cadmium, as described above, suggest no correlation between cadmium and oil operational activities during this sampling period.

3.3 PTR-TOFMS Volatile Organic Compounds

3.3.1 VOC Diurnal Patterns

As explained in Section 2.4.3, seven VOCs were measured in units of parts per billion (ppb) as well as the arbitrary units particular to the PTR-TOFMS instrument. We examined the time series and diurnal patterns of these VOCs in context with BC to see (1) whether there were similar temporal patterns among VOC species, indicating similar sources; and (2) whether VOCs had any similarity to variations in BC. Similarities in either case would indicate similar sources for BC and VOCs. The VOCs with ppb units were acetaldehyde, butadiene, acrolein, benzene, toluene, xylenes, and naphthalene.

Figures 3-20 and 3-21 show the time series and diurnal box plots of the VOCs, BC, and wind direction during the two-week VOC sampling period. In box plots, the interquartile range of the data are shown in a box, and the extent of the concentrations are shown by the whiskers. All species tend to have a morning peak, likely due to peak emissions during local morning rush hour plus influence from the Los Angeles Basin rush hour. Butadiene, acrolein, and naphthalene also have spikes of high concentrations, which are further evaluated in Section 3.3.3. The similar patterns across VOCs and BC suggest they are predominantly from local and regional combustion sources, i.e., vehicular emissions that tend to dominate VOCs in the Los Angeles area.

Next, we looked at how each of the seven VOCs compared to the difference in BC concentrations between the East and South sites, which indicates the oil operations' contribution to BC. A modest correlation between this difference and any species would indicate how much of that VOC species is from oil operations. Results are shown in **Figure 3-22**. No VOC had any correlation with the BC difference, though there were some high BC difference values that also had high VOC concentrations of acetaldehyde. These individual high values are used as case study examples in Section 3.3.3. The low correlation of VOC concentrations with BC difference indicates there is likely little consistent influence on VOC levels from the oil operations, although there may be influence for limited hours.

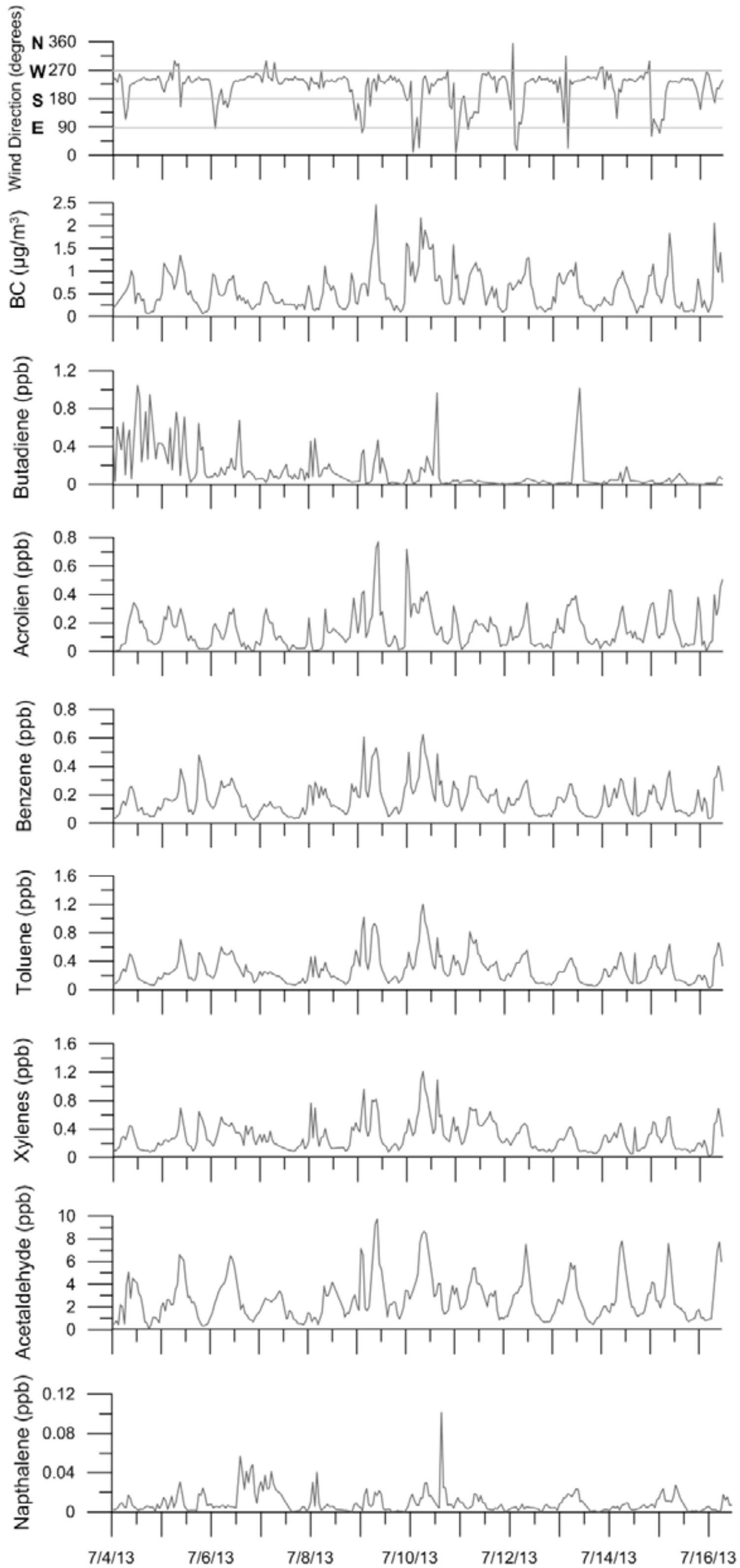


Figure 3-20. Time series of hourly VOC (ppb), BC (µg/m^3) and wind direction during the summer VOC intensive operating period.

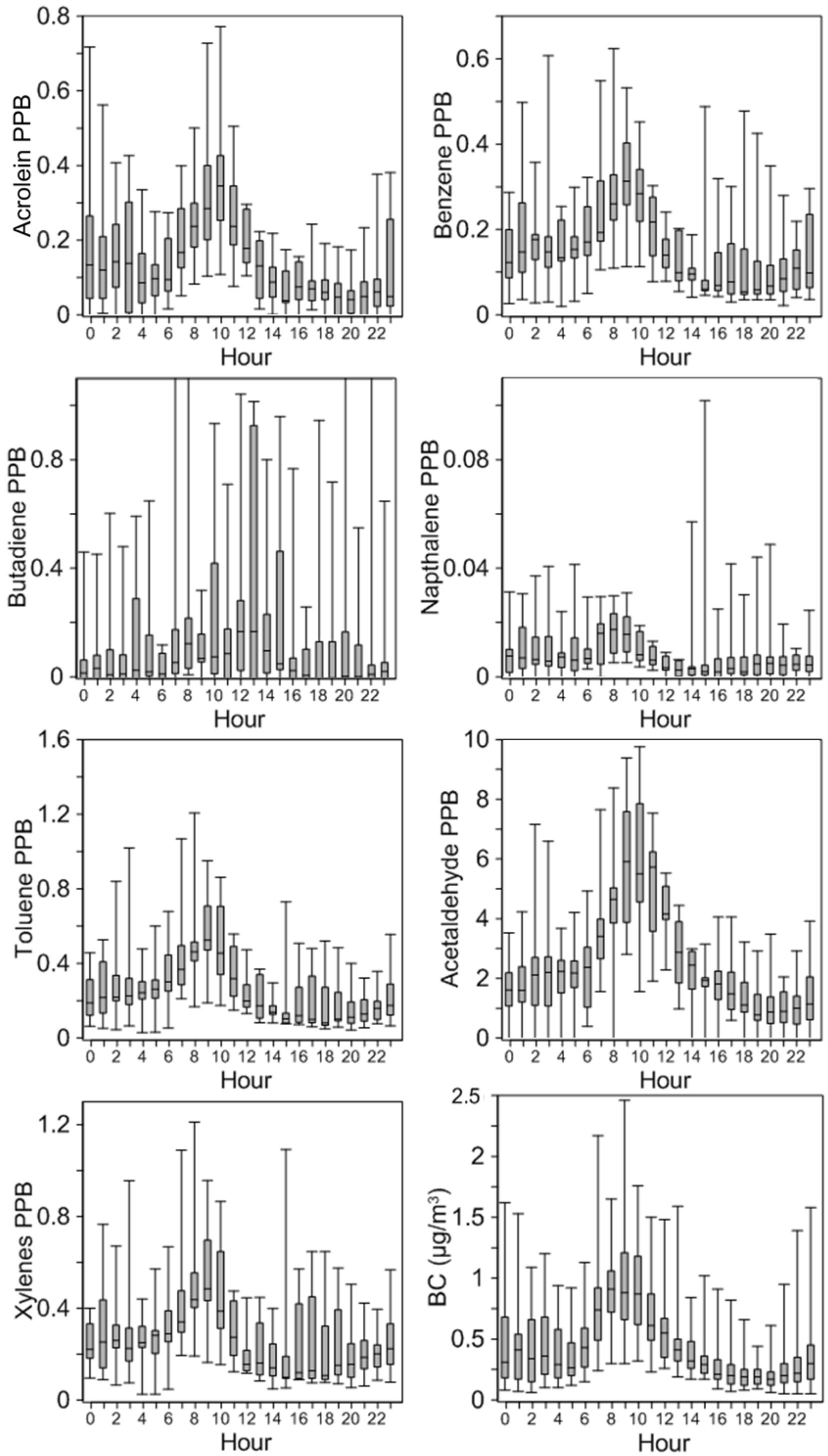


Figure 3-21. Box plots of VOC and BC concentrations by hour (ppb for VOC; µg/m^3 for BC).

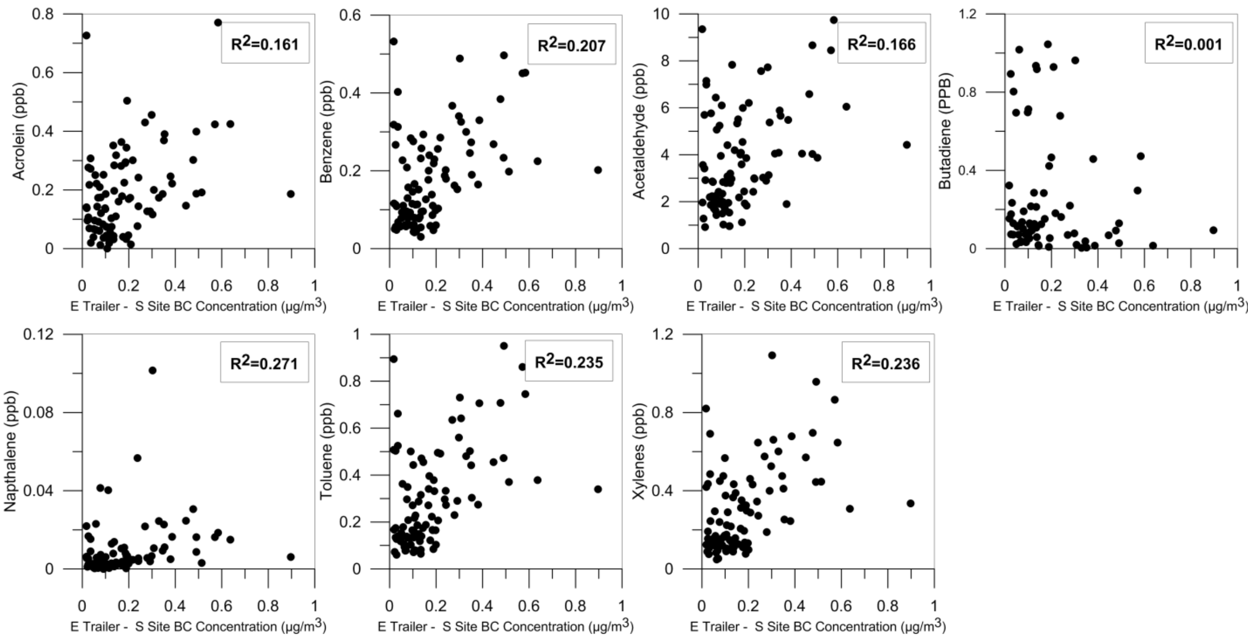


Figure 3-22. Scatter plots of VOC concentrations (ppb) with BC difference concentrations (μg/m^3) between the East and South sites.

3.3.2 VOC PMF Factor Analysis

A total of 23 VOC species with arbitrary units were measured by the PTR-TOFMS with significant signal-to-noise ratio to be included in the analysis. These include the seven species with ppb values, plus others such as formaldehyde, ethanol, acetone, isoprene, methyl ethyl ketone, and benzaldehyde. Some of these species, however, are identifiable only by their mass-to-charge ratio (*m/z)*, with multiple species possible for a given *m/z*. In these cases, we use the basic chemical formula of the *m/z*, e.g., C_3H_7+ for *m/z* 43.0542, which is a combination of n-propyl and isopropyl. **Table 3-5** summarizes the *m/z* available for PMF analysis, the ion associated with each *m/z*, and, where applicable, the likely VOC species name.

PMF was applied in order to separate out factors that influence the VOCs. No unique tracer for Oil Field operations was identified, so we used a given PMF factor's variation with wind direction, time of day, and the BC signal from the Oil Field to determine whether the PMF factor is likely to be associated with the Oil Field. Typically in PMF analysis of VOC data, the PMF factors are more representative of atmospheric chemical and transport processes, rather than specific sources, since many VOC species have multiple sources and short atmospheric lifetimes. This was the case here, where three PMF factors were identified, two of which—a reactive alkene/alkyne factor and a factor with oxygenated VOCs—were more associated with atmospheric processes. The additional factor was typical of mobile source emissions.

Table 3-5. Summary of PTR-TOFMS species including the *m/z* available for PMF analysis, the ion associated with each *m/z*, and, where applicable, the likely VOC species name.

m/z	Ion	Name	Concentrations Calibrated for ppb	Used in PMF?
31.0178	CH_2OH^+	Formaldehyde	No	Yes
33.0335	CH_4OH^+	Methanol	No	Yes
41.0391	$C_3H_5^+$	Propyne	No	Yes
43.0542	$C_3H_7^+$	Propyl groups	No	Yes
45.0335	$C_2H_4OH^+$	Acetaldehyde	Yes	Yes
47.0497	$C_2H_6OH^+$	Ethanol	No	Yes
55.0548	$C_4H_7^+$	1,3-Butadiene	Yes	No – signal/noise=0
57.0335	$C_2H_5CO^+$	Acrolein	Yes	Yes
57.0699	$C_4H_9^+$		No	Yes
59.0491	$C_3H_6OH^+$	Acetone	No	Yes
69.0699	$C_5H_9^+$	Isoprene	No	Yes
71.0491	$C_3H_6COH^+$	Methyl ethyl ketone	No	Yes
71.0855	$C_5H_{11}^+$		No	Yes
73.0648	$C_4H_8OH^+$	Methyl vinyl ketone	No	Yes
75.0446	$C_3H_6O_2H^+$		No	Yes
79.0542	$C_6H_8^+$	Benzene	Yes	Yes
83.089	$C_6H_{11}^+$		No	Yes
85.0648	$C_4H_8COH^+$		No	Yes
93.0699	$C_7H_9^+$	Toluene	Yes	Yes
97.1012	$C_7H_{13}^+$		No	Yes
107.049	$C_7H_6OH^+$	Benzaldehyde	No	Yes
107.0855	$C_8H_{11}^+$	Xylene	Yes	Yes
111.118	$C_8H_{15}^+$		No	Yes
125.132	$C_9H_{17}^+$		No	Yes
129.069	$C_{10}H_9^+$	Naphthalene	Yes	No – signal/noise=0

Table 3-6 summarizes the PMF factors; **Figure 3-23** shows the profiles of the three factors; and **Figure 3-24** shows the time series of the three factors, the BC concentrations at the East site, and the BC differential between the East and South sites. **Figure 3-25** shows pollution roses for the three PMF factors. Since the patterns are essentially the same for all three factors, wind direction analysis of VOCs and the VOC PMF factors does not provide information on potential sources. The mobile source factor was composed of species typical of exhaust, such as benzene, toluene and xylenes, as well as ethanol and benzaldehyde, which may be secondarily formed from exhaust. This factor had a strong morning and midday peak, typical of the morning rush hour, and likely came from emissions throughout the Los Angeles

Basin. The alkene/alkyne factor was composed of reactive unsaturated VOCs such as propyne and isoprene. These species have relatively short atmospheric lifetimes, and thus they vary together, forming their own factor. They are likely from multiple sources, including mobile sources and biogenic emissions, but their variations are more influenced by their atmospheric reactivity rather than by variations in emissions. The last factor, composed of oxygenated VOCs such as formaldehyde and acetaldehyde, was similar in that it was composed of VOCs that vary together in the atmosphere and can be from multiple sources. The VOCs in this oxygenates factor are emitted as primary emissions from combustion and can also be formed in the atmosphere; thus, this factor is at least as representative of atmospheric processes as it is of a primary emissions source.

Table 3-6. Summary of VOC PMF factors.

Factor	Description	Species	Diurnal Pattern	Correlation with E-S Site BC Difference?
Mobile source	Typical mobile source signature of BTEX, plus methanol	Benzene, Toluene, Xylene, Ethanol, Benzaldehyde	Strong morning and midday peak	No
Alkenes/alkynes	Unsaturated VOCs; very reactive	Propyne, Isoprene, etc.	Highly variable time series	No
Oxygenates	VOCs with oxygens, excluding benzaldehyde and ethanol	Formaldehyde, Methyl ethyl ketone, Methanol, Acetaldehyde, Acrolein, Acetone, etc.	Modest morning, midday peak	No

None of the factor profiles or time series indicated that they were specifically from the oil operations. To further examine the possibility of Oil Field impact, we used the BC concentrations' difference between the East and South sites as an indicator of the oil operations' BC contribution and compared this difference to the factor contributions. A modest correlation or better between a factor's contributions and the BC difference would indicate that the factor may also be from oil operations. **Figure 3-26** shows scatter plots of the BC difference with each factor's contributions, for all hours and for daytime hours only. There is little correlation between the BC difference and the factor contributions, indicating that none of these factors are directly attributable to the oil operations. This is consistent with the observations that individual species had little correlation with the BC difference.

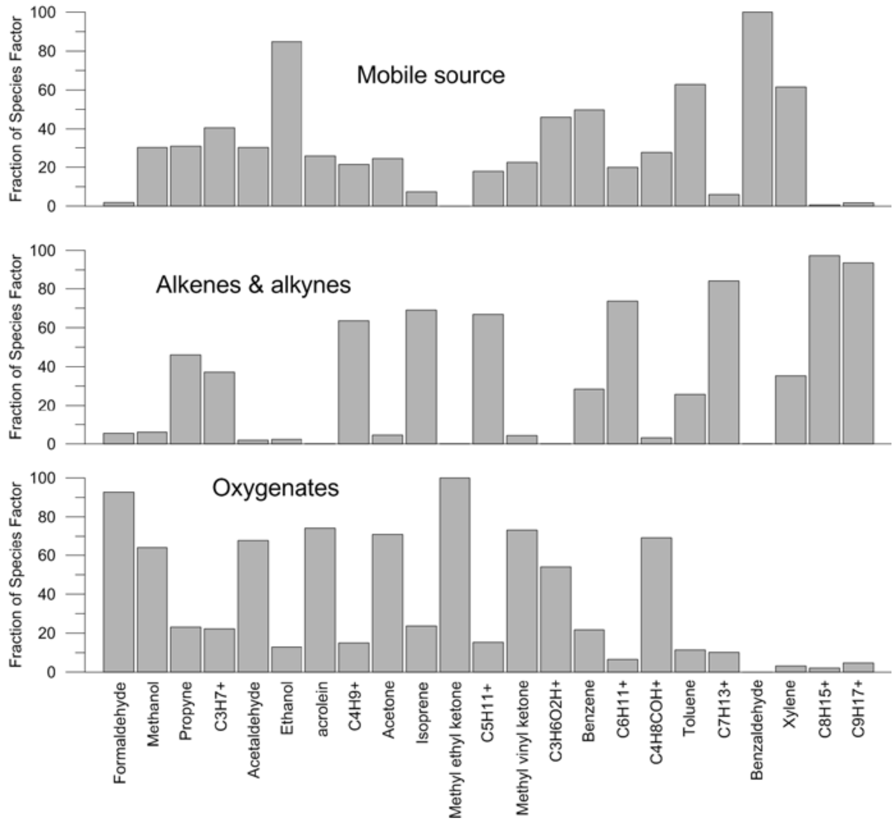


Figure 3-23. PMF VOC factor profiles.

3.3.3 VOC Case Study Analysis

While there was no consistent signal in the VOC data from the oil operations seen in earlier analyses, as a last step we examined the highest 5th percentile of BC difference concentrations that occurred concurrently with daytime VOC sampling, to see whether times of high BC differences also had high VOC concentrations. High VOC concentrations and the highest BC difference values occurring at the same time might indicate that, for certain specific hours, there was some qualified influence from the oil operations on VOC levels.

Table 3-7 summarizes the hourly BC difference and VOC concentrations during the highest 5th percentile of BC difference values that occurred during the daytimes of the VOC sampling period. Winds were typically out of the west-southwest. The 1,3-butadiene and naphthalene concentrations were low during these high BC difference periods. Of the six highest BC difference hours, four of these coincided with the highest 5th percentile concentrations of acetaldehyde and toluene, and three coincided with the highest 5th percentile concentrations of benzene and xylenes. Oil Field operations were active south of the site during these hours, so it appears that on some discrete hours, there is likely a noticeable, if not statistically quantifiable, influence from oil operations on acetaldehyde, benzene, and toluene. Each of the hourly episodes with high VOC concentrations was associated with either drill rig operations 518 feet from the East site, workover rig operations 661 feet from the East site, or both. All of the episodes occurred during workover rig operational hours.

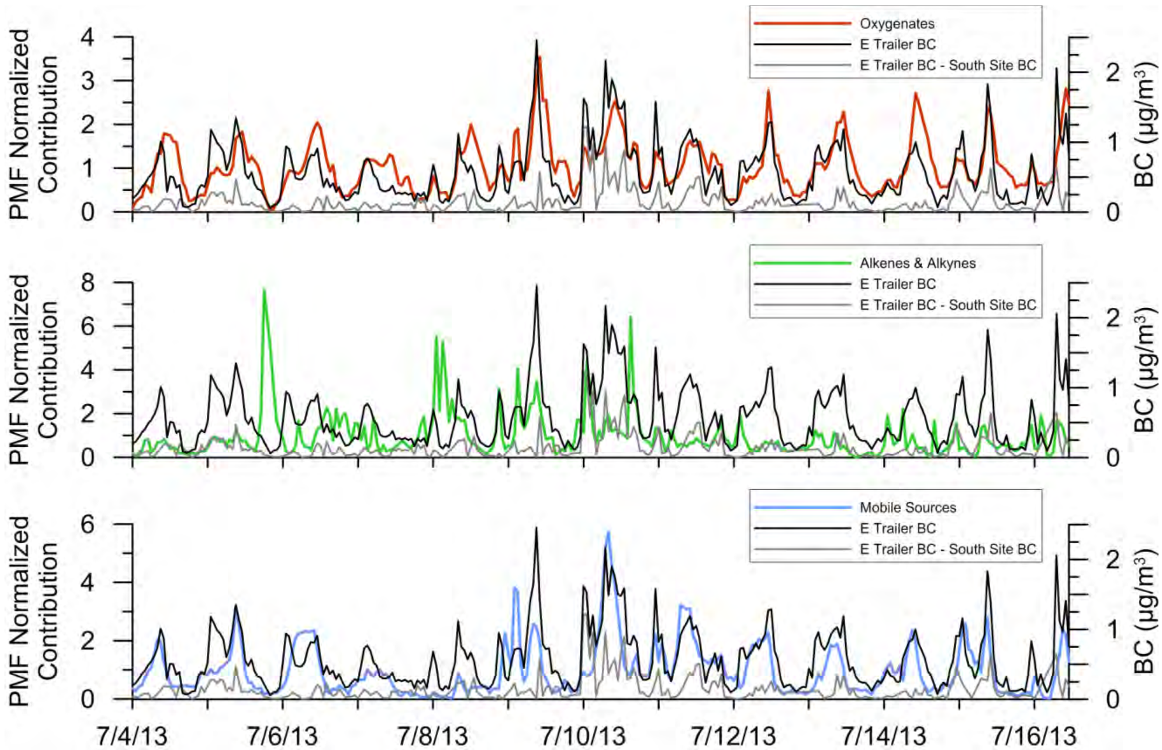


Figure 3-24. Time series of PMF factor normalized contributions, BC, and East minus South BC difference.

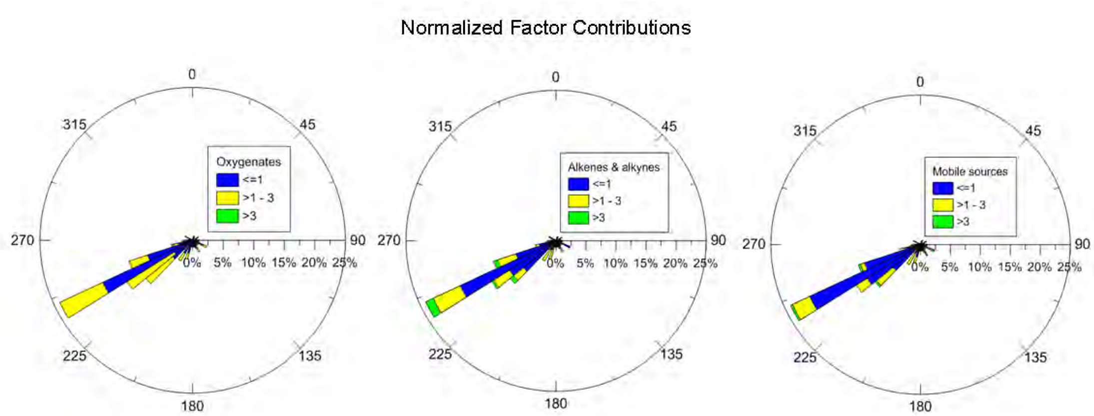


Figure 3-25. Pollution roses for VOC PMF normalized factor contributions.

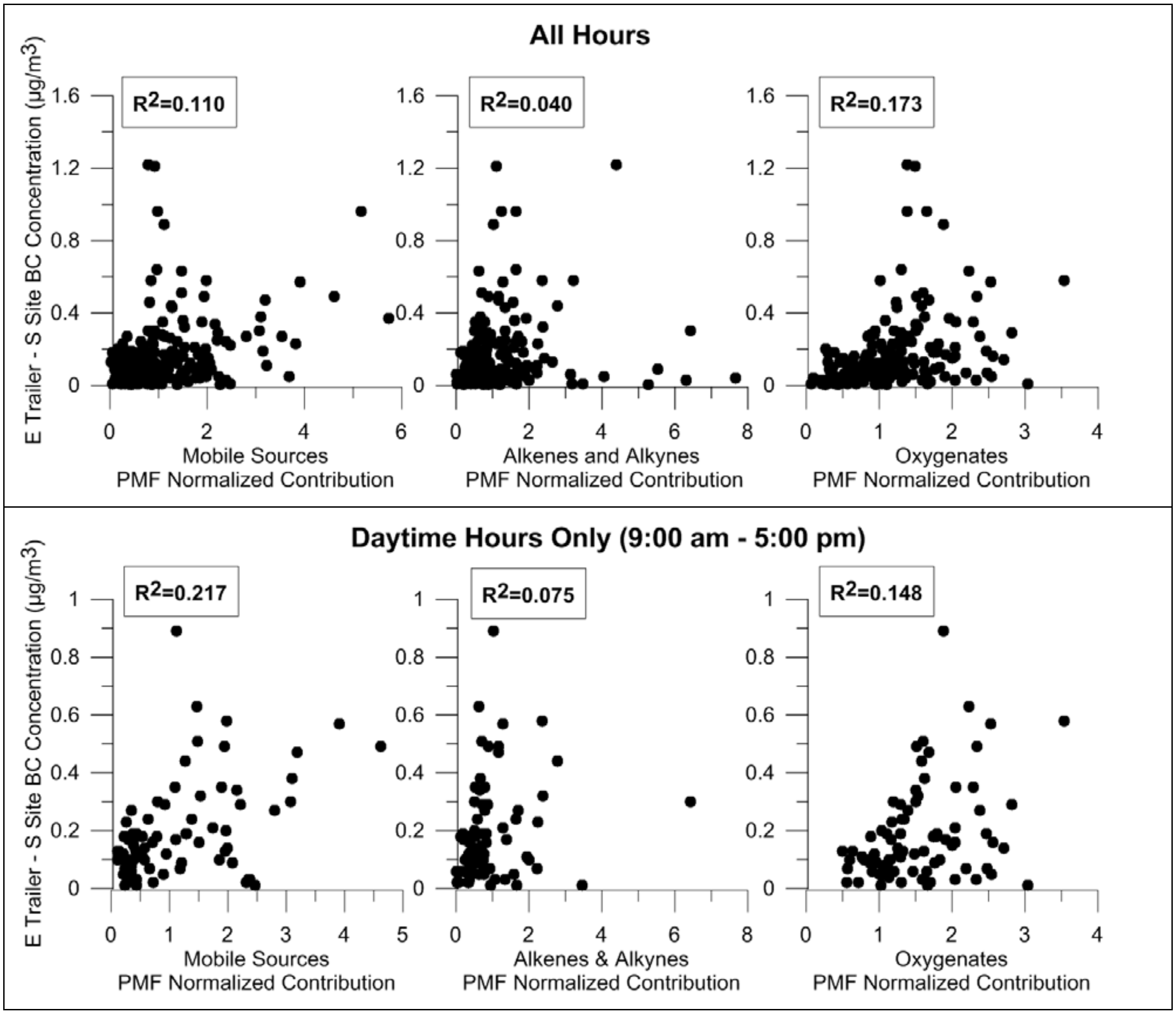


Figure 3-26. Scatter plot of PMF VOC factor normalized contributions and BC difference during all hours and daytime hours (9:00 a.m. to 5:00 p.m.).

Table 3-7. Wind direction and concentrations of BC difference and VOCs during the highest 5th percentile concentrations of BC difference between the East and South sites. For comparison, the highest 5th percentile of each species is shown in bold.

Date and Time	BC Difference μg/m³	Wind Direction	1,3-Butadiene (ppb)	Acrolein (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)	Naphthalene (ppb)	Acetaldehyde (ppb)
7/10/13 13:00	0.897	SW	0.093	0.186	0.202	0.340	0.336	0.006	4.423
7/15/13 10:00	0.637	SW	0.016	**0.425**	0.225	0.378	0.307	0.015	**6.051**
7/9/13 10:00	0.584	W	0.472	**0.771**	**0.452**	**0.745**	0.646	0.019	**9.733**
7/10/13 10:00	0.571	SW	0.296	0.423	**0.450**	**0.861**	**0.865**	0.016	**8.449**
7/11/13 13:00	0.513	SW	0	0.192	0.198	0.370	0.447	0.003	3.874
7/10/13 9:00	0.491	W	0.129	0.399	**0.497**	**0.951**	**0.957**	0.016	**8.664**
7/11/13 12:00	0.491	SW	0.028	0.187	0.234	0.473	0.445	0.009	4.031
7/5/13 9:00	0.477	SE	0.093	0.302	0.384	**0.708**	**0.696**	0.031	6.585
95th percentile concentration	0.491		0.918	0.425	0.403	0.708	0.691	0.025	7.719

3.4 Risk and Hazard Characterization

3.4.1 Diesel PM Risk and Hazard Characterization

Black carbon can be used as a proxy for DPM concentrations. In the MATES III exposure study, elemental carbon (EC) concentrations (μg/m^3) were used as a proxy for DPM concentrations. EC concentrations were multiplied by a factor ranging from 1.04 to 1.95 to estimate DPM concentrations (South Coast Air Quality Management District, 2008).

Dozens of studies have compared elemental carbon and black carbon measurement methods and have attempted to compare instrument response. An excellent summary of those studies is available in Appendix 1 of the U.S. Environmental Protection Agency's *Black Carbon Report to Congress* (U.S. Environmental Protection Agency, 2012). Table A1-3 and Figure A1-2 of the EPA report show that more than 65% of intercomparison studies showed BC/EC ratios of between 0.7 and 1.3.

We note that draft MATES IV measurements indicate that BC concentrations in the Los Angeles Basin averaged between ~0.95 to ~1.7 μg/m^3 during 2012-2013, with a basin average of about 1.3 μg/m^3. Our average measurements from November 2011 through November 2012 indicated average BC concentrations of approximately 0.67 μg/m^3 for the four monitoring sites, which is significantly lower than any BC site in MATES IV. Some of this discrepancy may be due to the offset in sampling periods, or due to cleaner coastal air being more influential at the Baldwin Hills sites.

For the purposes of this comparison, we used a BC:EC ratio of 1.5 based on the SCAQMD BC results to bound our estimates of DPM. For the conversion from EC to DPM, we will use the MATES IV draft report ratio of 0.82 to calculate our DPM:EC ratio.

Average DPM concentration estimates are shown in **Table 3-8** for each of the four Baldwin sites. The annual mean BC concentrations at each site is known very well, but the conversion to DPM requires assumptions that reduce our certainty in the estimates of those concentrations. Note that these are total cancer and noncancer estimates that do not identify the fraction of risk attributable to any particular emissions source.

Table 3-8. Summary of the average BC, EC, and DPM concentrations, and the corresponding risk and hazard characterization, at each Baldwin monitoring location for the November 2011 through November 2012 monitoring period.

Site	Average BC (μg/m^3)	BC:EC ratio of 1.5 (μg/m^3)	EC:DPM ratio of 0.82 (μg/m^3)	Cancer Risk (per million)	Noncancer Hazard Quotient
East	0.676	1.014	0.83	249	0.17
South	0.641	0.9615	0.79	237	0.16
West	0.724	1.086	0.89	267	0.18
North	0.672	1.008	0.83	248	0.17

Total cancer risks from DPM do not point to the total Oil Field contribution to cancer risks. As shown in Section 3.1.3, under west-southwest winds, daytime concentrations often showed an increment in concentrations. Under east-northeast winds, concentration gradients across the Oil Field were negative or zero, indicating no significant contribution of the Oil Field.

Table 3-9 summarizes the potential increment of BC concentrations across the Oil Field under west-southwest winds, which account for approximately half of all hourly measurements taken during the year-long study. Average contributions at the East minus South pair are higher than at the North minus West pair in most seasons. Total contributions for the year were estimated by dividing the BC difference for the pair by the BC concentration at the downwind site. Relative Oil Field contributions were estimated to be 5.2% at the North minus West pair and 8.6% at the East minus South pair. It is likely that emissions from traffic on La Cienega Blvd. are contributing to the East minus South pair, which is consistent with the higher contributions from that site pair overall, during most seasons, weekdays, and during average and maximum daytime increments. Finally, we note that the actual exposures to the Oil Field contributions across an annual mean are a little more than half of the values listed because the winds are from directions other than the Oil Field almost half of the time.

Table 3-9. Comparison of absolute and percentage contributions of the Oil Field operations to BC concentrations on the east side of the Oil Field when winds are from the west-southwest under a variety of conditions.

Increment Metric	North – West (µg/m^3)	East – South (µg/m^3)	% Contribution (North – West)	% Contribution (East – South)
WSW annual increment	0.036	0.056	5.2%	8.6%
WSW winter increment	0.023	0.067	3.3%	10.3%
WSW spring increment	0.057	0.037	8.2%	5.7%
WSW summer increment	0.021	0.07	3.0%	10.7%
WSW Fall increment	0.048	0.052	6.9%	8.0%
WSW average daytime positive increment	0.072	0.154	10.3%	23.6%
WSW maximum average hourly increment	0.146	0.242	20.9%	37.0%

We do not display results for when winds are from the east-northeast. Concentration differentials are routinely negative, indicating lower concentrations across the Oil Field. Winds from the east-northeast happened for about 25% of the overall study. Under east-northeasterly winds, residents on the western edge of the Oil Field are typically exposed to BC concentrations that are 0.065 to 0.096 µg/m^3 lower on average than those affecting residents on the eastern side of the Oil Field.

3.4.2 Metals Risk Characterization

Table 3-10 includes a comparison between the mean and maximum 1-hr concentrations of toxic metals and the dose-response factors for this study. The dose-response factors are the non-cancer reference exposure levels (REL) for both chronic (annual) and acute (less than a day) and 1-in-a-million cancer risk benchmark level.

Table 3-10. Comparison between dose-response factors and metal concentrations.

Metal Element	Chronic REL[a] (ng/m^3)	Acute REL[a] (ng/m^3)	Cancer 1-in-a-Million Level (ng/m^3)	Mean (Hourly Average in 2.5-Month) (ng/m^3)	Maximum 1-Hr (ng/m^3)
Arsenic	15	200 (8-hr)	0.300	0.013	2.112
Cadmium	20		0.238	5.35[b]	21.4
Chromium	200			0.195	25.4
Copper		100,000 (1-hr)		6.847	323.8
Lead	150		83.0	3.173	27.9
Manganese	90	170 (8-hr)		1.424	30.2
Mercury	30	600 (1-hr)		0.004	0.303
Nickel	14	200 (1-hr)	3.8	0.694	248.4
Selenium	20,000			0.474	29.3

[a] Chronic and acute RELs were obtained from the Office of Environmental Health Hazard Assessment (OEHHA); see http://oehha.ca.gov/air/allrels.html.
[b] Average concentrations for cadmium are below the reported method detection limit for the XACT instrument (5.78 ng/m^3).

Among the metals measured, there was one reported hourly value for any metal that exceeded the acute REL standard; this was for the nickel REL of 200 ng/m^3. This hourly value occurred on November 17, 2012, at 10:00 PM LST. Multiple other metals had high concentrations on that hour, including manganese, iron, zinc, and potassium. Winds for that hour were from the northeast, which is in the direction of Kenneth Hahn State Park, the opposite direction from the Oil Field. BC concentrations for that same hour were below 1 $\mu g/m^3$. It is unclear what caused the high nickel concentration, but it did not appear to be associated with onsite operations at the Oil Field.

Comparing the mean concentrations for the 2.5-month monitoring period to chronic RELs indicates that no metals were above their dose-response level. The metal with the closest concentration to an REL was cadmium, which was almost a factor of four below the chronic REL value. Moreover, for most of the metals, the maximum 1-hr concentration observed was below the chronic REL value (again, except for nickel).

Finally, comparing the mean 2.5-month concentration to the 1-in-a-million level cancer risk for each of the metals indicates that arsenic, lead, and nickel are all below the level of concern. In contrast, the mean cadmium concentration measured by the XRF instrument was above the 1-in-a-million level of concern, leading to an excess cancer risk for cadmium of 22.5-in-a-million. STI scientists consider this result uncertain for a number of reasons. First, we note that MDLs for cadmium measurements are at 5.75 ng/m^3, and the mean measured concentration was below the MDL. Second, 64% of individual hourly measurements were below the MDL. Third, the lowest 1-hr concentration reported by the XRF instrument was 1.1 ng/m^3, which is above the 1-in-a-million benchmark of 0.238 ng/m^3. This is almost as high as annual mean measurements of cadmium in the MATES III study, which reported average concentrations of 1.5 to 1.6 ng/m^3, based on a 2.0 ng/m^3 MDL, and it is a factor of 10 higher than average concentrations of 0.1 ng/m^3 reported in the draft MATES IV study.

Cadmium concentrations showed no wind direction dependence, no distinguishable diurnal pattern, and no weekday-weekend differences. As a result, while cadmium concentrations were higher than the 1-in-a-million risk level value, we cannot attribute what fraction, if any, of the local concentrations may be attributable to the Oil Field. We note that the discrepancy in concentrations between our measurements and the SCAQMD MATES III and MATES IV measurements may be partly a result of our 2.5-month sampling period relative to the annual means calculated in MATES; it is plausible that winter concentrations could be higher than summer concentrations as a result of lower wintertime mixing heights and winds.

3.4.3 VOC Risk Characterization

Concentrations of the VOC species were compared to non-cancer and cancer benchmarks, shown in **Table 3-11**. The product of the mean concentration and the 1-in-a-million cancer risk benchmark for a given species was used to assess the cancer risk. No VOC species average was above the chronic REL, although acrolein was very close. Each of the pollutants with cancer risk levels was above the 1-in-a-million level, with 1,3-butadiene having the highest cancer risk for this two-week period, followed by benzene, acetaldehyde, and naphthalene. Note that the two-week average concentration is unlikely to be representative of the annual mean exposure for any of these pollutants, as the seasonal patterns in these pollutants may vary by a factor of three or more (McCarthy et al., 2007). However, these concentrations are similar to those observed in MATES III and are useful as benchmarks for assessing potential risks from the Oil Field operations.

Table 3-11. Comparison of VOC concentrations to OEHHA dose-response factors.

Pollutant	Chronic REL (µg/m^3)	Acute REL (µg/m^3)	Cancer 1-in-a-Million Level	2-Week Average (µg/m^3)	1-hr Maximum (µg/m^3)	Excess Cancer Risk (per Million)
1,3-Butadiene	2	9	0.00588	0.22	2.31	37
Acrolein	0.35	2.5		0.33	1.77	
Benzene	60	1300	0.0345	0.55	1.70	16
Toluene	5000	37000		1.08	3.58	
Xylenes	300			1.31	4.74	
Naphthalene	9		0.0294	0.05	0.53	1.7
Acetaldehyde	140	470	0.37	4.72	17.5	13

As noted in Section 3.3, the two weeks of five-minute average measurements did not show any statistically significant contributions of Oil Field operations to the identified source factors contributing to concentrations of these toxic air pollutants. Due to the short deployment, it is not possible to rule out Oil Field contributions to ambient VOC concentrations; however, diurnal time series and case studies were not consistent with the hypothesis that the Oil Field was a major contributor to any of the VOCs we examined.

3.5 Supplementary Emissions Activity Analysis

Emissions activity data from on-field and roadway activities were used to attempt to distinguish among the different possible sources of higher black carbon concentrations across the Oil Field that occurred when winds were from the west-southwest. The key distinguishing information we had to work with from the BC differential analyses included

- Differentials were greater at the East minus South pair of monitors than at the North minus West pair. It was hypothesized that onroad emissions from motor vehicles were responsible for some of the higher concentrations for the East minus South pair.
- Concentration differentials were highest during daytime business hours, particularly from 8:00 a.m. LST to about 3:00 p.m.
- Concentration differentials were higher on weekdays than weekends.

Emissions activity data were examined to see what Oil Field and traffic activity were consistent with the activity patterns seen in the BC differential analysis. Of the emissions sources with available activity data, we see that the timing of heavy-duty truck traffic, medium-duty vehicle traffic, light-duty vehicle traffic, and maintenance and workover rig operation is consistent with the observed temporal profile of increased BC concentrations across the Oil Field. Each of these sources has higher daytime and weekday emissions activity.

The East minus South pair has a higher BC differential than the North minus West site pairing; this is consistent with both roadway and Oil Field maintenance and workover rig emissions. La Cienega Blvd. north of Stocker is between the East minus South pair; thus we expect some influence from the roadway emissions to the observed differential. Given the available activity data, it is not possible to separate the Oil Field and traffic contributions at this site pairing since the observed patterns are consistent with both traffic and maintenance and workover rig operations.

In contrast, the North minus West pair has no intervening roadway; both sites are west of La Cienega Blvd. Therefore, the BC differential under west-southwesterly winds should not have any roadway influence at the North minus West pair. This site pair still has higher weekday and daytime BC differential concentrations (under WSW winds) than weekend and nighttime conditions. The North minus West pair also has a lower BC concentration differential than the East minus South pair on average during each season. This observational evidence is consistent with the temporal activity patterns of Oil Field maintenance and workover rigs without the confounding traffic influence. Thus, we conclude that this site pair is capturing a small but real source of Oil Field emissions of diesel PM.

Table 3-12 shows a summary of some characteristics of the supplemental emission sources and a statement of whether or not those characteristics are consistent with the characteristics of the BC differentials. Source characteristics include a qualitative magnitude of the activity and a classification of the diurnal emissions pattern. The BC differential diurnal pattern is consistent with the diurnal pattern of workover and maintenance rigs and with some, but not all, of the on-road diesel activity diurnal patterns on La Cienega Boulevard.

Table 3-12. Emission sources temporal activity patterns and consistency with observed BC differential temporal patterns

Emissions Source	Approximate Magnitude	Higher on Weekdays than Weekends?	Higher During Daytime Business Hours?	Peak Hour	Consistent with BC Differential?
La Cienega north of Stocker - Heavy-duty diesel	30 vehicles	Yes	Yes	8:00 AM	Yes
La Cienega south of Stocker - Heavy-duty diesel	100 vehicles	Yes	Yes	6:00 PM	No
La Cienega north of Stocker - Medium-duty vehicles	1,000 vehicles	Yes, but only during AM	Yes	4:00 PM	No
La Cienega south of Stocker - Medium-duty vehicles	1,100 vehicles	Yes, but only during AM	Yes	8:00 AM	Yes
La Cienega north of Stocker - Light-duty vehicles	3,500 vehicles	Yes, but only during AM	Yes	6:00 PM	No
La Cienega south of Stocker - Light-duty vehicles	4,300 vehicles	Yes, but only during AM	Yes	7:00 AM	Yes
Stocker and Fairfax Gate- Car and truck entries	40 vehicles	No	Yes	6:00 AM	No
Stocker and Fairfax Gate- Heavy-duty diesel entries	3 vehicles	No	Yes	10:00 AM	No
Drill rig	1 rig - 3 parts	No	No	Not available	No
Workover and maintenance rigs	6 rigs	Yes	Yes	Not available	Yes

4. Discussion

4.1 Comparison of Risk and Hazard Across Target Air Toxics

Section 3.4 discusses the individual risk and hazard associated with each pollutant in the Oil Field. **Figures 4-1 and 4-2** compare the total excess cancer risk and noncancer hazard index measured by pollutant in the Baldwin Hills Air Quality Study. Note that all DPM risk and hazard values in this section of the report use the more conservative estimates (BC*1.5 = EC) that lead to higher cancer risk and noncancer hazard estimates. As expected, Diesel PM had the highest individual contribution to total cancer risk, with values more than ten times higher than the sum of the risk of all other pollutants measured in the study. This cancer risk estimate for DPM is quantitatively comparable to the estimates of total cancer risk in the MATES IV study, which found total risk from Diesel PM to be approximately 285-in-a-million.

Regarding excess cancer risk, the OEHHA states, "For chemicals that are listed as causing cancer, the "no significant risk level" is defined as the level of exposure that would result in not more than one excess case of cancer in 100,000 individuals exposed to the chemical over a 70-year lifetime. In other words, a person exposed to the chemical at the "no significant risk level" for 70 years would not have more than a "one in 100,000" chance of developing cancer as a result of that exposure."[3] Benzene, 1,3-butadiene, and the combination of formaldehyde and acetaldehyde were found to make up the largest individual components of risk after Diesel PM. Cadmium was found to contribute slightly to risk, but our estimate is about 50 times higher than the MATES IV estimate, which may be due to instrument measurement differences. We recommend a comparison of ICP-MS and XRF cadmium measurements using filters collected in the western Los Angeles Basin to resolve the potential cadmium discrepancy.

Figure 4-1 shows that estimated diesel particulate matter concentrations in the area constitute the dominant contribution to excess cancer risk from ambient air. The relative contributions from the Oil Field are shown as the smaller bar within the total local risk. Total risk estimates for each of the air toxics are in reasonable agreement with SCAQMD MATES IV estimates of excess cancer risk across the Los Angeles Basin, with the exception of cadmium.

In comparison to the cancer risks, which are well above a screening value of 1-in-a-million excess cancer cases, all noncancer hazard index values shown in Figure 4-2 are below a value of 1.0. A noncancer risk of 1.0 is considered the "health reference level" and is expected to be below the level at which adverse human health effects would occur. Thus, acrolein, which has the highest noncancer hazard index at 0.94, is expected to have no adverse health impacts. However, we note that for most of the toxics shown in Figure 4-2, there is some additional uncertainty associated with the shorter sampling periods (2.5 months for metals, 2 weeks for VOCs); these values do not necessarily represent true annual mean concentrations. Additionally, we are considering each pollutant's effect individually; these pollutants may have additive or synergistic effects that would lead to higher estimated cumulative risks than the estimates shown below.

[3] See "Proposition 65 in Plain Language" at http://www.oehha.ca.gov/prop65/background/p65plain.html.

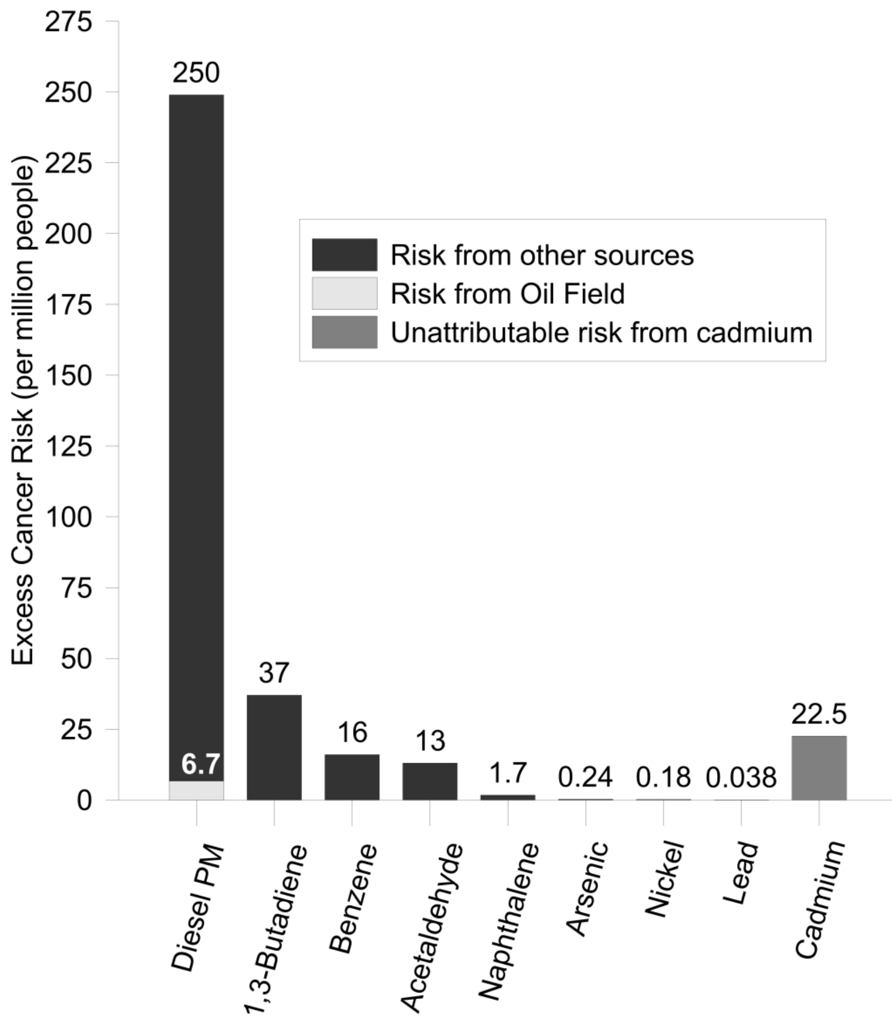


Figure 4-1. Individual pollutant contributions to total excess cancer risk (per million people) at the Baldwin Hills Air Quality Study. The graph shows total risk from ambient air and the incremental contribution of the Oil Field. Cadmium risk could not be attributed and should be validated through measurement intercomparison studies.

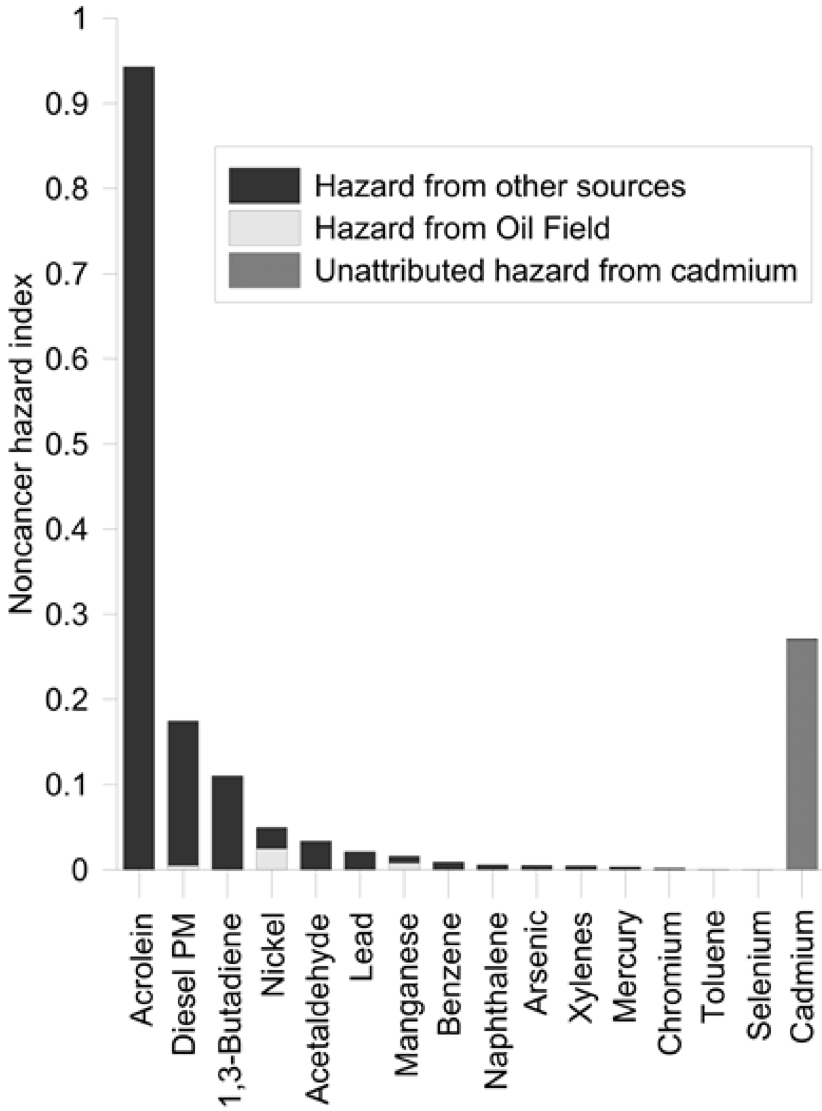


Figure 4-2. Relative contributions to the chronic noncancer hazard index for the Baldwin Hills Air Quality Study. This graph shows total chronic noncancer hazard from ambient air and the incremental contribution of the Oil Field. If the noncancer hazard index is below a value of one, then no adverse effects are expected.

In summary, Diesel PM is the pollutant of most concern identified by this monitoring study based on total ambient concentrations. This finding is consistent with previous risk assessments performed in the SCAQMD and the quantitative results from those larger studies of air quality in the Los Angeles Basin.

4.2 Assessment of the Oil Field Contributions to Risk and Hazard

Of the pollutants examined, only Diesel PM showed solid evidence of significant contributions from the Oil Field to chronic cancer risk or noncancer hazard. Under west-southwest conditions, concentrations of DPM across the Oil Field increased by 5.2 to 8.6%

on average. The wind direction frequency bins are shown in **Table 4-1**. West-southwesterly (onshore flow) winds were dominant, occurring 53% of the time. East-northeast winds, or offshore flow, were the second most common, occurring 25% of the time. Winds from the south or north were much less frequent, at 13.1 and 7.8% of the time, respectively.

Table 4-1. The percentage of hours during which wind originated from four major directions.

Direction	Wind Direction Angles	Percent of Total Winds
East-northeast	30°–120°	25.0
North-northwest	300°–30°	7.8
South-southeast	120°–210°	13.1
West-southwest	210°–300°	53.0

Under west-southwesterly conditions, residents to the east of the Oil Field were exposed to higher DPM concentrations than those on the west of the Oil Field. However, under other wind regimes, these residents were not exposed to Oil Field contributions. For example, under east-northeast winds, concentrations of DPM on the eastern side of the Oil Field would not be influenced by the Oil Field operations. Similarly, south-southeasterly flow and north-northwesterly flow would not expose residents on the eastern side of the Oil Field to Oil Field contributions. Therefore, the total contribution of pollutants from the Oil Field to residents on the eastern side of the Oil Field comes during the 53% of the time when winds are west-southwesterly. This reduces the estimated contribution to 2.6 to 4.6% of the total DPM exposure. Taking the most conservative estimate of DPM cancer risk of 250 per million, we estimate that the Oil Field may be directly responsible for approximately 6.7 to 11.3 per million of the total DPM risk. Given that the higher estimate of 11.3 per million is likely influenced by traffic on La Cienega Boulevard emissions of DPM, we consider this a conservative upper estimate of total risk to residents on the eastern side of the Oil Field. The contributions to excess cancer risk and to noncancer hazard index are shown in Figures 4-1 and 4-2.

The differential analysis showed a decrease in BC concentrations when winds were from the east-northeast. Therefore, there is no evidence of Oil Field operations contributing to enhanced DPM exposure under those wind conditions.

Winds from the south-southeast and north-northwest were much less frequent than the primary onshore-offshore flow. As a result, Oil Field operations have proportionately less potential impact because residents downwind of the Oil Field in these directions will be exposed much less of the time.

We found no evidence of contributions to other key species such as benzene, acetaldehyde, acrolein, or 1,3-butadiene. It is possible that the Oil Field operations could contribute significantly to some of these species, but we have no compelling evidence to suggest it does, based on the two weeks of VOC monitoring. Additionally, the concentrations observed at the Oil Field are generally consistent with concentrations observed in other parts of the Los Angeles Basin, suggesting that any possible contributions of the Oil Field are incremental or marginal, rather than a dominant local source.

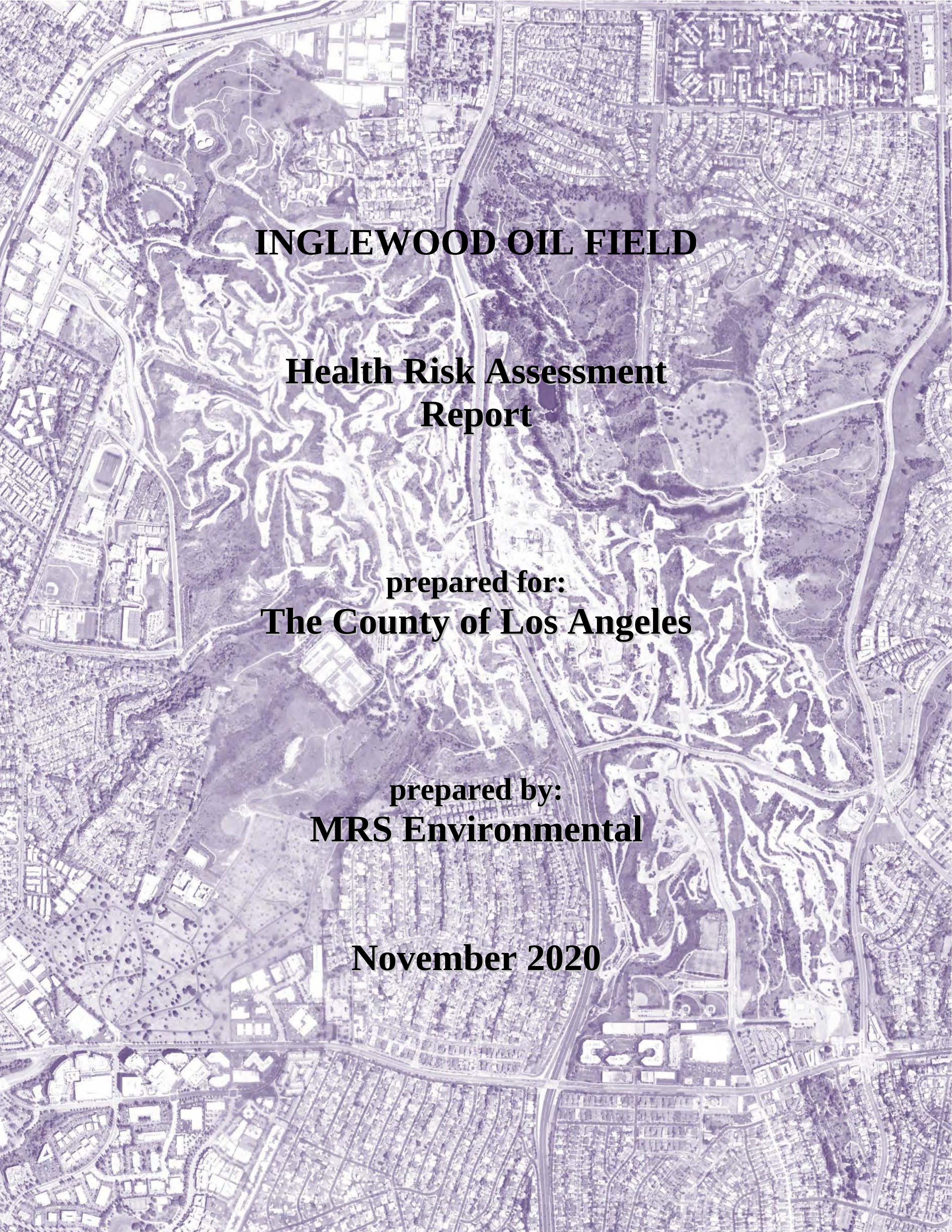
The contribution of the Oil Field to cadmium concentrations is more complicated because of the detection limit issues with the analytical method. The average cadmium concentration was below the MDL. Wind direction, day-of-week, and time-of-day analyses showed no patterns in concentrations that would suggest Oil Field contributions. However, the average concentration of cadmium was a little more than three times higher than concentrations reported in MATES III and more than 50 times higher than concentrations in the draft MATES IV report. This could be evidence of a local contribution from the Oil Field. It may also indicate higher wintertime concentrations or issues with the analytical method. While cadmium cancer risk in this study is 22.5-in-a-million, attribution of the source of the cadmium is not possible with the available data.

Nickel and manganese concentrations may be influenced by Oil Field operations, but their total cancer risk and noncancer hazard are negligible.

Therefore, we find the total maximum cancer risk that can be plausibly attributed to the Oil Field operations is in excess of 11.3 per million cancer risk. This number is a conservative estimate, and may include contributions from La Cienega Blvd. emissions and does not include any contribution from cadmium.

Excerpt of reference cited at point d. to Sentinel Peak Resources September 27, 2023 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_health-risk-assessment-report.pdf



INGLEWOOD OIL FIELD

Health Risk Assessment Report

prepared for:

The County of Los Angeles

prepared by:

MRS Environmental

November 2020

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DEFINITIONS, ACRONYMS AND ABBREVIATIONS

Acute Health Impacts	Non-cancer health impacts for short-term, one-hour peak exposures to potential facility emissions. The total sum of the ratio of concentrations of each toxic air contaminant to its acute reference exposure level (REL).
Chronic Health Impacts	Non-cancer health impacts for long-term exposure to potential facility emissions. The total sum of the ratio of concentrations of each toxic air contaminant to its chronic reference exposure level (REL).
8-Hour Chronic Health Impacts	The ratio of the predicted air toxic exposure to the air concentrations at or below which health impacts would not be expected with repeated daily 8- hour exposures over a significant fraction of a lifetime. The 8-hour noncancer hazard index is considered a chronic risk as it uses an 8-hour concentration that represents the long-term average of repeated 8-hour daily averages that occur.
Cancer Risk	The health risk associated with long-term exposures resulting from emissions of carcinogenic agents.

AB 2588	Assembly Bill 2588
AE	Annual Emissions
AER	Annual Emissions Report
AERMOD	American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
ARB	California Air Resources Board
BL	Breathing Loss
BPIP	Building Profile Input Program
CE	Control Efficiency
CSF	Cancer Slope Factor
DICE	Diesel Internal Combustion Engines
DPM	Diesel Particulate Matter
EF	Emission Factor
EPA	U.S. Environmental Protection Agency
HARP2	Hot Spots Analysis and Reporting Program 2
HI	Hazard Index
HRA	Health Risk Assessment
ICE	Internal Combustion Engine
lb	Pound
lb/lb-mol	Pound per Pound Mole
lb/MMscf	Pounds per Million Standard Cubic Feet
m	Meter
MEIR	Maximally Exposed Individual Resident
MEIW	Maximally Exposed Individual Worker
MHE	Maximum Hourly Emissions
MSDS	Material Safety Data Sheet
µg/m3	Micrograms per Cubic Meter

NOx	Oxides of Nitrogen
OEHHA	Office of Environmental Health Hazard Assessment
PF	Potency Factor
PM	Particulate Matter
PM10	Particulate Matter less than 10 Microns in Diameter
PMI	Point of Maximum Impact
Ppmv	Parts per Million by Volume
REL	Reference Exposure Level
RY	Reporting Year
SCAQMD	South Coast Air Quality Management District
scf/lb-mol	Standard Cubic Feet per Pound Mole
scfm	Standard Cubic Feet per Minute
SOx	Oxides of Sulfur
TAC	Toxic Air Contaminant
URF	Unit Risk Factor
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound
WL	Working Loss

Summary

The Inglewood Oil Field (IOF) has operated since the discovery of oil and natural gas resources in the area in 1924. Over the field's history 1,600 wells have been drilled within the historical boundaries of the field. Today, the oil field's boundary covers approximately 1,000 acres making it one of the largest contiguous urban oil fields in the United States.

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and potentially expose the general public and workers to these airborne pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this analysis is to determine whether a significant health risk would result from the publics continued exposure to these emissions as routinely emitted during project operations.

A health risk assessment (HRA) utilizes emissions levels from the oil field equipment, as reported to the SCAQMD, and operations along with historical site-specific meteorological data and computerized dispersion models to estimate the pollutant concentrations at receptors and the resulting short (acute) or longer term (chronic and cancer) health impacts. There are stringent guidance documents promulgated by the California Office of Health Hazard Assessment (OEHHA) and the South Coast Air Quality Management District (SCAQMD) which were followed in the development of this analysis. The modeling inputs and methodology were reviewed by the SCAQMD (see Section 5.1).

An HRA was prepared in 2008 as part of the oil field Community Standards District (CSD) EIR. This HRA is being prepared to address the changes to the OEHHA HRA guidelines as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations. The HRA is a CEQA HRA, as per CAPCOA Land Use guidelines (CAPCOA 2009), which means that, as opposed to an AB2588 HRA, this analysis is more conservative and includes mobile sources that are present at the field. Therefore, this HRA includes all potential sources of Toxic Air Contaminants (TACs) and is the same approach that was utilized in preparing the previous 2008 EIR HRA during the development of the CSD.

This HRA was prepared to address the changes to the OEHHA HRA guidelines (related to childhood exposure calculations and exposure durations, amongst others) as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations.

Analysis Scenarios

The analysis examined two operating scenarios: the year 2019 operations and a worst-case future operating scenario. During the year 2019, there was no drilling occurring at the oil field and operations were limited to normal production and maintenance operations. The 2019 operating year with no drilling is typical of recent operating years as the last new well drilled at the oil field was in 2014.

The future worst-case operation scenario assumed the average level of drilling that could occur under the limits of the CSD between 2021 and the end of the CSD in 2028 (46 wells drilled per year), with extensive drilling occurring at the limits allowed by the CSD. The worst-case future scenario assumed that this level of operations would continue into the future, even though potential drilling at the oil field during the post-2028 period are uncertain.

Analysis Results

For both scenarios, the results of the HRA are shown in Table ES.1 below.

For the 2019 operations scenario, the estimated peak risks at the facility boundary would be a peak cancer risk of 5.2 cases per million, and an acute and chronic risk of 0.48 and 0.06 HI, which are below the SCAQMD thresholds for AB2588 facilities, defined as below 10 cancer cases per million and below a Hazard Index (HI) of 1.0. The peak cancer risk at the nearest residence would be 1.0 cancer cases per million, which would be below the SCAQMD AB2588 thresholds.

For the worst-case future operations scenario including drilling of 46 wells per year, the estimated peak cancer risks at the facility boundary (PMI at the fence line) would be 13.8 cancer cases per million, and an acute and chronic HI of 0.55 and 0.18. The cancer risk would be above the SCAQMD thresholds for AB2588 facilities; however, the peak acute and chronic risks would be below the thresholds. The peak cancer risk would occur near Kenneth Hahn Park along the fence line. The peak cancer risk at the nearest residence would be 5.6 cancer cases per million, which would be below the SCAQMD AB2588 thresholds.

Based on the worst-case scenario and the 2019 operational scenario, the level of drilling that would result in peak cancer risk levels below the SCAQMD threshold level would correspond to about 25 wells drilled per year average.

Table ES.1 Risks Results

Location	Location Description	Cancer Risk, per million	Acute Risk, HI	Chronic Risk, HI
2019 Year Operating Scenario				
PMI	Highest value along the oil field fence line	5.2	0.48	0.06
MEIR	Highest value at any residence	1.0	0.09	0.01
MEIW	Peak value at any work location	0.07	0.05	0.003
School	Highest value at any school	0.63	0.04	0.004
Worst-case Future Year Operating Scenario				
PMI	Highest value along the oil field fence line	13.8	0.55	0.18
MEIR	Highest value at any residence	5.6	0.11	0.03
MEIW	Peak value at any work location	0.34	0.05	0.005
School	Highest value at any school	5.1	0.05	0.014

Note: health index (HI), point of maximum impact (PMI), the maximally exposed individual resident (MEIR), the maximally exposed individual worker (MEIW).

1.0 Introduction

The Inglewood Oil Field (IOF) has operated since the discovery of oil and natural gas resources in the area in 1924. Over the field's history 1,600 wells have been drilled within the historical boundaries of the field. Today, the oil field's boundary covers approximately 1,000 acres making it one of the largest contiguous urban oil fields in the United States.

A Community Standards District (CSD) was established at the oil field in 2008 and has been overseen by the County of Los Angeles since. As part of the CSD, an EIR was prepared that included a Health Risk Assessment (HRA). The Inglewood Oil Field was purchased by Sentinel Peak Resources in 2016.

This HRA was prepared to address the changes to the OEHHA HRA guidelines (related to childhood exposure calculations and exposure durations, amongst others) as revised in 2015 and to provide full disclosure to the public and decision makers on the potential impacts of oil field operations. The HRA is a CEQA HRA, as per CAPCOA Land Use guidelines (CAPCOA 2009), which means that, as opposed to an AB2588 HRA, mobile sources that are present at the field are also included. This is the same approach that was utilized in preparing the previous 2008 EIR HRA during the development of the CSD.

This HRA report follows the outline specified in Appendix C of the SCAQMD supplemental risk assessment guidelines for preparing an HRA. The modeling inputs and methodology were reviewed by the SCAQMD (see Section 5.1).

Operations at the Inglewood Oil Field create combustion products and fugitive hydrocarbon emissions, and potentially expose the general public and workers to these airborne pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this analysis is to determine whether a significant health risk would result from the publics continued exposure to these emissions as routinely emitted during project operations.

The following sections provide a description of facility operations, modeling parameters, area and populations, hazard identification, exposure assessment, risk characterization, and appendices and computer files.

Attachment A includes the HRA Review Checklist and the Health Risk Assessment Summary Form. Attachments B and C include detailed equipment and emissions listing for the 2019 operations and the future worst-case operations. Attachment D includes source test files. Attachment E includes detailed HRA results by receptor and maps showing the receptor locations.

2.0 Facility, Emissions and Modeling Setup

Information on the facility operations, TAC emissions, pathways, dispersion modeling, meteorological data, emissions sources, dose-response and receptor grids are discussed below.

2.1 Description of Facility Operations

Facility information is shown in Table 1 below.

Table 1 Facility Information

Item	Value
Name of facility and the address	5640 S Fairfax Ave, Los Angeles, CA 90056
SCAQMD ID	184301
Area of the field	885 acres (in Los Angeles County and Culver City)
Number of Active Wells	675 Active wells (436 producers, 239 injectors)

Current activities at the Inglewood Oil Field involve extracting oil and gas from subsurface reservoirs located between 500 and 10,000 feet deep, processing the crude oil to remove water and processing the gas to remove hydrogen sulfide and gas liquids. Crude oil is then shipped by pipeline to area refineries to be processed into gasoline and other products. The gas is shipped by pipeline to The Gas Company for end use by consumers and industry or is shipped to area refineries for use in the refining processes. Processing activities at the Inglewood Oil Field include the following:

- Gross Fluid Production Gathering and Testing;
- Crude Oil Handling;
- Water Processing;
- Water Injection;
- Gas Gathering/Gas Processing;
- Well Drilling, Maintenance and Workovers; and
- Ancillary Systems.

2.2 TAC Emissions

Toxic Air Contaminants (TAC) emissions occur from a number of processes and equipment at the oilfield, including the following:

- Drilling rig diesel engines;
- Well maintenance rig diesel engines;
- Emergency generator diesel engine;
- Fire water pump diesel engine;
- Heaters;
- Storage tanks;
- Flare;
- Well heads and associated equipment;
- Well cellars;
- Fugitive components;
- Construction equipment (backhoes, loaders, graders, fork lifts, etc);
- Onsite vehicles, both gasoline and diesel; and
- Onsite fugitive dust.

Emitting substances and emissions levels, both peak hour and annual emissions, are listed in Attachments B and C.

Table 2 below is a summary of the emissions levels for each TAC pollutant.

Table 2 TAC Field-Wide Emissions Levels Summary – 2019 Operations

Pollutant	CAS	All Equipment			
		Annual Pounds	Peak Hour pounds	Annual grams/sec	Peak Hr grams/sec
PAHs [PAH, POM] All except napth	1151	8.0E-01	8.4E-04	1.2E-05	1.1E-04
Silica, crystalline	1175	2.1E+03	1.0E+00	3.0E-02	1.3E-01
Diesel exhaust particulates	9901	1.4E+01	3.9E-01	2.0E-04	5.0E-02
Formaldehyde	50000	4.1E+01	5.2E-02	6.0E-04	6.6E-03
Benzoapyrene	50328	1.8E-05	8.5E-09	2.6E-10	1.1E-09
Carbon tetrachloride	56235	1.1E-05	1.1E-05	1.6E-10	1.4E-06
Benzaanthracene	56553	3.3E-04	1.6E-07	4.7E-09	2.0E-08
Methanol	67561	1.9E-02	1.9E-02	2.7E-07	2.4E-03
Chloroform	67663	8.4E-05	8.4E-05	1.2E-09	1.1E-05
Benzene	71432	3.3E+02	4.3E-02	4.7E-03	5.5E-03
Vinyl chloride	75014	4.4E-06	4.4E-06	6.3E-11	5.6E-07
Acetaldehyde	75070	8.4E-01	2.6E-02	1.2E-05	3.3E-03
Methylene chloride {Dichloromethane}	75092	2.5E-03	2.5E-03	3.6E-08	3.2E-04
1,2-Dichloropropane {Propylene dichloride}	78875	8.0E-05	8.0E-05	1.1E-09	1.0E-05
1,1,2-Trichloroethane {Vinyl trichloride}	79005	9.4E-05	9.4E-05	1.4E-09	1.2E-05
1,1,2,2-Tetrachloroethane	79345	1.6E-04	1.6E-04	2.2E-09	2.0E-05
PAH: napthalene	91203	1.4E+00	5.4E-04	2.0E-05	6.7E-05
Ethyl benzene	100414	7.5E+01	1.6E-02	1.1E-03	2.0E-03
Styrene	100425	2.0E-01	1.7E-04	2.9E-06	2.1E-05
Ethylene dibromide {1,2-Dibromoethane}	106934	1.3E-05	1.3E-05	1.9E-10	1.6E-06
Butadiene [1,3]	106990	2.9E+00	4.4E-03	4.2E-05	5.6E-04
Acrolein	107028	3.5E-01	1.7E-02	5.1E-06	2.1E-03
Ethylene dichloride {1,2-Dichloroethane}	107062	6.9E-06	6.9E-06	1.0E-10	8.7E-07
Toluene	108883	2.8E+02	3.9E-02	4.0E-03	4.9E-03
Hexane	110543	1.2E+02	1.5E-02	1.8E-03	1.9E-03
Benzobfluoranthene	205992	2.4E-04	1.2E-07	3.5E-09	1.5E-08
Benzokfluoranthene	207089	2.4E-04	1.2E-07	3.5E-09	1.5E-08
Chrysene	218019	3.7E-04	1.8E-07	5.3E-09	2.2E-08
1,3-Dichloropropene	542756	7.8E-05	7.8E-05	1.1E-09	9.8E-06
Xylenes	1330207	1.6E+02	2.2E-02	2.4E-03	2.8E-03
2378TetrachlorodibenzopDioxinTCDD	1746016	4.5E-11	2.2E-14	6.5E-16	2.7E-15
Octachlorodibenzopdioxin	3268879	2.6E-09	1.2E-12	3.7E-14	1.5E-13

Table 2 TAC Field-Wide Emissions Levels Summary – 2019 Operations

Pollutant	CAS	All Equipment			
		Annual Pounds	Peak Hour pounds	Annual grams/sec	Peak Hr grams/sec
Aluminum	7429905	1.7E+03	8.1E-01	2.4E-02	1.0E-01
Lead compounds (inorganic)	7439921	1.8E+01	8.8E-03	2.6E-04	1.1E-03
Manganese	7439965	2.0E+01	9.6E-03	2.9E-04	1.2E-03
Mercury and mercury compounds	7439976	3.7E-05	2.2E-05	5.3E-10	2.8E-06
Nickel	7440020	1.4E+00	7.1E-04	2.0E-05	9.0E-05
Arsenic and Compounds (inorganic)	7440382	3.1E-01	1.7E-04	4.5E-06	2.1E-05
Barium	7440393	2.0E+01	9.8E-03	2.9E-04	1.2E-03
Beryllium	7440417	2.1E-02	1.0E-05	3.0E-07	1.3E-06
Cadmium	7440439	4.8E-01	2.5E-04	6.9E-06	3.1E-05
Chromium (total)	7440473	5.2E+00	2.5E-03	7.5E-05	3.1E-04
Copper	7440508	1.8E+00	9.3E-04	2.6E-05	1.2E-04
Zinc	7440666	1.3E+01	6.1E-03	1.8E-04	7.6E-04
Hydrochloric acid	7647010	2.1E-03	2.1E-03	3.0E-08	2.6E-04
Ammonia	7664417	4.4E+02	1.9E-01	6.3E-03	2.4E-02
Selenium and compounds	7782492	2.1E-02	3.5E-05	3.0E-07	4.4E-06
Hydrogen sulfide	7783064	9.7E-01	1.1E-04	1.4E-05	1.4E-05
Chromium, hexavalent (and compounds)	18540299	1.3E-03	1.9E-06	1.9E-08	2.3E-07
123789HexachlorodibenzopDioxin	19408743	2.7E-11	1.3E-14	3.9E-16	1.6E-15
1234678HeptachlorodibenzopDioxin	35822469	3.2E-10	1.6E-13	4.7E-15	2.0E-14
Octachlorodibenzofuran	39001020	7.5E-10	3.6E-13	1.1E-14	4.5E-14
123478HexachlorodibenzopDioxin	39227286	2.1E-11	1.0E-14	3.0E-16	1.3E-15
12378PentachlorodibenzopDioxin	40321764	2.0E-11	9.7E-15	2.9E-16	1.2E-15
2378Tetrachlorodibenzofuran	51207319	1.5E-10	7.2E-14	2.2E-15	9.1E-15
1234789Heptachlorodibenzofuran	55673897	2.1E-11	1.0E-14	3.0E-16	1.3E-15
23478Pentachlorodibenzofuran	57117314	5.3E-11	2.5E-14	7.6E-16	3.2E-15
12378Pentachlorodibenzofuranj	57117416	7.2E-11	3.4E-14	1.0E-15	4.3E-15
123678Hexachlorodibenzofuran	57117449	6.3E-11	3.0E-14	9.1E-16	3.8E-15
123678HexachlorodibenzopDioxin	57653857	4.3E-11	2.1E-14	6.2E-16	2.6E-15
234678Hexachlorodibenzofuran	60851345	7.4E-11	3.6E-14	1.1E-15	4.5E-15
1234678Heptachlorodibenzofuran	67562394	6.6E-10	3.2E-13	9.5E-15	4.0E-14
123478Hexachlorodibenzofuran	70648269	5.9E-11	2.8E-14	8.6E-16	3.6E-15
123789Hexachlorodibenzofuran	72918219	1.7E-11	8.3E-15	2.5E-16	1.0E-15

2.3 Multipathway Substances and Their Pathways

Based on SCAQMD guidelines, the inhalation pathway is addressed for all modeled sources and substances. Residential cancer and non-cancer risks for multi-pathway substances evaluated the following non-inhalation exposure pathways: dermal exposure, soil ingestion, plant ingestion, and mother's milk. Worker cancer and non-cancer risks for multi-pathway substances were modeled with the pathways of dermal exposure and soil ingestion. The OEHHA guidelines also lists other pathways, which include water ingestion, dairy and beef, and poultry and eggs. However, these pathways are not applicable exposure routes for the facility due to the surrounding land use. Table 3 lists the pathways evaluated for all emitted substances at the facility.

Table 3 TAC Pollutants and Multipathways

Pollutant	CAS	Multi pathway?	Inhalation	Dermal	Soil Ingestion	Homegrown Produce	Mothers Milk
PAHs [PAH, POM] All except napth	1151	Y	R&W	R&W	R&W	R	R
Silica, crystalline5	1175		R&W				
Diesel exhaust particulates	9901		R&W				
Formaldehyde	50000		R&W				
Benzoapyrene	50328		R&W				
Carbon tetrachloride	56235		R&W				
Benzaanthracene	56553		R&W				
Methanol	67561		R&W				
Chloroform	67663		R&W				
Benzene	71432		R&W				
Vinyl chloride	75014		R&W				
Acetaldehyde	75070		R&W				
Methylene chloride {Dichloromethane}	75092		R&W				
1,2-Dichloropropane {Propylene dichloride}	78875		R&W				
1,1,2-Trichloroethane {Vinyl trichloride}	79005		R&W				
1,1,2,2-Tetrachloroethane	79345		R&W				
PAH: napthalene	91203	Y	R&W	R&W	R&W	R	R
Ethyl benzene	100414		R&W				
Styrene	100425		R&W				
Ethylene dibromide {1,2-Dibromoethane}	106934		R&W				
Butadiene [1,3]	106990		R&W				
Acrolein	107028		R&W				
Ethylene dichloride {1,2-Dichloroethane}	107062		R&W				
Toluene	108883		R&W				
Hexane	110543		R&W				
Benzobfluoranthene	205992		R&W				
Benzokfluoranthene	207089		R&W				
Chrysene	218019		R&W				
1,3-Dichloropropene	542756		R&W				
Xylenes	1330207		R&W				
2378TetrachlorodibenzopDioxinTCDD	1746016		R&W				
Octachlorodibenzopdioxin	3268879		R&W				
Aluminum	7429905		R&W				

Table 3 TAC Pollutants and Multipathways

Pollutant	CAS	Multi pathway?	Inhalation	Dermal	Soil Ingestion	Homegrown Produce	Mothers Milk
Lead compounds (inorganic)	7439921	Y	R&W	R&W	R&W	R	R
Manganese	7439965		R&W				
Mercury and mercury compounds	7439976	Y	R&W	R&W	R&W	R	R
Nickel	7440020	Y	R&W	R&W	R&W	R	R
Arsenic and Compounds (inorganic)	7440382	Y	R&W	R&W	R&W	R	R
Barium	7440393		R&W				
Beryllium	7440417		R&W				
Cadmium	7440439	Y	R&W	R&W	R&W	R	R
Chromium (total)	7440473	Y	R&W	R&W	R&W	R	R
Copper	7440508		R&W				
Zinc	7440666		R&W				
Hydrochloric acid	7647010		R&W				
Ammonia	7664417		R&W				
Selenium and compounds	7782492	Y	R&W	R&W	R&W	R	R
Hydrogen sulfide	7783064		R&W				
Chromium, hexavalent (and compounds)	18540299	Y	R&W	R&W	R&W	R	R
123789HexachlorodibenzopDioxin	19408743		R&W				
1234678HeptachlorodibenzopDioxin	35822469		R&W				
Octachlorodibenzofuran	39001020		R&W				
123478HexachlorodibenzopDioxin	39227286		R&W				
12378PentachlorodibenzopDioxin	40321764		R&W				
2378Tetrachlorodibenzofuran	51207319		R&W				
1234789Heptachlorodibenzofuran	55673897		R&W				
23478Pentachlorodibenzofuran	57117314		R&W				
12378Pentachlorodibenzofuranj	57117416		R&W				
123678Hexachlorodibenzofuran	57117449		R&W				
123678HexachlorodibenzopDioxin	57653857		R&W				
234678Hexachlorodibenzofuran	60851345		R&W				
1234678Heptachlorodibenzofuran	67562394		R&W				
123478Hexachlorodibenzofuran	70648269		R&W				
123789Hexachlorodibenzofuran	72918219		R&W				

Based on OEHHA 2015 Table 5.1
R= Residential, W= Worker

2.4 Dispersion Modeling and Exposure Assessment

Air dispersion modeling is performed for the exposure assessment of the health risk assessment. This HRA utilizes the most recent version of AERMOD (version 18081) to estimate ambient concentrations of pollutants offsite. Modeled results were then integrated into the latest version of HARP2 (version 19121). The air dispersion analysis was performed in accordance with OEHHA

Guidance, the SCAQMD Supplemental Guidelines, and SCAQMD Modeling Guidance for AERMOD. Elevations were determined using AERMAP version 18081.

Dispersion modeling assumptions are listed in Table 4 below.

Table 4 Dispersion Modeling Assumptions

Parameter	Value
Use regulatory default	Yes
Urban or rural	Urban County: Los Angeles Population: 9,818,605
Include Building Downwash	Yes
Meteorological Data	IOF met station, 2015-2019, processed by Breeze Software using AERMET 19121. Upper air data station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) Base elevation: Met station site at IOF = 124 meters
Fence line spacing	25 meters
Grid spacing	100 meters
Coordinate System and Datum	UTM And NAD 83 zone 11 (as per HARP2, NAD83 and WGS84 are very similar and can be treated the same without significant difference)
Analysis Option	Cancer Residential: RMP Derived Method Workers and Non-cancer: OEHHA Derived Method
Deposition rate	0.02 m/s
Exposure assumptions	HARP defaults except dermal pathway = “warm”
Residential exposure duration for cancer analysis	30 years for individual receptors 70 years for cancer burden
Worker exposure duration for cancer analysis	25 year exposure
Facility Operating Schedule	24 hours per day/7 days per week
Urban options	Applied to all sources, population = 9,818,605. Roughness=1.0 m
Flagpole Height	0 meters
Elevations	Determined through AERMAP
Regulatory Defaults	Used
Appy fraction of time at residence for < 16yrs age	No
Apply fraction of time at residence for > 16yrs age	Yes
Mandatory minimum Pathways	SCAQMD mandatory minimum: inhalation, soil, dermal, mothers milk, homegrown produce

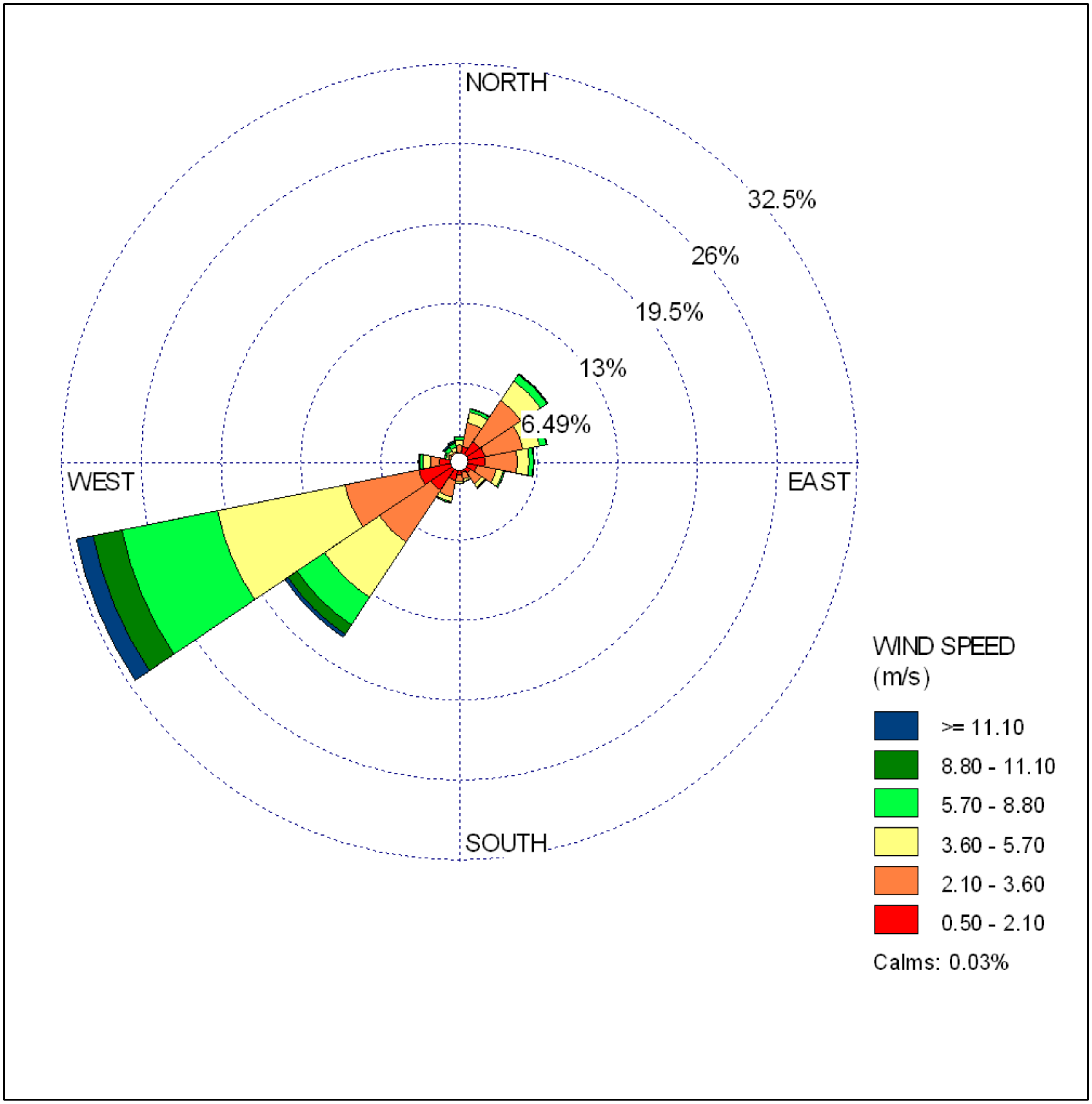
2.5 Meteorological Data

The IOF has a meteorological station onsite. Five years of meteorological data for the years 2015-2019 was processed by BREEZE Software to produce the surface and upper air AERMOD-ready files. Some missing data was supplemented with the data set collected at Los Angeles International Airport meteorological station (KLAX) as the most representative backup surface station for the facility. LAX is the closest meteorological station and is expected to record similar meteorological conditions to that of the facility. A Wind Rose for the IOF met station is shown in Figure 1

The surface data used for the meteorological analysis utilized the data gathered at the IOF site from 2015 through 2019.

The upper air data utilized the upper air location station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) as recommended and utilized by the SCAQMD.

Figure 1 **IOF Met Station Wind Rose**



Years of data: 2015 – 2019

2.6 Emissions Source Listing

Emission sources were categorized into three basic types: point, area, or line sources. Table 5 summarizes the dispersion modeling assumptions. Detailed source information is included in Attachments B and C. A discussion of each source category is shown below.

Table 5 Source Type Summary

Source	HARP IDs	HARP Type	How Applied?	Base_Elev [m]	Release Height [m]
FLARE, GROUND FLARE	554988	Point	Point	98.44	18.3
HEATER, H-100	554965	Point	Point	102.65	22.13
FIRE PUMP	554957	Point	Point	85.47	2.60
WAUKESHA EMERGENCY Gen	554983	Point	Point	88.86	4.0
Gasoline Dispensing	564886	Volume	Volume	73.76	1.0*
BC tank farm	901	Area	Entire Tank Farm	83.73	7.0
Central Sales/Packard tank farm	902	Area	Entire Tank Farm	96.87	5.3
LAI-A tank Farm	903	Area	Entire Tank Farm	76.1	6.1
LAI-B tank Farm	904	Area	Entire Tank Farm	79.9	7.3
TVIC Tank Farm	905	Area	Entire Tank Farm	100.7	6.7
TVIC Remote Tank Farm	906	Area	Entire Tank Farm	119.45	7.3
Water Treatment Plant	907	Area	Entire Tank Farm	94.47	6.9
Gas Plant-Fugitives	910	Area	Entire Plant	97.86	1.0
Well Grid-Workovers	1-407	Area	by # wells	28-150	1.0
Well Grid-Drilling	1-407	Area	by # wells	28-150	1.0
Well Grid-Fugitives	1-407	Area	by # wells	28-150	1.0
Well Grid-Construction	1-407	Area	by Area of WellGrid	28-150	1.0
Vehicles-Combustion	500-524	Line	Along Main Roads	76-122	0.78
Vehicles-Fugitive Dust	500-524	Line	Along Main Roads	76-122	0.78

*Although the SCAQMD has specific procedures for modeling gasoline stations, given the size of the property and the distance to nearest receptors from the gas station, modeling this as volume source was used as a reasonable estimate. The release height was used to simulate the loading/refueling emissions component.

Combustion Sources

Generally, all stationary sources with combustion sources are point sources, such as the diesel generators, heaters and flares. All stacks, except for the Waukesha generator and the fire pump, are vertical stacks with release temperature and velocity as per manufacturer data. The Waukesha Generator and the fire pump have horizontal stacks that are uncapped. Heights of stacks were measured in-field.

Emissions and emission factors are based on those in the SCAQMD Annual Emissions Report (AER) for the year 2019.

The heater is assumed to operate 24/7, 365 day per year, with the peak hour calculated based on the 24/7/365 schedule.

The flare utilizes the 2019 throughput data for the annual emissions and the flare capacity for the peak hour.

The fire pump and generator annual emissions are based on a single hour per year of testing, with the peak hour based on the fuel use during that single hour, as per the 2019 AER.

Tank Farms

The IOF has a total of 43 tanks that are grouped into 5 tank farm areas: BC Tank Setting, LAI Tank Setting, Packard Tank Setting, TVIC Tank Setting and the Water Plant. The tank farms are grouped into area sources that cover each of the entire tank farm area with a height equal to the average tank height of 24 feet (7.3m). Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Gas Plant

The gas plant fugitive emissions are grouped into a single area source that covers the entire gas plant area with an average height of 1 meter. Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Wells and Field Fugitives

The field has a large number of active wells, well cellars and fugitive sources that are located throughout the field. In order to capture these sources, the field is divided into a set of area source "well grids" with either 1.0 or 0.10 acres in area, depending on the location of the sources and the proximity to the field boundaries. All sources within each well grid cell are assigned to that cells area source emissions, meaning the emissions from all of the active wells, injection wells and idle wells located within that cell are assigned to that cells area emissions. Fugitive emissions are assigned to each cell based on the total fugitive emissions from the in-field (non-gas) plant fugitive emissions sources weighted by the individual cells area. Well grids are assigned a height of 1 meter based on the height of the well pumping units emission source height (packing valve). Emissions and emission factors are based on those in the AER for the year 2019.

Operations assume a 24/7 schedule, 365 days per year.

Vehicle Emissions

Vehicle onsite activity is due to pickup trucks (gasoline) and diesel delivery and maintenance trucks. Vehicle emissions are assigned to the main roads that travel through the field. Roads are defined as line sources and are a total of 2.4 miles in length composed of a main road and a side road area. The main road travels along the spine of the field from Stocker Road to the TVIC area. The side road travels from the main road through the LAI and BC tank farms. Vehicle emissions are assigned evenly along the entire main road length with 20% of vehicle traffic assigned to the side road.

Fugitive dust emissions from vehicle travel are assigned along the same line sources evenly distributed along the roadways as a function of vehicle traffic. Fugitive dust emissions are based on assuming that 50% of the roadways are paved. CalEEMod defaults are used for paved and unpaved road dust. Vehicle weights are based on the fleet average vehicle weight weighted by annual miles. Detailed calculations are included in Attachment B.

Vehicle tailpipe emission factors are based on USEPA Moves program (USEPA 2016 and 2018). Fugitive dust TAC emissions are based on the CARB profile 394. Vehicle miles are logged by the operator and this information was used to estimate total annual and peak hour on-site mileage.

Vehicles are assumed to operate only during the daytime, from 7am – 7pm. The EMISFACT HROFDY parameter in AERMOD will be set to a value to "2" during the daytime hours and zero at night. For the acute analysis, the HARP2 variable emission additional run was conducted (EMISFACT HROFDY values of "1" during the daytime).

The annual emissions are based on the total annual miles, with the peak hour of vehicle emissions is based on the estimated peak hour vehicle miles.

Construction Emissions

Construction emissions could occur at any location in the field. Therefore, construction emissions are evenly distributed by area across all of the well grid cells covering the field. Emissions and emission factors are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016.

Construction emissions are assumed to occur continuously, with the peak hour being the annual emissions divided by 52 weeks, 5 days per week and 12 hours per day.

Well Maintenance Rig Emissions

Total field-wide maintenance rig emissions are distributed to the well grid cells based on the number of active wells within each grid cell. Emissions and emission factors are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016. As the workover rigs utilize Tier 4 engines, with substantially lower DPM emissions than the SCAQMD December 2016 Guidance, a reduction percentage of 85% was applied to the TAC emissions from workover diesel engines, equivalent to a CARB Level III catalyst certification reduction percentage.

Well maintenance emissions are assumed to occur continuously, with the peak hour being the annual emissions divided by 50 weeks per year, 5 days per week and 12 hours per day.

Well Drilling and Future Emissions

Well drilling could occur at the IOF under the current CSD allowances. No drilling has occurred at the IOF since Sentinel Peak has taken over in 2016 and there are no current plans for drilling. However, as the CSD allows drilling, and the future of the field in terms of ownership and drilling plans are not known at this time, two scenarios are examined to address drilling emissions:

1. No drilling activities, as per the activities at the field in 2019.
2. Drilling activities at the maximum allowable levels defined by the CSD.

As regulated by the CSD, drilling activities are not allowed within a 400 foot buffer of the oil field boundary.

The CSD allows for a maximum of 53 wells to be drilled in one year with a total of 500 wells allowed to be drilled by 2028 since the start of the CSD in 2008. As of 2020, a total of 132 wells have been drilled since 2008. Bonus wells are also allowed based on the abandonment of wells within setback areas. Table 6 shows the estimated worst-case drilling scenario through 2028 with the maximum allowed drilling of wells a per the CSD. Note also that wells are generally abandoned each year at a historical rate of 5-6 wells abandoned per year.

Table 6 Estimated Future Well Drilling Activity at CSD Maximum Levels

Year	Wells Drilled /yr	Bonus Used /yr	Annual Wells Drilled	Wells Cumulative	Wells Abandoned	Bonus Earned	Bonus Remaining	Field Active Oil Wells
2009	0	0	0	0	10	5	5	517
2010	19	0	19	19	2	2	7	527
2011	40	5	45	64	4	2	4	510
2012	20	0	20	84	4	3	7	469
2013	30	0	30	114	8	7	14	453
2014	18	0	18	132	5	1	15	431
2015	0	0	0	132	10	7	22	418
2016	0	0	0	132	8	6	28	428
2017	0	0	0	132	0	0	28	436
2018	0	0	0	132	2	2	30	436
2019	0	0	0	132	7	4	34	438
2020	0	0	0	132	12	6	40	426
2021	35	18	53	185	11	7	29	468
2022	35	11	46	231	11	7	25	503
2023	35	10	45	276	11	7	22	537
2024	35	10	45	321	11	7	19	571
2025	35	10	45	366	11	7	16	605
2026	35	10	45	411	10	6	12	640
2027	35	10	45	456	10	6	8	675
2028	33	11	44	500	5	3	0	714
Total		***95***		***500***	***152***	***95***		

For the years after 2028, the number of wells at the field would be affected by the wells abandoned, which would decrease the number of wells at the field, and the level of drilling. Table 7 shows the estimated post-2028 wells inventory assuming the average well abandonment rate along with the average drilling rate from 2021 - 2028. It should be noted that drilling of wells under the CSD is only approved until the year 2028. Any additional drilling beyond that date is speculative and the process is not clear at this time. Information about additional wells is provided only to show maximum number of wells for the purpose of understanding the worst case scenario and the risk associated with it.

Table 7 Well Inventory Post 2028

Year	Wells Abandoned	Wells Drilled	Field Active Oil wells
2029	5.5	46	755
2030	5.5	46	795
2031	5.5	46	836
2032	5.5	46	876
2033	5.5	46	917
2034	5.5	46	957
2035	5.5	46	998
2036	5.5	46	1038
2037	5.5	46	1079
2038	5.5	46	1119
2039	5.5	46	1160
2040	5.5	46	1201
2041	5.5	46	1241
2042	5.5	46	1282
2043	5.5	46	1322
2044	5.5	46	1363
2045	5.5	46	1403
2046	5.5	46	1444
2047	5.5	46	1484
2048	5.5	46	1525
2049	5.5	46	1565
2050	5.5	46	1606
Average Since 2020	-	46	1003

In order to estimate the 30-year worst case cancer risk levels, field activity over the 30 years from 2020-2050 assuming the worst-case scenario above is proposed. Over the 30-year period from 2020-2050, the field would have an average of 1,003 active wells with a yearly average of 46 wells drilled per year as a worst case. These drilling emissions will be placed evenly within each well grid cell. Only well grid cells that are located outside of the 400 foot buffer would be assigned drilling emissions.

For future well drilling, the number of producing wells could increase, and production at the field could increase as a worst case, thereby potentially increasing emissions from a number of sources. Therefore, for the future worst-case scenario, the following emissions sources would change:

- Drilling emissions would occur at the worst-case annual average rate (average wells drilled as allowed by the CSD until year 2028) with a peak hour of 2 drilling rigs;
- Fugitive emissions from wells would increase proportional to the number of active oil wells;
- Workover emissions would increase proportional to the number of active oil wells with a peak hour of 8 workover rigs operating (as per the CSD limits);

- Equipment emissions from most tanks and processes (heaters, etc.) would increase by the proportional number of active oil wells.

The following sources emissions would not change under the future scenario:

- Field fugitive emission sources (piping and connections not at a well site);
- Construction emissions;
- Onsite vehicle emissions;
- Equipment including the flare, fire pump, generator, and gasoline dispensing.

Emissions and emission factors for drilling are based on those for diesel combustion in the SCAQMD Supplemental Instructions Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, December 2016. As the workover rigs utilize Tier 4 engines (or Tier 3 with CARB Level III catalysts), with substantially lower DPM emissions than the SCAQMD December 2016 Guidance, a reduction percentage of 90% was applied to the TAC emissions from drilling diesel engines, which is the reduction percentage required by the CSD.

Annual emissions are based on the average number of wells drilled. Peak hour emissions are based on the number of wells drilled and the days per well, along with 24 hours per day of drilling.

2.7 Dose-Response Assessment

A dose-response assessment was then performed using the Hot Spots Analysis and Reporting Program 2 (HARP2) model, version 19121, developed by the California Air Resources Board (ARB). This HRA evaluates upper-level estimates of potential cancer, non-cancer chronic, and non-cancer acute health effects at the point of maximum impact (PMI), the maximally exposed individual resident (MEIR), the maximally exposed individual worker (MEIW), and at sensitive receptors. The potential excess cancer burden was also evaluated.

For cancer and non-cancer health impacts, Table 8 shows target organ systems by substance for non-cancer impacts.

Table 8 Non-cancer Target Organs by Substance

Pollutant	CAS	Target Organ System
Formaldehyde	50000	Eyes (sensory irritation)
Carbon tetrachloride	56235	Alimentary System (Liver); Nervous System Reproductive/Developmental
Methanol	67561	Nervous System
Chloroform	67663	Nervous System; Respiratory System; Reproductive/Developmental
Benzene	71432	Reproductive/Developmental; Immune System; Hematologic System
Vinyl chloride	75014	Nervous System; Eyes; Respiratory System
Acetaldehyde	75070	Eyes; Respiratory System (sensory irritation)
Methylene chloride {Dichloromethane}	75092	Nervous System; Cardiovascular System
Styrene	100425	Eyes; Respiratory System; Reproductive/Developmental
Butadiene [1,3]	106990	Development
Acrolein	107028	Eyes; Respiratory System (sensory irritation)
Toluene	108883	Nervous System; Respiratory System; Eyes; Reproductive/Developmental

Table 8 Non-cancer Target Organs by Substance

Pollutant	CAS	Target Organ System
Xylenes	1330207	Eyes; Respiratory System; Nervous System
Mercury and mercury compounds	7439976	Nervous System; Development
Nickel	7440020	Immune System
Arsenic and Compounds (inorganic)	7440382	Development; Cardiovascular System; Nervous System
Copper	7440508	Respiratory System
Hydrochloric acid	7647010	Eyes; Respiratory System
Ammonia	7664417	Eyes; Respiratory System

Source: OEHHA 2015 Guidelines Table 6.1

2.8 Buildings

Buildings affect dispersion by producing downdrafts in wind fields and increasing the ground-level concentrations of pollutants of sources that are close to buildings. AERMOD and BPIP (the building program in AERMOD and HARP2) only address building influences from point sources. Buildings located farther than five times the height of the building from a source do not generally influence the dispersion and are therefore not addressed in the BPIP program. The field has 4 different point sources (flare, heater, generator and fire pump) and therefore only buildings located within 5 times the building height of those sources have been included in the HARP2 building BPIP modeling assessment. These include the following:

- Tanks T-50, T-56A/B/C located in proximity to the Generator
- Tanks T-9B, T-2A, T-2B located in proximity to the Fire Pump

These tanks are assumed to be square buildings with a height of 24 feet (7.3 meters, the average tank height), and a side dimension of 40 feet (12.2 meters, the average tank diameter) with a single tier. Below are listed the building parameters.

Table 9 Building Parameters

Building	Proximate to Point Source	Height, m
T-50	Generator	7.3
T-56A	Generator	7.3
T-56B	Generator	7.3
T-56C	Generator	7.3
T-9B	Fire Pump	7.3
T-2A	Fire Pump	7.3
T-2B	Fire Pump	7.3

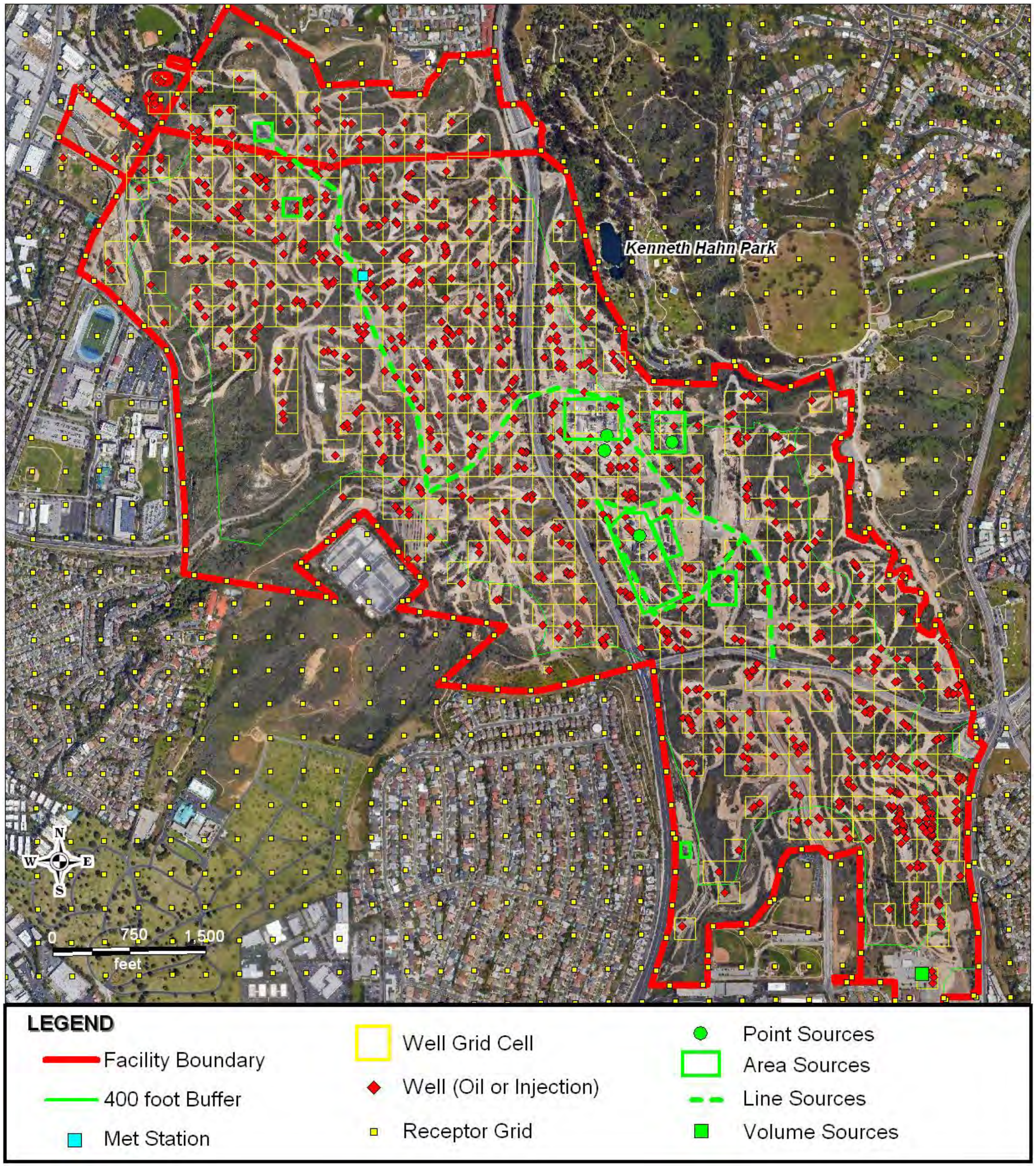
2.9 Area Populations and Receptor Grids

In order to identify the maximum impacted receptor locations, receptor networks were constructed which include the IOF property boundary line with a spacing of 100 meters, and a receptor grid containing receptors spaced 100 meters apart out to a 1-2 km radius. The locations of the off-site residential and worker receptor areas were identified based on Google Earth/Maps. Discrete receptors were identified for the sensitive receptors and are shown in Figure 2.

Estimates of population exposure will be based on census tract data as included in HARP2.

There are a number of schools located within 2 km of the IOF, including Baldwin Hill Elementary School, Windsor Hills, La Tijera Elementary, El Rincon Elementary and Culver City High School. Therefore, for exposure, estimates of under 16 years of age exposure will assume 100% of the time in the exposure area (at home or at school).

Figure 2 IOF Sources and Receptors



2.10 Version of the Risk Assessment Guidelines

The HARP2 version 19121 model was used along with the SCAQMD AB 2588 and Rule 1402 Supplemental Guidelines dated September 2018 (SCAQMD 2018).

2.11 Elevations

Elevations of sources and receptors are determined using AERMAP within the HARP2 modeling program. AERMAP model outputs are included in the modeling files. The Digital Elevation Model (DEM) files are also include and include: Beverly hills (30m), Inglewood (10m), Hollywood (30m) and Venice (10m).

3.0 Hazard Identification

Table 2 shows all substances emitted from the facility including the CAS and estimated emissions levels. The physical form of the substance are all air emissions and/or particulates.

All substances in Table 2 were evaluated for cancer risk and/or non- cancer acute and chronic health impacts in HARP2.

Table 3 identifies the substances that present a potential cancer risk or chronic non-cancer hazard via non-inhalation routes of exposure.

All estimated emissions from the facility are listed in Table 2 and include those from continuous or intermittent processes.

Attachment B and C shows the emissions by sources for all sources and TAC Pollutants.

4.0 Exposure Assessment

This section describes the information related to the air dispersion modeling process that is reported in the risk assessment. In addition, doses calculated by pathway of exposure for each substance are included in this section and presented as results from the HARP2 model.

4.1 Facility Description

Section 2.1 provides information on the facility. The local topography is rolling hills with a high of about 150 meters in elevation and a low of about 50 meters in elevation.

Figures 2 shows the facility plot plan identifying emission source locations, property line, and receptor locations.

As the area is urban, there are no water or grazing intake areas.

4.2 Emissions Inventory

Attachments B and C shows the sources used in the modeling along with the source specific parameters. Section 2.6 includes a summary listing of all sources.

All equipment at the field operates 24 hours per day, 7 days per week. Vehicle use is the only variable emission source analyzed in this analysis as almost all vehicle use occurs during the daytime. All other sources assumed that all emissions occur 24/7.

Emission control equipment and emissions measuring methods are listed in Attachments B and C.

Emission rates and total and hourly emissions are listed in Attachments B and C.

Facility total emission rates by substance for all pollutants are listed in Table 2 and in Attachments B and C.

The emission rates for each toxic substance, grouped by source, in table form are located in Attachments B and C, the table includes the following:

- Source name;
- Source identification number;
- Substance name and CAS number;
- Annual average emissions for each substance (lbs/yr and g/s); and,
- Maximum one hour emissions for each substance (lbs/hr and g/s).

There are no radionuclides emitted at the facility and are therefore not included in the analysis.

Table 2 and Attachments B and C shows the facility total emission rates by substance for all pollutants including the following information:

- Substance name and CAS number;
- Annual average emissions for each substance (lbs/yr and g/s); and
- Maximum one-hour emissions for each substance (lbs/hr and g/s).

4.3 Air Dispersion Modeling

Meteorological data is discussed in Section 2.5.

The IOF has a meteorological station onsite. Five years of meteorological data for the years 2015-2019 was processed by BREEZE Software to produce the surface and upper air AERMOD-ready files. Some missing data was supplemented with the data set collected at Los Angeles International Airport meteorological station (KLAX) as the most representative backup surface station for the facility. LAX is the closest meteorological station and is expected to record similar meteorological conditions to that of the facility. Wind Rose for the IOF met station are shown in Figure 1.

The upper air data utilized the upper air location station ID NKX, with WBAN ID 03190 (Lat 32.8700, Lon -117.150, San Diego Airport) as recommended and utilized by the SCAQMD.

5.0 Risk Characterization Results

HARP generates the risk characterization data needed to generate the risk results as presented in this report. All HARP files are included in the HRA submittals.

The potential cancer risk for the PMI, MEIR, and sensitive receptors of interest are presented in the HRA’s text, tables, and maps using a residential 30-year exposure period. MEIW location will use appropriate exposure periods as per the requirements; as the facility operates 24/7, no adjustments to MEIW are proposed.

The report presents the results of a Tier-1 exposure assessment as per HARP2 and OEHHA Guidelines.

The following information are presented in previous sections of the HRA:

- Description of receptors to be quantified – Section 2.9 presents a description of the receptors; and,

- The site-specific inputs used for each exposure pathway (e.g., water or grazing intake assumptions) are discussed in Section 2.3.

5.1 SCAQMD Review of the Modeling Report

A modeling protocol report was submitted to the SCAQMD in September 2020 for comments. The following comments were received from the SCAQMD:

- "Overall, the project looks good. It is obvious that time was spent on the modeling and gridding is good."
- "There are some emissions included that would typically occur in an environmental assessment but would not be included in an AB 2588 submittal, such as construction emissions, motor vehicle tailpipe and averaging of emissions. Regarding construction emissions, this actually makes the review more conservative, so that is not a bad thing overall looking at the risk. "
- "AB 2588 would not consider future emissions and would only analyze the 2019 emissions."
- "Based on the size of the site, the use of a single source for gasoline stations is acceptable."
- Some editorial and model version comments on the report.

The SCAQMD did not do a detailed review of the meteorological data and upper air data or confirm that the emissions would meet the Air Toxic Inventory Reporting requirements under AB2588, although emissions from the annual submissions to the SCAQMD, which are reviewed and approved by the SCAQMD annually, were used.

5.2 Year 2019 Operations Health Risk Results

The HRA presents the results of the analysis for cancer, acute and chronic health impacts. Cancer risk are defined as the number of cancer cases that are projected to be generated per million people exposed.

Chronic and acute impacts are based on the reference exposure level (REL) as an indicator of potential adverse non-cancer health effects. A REL is a concentration at which no adverse health effects are anticipated. RELs are provided by OEHHA and incorporated into the HARP2 model. A hazard index (HI) is defined as the ratio of the pollutant concentration estimated by the models at the receptors to the REL. When several pollutants affect the same organ system in the body (e.g., respiratory system, nervous system, reproductive system), there can be a cumulative effect on the target organ. In these cases, the sum of the HI for all chemicals emitted that impact the same target organ is performed by the HARP2 model. An HI of over 1.0 would indicate that the receptor is exposed to a cumulative effect exceeding the REL.

The SCAQMD has establish thresholds for AB2588 analysis of 10 cancer cases per million and any HI of over 1.0.

The following tables provide the detailed results of the HRA analysis for the 2019-year operations. Section 5.2 presents summaries of the future operations HRA results.

Table 10 Year 2019 Cancer Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Cancer Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	5.2	Benzene (39%), Arsenic (31%), DieselExhPM (13%), Lead (8%), Cadmium (6%)	Roads (48%), WellGrids (33%), Gas Plant (17%), Packard Tank Farm (1%), Flare (0%),
MEIR	1775	373,379	3,762,767	1.0	Benzene (58%), DieselExhPM (25%), Arsenic (11%), Lead (3%), Cadmium (2%),	WellGrids (64%), Roads (16%), BC Tank Farm (9%), Gas Plant (4%), LAI-A Tank Farm (3%),
MEIW	1818	372,038	3,764,399	0.07	Benzene (59%), DieselExhPM (33%), Arsenic (5%), Lead (1%), Cadmium (1%),	WellGrids (87%), Roads (7%), Gas Plant (2%), TVIC Remote Tank Farm (1%), TVIC Tank Farm (1%),

Notes: UTM Zone 11, NAD83, Cancer risk per million.

Table 11 Year 2019 Cancer Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Cancer Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.27
Village Tree School	1298	371,602	3,765,015	0.10
Linwood How Elem School	1299	371,458	3,765,442	0.07
Willows Community School	1300	372,537	3,765,521	0.08
Baldwin Dill Elem School	1301	373,913	3,765,441	0.21
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.44
Windsor Hill Magnet School	1303	374,735	3,762,558	0.44
Community Christian Elem	1304	374,502	3,761,177	0.08
ICEF School	1305	373,575	3,761,806	0.34
La Tijera Elem School	1306	373,549	3,760,990	0.11
Frank Parent School	1307	372,980	3,761,081	0.15
El Rincon Elem School	1308	371,566	3,762,615	0.27
West La College South	1309	372,008	3,763,263	0.49
We LA College North	1310	372,011	3,763,812	0.63
Culver City HS	1311	370,802	3,763,850	0.15
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.86
Shenandoah Ave	1775	373,379	3,762,767	0.99
Stoneview Ave	1831	372,932	3,764,576	0.89
S Cloverdale Ave	997	373,900	3,764,100	0.92
Punta Alta Ave	964	374,200	3,764,000	0.86

Table 12 Year 2019 Acute Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Acute Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1847	373,743	3,763,650	0.48	Acrolein (73%), Nickel (15%), Benzene (5%), Arsenic (3%), Formaldehyde (3%),	Generator (79%), Roads (16%), WellGrids (2%), Gas Plant (1%), Packard Tank Farm (1%),
MEIR	1775	373,379	3,762,767	0.09	Nickel (46%), Acrolein (25%), Benzene (14%), Arsenic (10%), Formaldehyde (4%),	Roads (53%), Generator (29%), WellGrids (12%), Fire Pump (2%), Gas Plant (2%),
MEIW	1818	372,038	3,764,399	0.05	Nickel (54%), Benzene (16%), Acrolein (14%), Arsenic (12%), Formaldehyde (3%),	Roads (63%), WellGrids (18%), Generator (15%), Fire Pump (1%), Gas Plant (1%),

Notes: UTM Zone 11, NAD83, Acute risk hazard index.

Table 13 Year 2019 Acute Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Acute Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.03
Village Tree School	1298	371,602	3,765,015	0.02
Linwood How Elem School	1299	371,458	3,765,442	0.01
Willows Community School	1300	372,537	3,765,521	0.02
Baldwin Dill Elem School	1301	373,913	3,765,441	0.02
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.02
Windsor Hill Magnet School	1303	374,735	3,762,558	0.04
Community Christian Elem	1304	374,502	3,761,177	0.02
ICEF School	1305	373,575	3,761,806	0.03
La Tijera Elem School	1306	373,549	3,760,990	0.02
Frank Parent School	1307	372,980	3,761,081	0.02
El Rincon Elem School	1308	371,566	3,762,615	0.02
West La College South	1309	372,008	3,763,263	0.04
We LA College North	1310	372,011	3,763,812	0.04
Culver City HS	1311	370,802	3,763,850	0.02
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.06
Shenandoah Ave	1775	373,379	3,762,767	0.09
Stoneview Ave	1831	372,932	3,764,576	0.05
S Cloverdale Ave	997	373,900	3,764,100	0.06
Punta Alta Ave	964	374,200	3,764,000	0.05

Table 14 Year 2019 Chronic Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Chronic Risk	Primary Substances	Primary Sources
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	0.06	Silica, Crystln (54%), Manganese (17%), Benzene (17%), Nickel (7%), Cadmium (2%),	Roads (95%), WellGrids (3%), Gas Plant (2%), Packard Tank Farm (0%), BC Tank Farm (0%),
MEIR	1775	373,379	3,762,767	0.01	Silica, Crystln (41%), Benzene (36%), Manganese (13%), Nickel (6%), Cadmium (1%),	Roads (80%), WellGrids (13%), BC Tank Farm (3%), Gas Plant (1%), LAI-A Tank Farm (1%),
MEIW	1818	372,038	3,764,399	0.003	Benzene (55%), Silica, Crystln (28%), Manganese (9%), Nickel (4%), DieselExhPM (2%),	Roads (65%), WellGrids (32%), Gas Plant (1%), TVIC Remote Tank Farm (1%), TVIC Tank Farm (1%),

Notes: UTM Zone 11, NAD83, Chronic risk hazard index.

Table 15 Year 2019 Chronic Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Chronic Risk
Sensitive Receptors				
Star School	1297	371,655	3,764,335	0.0009
Village Tree School	1298	371,602	3,765,015	0.0004
Linwood How Elem School	1299	371,458	3,765,442	0.0003
Willows Community School	1300	372,537	3,765,521	0.0004
Baldwin Dill Elem School	1301	373,913	3,765,441	0.0018
Hillcrest Drive Elem School	1302	375,384	3,764,569	0.0044
Windsor Hill Magnet School	1303	374,735	3,762,558	0.0014
Community Christian Elem	1304	374,502	3,761,177	0.0003
ICEF School	1305	373,575	3,761,806	0.0011
La Tijera Elem School	1306	373,549	3,760,990	0.0004
Frank Parent School	1307	372,980	3,761,081	0.0005
El Rincon Elem School	1308	371,566	3,762,615	0.0010
West La College South	1309	372,008	3,763,263	0.0020
We LA College North	1310	372,011	3,763,812	0.0022
Culver City HS	1311	370,802	3,763,850	0.0005
Residential Receptors				
Brea Crest Dr	355	374,500	3,762,300	0.0026
Shenandoah Ave	1775	373,379	3,762,767	0.0040
Stoneview Ave	1831	372,932	3,764,576	0.0096
S Cloverdale Ave	997	373,900	3,764,100	0.0108
Punta Alta Ave	964	374,200	3,764,000	0.0095

The chronic risk 8-hour results all fall below 0.01 HI at all receptors; therefore, detailed results are not shown.

Table 16 Year 2019 Risk Population Exposure

Risk Level	Population Exposure
Cancer greater than 1 in a million	353

Note: Calculated in HARP2 using Census Block centroids

Table 17 Year 2019 Excess Cancer Burden

Risk Level	Excess Cancer Burden
Excess Cancer Burden	4.3e-4

Note: Calculated in HARP2 using Census Block centroids

Figure 3 Year 2019 Cancer Risk Contours and Location PMI, MEIR, MEIW

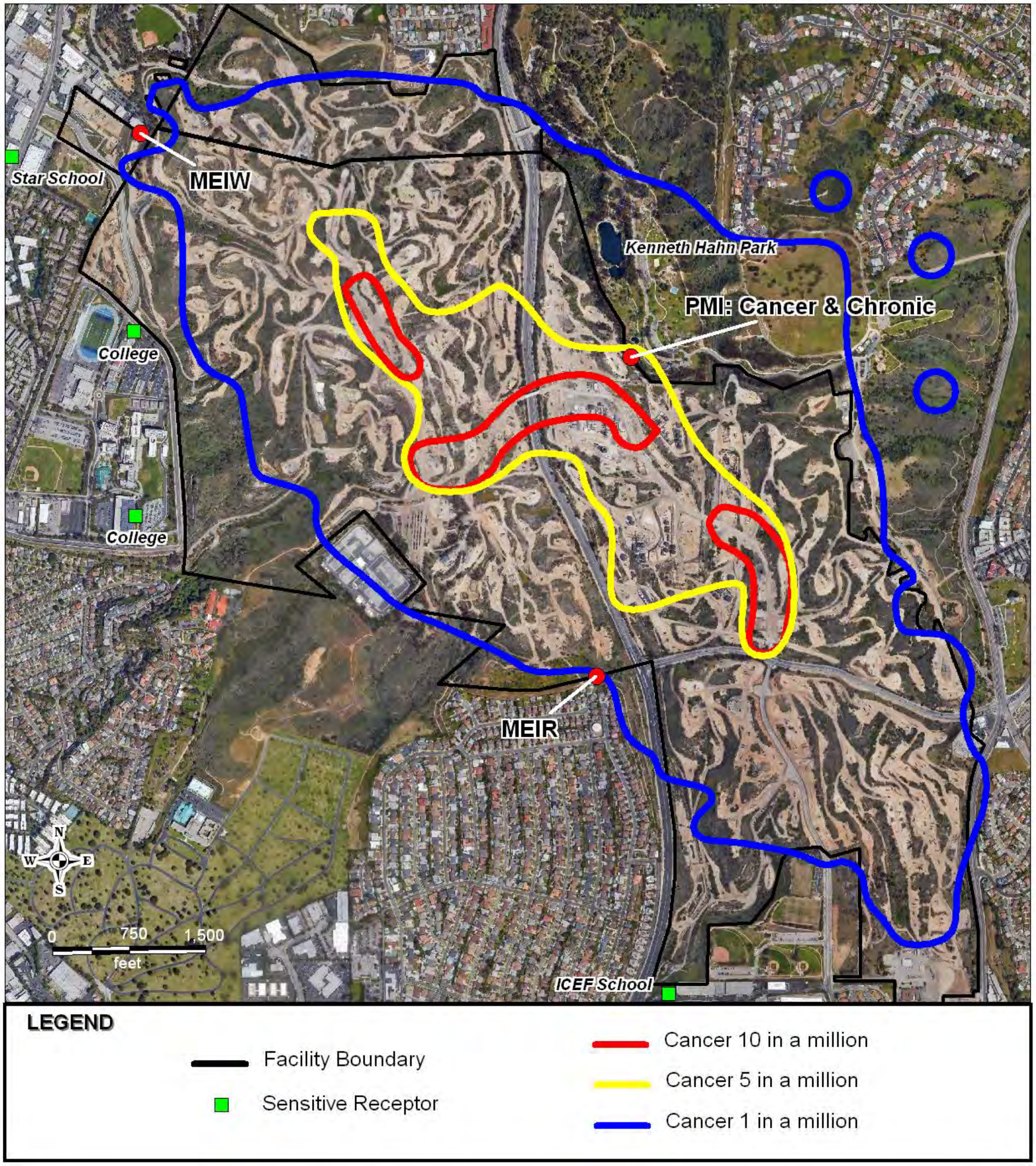
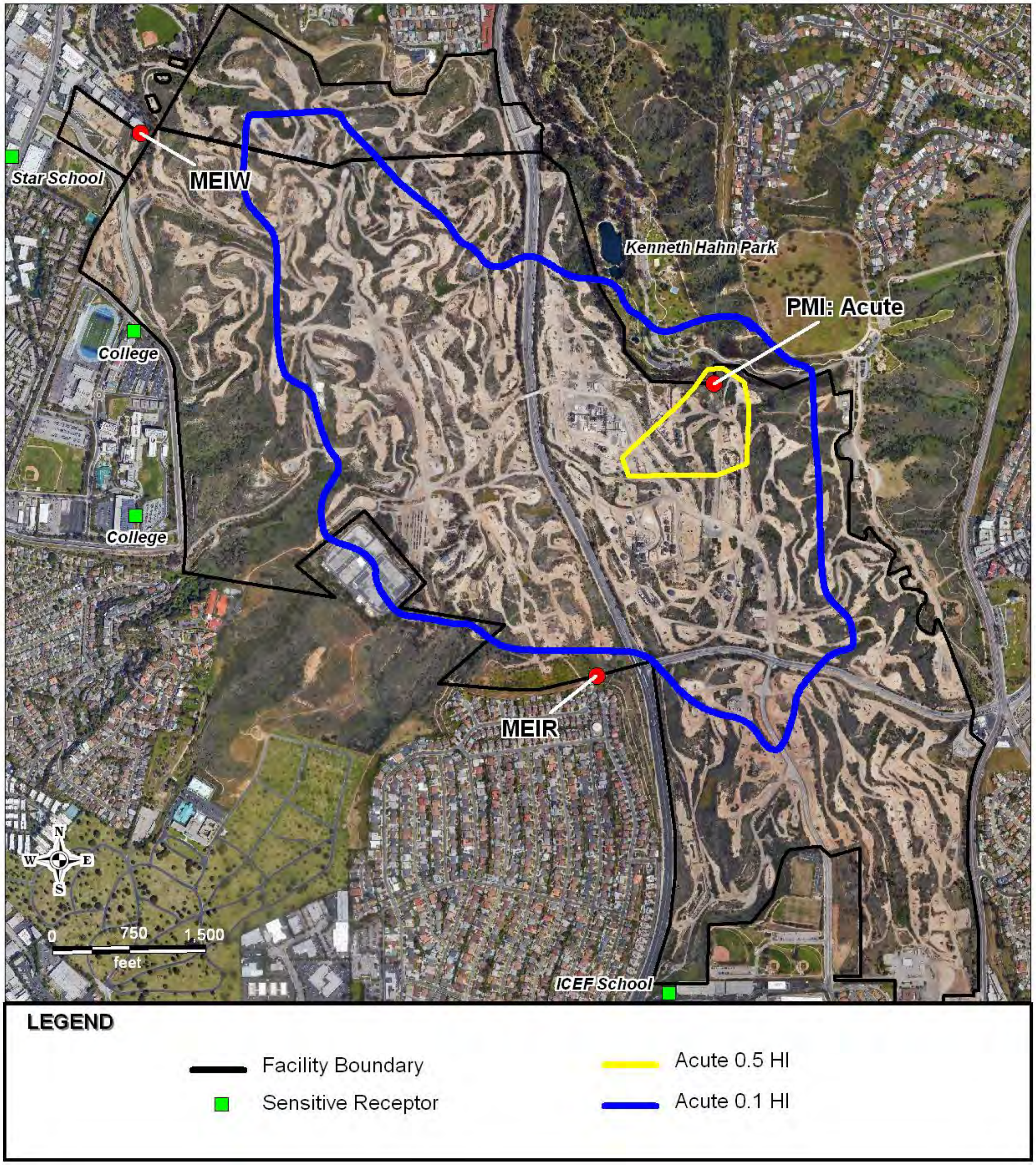


Figure 4 Year 2019 Acute Risk Contours and Location PMI, MEIR, MEIW



5.3 Future Operations Health Risk Results

Health risks in the future are a function of the extent of operations, primarily drilling, that may occur in the future. The current operator indicates that future operations would be similar to 2019 with minimal to zero drilling. However, the CSD allows for drilling until the year 2028. After the year 2028, the level of field activities are unknown. Estimated future operations levels are discussed in section 2.6. The health risks are summarized in the following tables for the different future scenarios. As the future operations are speculative, the information is not presented to the same level of detail as Year 2019 which is presented to the AB2588 level of detail. Figure 5.3 shows a map of the cancer risks. The worst case future acute and chronic risk maps are very similar to the 2019 operations.

The cancer risk drivers for the future worst-case scenario is primarily diesel exhaust (64-89% depending on receptor) followed by benzene (9-16%) and arsenic (1-12%). For acute and chronic, the pollutant drivers are similar to the 2019 operating year scenario.

For the worst-case future operations scenario including drilling of 46 wells per year, the estimated peak cancer risks at the facility boundary (PMI at the fence line) would be 13.8 cancer cases per million, and an acute and chronic HI of 0.55 and 0.18. The cancer risk would be above the SCAQMD AB2588 thresholds; however, the peak acute and chronic risks would be below the thresholds. The peak cancer risk would occur near Kenneth Hahn Park along the fence line. The peak cancer risk at the nearest residence would be 5.6, which would be below the SCAQMD AB2588 thresholds.

Based on the worst-case scenario and the 2019 operational scenario, the level of drilling that would result in peak cancer risk levels at the PMI below the SCAQMD threshold level would correspond to about 25 wells drilled per year average.

Table 18 Future Worst Case Risks at the PMI, MEIR, MEIW

Location	Receptor Number	UTM Coordinates		Cancer Risk	Acute Risk	Chronic Risk
		X Coord, m	Y Coord, M			
PMI	1844	373,493	3,763,713	13.8	0.55	0.18
MEIR	1775	373,379	3,762,767	5.63	0.11	0.03
MEIW	1818	372,038	3,764,399	0.34	0.05	0.005

Cancer, acute and chronic risk levels at different receptors are shown in Table 19.

The estimated exposed populations and cancer burden are shown in Tables 20 and 21. These numbers are estimated in the HARP2 modeling program based on census blocks and the resulting modeling results.

Table 19 Future Worst-Case Risks at Other Receptors

Location	Receptor Number	UTM Coordinates		Cancer Risk	Acute Risk	Chronic Risk
Sensitive Receptors						
Star School	1297	371,655	3,764,335	1.71	0.03	0.0030
Village Tree School	1298	371,602	3,765,015	0.60	0.02	0.0014
Linwood How Elem School	1299	371,458	3,765,442	0.39	0.02	0.0010
Willows Community School	1300	372,537	3,765,521	0.45	0.02	0.0014
Baldwin Dill Elem School	1301	373,913	3,765,441	1.16	0.02	0.0055
Hillcrest Drive Elem School	1302	375,384	3,764,569	1.68	0.02	0.0136
Windsor Hill Magnet School	1303	374,735	3,762,558	2.15	0.05	0.0018
Community Christian Elem	1304	374,502	3,761,177	0.41	0.02	0.0011
ICEF School	1305	373,575	3,761,806	1.93	0.04	0.0024
La Tijera Elem School	1306	373,549	3,760,990	0.62	0.02	0.0010
Frank Parent School	1307	372,980	3,761,081	0.82	0.02	0.0012
El Rincon Elem School	1308	371,566	3,762,615	1.63	0.02	0.0032
West LA College South	1309	372,008	3,763,263	3.19	0.04	0.0067
West LA College North	1310	372,011	3,763,812	5.05	0.05	0.0077
Culver City HS	1311	370,802	3,763,850	0.99	0.02	0.0018
Residential Receptors						
Brea Crest Dr	355	374,500	3,762,300	4.14	0.06	0.0034
Shenandoah Ave	1775	373,379	3,762,767	5.63	0.11	0.0129
Stoneview Ave	1831	372,932	3,764,576	4.70	0.06	0.0296
S Cloverdale Ave	997	373,900	3,764,100	3.28	0.07	0.0328
Punta Alta Ave	964	374,200	3,764,000	2.76	0.05	0.0288

Table 20 Future Worst Case Risk Population Exposure

Risk Level	Population Exposure
Cancer greater than 1 in a million	16,797

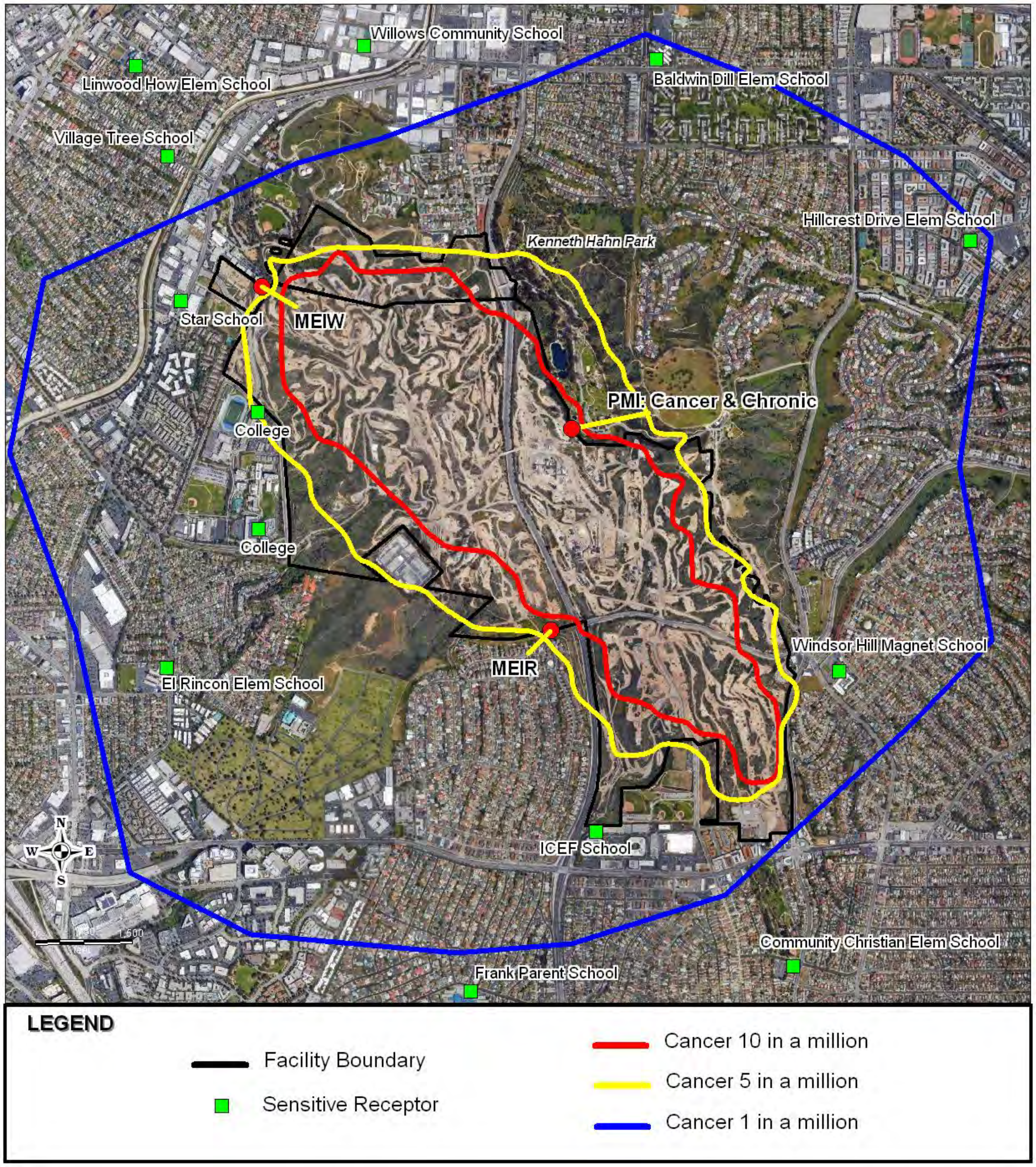
Note: Calculated in HARP2 using Census Block centroids

Table 21 Future Worst Case Excess Cancer Burden

Risk Level	Excess Cancer Burden
Excess Cancer Burden	0.0356

Note: Calculated in HARP2 using Census Block centroids

Figure 5 Future Worst-Case Cancer Risk Contours and Location PMI, MEIR, MEIW



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January 29, 2024

County of Los Angeles Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

Re: Comments on Proposed Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2); Board of Supervisors Meeting, January 30, 2024

Dear Board of Supervisors:

We represent Sentinel Peak Resources California LLC ("Sentinel") regarding the County of Los Angeles's ("County") proposed Baldwin Hills Community Standards District ("BHCSD") amendment, which would amend Title 22 of the Los Angeles County Code "to prohibit the location of new oil wells and production facilities, make existing oil wells and production facilities as nonconforming due to use, and maintaining regulations for existing oil wells and production facilities during the amortization period." (September 7, 2023 Draft BHCSD Amendment, p. 1.)

Sentinel owns and operates oil and gas production facilities in the County that are governed by the existing BHCSD. Sentinel has vested rights that are jeopardized by the proposed amendment, not only under the existing BHCSD, but pursuant to operations that have existed for decades prior to the establishment of the BHCSD—which the County acknowledged in its adoption of the existing BHCSD. Quite simply, the County has not established a legitimate basis for its action. The County's proposed amendment would amortize the newly created non-conforming uses over an unspecified time period, and the proposed amendment does not identify a specific amortization period. Instead, the proposed amendment refers to Section 22.172 of the Los Angeles County Code for Nonconforming Uses, Buildings and Structures, which includes provisions for different amortization periods.

Following the Regional Planning Commission's ("RPC") August 16, 2023, hearing on the proposed amendment—where RPC staff confirmed they had previously failed to adequately meet with stakeholders to discuss the BHCD amendment—RPC staff met with stakeholders, including Sentinel, and indicated the applicable amortization period is 20 years pursuant to Sections 22.172.050.B and 22.172.050.B.1.f. However, the proposed amendment does not identify these provisions from Section 22.172, and in any event, Sections 22.172.050.B and 22.172.050.B.1.f themselves identify a variety of different amortization periods. The applicable amortization period of the proposed amendment is still unclear.

Further, the County has not demonstrated that amortization is applicable to oil and gas operations, nor has it performed an amortization analysis to support any amortization period. An amortization analysis may consider available reserves, capital investments, revenue, operating expenses, and a reasonable rate of return. (See January 29, 2024 Alvarez & Marsal memorandum, attached.) The proposed amendment does not appear to consider any of these factors.

The proposed amendment is not consistent with the County's General Plan, and it is in fatal conflict with the State's statutory obligation to administer oil and gas regulations in a way that ensures the state has adequate oil and gas resources, as recently held by the California Supreme Court.

We submit these comments ahead of the January 30, 2024 public hearing on the proposed amendment—to which we were provided one week's notice—to share Sentinel's objections. Not only is the proposed amendment legally invalid, but the County has also failed to conduct a proper environmental analysis, including, but not limited to, fulfilling its obligations under the California Environmental Quality Act ("CEQA"), not the least of which is its failure to designate land uses under the General Plan to replace the existing oil and gas operations, resulting in improper piecemealing. Sentinel urges the Board of Supervisors to postpone consideration of the proposed amendment; direct the Regional Planning Commission to take necessary, additional steps to study the environmental impact of the proposed amendment, including completing a legally proper environmental analysis required by CEQA, reviewing in good faith the issues raised by public comment letters; and reconsidering the proposed amendment as currently drafted.

I. <u>The Proposed Amendment Is Preempted by State Law</u>

The proposed amendment conflicts with existing California law and is therefore preempted, as recently addressed by the California Supreme Court in *Chevron U.S.A. Inc. v. County of Monterey* (2023) 15 Cal.5th 135 ("*County of Monterey*"). In *County of Monterey*, the Supreme Court considered the validity of a Monterey County ordinance banning oil and gas wastewater injection and impoundment and the drilling of new oil and gas wells in the county's unincorporated areas ("Measure Z"). On August 3, 2023, the California Supreme Court affirmed the lower courts' determination that Measure Z was preempted by state law.

The California Constitution provides that a "county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws." (Cal. Const., Art. XI, § 7.) "If otherwise valid local legislation conflicts with state law, it is preempted by such law and is void." (*County of Monterey*, *supra*, 15 Cal.5th at 142, citing *Sherwin-Williams Co. v. City of Los Angeles* (1993) 4 Cal.4th 893, 89.) A preempting conflict may arise in three ways: when the local legislation "duplicates, contradicts, or enters an area fully occupied by general law, either expressly or by legislative implication." (*County of Monterey*, *supra*, 15 Cal.5th at 142, citation omitted.) Preemption based on contradiction applies when the local legislation is "inimical" to state law or when it "cannot be reconciled with state law." (*Id.*, at 145, citations omitted.) Further, "state law may preempt local law when local law prohibits not only what a state statute 'demands' but also what the statute permits or authorizes." (*County of Monterey*, *supra*, at 149, quoting *City of Riverside v. Inland Empire Patients Health & Wellness Center, Inc.* (2013) 56 Cal.4th 729, 763 ("City of Riverside") (conc. opn. of Liu, J.).) Thus, if a local ordinance attempts to "prohibit conduct proscribed or *permitted* by state law[,] either explicitly or implicitly, it would be preempted." (*County of Monterey*, *supra*, 15 Cal.5th at 149, citing *City of Riverside*, *supra*, at p. 758.)

Applying this standard, the Supreme Court in *County of Monterey* found that Measure Z—which provides that "certain oil production methods may *never* be used by anyone, anywhere, in the County"—contradicts Public Resources Code section 3106's "mandate that the state 'shall' supervise oil operation in a way that permits well operators to 'utilize *all* methods and practices' the [State Oil & Gas] supervisor has approved" and "directs the [State Oil & Gas] supervisor to administer the state's regulations in a way that serves the dual purpose of ***ensuring*** the state has adequate oil and gas resources, while protecting the environment." (*County of Monterey*, *supra*, 15 Cal.5th at 144-45, emphasis added.) That is, "section 3106 implicitly limits a local entity's authority" by directing the [State Oil & Gas] *supervisor* to make decisions regarding all oil production methods. (*Id.* at 149.) In contravention of section 3106, "Measure Z authorizes *the County* to make decisions regarding some of those methods." (*Id.* at 146.) In particular, the Court held that broad language prohibiting the drilling of wells amounts to "a ban on certain oil production methods in existing oil fields." (*Id*. at 147.)

Here, the proposed CSD amendment similarly seeks to prohibit a permissible method of oil production in the existing Inglewood Oil Field: the drilling of new wells. As the Supreme Court has already held in *County of Monterey*, Public Resources Code section 3106 grants the California Geologic Energy Management Division ("CalGEM") with the authority to regulate all aspects of oil and gas production. A local law authorizing the County to make decisions about methods of oil and gas production—namely to prohibit such methods permitted by state law—would therefore be preempted. The proposed amendment seeks to do as much and is thus preempted, and the County cannot legally adopt the amendment.[1]

II. **The Proposed Amendment Does Not Identify an Amortization Period**

The County's proposed amendment would impose an amortization period on oil and gas operations, but it fails to identify a specific amortization period or provide evidence of factual support for the application of *any* amortization period. The County has not provided *any* evidence related to the potential factors for an amortization analysis described in the attached report from Alvarez & Marsal.

County staff have stated that the applicable amortization period is 20 years pursuant to Sections 22.172.050.B and 22.172.050.B.1.f of the Los Angeles County Code. However, the amendment does not identify Section 22.172 or any of its subsections, and Sections 22.172.050.B and 22.172.050.B.1.f identify a variety of different amortization periods—ranging from 1 year for unimproved land to 50 years for certain building types, including certain "[f]actories and industrial buildings." Thus, the applicable amortization period is still unclear.

Additionally, "an amortization period is not an absolute or unqualified defense to a takings claim." (*Levin Richmond Terminal Corp. v. City of Richmond,* 2020 U.S. Dist. LEXIS 156103, *36-37, emphasis added.) Rather, the legislation must provide a "reasonable amortization period commensurate with the investment involved." (*Id.,* quoting *Elysium Institute, Inc. v. County of Los Angeles* (1991) 232 Cal. App. 3d 408, 436.) While amortization does not apply to oil and gas interests (see Section III), even assuming that it does for the sake of argument, any amortization process requires a detailed, factual analysis evaluating numerous factors for a particular property, such as investment in the use, fair market value, and remaining useful life. (*See Metromedia, Inc. v. City of San Diego* (1980) 26 Cal.3d 848, 883-884, rev. on other grounds *Metromedia, Inc. v. San Diego* (1981) 453 U.S. 490.) The County bypasses this crucial step required to legally adopt its proposed amendment. No study has been conducted regarding an appropriate amortization period, and (even worse than with the recent oil ordinance adopted by the City of Los Angeles) no Mitigated Negative Declaration ("MND") has been prepared to support the proposed amendment or any amortization period. Proper analysis, including an amortization study, needs to be prepared before any amortization ordinance is adopted.

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[1] The proposed amendment is also preempted because state law has "fully occupied" the field of regulating the production of oil and gas, including drilling, operations, abandonment, and maintenance. The extensive host of State laws and associated regulations clearly reflect an intent to occupy the entire area of oil and gas production. As the proposed amendment also prohibits the drilling of injection wells regulated by the federal Safe Drinking Water Act, it is likewise preempted under federal law.

Any amortization period adopted must recognize that oil and gas operations require constant maintenance and ongoing investments to the operation's infrastructure. An amortization period must account for the need to regularly invest in order to continue to maintain profitable productivity levels.

III. **<u>Amortization Does Not Apply to the Extraction of Mineral Resources</u>**

The County fails to evaluate the legal propriety of establishing an amortization period for the extraction of mineral resources and ignores the legal doctrine that would invalidate this proposed amendment – the diminishing asset doctrine. (*See Hansen Bros. Enters. v. Board of Supervisors* (1996) 12 Cal.4th 533.) The California Supreme Court in *Hansen* recognized the "diminishing asset" doctrine and defined the scope of vested rights for mining, quarrying and other extractive uses, recognizing the unique qualities of extractive uses and holding that it includes an expansion of those uses.

As explained in the context of a quarry, the court in *Hansen* stated:

> The very nature and use of an extractive business contemplates the continuance of such use of the entire parcel of land as a whole, without limitation or restriction to the immediate area excavated at the time the ordinance was passed. A mineral extractive operation is susceptible of use and has value only in the place where the resources are found, and once the minerals are extracted it cannot again be used for that purpose. 'Quarry property is generally a one-use property. The rock must be quarried at the site where it exists, or not at all. An absolute prohibition, therefore, practically amounts to a taking of the property since it denies the owner the right to engage in the only business for which the land is fitted.'

(*Hansen,* 12 Cal.4th at 553-54 (and cases cited therein).)

Similarly, Sentinel's vested oil and gas rights—consistent with Sentinel's historic use even prior to the establishment of the existing BHCSD—are uniquely situated in the County, and the proposed amendment seeks to terminate the extraction of those resources in the entire County, without the ability to extract them elsewhere. (*See Los Angeles v. Gage* (1954) 127 Cal.App.2d 442.) The proposed amendment will deprive Sentinel of the right to engage in the only business for which its subsurface mineral rights are fitted. Under the diminishing asset doctrine, Sentinel is entitled to produce oil and gas resources under its vested rights until the resource is exhausted or otherwise uneconomical to produce—the continued production of oil and gas resources is the expanded use and is protected under *Hansen.* Moreover, in its adoption of the existing BHCSD, the County recognized as much: "Because oil operations have been ongoing at the Inglewood Field for more than

80 years, [operators have] certain rights to produce the oil and gas resources at the field and ***new zoning regulations cannot diminish those rights***." (10/21/2008 Motion amending CSD, at p. 3, emphasis added.)[2]

IV. <u>**The County Has Not Completed the Required CEQA Process**</u>

The County's circumvention of the CEQA process is against well-established laws, making the proposed amendment illegal if adopted. The County has failed to properly consider the significant impacts that the proposed amendment will have towards the availability of mineral resources, which is required under CEQA. In addition, California and the County will continue to rely on fossil fuels to meet most of their energy demands, particularly in the critical transportation sector. However, since the oil transmission capabilities of the State is mostly disconnected from the other lower-48 states and therefore unable to secure domestic crude oil sources to support its energy needs, the percentage of foreign oil imports to California will continue to increase as a result of the proposed amendment's restrictions.[3] Despite this reality, the County has failed to consider the increases in greenhouse gas ("GHG") emissions that will result from the proposed amendment's adoption. Because the oil and gas operations in the County are highly regulated, unlike foreign sources of oil, a reduction in production from the operations within the County will necessarily result in an immediate, significant, and foreseeable increase in the importation of foreign oil (which is necessarily more carbon intensive than oil produced in California), driving GHG emissions higher from ships and other vessels needed to import the oil to California and the County. These emissions, however, can be significantly reduced by the continuation of oil and gas production within the County. Yet the County has failed to analyze the proposed amendment's potentially significant GHG impacts under CEQA, including how the proposed amendment would result in emissions that conflict with the State's GHG reduction goals.

For instance, the City of Los Angeles published an Oil and Gas Health Report dated July 25, 2019, which confirms that 1.6 billion barrels of recoverable oil and gas reserves remain beneath the City, alone "rivaling the reserves of the Middle Eastern countries, like Saudi Arabia, Iraq, and Kuwait 14,000 miles away."[4] Even more oil can reasonably be expected to be within the County's borders, including within the BHCSD. However, the County's

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[2] https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

[3] Californians for Energy Independence, *What Is An Energy Island?*, https://www.energyindependenceca.com/what-is-an-energy-island/; Kern Economic Development Corp., *Where California Gets Its Energy*, available at https://kernedc.com/wp-content/uploads/2021/08/Kern-EDC-CA-Oil-Imports-Fact-Sheet.pdf; California Policy Center, https://californiapolicycenter.org/reality-check-half-of-californias-energy-comes-from-crude-oil/; U.S. Energy Information Administration, https://www.eia.gov/state/?sid=CA#tabs-1.

[4] https://clkrep.lacity.org/onlinedocs/2017/17-0447_rpt_BPW_07-29-2019.pdf

proposal for elimination of oil and gas operations will not eliminate the County's ongoing demand for oil and gas products. To meet demand, every barrel of oil per day that is not produced within the County must necessarily be produced elsewhere, requiring further expenses and negative environmental impacts by instead requiring the importation of oil. Additionally, reliance on foreign oil from Middle Eastern countries—and in the midst of ongoing crises in Ukraine, Gaza, and Yemen—will create national security concerns. And indeed, over the past several years, California sources of petroleum have been replaced by foreign sources, increasingly from Saudi Arabia, Iraq, and Colombia—countries that do not adhere to California's high environmental and human rights standards.[5] According to the Yale University Environmental Performance Index, in 2020 Saudi Arabia and Iraq ranked in the lower half of all countries for environmental protection, far below U.S. levels,[6] and both countries ranked in the bottom 25 percent on the Freedom House index of political and civil rights in 2020.[7]

The County also fails to analyze the potentially significant environmental effects to air quality, aesthetics, traffic, odor, and noise that may be caused by the accelerated rate of abandonment activities as a result of the proposed amendment.

The County is also required to analyze reasonably foreseeable indirect impacts under CEQA, which extends to the adoption of lead agency ordinances that result in changes to land use patterns. CEQA review is necessary to assess the potential impacts that may result from the development of the sites as they are abandoned. If a direct change in the physical environment will cause another change in the environment, the secondary effect must be evaluated as an indirect effect of the project. (CEQA Guidelines, § 15064(d).) The impact analysis must consider the potential for growth-inducing impacts, including increases in population growth and construction that may result from discontinuing and removing legally established oil wells and production facilities. (CEQA Guidelines § 15126(d), 15126.2(d).) The County fails entirely to consider these impacts.

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[5] California Energy Commission, *Oil Supply Sources To California Refineries*, available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries; see, e.g. California Energy Commission, *Foreign Sources of Crude Oil Imports to California 2018*, available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/foreign-sources-crude-oil-imports; U.S. Energy Information Administration, *California State Energy Profile*, available at https://www.eia.gov/state/print.php?sid=CA.

[6] Environmental Performance Index, "2020 EPI Results," Yale Univ., available at https://epi.yale.edu/epi-results/2020/component/epi.

[7] Freedom House, *Global Freedom Scores,* available at https://freedomhouse.org/countries/freedom-world/scores.

Not to mention, the County entirely fails to address the EIR for the existing BHCSD, completed in October 2008, which analyzed the potential environmental effects associated with the operation of the Inglewood Oil Field and continued drilling of new wells over the next 20 years. In addition to the other potentially significant impacts described above, the EIR recognized, in relevant part, the increased GHG emissions associated with the importation of foreign crude oil: "The use of foreign crude oil is associated with substantial emissions associated with transportation [which] causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil." (See Final EIR for BHCSD,[8] at 4.2-42 to 4.2-45.) The Board concluded in 2008 that any "remaining unavoidable environmental effects of continuing operations at the oil field will be reduced to the extent possible by the CSD and are outweighed by social, economic and environmental benefits provided by the CSD." (10/21/2008 Motion adopting Final EIR and amending CSD, at pp. 4-5.)[9] County staff has provided no justification for ignoring this prior conclusion by the Board. The County must address the existing EIR — just as was done for the existing BHCSD — and complete the legally required CEQA process for the proposed amendment.

Ultimately, the County has a duty to thoroughly evaluate and analyze the significant impacts to mineral resources, air quality, GHG emissions, and other environmental effects under CEQA before the proposed amendment may be considered for adoption. But as it stands, the County has performed inadequate analysis regarding the direct, cumulative, and indirect impacts the proposed amendment will have on the environment. And as evidenced by the significant environmental impacts that the proposed amendment will have on the environment, the fair argument standard would require the County to prepare an Environmental Impact Report ("EIR"). (*No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68; *Friends of "B" Street v. City of Hayward* (1980) 106 Cal.App.3d 988; Cal. Pub. Res. Code §§ 21080(c)-(d), and 21100(a); CEQA Guidelines § 15064(f)(1).) "Given the statute's text, and its purpose of informing the public about potential environmental consequences, it is quite clear that an EIR is required even if the project's ultimate effect on the environment is far from certain." (*Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist.* (2015) 62 Cal.4th 369, 382-83.) And, in addition, because the County is faced with the fair arguments raised herein and by other public comments that the proposed amendment may have a significant effect on the environment, the County is required to prepare an EIR. (*Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1104; CEQA Guidelines § 15064(f)(1).) Since the County has not done so, it has not completed the CEQA process and may not approve or adopt the proposed amendment.

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[8] https://inglewoodoilfield.com/wp-content/uploads/2017/10/baldwin_hills_community_standards_district_final_eir-.pdf

[9] https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

V. The County Improperly Relies on Exemptions to Sidestep the CEQA Process

The County has failed to conduct any CEQA review at all, improperly relying on the proposition that the proposed amendment fits within several exemptions to CEQA. In doing so, the County fails to provide sufficient evidence for its assertions. The County's determination that the proposed amendment fits within the CEQA exemptions will only be upheld if supported by substantial evidence. (*North Coast Rivers Alliance v. Westlands Water Dist.* (2014) 227 Cal. App. 4th 832, 852.) The proposed amendment and the County's Staff Report fail to provide necessary evidence to qualify for a CEQA exemption. No MND was prepared, and further no amortization study has been conducted. Instead, the County only provides conclusory statements regarding potential impacts, which are insufficient to support the exemptions claimed. Additionally, the proposed amendment does not qualify for any of the purported CEQA exemptions.

First, the proposed amendment does not fall within the "common sense exemption" under sections 15061(b)(2)-(3). The reduction in the ability to conduct local oil production within the County can and will have a material effect on the availability of mineral resources within the County and, consequently, GHG emissions due to the increased demand for foreign oil and the transport of foreign oil to the County. And importantly, CEQA recognizes that limitations in the access of mineral resources creates a significant environmental impact. Further, the County has not properly evaluated the impacts to air quality that well abandonment and well plugging may have on the environment. As the proposed amendment works to limit the ability to access oil and gas within the County, which constitute a "known mineral resource that would be of value to the region and the residents of the state," the loss of such creates a significant environmental impact. (*See* State CEQA Guidelines, Appendix G, section XII(a).) Therefore, the County cannot accurately state that the proposed amendment does not have any potential for causing significant environmental impacts, and a proper study is required under CEQA.

Second, the "existing facilities exemption" (Class 1) under section 15301 does not apply. Substantial evidence does not support application of this exemption. The proposed amendment necessarily involves significant changes to existing facilities because it requires their removal, thereby catalyzing further, foreseeable environmental consequences.

Third, the Class 8 exemption under section 15308 for actions by regulatory agencies for the protection of the environment is similarly inapplicable. That exemption only applies to "actions taken by regulatory agencies, as authorized by state or local amendment, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." The County is a legislative body—not a regulatory agency—and thus the exemption cannot apply.

Additionally, the Class 8 exemption does not apply to agency actions that improve one element of the environment but have significant effects on another. (*Dunn-Edwards Corp. v. Bay Area Air Quality Management District* (1992) 9 Cal.App.4th 644.) The County cannot simply "circumvent CEQA merely by characterizing its ordinance[] as environmentally friendly and therefore exempt" under a Class 8 exemption. (*Save the Plastic Bag Coalition v. County of Marin* (2013) 218 Cal.App.4th 209, 219-220.) Substantial evidence indicates the proposed amendment would have significant, adverse impacts to the County's mineral resources, air quality, and GHG emissions.

Finally, the Class 8 exemption is inapplicable to projects that result in cumulative impacts. (*San Lorenzo Valley Community Advocate for Responsible Education v. San Lorenzo Unified School District* (2006) 139 Cal.App.4th 1356, 1381.) The proposed amendment would result in cumulative environmental impacts from the many other restrictions on oil and gas operations concurrently being adopted, including by the City of Los Angeles and the increased setback provisions adopted by SB 1137.

Regardless, none of the CEQA exemptions apply because the "unusual circumstances exception" under section 15300.2(c) bars reliance upon any exemption located within sections 15301 through 15333. An unusual circumstance refers to "some feature of the project that distinguishes it from others in the exempt class." (*San Lorenzo Valley Community Advocate for Responsible Education v. San Lorenzo Unified School District* (2006) 139 Cal.App.4th 1356, 1381.) The proposed amendment presents "unusual circumstances" for several reasons. The proposed amendment does not impose procedures for the protection of the environment, but instead imposes an arbitrary and economically unsupportable amortization period to unlawfully eviscerate property rights. Further, the unusual circumstances exception applies when evidence demonstrates a project will have a significant impact on the environment. (*World Business Academy v. Cal. State Lands Commission* (2018) 24 Cal.App.5th 476, 499.) The proposed amendment will clearly have a significant impact on the environment. The loss of availability of known mineral resources that would be of value to the region and the residents of the state constitutes a significant impact on the environment under State CEQA Guidelines. (CEQA Guidelines, Appendix G, section XII(a).) State CEQA Guidelines, Appendix G, section XII(b) similarly finds a resulting significant environmental impact from "the loss of availability of a locally-important mineral resource recovery site delineated on a local general, specific plan or other land use plan[.]" In both respects, the proposed amendment creates a significant environmental impact, which distinguishes the proposed amendment from other ordinances covered under these CEQA exemptions.

VI. <u>The County Engaged in Improper Piecemealing under CEQA</u>

The County has failed to designate land uses for the area to replace oil and gas land uses that the proposed amendment seeks to eliminate, which constitutes improper piecemealing under CEQA. CEQA defines "project" as the "whole of an action" (CEQA

Guidelines, § 15378) and "forbids piecemeal review of the significant environmental impacts of a project." (*Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal. App. 4th 1209, 1222, citations omitted.) "Environmental considerations may not be submerged by chopping a single CEQA project into smaller parts for piecemeal assessment." (*Nelson v. County of Kern* (2010) 190 Cal.App.4th 252, 271.) Moreover, when the activity involves a regulation, "the whole of activity constituting the 'project' includes the enactment, implementation and enforcement of the regulation." (*POET, LLC v. State Air Resources Bd.* ("*Poet II*") (2017) 12 Cal.App.5th 52.) The test for determining which acts are part of the whole is whether the acts in question are "related to each other." Actions can be "related in (1) time, (2) physical location and (3) the entity undertaking the action." (*Id.*, *at* p. 74 [quoting *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1227].) Another relevant factor is "how closely related the acts were to the overall objective of the project…The relationship between the particular act and the remainder of the project is sufficiently close when the proposed physical act is among the various steps which taken together obtain an objective." (*Poet II*, *supra*, at p. 75 [citing *Tuolumne County Citizens, supra*, at p. 1226], internal quotation marks omitted.)

Here, the entire activity before the County is the phasing-out of oil operations within the BHCSD area, but the County only analyzes a portion of that project in its Staff Report. The phasing-out of oil operations would necessarily include the designation of land uses to replace the oil and gas land uses prohibited by the proposed amendment. The designation achieves the same overall objective of eliminating oil and gas land uses within the BHCSD, would be adopted by the same entity, covers the same geographical matter, addresses the same subject matter, and is temporally connected to the proposed amendment, thereby making it "related to" the proposed amendment. It is also a reasonably foreseeable consequence of the proposed amendment and indeed "part of a single, coordinated effort" by the County to phase out all oil and gas operations in the BHCSD. (*Poet II*¸*supra*, at p. 75.) Thus, the County must designate such land uses and analyze them in the EIR that the County is legally required to complete, as discussed in Sections IV and V above.

VII. <u>The Proposed Amendment Is Inconsistent with the General Plan</u>

In contrast to the existing BHCSD, which is consistent with the County's General Plan as analyzed in its EIR and related Staff Report (see 2008 BHCSD EIR at 4.8.5; July 24, 2008 RPC Staff Report at pp. 15-16), the County has failed to demonstrate how the proposed amendment is compatible and consistent with the General Plan. Instead, the Staff Report simply states in a conclusory manner that "[t]he Amendment is consistent with and supportive of the goals, policies, and principles of the General Plan," listing Land Use Policies 7.1, 7.8, 9.1, and 9.4—none of which specifically pertain to oil and gas. (Staff

Report at pp. 3-4.) The County, however, has not shown how the proposed amendment is consistent with other relevant goals, policies, and principles of the General Plan.

For example, the General Plan's Land Use Element states:

> The General Plan encourages the protection of major facilities, such as landfills, solid waste disposal sites, energy facilities, natural gas storage facilities, oil and gas production and processing facilities, military installations, and airports from the encroachment of incompatible uses.

(General Plan Land Use Element, p. 74.)[10] Similarly, the General Plan's Conservation and Natural Resources Element states:

> The General Plan protects Mineral Resources, as well as the conservation and production of these resources, by encouraging compatible land uses in surrounding and adjacent areas.

(General Plan Conservation and Natural Resources Element, pp. 155-156 & Figure 9.6.)[11]

As such, Land Use Policy 7.5 states:

> Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.

(General Plan Land Use Element, p. 87.) The General Plan also includes a map of Mineral Resources Zones (Figure 9.6),[12] which depicts oil and gas resources, including the Inglewood Oil Field. None of these General Plan provisions, though directly related to oil and gas uses, have been addressed by the County.

VIII. <u>The Proposed Amendment Violates Due Process and Equal Protection Under the U.S. and California Constitutions</u>

The U.S. and California Constitution guarantee equal protection of the laws and adequate due process. These rights also apply in the land use context. (Cal. Const., Art. 1, § 7(a); U.S. Const. amend V, XIV; *College Area Renters & Landlord Ass'n v. City of San Diego* (1996) 43 Cal.App.4th 677, 686.) Substantive due process addresses improper governmental

[10] https://planning.lacounty.gov/wp-content/uploads/2022/11/6.0_gp_final-general-plan-ch6.pdf.

[11] https://planning.lacounty.gov/wp-content/uploads/2022/11/9.0_gp_final-general-plan-ch9.pdf

[12] https://planning.lacounty.gov/wp-content/uploads/2022/11/9.1_Chapter9_Figures.pdf

interference with property rights and irrational actions by government decision-makers. (*Lingle v. Chevron U.S.A. Inc.* (2005) 544 U.S. 528, 541; *Arnel Development Co. v. City of Costa Mesa* (1981) 126 Cal.App.3d 330, 337.)

Adoption of the proposed amendment would violate Sentinel's due process rights under article I, section 7 of the California Constitution and the Due Process Clause of the Fourteenth Amendment to the U.S. Constitution. There is no legitimate interest in terminating oil and gas operations in the BHCSD, nor is there any legitimate interest in eliminating an industry that is already regulated, permitted by various government entities, and contributes to the local economy. The proposed amendment would also interfere with Sentinel's vested rights to complete the development and production of oil and gas resources within the BHCSD, pursuant to Sentinel's current and historic operations prior to the establishment of the BHCSD. There are substantive due process requirements that vested rights cannot be terminated or impaired by ordinary police power regulations and can be revoked or impaired only to serve a "compelling state interest," such as harm, danger, or menace to public health and safety or public nuisance. The government's interference with vested rights must be narrowly tailored to address the compelling interest and its magnitude. The County, however, has not identified any compelling state interest to justify terminating or impairing Sentinel's vested rights, nor are there any. Moreover, the County has not followed the necessary procedures to demonstrate that oil and gas production in the BHCSD results in any environmental, health, or safety hazards. Further, the County exempts certain other oil and gas uses without any explanation for those exemptions.

IX. The Proposed Amendment Would Constitute a Taking of Vested Rights in Violation of the U.S. and California Constitutions

The U.S. and California Constitutions provide that private property shall not be taken without just compensation. (U.S. Const. amend. V; Cal. Const., Art. 1, § 19.) These constitutional protections apply to regulatory takings. (*Lucas v. S.C. Coastal Council* (1992) 505 U.S. 1003, 1014.) "The right to remove oil and gas from the ground is a property right." (*Maples v. Kern Cty. Assessment Appeals Bd.* (2002) 103 Cal.App.4th 172, 186.) Moreover, a land use regulation constitutes to a facial taking of property when it "denies an owner economically viable use of his land" (*id.* at 1016, citations omitted), and the implementation of the proposed amendment strips a property owner of "substantial economic use" of their affected property. (*See Maritrans Inc. v. U.S.* (2003) 342 F.3d 1344, 1351-52.)

Sentinel has vested property rights to develop and produce oil and gas resources, consistent with its historical use and its ownership in mineral rights and right to conduct its operations in the BHCSD. There are many years of oil and minerals yet to be extracted from Sentinel's mineral rights and leases, and Sentinel's reasonable, investment-backed expectation was that it would continue to produce and develop oil and gas until its leased assets are no longer capable of producing oil and gas in commercial quantities. The proposed amendment, however, ignores these rights, requiring abandonment of these wells. The County's proposed amendment, if implemented, serves to affect an unconstitutional taking of Sentinel's property as an owner and lessee of mineral rights and as an oil and gas operator, along with the property of other landowners and mineral rights holders in connection to Sentinel's leasehold interests.

X. The Proposed Amendment Would Interfere with Sentinel's Contractual Relations

Both the U.S. and California Constitutions prohibit the enactment of laws effecting a "substantial impairment" of contracts, which applies to public contracts as well as contracts between private parties. (*Alameda County Sheriff's Assn. v. Alameda County Employees' Retirement Assn.* (2020) 9 Cal.5th 1032, 1074.)

Sentinel has contracts with various private parties, which impose obligations on Sentinel that likely will continue beyond the date the amortization period expires, once determined. The proposed amendment will impair these contracts by forcing Sentinel to terminate its operations on or well before the amortization deadline, which will undermine Sentinel's reasonable expectations under the contracts.

XI. The County's Liability for Damages Under the Civil Rights Act

The federal Civil Rights Act, 42 U.S.C. § 1983 ("Section 1983"), provides a cause of action for damages based on claims arising from violations of federal rights. (*Sveen v. Melin* (2018) 138 U.S. 1815, 1822.) As discussed at length herein, the proposed amendment will significantly impair Sentinel's constitutional rights, including its right to just compensation, due process rights, and equal protection rights. Accordingly, if the County adopts the proposed amendment, the County and its Supervisors will place themselves at significant risk of liability under Section 1983, including for payment of damages suffered as a result of unreasonably phasing out oil and gas production within the BHCSD.

XII. Approval of the Proposed Amendment Would Not Be a Legitimate Exercise of the Police Power

The proposed amendment is arbitrary, capricious, entirely lacking in evidentiary support, and contrary to established public policy supporting the extraction of oil and gas in the County, including within the BHCSD. While the County is afforded latitude in adopting land use regulations, the County's police power is not unlimited. Land use regulations, such as the County's proposed amendment, must be "reasonable in object and not arbitrary in operation [in order to] constitute a valid exercise of that power" and reasonably related to the public welfare, which the County fails to demonstrate. (*La Mesa* *v. Tweed & Gambrell Planning Mill* (1956) 146 Cal. App. 2d 762, 768; *Associated Home Builders, Inc. v. City of Livermore* (1976) 18 Cal.3d 582.) As discussed above, the adoption of the CSD amendment would have tremendous negative impacts that have not been analyzed by the County.

Moreover, adoption of the proposed amendment will result in the loss of good-paying industry jobs, such as those for which Sentinel supplies to the County's residents through its oil and gas operations. But fatally, the County fails to forecast the probable effect of the amendment, fails to identify the competing interests involved, and fails to justify why the amendment reflects a reasonable accommodation of competing interests.

For all of these reasons, we urge the County to postpone consideration of the proposed BHCSD amendment unless and until it cures the numerous legal defects discussed herein.

Sincerely,

Nicki Carlsen

Attorney for Sentinel Peak Resources California LLC

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January 29, 2024

To: Sentinel Peak Resources California LLC

Subject: Items that May be Considered in Amortization

1. Alvarez & Marsal has been retained by counsel on behalf of Sentinel Peak Resources California LLC in a matter related to the Inglewood oil field in Los Angeles County.

2. I have been asked by counsel to provide an illustrative list of the types of items that may be considered in an amortization calculation assuming such amortization calculation is legally permissible.

3. An amortization calculation of producing oil and gas reserves may consider, but is not limited to, the following categories of information:

a. An understanding of the extent of the resources in the oil and gas field.

b. An assessment of capital investment into the producing oil and gas field including:

   i. the purchase or acquisition price,

   ii. facility and maintenance capital,

   iii. recompletion or workover capital,

   iv. development capital,

   v. required remediation costs, and

   vi. required abandonment capital.

c. Revenue derived from the production of oil and gas from the field.

d. Operating expenses associated with the production of oil and gas from the field including:

   i. fixed and variable lease operating expenses,

   ii. royalty expenses,

   iii. ad valorem taxes,

   iv. severance taxes,

   v. general and administrative costs,

   vi. income taxes, and

   vii. any other costs allocable to the production of oil and gas.

e. A reasonable rate of return.

4. Additional factors may be considered depending on the specific characteristics of the oil and gas field.

Kind Regards,

Robert Lang

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Certification

Chartered Financial Analyst (CFA)

Professional History

Navigant Consulting (2010 – 2016)

UHY Advisors (2005 – 2010)

Arthur Andersen/FTI Consulting (1995-2005)

Professional Affiliations

CFA Society

CFA Society of Dallas

American Bar Association Commercial Litigation—Energy Committee

Education

Baylor University, BBA—Financial Services

Robert Lang, CFA, ABV

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For more than 25 years, Robert has been trusted by attorneys and companies to analyze complex commercial disputes and measure the financial impact of external events, operational changes, and other market factors. He has served as an expert and testified in high profile cases involving hundreds of millions of dollars and has led large investigations into complex economic and accounting issues.

Mr. Lang earned a Bachelor's of Business Administration in Finance from Baylor University. He holds the Chartered Financial Analyst (CFA) designation and is accredited by the AICPA in Business Valuation. Robert serves as a guest lecturer in the Graduate Accounting program at Baylor University, where he also serves on the Advisory Board for the Accounting and Business Law department.

Many of Robert's cases involve the measurement of value and quantifying the creation or destruction of value. He has analyzed the value of entities and assets ranging from oil & gas operations to steel mills to complex securities to the world's largest cancer tumor bank. He has performed these assignments for clients in the US, Canada, Mexico, South America, the Middle East and Asia.

Robert has assisted companies across a wide variety of industries and has a particular expertise in the energy industry, dealing with matters throughout the product life cycle. Robert has assisted oilfield services, E&P, midstream, and downstream entities with valuation issues, transaction support/analysis, business interruptions, royalty disputes and many other matters. Representative practice areas and example engagements include:

Energy Related Disputes

- Performed several calculations of damages and testified at jury trial regarding lost profits and fraud damages suffered by a supplier of materials used for construction of well pads at shale drilling sites.

- Calculated damages and provided expert testimony in a large claim on behalf of an offshore oil & gas operator in litigation over repair, rebuild, and pollution cleanup costs.

- Analyzed damages and drafted expert report on over $150mm of economic losses suffered by a refinery. Analysis included review of economic and operational issues leading to bankruptcy and determination of resulting losses.

- Assisted a major natural gas producer faced with hundreds of royalty litigation cases regarding midstream deductions. Analyzed gathering costs including review of cost of service model used to determine cost. Evaluated reasonableness of terms, including targeted rate of return, negotiated with the midstream company after producer spun it out into a separate entity. Reviewed net wellhead prices and reasonableness of all deductions. Analyzed impact of trading operations on royalty payments.

- Assisted a major oil and gas client in developing a “net-back pricing” model for litigation that tracked the delivery of and payment for product originating in 4,000 wells and covering five pricing pools over seven years.

- Conducted royalty audits and performed numerous damage calculations in royalty disputes on behalf of major oil and gas clients.

- Calculated damages and drafted expert report to determine the lost profits suffered by a refinery as a result of contractor negligence and the resulting inability to produce cyclohexane and paraxylene. Analysis included an estimation of “but for” market prices in the absence of the supply shock.

- Calculated lost profits and performed valuations in a dispute between a major oil and gas company and numerous franchised service stations.

- Assisted oilfield services company with complex database analysis to identify and characterize competing sales in an anti-trust matter.

- Assisted a litigation trust with financial advisory and litigation related to the bankruptcy of a coal producer. Reconstructed the accounting environment of the bankrupt entity, analyzed more than 50 entities and thousands of related party transactions, performed solvency and valuation analysis, and calculated damages.

- Calculated contract damages in a pricing dispute between a Marcellus natural gas fracking operator and an oilfield services company.

- Analyzed project economics and calculated damages on behalf of an oil field services company involved in converting natural gas into clean diesel. Analyzed the impact of several interruptions on the project.

Valuation, Forensic Accounting, and Commercial Damages

- Testified as an expert regarding lost profits and lost value suffered by a hedge fund due to alleged errors made by a drilling operator in E&P operations in the Monterrey Shale.

- Conducted valuation analysis and testified as an expert for a manufacturing client regarding the lost profits and value related to lost business opportunities.

- Analyzed damages and testified as an expert regarding lost business value in a dispute between former business partners of a consumer products company.

- Analyzed damages and testified as an expert regarding the lost profits and lost business value that resulted from an alleged faulty installation of Customer Relationship Management software.

- Determined loss research value suffered by an academic medical center following a tropical storm. Analyzed impact to hundreds of clinical and hospital operations and determined value of destroyed research. Testified as an expert on over $100mm of losses when claim was litigated. Judge ultimately awarded the exact damage calculation.

- Performed valuation analysis and testified in bench trial regarding the difference in standard and liquidated values.

- Calculated lost business value and provided expert opinion regarding the construction of fueling stations for a major airline.

- Analyzed financial viability for a Children's Hospital under various scenarios. Issued expert report and testified at deposition.

- Advised a large REIT and its portfolio companies on strategies to recover losses suffered due to the Covid19 pandemic.

- Established a Project Management Office (PMO) for an academic medical center to oversee the management of recovery and liquidity opportunities related to Covid19 losses. Identified and pursued recovery from numerous federal programs and identified sources of liquidity.

- Analyzing the financial impact of opioid addiction and abuse on over 1,500 county, municipal and state governments in national multi-district litigation.

- Provided expert testimony regarding lost profits alleged by an owner of a clay mining operation in Georgia. Following my rebuttal testimony in deposition, opposing side decided to not call their expert at trial.

- Calculated damages and testified regarding lost profits suffered by a warehouse equipment distributor due to an alleged breach of contract.

- Served as court-appointed auditor in an alleged real-estate investment Ponzi scheme. Traced funds, identified improper transfers, and analyzed distributions within over 100 investment and development funds.

- Performed analysis and testified at trial regarding an alleged Ponzi scheme involving 1031 exchange investments and alleged violations of the

Texas Securities Act.

- Calculated damages and investigated allegations in a healthcare quit am action.

- Analyzed lost profits suffered by a regional airline that resulted from non-performance of a software vendor that was engaged to install an ERP system.

- Developed damage analysis and drafted expert report regarding an investment fund's participation in a regional shopping mall as compared with suitable alternative investments.

- Assisted a multibillion-dollar underwriter in litigation regarding the profitability of its automotive extended-warranty business and the causes of decreasing margins.

- Quantified damages for defendant in a breach of contract suit concerning the distributorship agreement of a large athletic shoe company.

- Performed analysis of tracking data collected from a website in a class action lawsuit alleging deceptive billing practices against a dating website.

Bankruptcy Litigation and Restructuring

- Designated as an expert and performed valuation and solvency analysis in a dispute between a trustee and the previous owners of a multi-billion dollar telecommunications company.

- Calculated damages, rebutted opposing expert's calculation of lost business value, and analyzed solvency issues for a telecom company concerning a breach of contract with a developer of GPS technology who claimed the alleged breach forced bankruptcy.

- Analyzed debtors' plans for reorganization while working on behalf of creditors' committees in several bankruptcy matters.

- Advised a large manufacturer in restructuring various operations and financial structure.

- Developed damage model, refuted opposing expert's analysis, and drafted expert report for a utility industry client concerning the valuation of an acquired security alarm company and the impact of the software on the operations of the business.

- Analyzed transactions and calculated damages alleged by several municipalities against the bank that assisted in bond issuances.

Insurance and Construction Claims

- Assisted numerous clients in preparing insurance claims and negotiating settlements for business interruption and property damage totaling nearly $1 billion. Served as the National Practice Leader for the Business Insurance Claims practice of a large accounting firm. Clients have included universities, hotels, hospitals, retailers, engine manufacturer, cement plant, power plant, steel plants, retailers, grocery stores, golf clubs, and numerous other manufacturers.

General Strategic and Business Advisory

- Helped a textile manufacturer identify the causes of lagging profits, streamline operations, reduce throughput, determine which plants to close, and determine the impact to shareholder value of the recommendations.

- Assisted several start-up businesses in formulating business plans, building financial infrastructure and structuring the financing.

- Assisted several growing private companies in securing private placements of additional capital.

Excerpt of reference cited at footnote 2 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/10/bh_BOS-Hearing-Packet.zip

AGN. NO._____

MOTION BY SUPERVISOR YVONNE B. BURKE **OCTOBER 21, 2008**

RELATES TO ITEM NO. 58

RE: BALDWIN HILLS COMMUNITY STANDARDS DISTRICT

The Inglewood Oil Field has been a fixture in the Baldwin Hills for more than 80 years. For much of that time, the oil field and the surrounding community coexisted in relative harmony. In recent years, however, local residents expressed concerns regarding odors, noise, vibration, and visual blight caused by the operation. In 2006, State and local agencies joined in investigating residents' complaints.

To allow time for the County to study the oil operation, the Board of Supervisors, at my urging, adopted an interim ordinance as a direct and necessary response to the residents' concerns. The initial interim ordinance placed temporary restrictions on oil productions until an environmental analysis could be performed and permanent restrictions adopted. In May of 2007, that measure was extended and amended to prohibit the drilling of new wells and the deepening of existing wells. The maximum

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YAROSLAVSKY	____________________
KNABE	____________________
ANTONOVICH	____________________
BURKE	____________________

two-year term of the interim ordinance expired in June, 2008. Since that time, PXP, the operator of the Inglewood Field, has voluntarily refrained from drilling any wells.

The County Department of Regional Planning determined in its study that a new zoning ordinance, called a Community Standards District or "CSD" is the most appropriate mechanism for further regulating the Inglewood Field. The new CSD will define the boundary of the field and establish permanent development standards, operating procedures, and requirements for the oil operation.

In 2006, when residents of Baldwin Hills, Culver City and others called for additional environmental information to guide development of the CSD, PXP agreed to submit an application for formation of a CSD, thereby making PXP responsible for funding the environmental review, and PXP agreed to fund an Environmental Impact Report (EIR). The County selected an environmental consultant with significant experience and knowledge of oil production to prepare the EIR, which analyzed a draft CSD prepared by PXP as well as potential impacts from oil field operations for the next 20 years, based on PXP's estimate of the maximum number of wells it would drill over that time period. The EIR is an exhaustive document and identified necessary mitigation measures to reduce impacts from such operations, and thus recommends mitigation measures beyond those set forth in PXP's proposed CSD. As a result of that EIR review process, significant changes were made by the County to the CSD ultimately resulting in the CSD recommended by the Regional Planning Commission.

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This is the first-ever comprehensive environmental analysis of an established oil field conforming with County General Plan policies and zoning regulations, and marks the first time an EIR has been prepared for a CSD.

As the County developed the revised CSD, we were faced with certain limitations and constraints. Because oil operations have been ongoing at the Inglewood Field for more than 80 years, PXP has certain rights to produce the oil and gas resources at the field and new zoning regulations cannot diminish those rights.

Moreover, the State of California, through the Department of Oil, Gas and Geothermal Resources (DOGGR), has exclusive jurisdiction over subsurface oil and gas activities. Although local regulation is allowed with regard to surface activities, such as land use control and environmental protection, the County's CSD cannot conflict with those exclusive state regulations.

Finally, most of the field is not owned by PXP, but remains a collection of privately owned parcels. PXP maintains lease agreements with the owners that allow it to explore, drill, and produce oil and gas in exchange for royalty payments. Because these parcels are privately owned, the CSD cannot control their use once the oil and gas resources are exhausted.

The County, however, is a part of a Joint Powers Authority that over the last 15 years has acquired easements and fees over 600 acres in the Baldwin Hills.

Despite these limitations, I am committed to the Baldwin Hills CSD, which

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contains the most stringent oil and gas regulations in Southern California, and arguably for the state and country, for an established onshore or offshore oil field and will ensure that all oil operations are performed in the safest manner possible to protect surrounding communities. I am very proud of the fact that to date, since April, 2007, county staff and its consultants have held 18 community meetings in both large public venues and small neighborhood coffees in peoples' homes in their efforts to educate the community and receive community input to the EIR and CSD process. Therefore, to ensure this continued community input, the CSD requires the formation of a Community Advisory Panel appointed by the director of Planning comprised of members of the surrounding communities.

I THEREFORE MOVE THAT THE BOARD OF SUPERVISORS:

Close the public hearing and approve the FEIR prepared for the Baldwin Hills CSD; certify that it has reviewed and considered the environmental information contained in the FEIR; certify that the FEIR has been completed in compliance with CEQA, the CEQA Guidelines, and County CEQA Guidelines and reflects the independent judgment of the Board as to the environmental consequences of the proposed CSD; determine that the mitigation measures required by the CSD are the only mitigation measures that are feasible; determine that the remaining unavoidable environmental effects of continuing operations at the oil field will be reduced to the extent possible by the CSD and are outweighed by social, economic, and environmental benefits provided by the CSD, and adopt the Findings of Fact and Statement of Overriding Considerations for the CSD.

I FURTHER MOVE THAT THE BOARD OF SUPERVISORS:

Instruct the County Counsel and Regional Planning Department to prepare the following changes to the ordinance establishing the Baldwin Hills Community Standards District, and submit the revised ordinance to the Board of Supervisors for final consideration on October 28, 2008:

- Add a provision so that the number of new wells drilled during the first year shall be limited to 24.
- Add a provision, capping the total number of newly drilled wells over the next 20 years to 600 wells for an average of 30 wells per year.
- Revise the provision on the maximum number of wells that may be drilled or redrilled in one year under the Director's Review procedure to 53 wells, with a maximum of 45 for drilling new wells and the remaining wells of that annual total limited to redrilling of existing wells.
- Add a provision to prevent over-concentration in any one year of drilling activities in any one area, if located near developed areas.
- The CSD now requires Public Works to refer to DOGGR the results of

investigations by PXP which are required when complaints are made by the public or public entities about damage to their property potentially caused by subsidence and PXP concurs with that assertion. That provision should be changed to require Public Works to forward to DOGGR any concerns Public Works has about subsidence causing damage, regardless of the conclusion of the PXP report investigating subsidence damage claims. Thus, the process will be, the public submits claims of damage to PXP, which is then required to investigate those claims, prepare a report and submit that to Public Works. Public Works will analyze PXP's report. If either PXP concurs that damage was caused by Oil Field operations or if Public Works believes that damage was caused by Oil Field operations even when PXP disagrees, then Public Works will submit its concerns to DOGGR, which has jurisdiction to require PXP to take action in response to damage.

- Include the recommendation of the Department of Regional Planning regarding fines for violations of the CSD except leave in a provision that allows for time to cure the violation.

- Include a modification procedure similar to those in other CSDs. This CSD includes a number of technical requirements, many of which are not in wide use and may be untested or which may become outdated. Thus, the CSD should include a procedure to modify provisions when necessary.

- Add a provision to the CSD that requests Regional Planning to develop an

Implementation Plan for the CSD that addresses the requirements that must be included in each of the plans that are prepared by the Operator and approved by the County. The Implementation Plan shall include any specific Plan items deemed necessary by the EIR to reduce environmental impacts to less than significant in those cases where impacts can be so reduced.

- Require a uniform time frame for review of plans needed prior to new drilling. The time frame for the Director to review the Air Monitoring Plan should match the 45-day review period for the annual Drilling, Redrilling and Well Abandonment and Well Pad Restoration Plan.

- Require shut-down of operations for exceedance of hydrogen sulfide and hydrocarbon thresholds unless shut-down would create a safety hazard.

- Require the operator to conduct the initial community meeting within 180 days, instead of the current 60-day requirement. Sixty days is too soon for a report back to the community on all the important work this ordinance will require in the first year. The community deserves a full update in 180 days, when the work should be complete.

- Allow the existing gas plant flare to remain on-site as back-up if the South Coast Air Quality Management District (AQMD) determines it may stay. The CSD requires a new gas flare, estimated to cost $2 million, to mitigate vibration impacts that have been so distressing for the community. It may, however, be beneficial to keep the

- M O R E -

existing flare as back-up, and AQMD's review and permitting of the new flare will determine whether the existing flare can stay.

- The CSD establishes a Multiple Agency Coordination Committee (MACC) to ensure appropriate communication between the County and other agencies with regulatory oversight of the oil field. Members of the MACC will include: Regional Planning, County Fire Department, Public Works and County Department of Public Health. Also, SCAQMD, Regional Water Board, DOGGR and Culver City Fire Department will be invited to appoint a representative from their agency as a member of the MACC. The MACC process, combined with the requirement for an on-site Environmental Compliance Coordinator, will provide the strongest assurance to the County, on an ongoing basis, that the oil field complies with all local, state and federal laws, rules and regulations. This ongoing review provides the same or better oversight as the five-year third-party audit to be paid for by the Operator that was required by the Commission-recommended CSD. Thus, that audit provision should be removed from the CSD. This should not be confused with the County's periodic five-year review to assess the effectiveness of the CSD provisions.

- The CSD should allow alternatives for construction equipment engine technology that reduces the air impact emissions to less than significant. The CSD requires the installation of new technology on off-road diesel construction equipment and drill rig engines to reduce air emissions. The CSD should include a third alternative to allow for other options that would result in less than significant impacts to air quality and to allow for technological advancement.

- Implement the new conceptual landscaping plan designed by the architect of the Baldwin Hills Park Master Plan to be completed in phases over a two to five year period. The proposed well-by-well landscaping plan in the CSD currently is not the ideal approach. Instead, the operator will be required to implement the oil field screening and landscaping plan designed by the architect for the Baldwin Hills Park Master Plan.

- The CSD included in the Board packet inadvertently deleted a section on the Emergency Response Plan in the Development Standards. That section should be reinserted into the CSD.

- Include a single uniform process for reporting complaints. One new section is created to prescribe a uniform process for reporting complaints.

- DOGGR has made clear that it has the exclusive regulatory province to determine whether a well should be abandoned and also expressed concern about the provision regarding hearings on ultimate shut-down of the facility when daily production is reduced to a certain level. It is anticipated that the County will interface with DOGGR through the MACC, and will utilize authority created by the CSD to review all idle wells and report to DOGGR any wells the County believes may meet DOGGR's criteria for abandonment. The well abandonment provision of the CSD was modified at the Commission level. The provision regarding consideration of facility shutdown when

- M O R E -

production decreases to a certain level should be changed to require a hearing when output has been reduced to 630 barrels per day, rather than 2,000 barrels per day, to address DOGGR's concerns.

- Add to the Review Requirements in the Periodic Review section of the CSD to include, at the option of the County, a public survey on various "quality of life" issues similar to the survey my office is funding.

- Eliminate redundant requirements for equipment storage. The oil field will be required to comply with County Code requirements for outdoor storage, which were restated in the CSD.

- Require public review of Auditor-Controller reports. The CSD should include a provision that the County Auditor-Controller makes available its reports concerning the administration of draw-down accounts established to implement and enforce the ordinance.

#####

(YBB:MSB:ec PXP CSD MOT 102108)

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.energyindependenceca.com/what-is-an-energy-island/

What is an Energy Island?

California is an Energy Island

A combination of geographical factors and public policy choices has led to California becoming an energy island — we are disconnected from the other lower-48 states and therefore unable to secure additional domestic crude oil sources to support our energy needs of fueling transportation, powering businesses, growing food and producing everyday products.

Unique challenges exist that create this dynamic including lack of pipeline infrastructure and little public support for oil by rail or truck. Of course, California is not an actual island, and it is blessed with abundant natural resources, but the policies it has adopted are forcing Californians to rely more and more on distant energy sources to meet our needs.

Currently, California imports more than 70% of its crude oil supplies, most of it from foreign sources. If California continues on this trajectory, it would be choosing even greater dependence on foreign oil which threatens reliability, sustainability and affordability for California's diverse communities. Instead, California's leaders can protect working families, consumers and our global environment by promoting in-state production under the world's most stringent safety, labor, and environmental standards.

Why Domestic Supplies Cannot Replace California Production

CALIFORNIA IS EXTREMELY LIMITED IN ITS ABILITY TO IMPORT CRUDE OIL FROM THE REST OF THE NATION: Within the 48 contiguous states, pipeline infrastructure, rail and truck transportation are the constraining factors. With Alaska, other existing commitments limit opportunities to increase supplies.

PIPELINE INFRASTRUCTURE: No crude oil pipelines exist from other states. Regulatory approvals make this an untenable option.

ALASKA: Alaska has been a declining source. While there has been an increase in investment that may counter that trend, it will not be enough to offset California's current production levels in the foreseeable future.

RAIL AND TRUCK TRANSPORTATION: Limited crude oil is transported by rail. Rail transport is extremely expensive, highly controversial, and would require an increase of 243,000 rail cars to meet current demands. Truck transport is unfeasible due to limited capacity.

If we want a domestic supply, we need to produce it here in California

WHAT'S AT RISK FROM CALIFORNIA'S DEPENDENCE ON FOREIGN CRUDE OIL: Reliance on foreign energy imports create risks including reliability of our energy supply, market volatility, international turmoil, global environmental quality, and increased global air emissions.

RELIABILITY AND AFFORDABILITY: Volatile Markets Volatility exists within the global oil market due to geo-political and economic reasons. This includes: unforeseen circumstances, new costly investments, needs of other foreign countries like China, India and Europe, and trade wars

Strait of Hormuz A blockage of the Strait of Hormuz, the only sea passage from the Persian Gulf, is possible due to regional skirmishes. One-third of the world's sea-borne oil passes through it every day.Unstable Foreign Countries Foreign countries may limit or shut off supplies due to embargoes or other means.

WORKER SAFETY AND ENVIRONMENTAL PROTECTIONS: Imported oil is not produced to California's stringent safety, labor, and environmental standards.

CONTROL AND SECURITY: What's our risk level for control? Is California okay handing over control of our energy needs to a remote source and putting our energy security at risk?

OUR COMMITMENT: Our industry is an active partner in helping California set an example to other states and other countries by producing the affordable, reliable energy we need in a way that safeguards public health, safety, and the environment. We share the state's commitment to a vibrant economic, energy and environmental future that strengthens California's working families, local employers, diverse communities and abiding values.

Sources:
"Sources of Crude Oil Imports to California, 2017." California Energy Commission.
https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_foreign_crude_sources.html
(https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_foreign_crude_sources.html)
"Oil Imports by Rail, 2017," California Energy Commission,

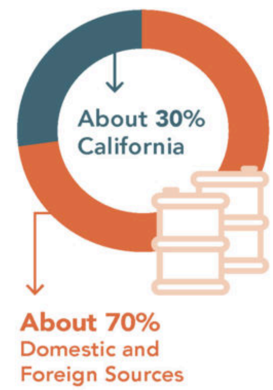
https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_crude_by_rail.html
(https://www.energy.ca.gov/almanac/petroleum_data/statistics/2017_crude_by_rail.html)
U.S. Energy Information Administration, October 13, 2015.
https://www.eia.gov/todayinenergy/detail.php?id=23312
(https://www.eia.gov/todayinenergy/detail.php?id=23312)

WHY CALIFORNIA IS AN ENERGY ISLAND AND HOW THAT IMPACTS OUR STATE

WHAT'S AN ENERGY ISLAND?

A combination of geographical factors and public policy choices has led to California becoming an energy island -- we are disconnected from the other lower-48 states and therefore unable to secure additional domestic crude oil sources to support our energy needs of fueling transportation, powering businesses, growing food and producing everyday products. Unique challenges exist that create this dynamic including lack of pipeline infrastructure and little public support for oil by rail or truck. Of course, California is not an actual island, and it is blessed with abundant natural resources, but the policies it has adopted are forcing Californians to rely more and more on distant energy sources to meet our needs. Currently, California imports more than 70% of its crude oil supplies, most of it from foreign sources.

If California continues on this trajectory, it would be choosing even greater dependence on foreign oil which threatens reliability, sustainability and affordability for California's diverse communities. Instead, California's leaders can protect working families, consumers and our global environment by promoting in-state production under the world's most stringent safety, labor, and environmental standards.



WHY DOMESTIC SUPPLIES CANNOT REPLACE CALIFORNIA PRODUCTION

CALIFORNIA IS EXTREMELY LIMITED IN ITS ABILITY TO IMPORT CRUDE OIL FROM THE REST OF THE NATION.

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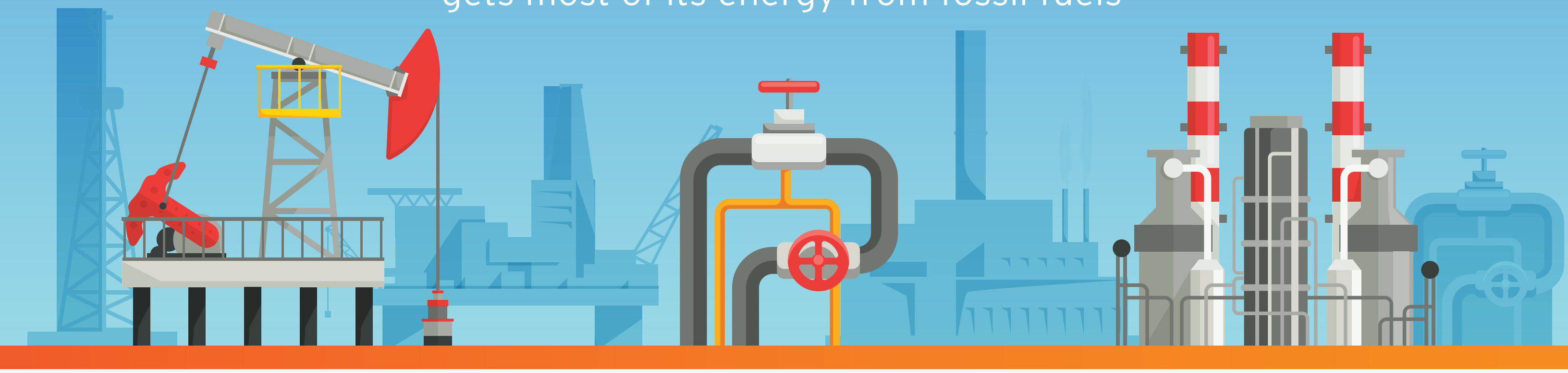
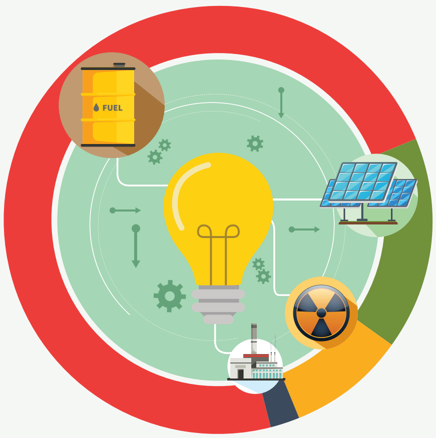
Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://kernedc.com/wp-content/uploads/2021/08/Kern-EDC-CA-Oil-Imports-Fact-Sheet.pdf

WHERE CALIFORNIA GETS ITS ENERGY

California is the world's 5th-largest economy and gets most of its energy from fossil fuels





73% Fossil Fuel

16% Renewables

9% Other

2% Nuclear

U.S. Energy Information Administration

California Oil Production

463,000 BBL/day

California Oil Usage

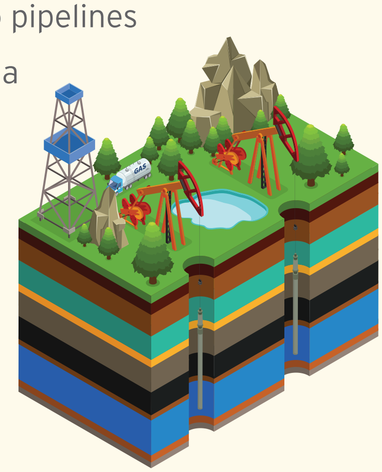
1,800,000 BBL/day

California Energy Commission

California uses almost **4x** more oil than it produces and accounts for 55% of net energy imports for the entire United States

CALIFORNIA, THE "ENERGY ISLAND"

There are currently no pipelines to bring oil to California from any other part of the United States. California must rely on imported oil to make up the difference



CALIFORNIA'S

TOP 5

FOREIGN OIL SOURCES (2019)

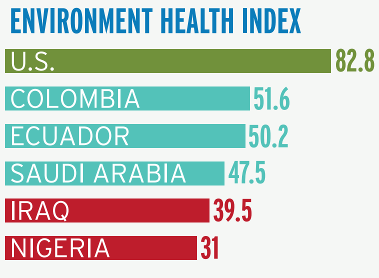
- *Saudi Arabia* **87,601,000 BBL**
- *Ecuador* **62,370,000 BBL**
- *Iraq* **58,730,000 BBL**
- *Colombia* **32,814,000 BBL**
- *Nigeria* **19,528,000 BBL**

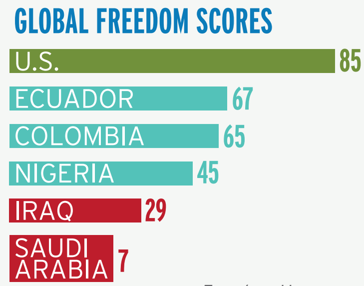
California Energy Commission

WHY IT MATTERS

LESS ACCOUNTABILITY

Oil exporting countries do not adhere to California's safety, labor, human rights, and environmental standards





Yale University

Freedom House

HIGHER COSTS

Imported foreign oil costs Californians over

$25 BILLION

a year and is less reliable and less sustainable

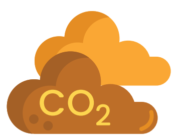
Capitol Matrix Consulting

NEGATIVE ENVIRONMENTAL IMPACT

THE LARGEST OIL TANKERS BURN NEARLY **4 TONS** OF FUEL EVERY DAY THEY ARE ANCHORED

International Council on Clean Transportation

EACH SHIP EMITS **11+ TONS** OF CARBON DIOXIDE PER DAY



International Council on Clean Transportation

A FOREIGN OIL TANKER TRAVELS AN ESTIMATED **8,865 MILES** AND AVERAGES **0.004 MILES PER GALLON** TO CALIFORNIA'S PORTS

Energy & Infrastructure of PTS Advance

OIL TANKERS ACCOUNT FOR **13%** OF WORLD MARINE CO2 EMISSIONS

International Council on Clean Transportation

KERN EDC
ECONOMIC DEVELOPMENT CORPORATION

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://californiapolicycenter.org/reality-check-half-of-californias-energy-comes-from-crude-oil/

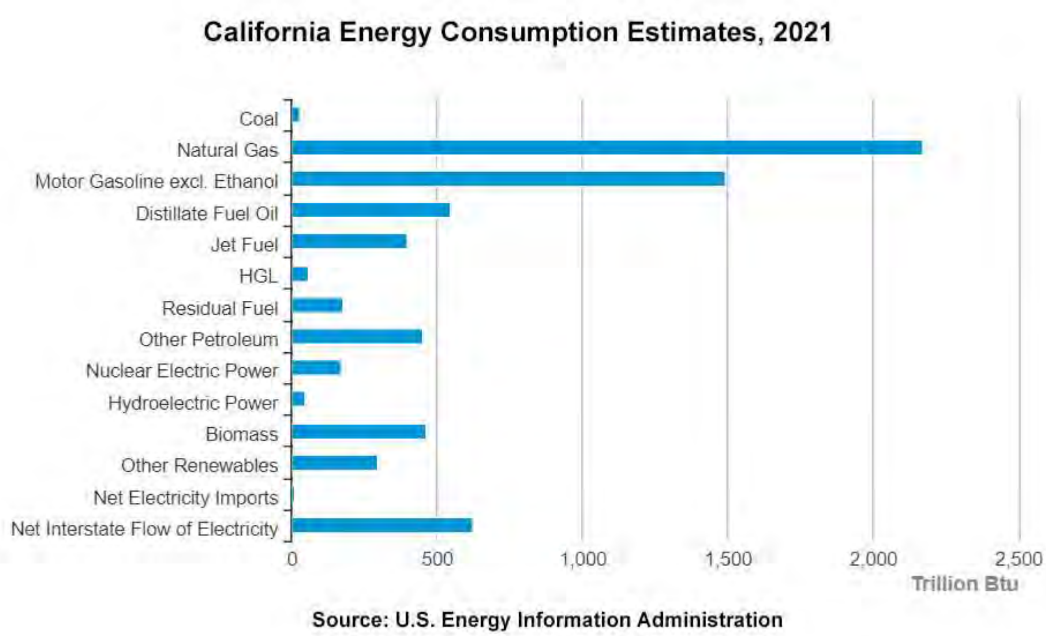
by **Edward Ring**

January 26, 2024

Despite Spending Billions on Climate-Change Initiatives, 84 Percent of California's Energy Still Comes from Fossil Fuels

Here's a reality check that ought to keep politicians up at night in California. Despite being a sunny, solar-friendly state, with ample areas **blessed with high wind**, California still derives 50 percent of its total energy from crude oil. Another 34 percent comes from natural gas. This fossil fuel total for California energy, 84 percent, actually exceeds the **world average for 2022**, which — including coal — came in at 82 percent.

These figures come from the U.S. Energy Information Administration report "**California Energy Consumption Estimates – Consumption by Source**" for 2021, which is the most recent year for which data is posted. This data is verified by another EIA report, produced in conjunction with Lawrence Livermore National Laboratory, "**California Energy Consumption in 2021**."



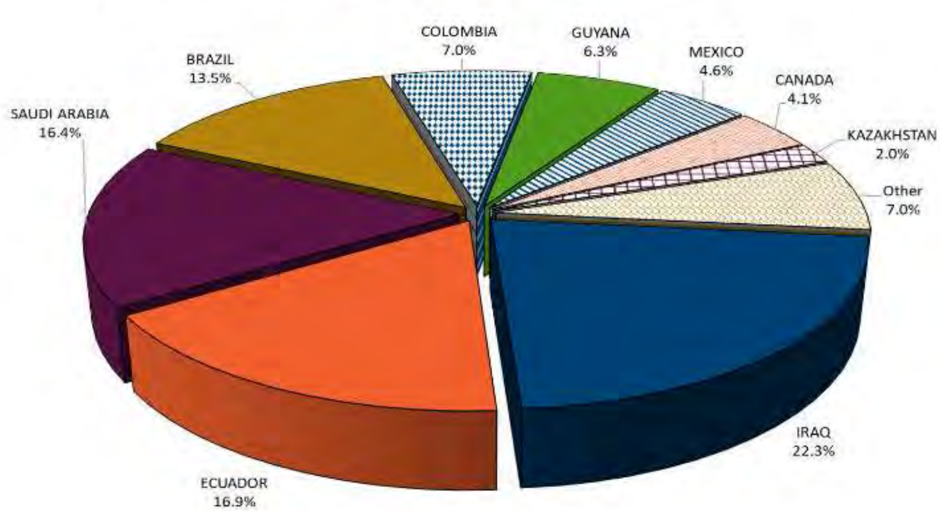
So from two authoritative sources we get the same result: half the fuel Californians rely on to power their civilization comes from crude oil. And yet California's state legislature has declared war on oil, along with natural gas. And here, it gets even more interesting.

Also relying on EIA statistics, but turning to a chart featured in "California Energy Production Estimates, 2021," it is possible to determine how much oil and natural gas is produced in-state. The numbers are shocking.

Californians import 93 percent of their natural gas, and 76 percent of their crude oil.

Another chart, "Foreign Sources of Crude Oil Imports to California," courtesy of the California Energy Commission, shows where it comes from: Iraq 22.3%, Ecuador 16.9%, Saudi Arabia 16.4%, Brazil 13.5%, Colombia 7%, Guyana 6.3%, Mexico 4.6%, Canada 4.1%, faraway Kazakhstan 2.0%, and assorted other nations, another 7 percent.

Foreign Sources of Crude Oil Imports to California



Source: California Energy Commission

Since half of California's energy comes from oil, it's easy to quantify the impact if problems arise with the supply from any of these nations. More to the point, why aren't we drilling here in California?

Won't our drilling practices be more environmentally responsible? And won't it benefit the environment to not have dozens of oil tankers perpetually belching bunker fuel exhaust off the coast of Long Beach, and that only after they've belched their way across the Pacific

Ocean? Even if Californians cut consumption of oil by 50 percent, we would still have to more than double our production of in-state oil before we'd eliminate imported oil.

Instead of recognizing that renewable energy technologies are not ready to pick up the slack, the state legislature has taken further steps to end oil production in California. SB 1137, signed by Governor Newsom in 2022, creates "health protection zones" within 3,200 feet of any "sensitive receptor," i.e., any establishment open to the public or any residence.

The practical impact of SB 1137 will not only be to ban most future drilling, but also impose restrictions (and invite lawsuits) that will compel the shutdowns of existing wells. Fighting for its life, and in the interests of all working Californians, the industry has qualified a referendum on SB 1137 that will be on the state ballot this November.

The big alleged problem? The unhealthy air quality caused by methane leaks from these wells. But methane is lighter than air, meaning whatever minor leakage may occur at any of California's strictly monitored wells will quickly dissipate upwards. Perhaps we may fulminate over the supposed climate impact of releasing methane into our atmosphere. But exporting that problem to other nations where wells will be even more prone to methane leakage is not a moral choice. It just kills good jobs right here in California.

California consumes 1.8 million barrels of oil per day, but only produces 463,000 barrels per day. In 1986, its production peak, California produced 1.1 million barrels per day.

The state did not run out of oil and gas reserves. The industry ran into the regulators.

What California's policymakers have not come to terms with is the fact that we are importing nearly everything relating to energy production in California. Not just crude oil and natural gas, but wind turbines and blades, photovoltaic panels, and batteries.

How is this considered sustainable? We have created a regulatory environment in California where it is nearly impossible to dig, drill, develop, mine, log, graze, grow, or manufacture anything.

Governor Newsom needs to face the reality that fossil fuel is going to be an integral part of California's energy landscape for decades to come, and that he is obligated to preserve the quality of life it enables. Newsom needs to work with energy producers, water agencies, and farming interests to formulate a new agenda for the state that puts people first.

Edward Ring is a senior fellow with the California Policy Center, which he co-founded in 2013. Ring is the author of *Fixing California: Abundance, Pragmatism, Optimism (2021)* and *The Abundance Choice: Our Fight for More Water in California (2022)*.

by **John Moorlach**

January 25, 2024

Newsom's Missed Opportunity on California's Annual Budgets

During my business career as a Certified Public Accountant and Certified Financial Planner, I also served on a credit counseling nonprofit board and advised those who were deep in debt on a plan toward becoming fiscally sound again.

During a good financial year, these individuals needed to dramatically reduce their existing debts. The unexpected bonus should go toward their high credit card balances. This reduces their monthly payments in the months ahead and makes staying within personal budgets more manageable.

This brings me to California. Sacramento has enjoyed some fiscally remarkable years during Gov. Gavin Newsom's tenure, but he failed to dramatically reduce the state's massive liabilities. According to the last audited financial statement the State Controller's office has released, the Golden State's balance sheet is upside down to the tune of $174 billion. And the recent bonus years were wasted.

The massive debt load started in 1999, with the passage of Senate Bill 400, which changed the pension formula for California Highway Patrol officers from 2 percent of final salary multiplied

Excerpt of reference cited at footnote 3 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.eia.gov/state/?sid=CA#tabs-1

U.S. Energy Information Administration

Skip to sub-navigation

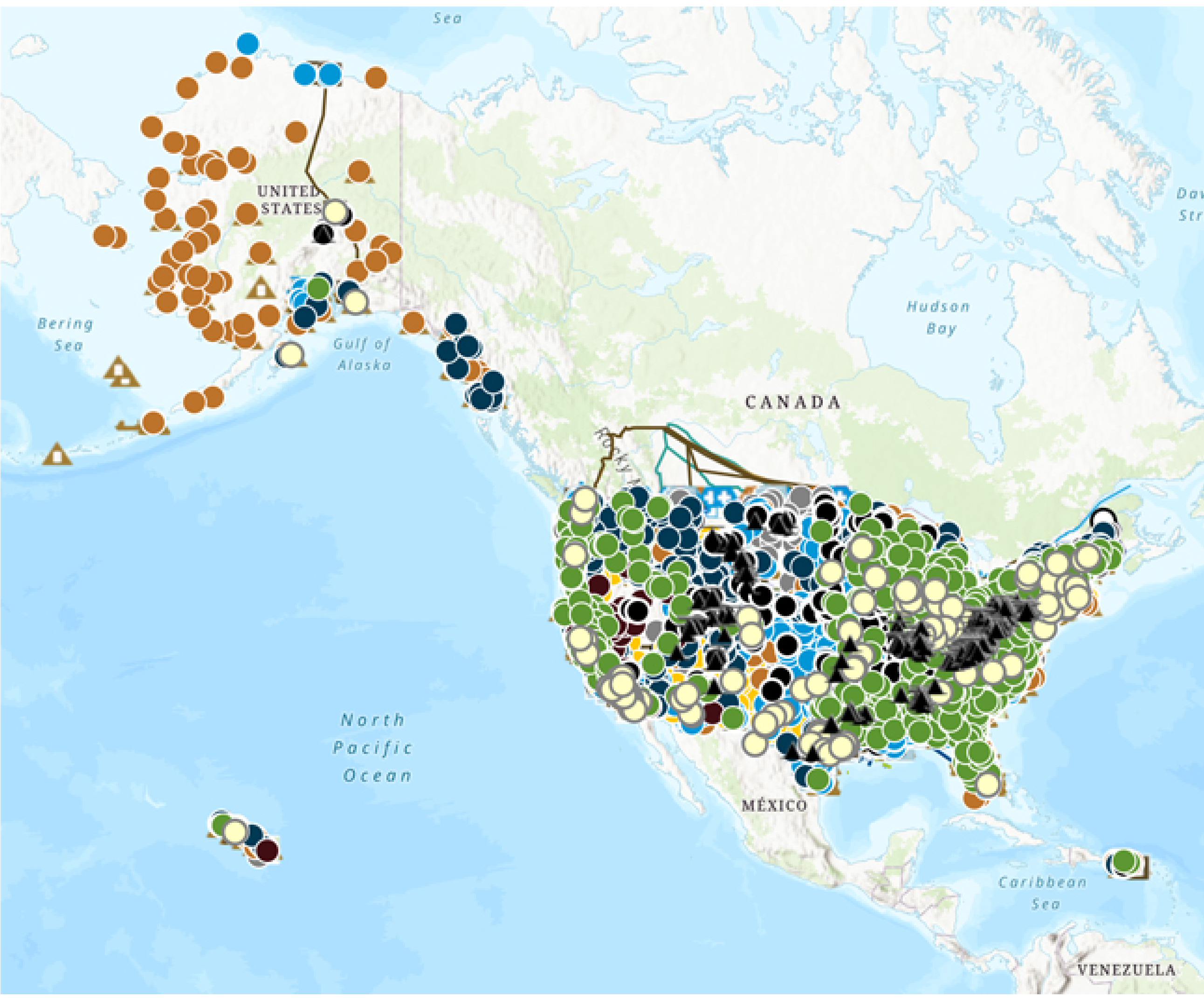
California 

State Profile and Energy Estimates

Changes to the State Energy Data System (SEDS) Notice: In October 2023, we updated the way we calculate primary energy consumption of electricity generation from noncombustible renewable energy sources (solar, wind, hydroelectric, and geothermal). Visit our Changes to 1960—2022 conversion factor for renewable energy page to learn more.

Profile Overview

U.S Energy Atlas with total energy layers



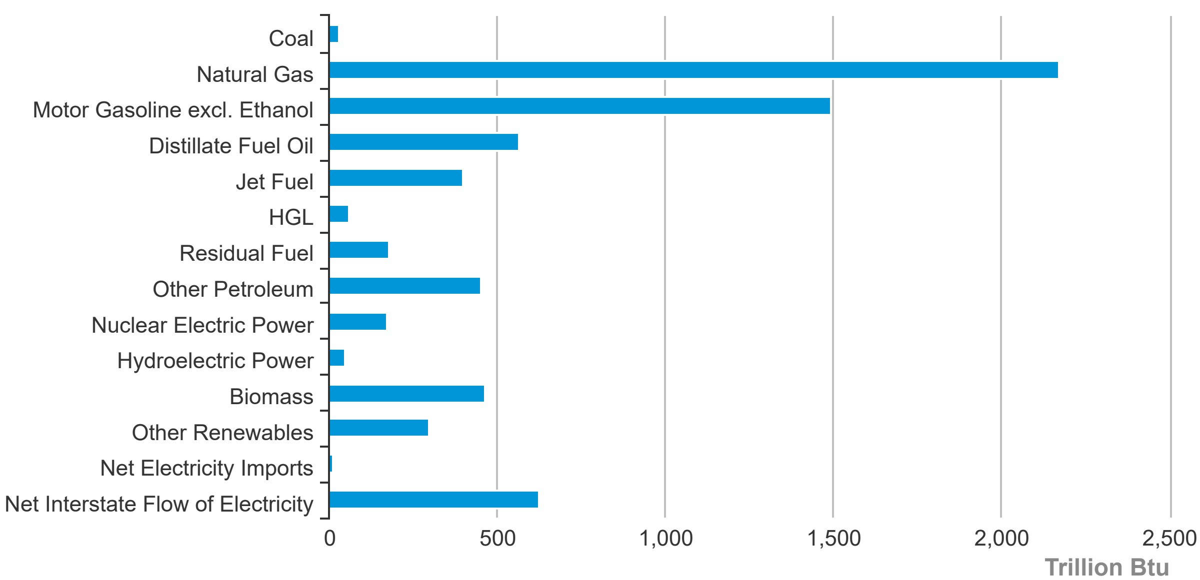
View the interactive map

Quick Facts

- In 2022, California was the seventh-largest producer of crude oil among the 50 states, and, as of January 2022, the state ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states.
- In 2020, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than in all but three other states.
- In 2022, renewable resources, including hydroelectric power and small-scale, customer-sited solar power, accounted for 49% of California's in-state electricity generation. Natural gas fueled another 42%. Nuclear power supplied almost all the rest.
- In 2022, California was the fourth-largest electricity producer in the nation. The state was also the nation's third-largest electricity consumer, and additional needed electricity supplies came from out-of-state generators.

Last Updated: April 20, 2023

California Energy Consumption Estimates, 2021



Source: Energy Information Administration, State Energy Data System

Excerpt of reference cited at footnote 4 to Alston & Bird's January 29, 2024 Letter

Full version available at https://clkrep.lacity.org/onlinedocs/2017/17-0447_rpt_BPW_07-29-2019.pdf

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

OFFICE OF THE
BOARD OF PUBLIC WORKS

FERNANDO CAMPOS
EXECUTIVE OFFICER

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http://bpw.lacity.org

July 29, 2019

Honorable Herb J. Wesson, Jr., Los Angeles City President
Honorable Gilbert Cedillo, Los Angeles City Councilmember
Honorable Nury Martinez, Los Angeles City Councilmember
Honorable Paul Koretz, Los Angeles City Councilmember
Honorable Mike Bonin, Los Angeles City Councilmember
Honorable Marqueece Harris-Dawson, Los Angeles City Councilmember
Honorable Jose Huizar, Los Angeles City Councilmember
Honorable David Ryu, Chair - Health, Mental Health, and Education Committee
Honorable Mitch O'Farrell, Member - Health, Mental Health, and Education Committee
Honorable Curren Price, Member - Health, Mental Health, and Education Committee

FROM: Uduak-Joe Ntuk, Petroleum Administrator
Office of Petroleum and Natural Gas Administration & Safety

SUBJECT: COUNCIL FILE NO 17-0447 – FEASIBILITY OF AMENDING CURRENT CITY LAND USE CODES IN CONNECTION WITH HEALTH IMPACTS AT OIL AND GAS WELLS AND DRILL SITES

On April 19, 2017, Council Motion #17-0447 (Wesson-Huizar) Feasibility of Amending Current City Land Use Codes in Connection with Health Impacts at Oil and Gas Wells and Drill Sites, was introduced and on June 14, 2017, the Health, Mental Health and Education Committee approved the motion with modified recommendations. On June 30, 2017, the City Council adopted the motion, with additional modifications, instructing the Petroleum Administrator in collaboration with the City Attorney, Los Angeles County Department of Public Health (LACDPH), relevant City departments, and other health agencies and regulatory entities as necessary to report on the following:

1. What types of health and environmental impacts can be measured at and around oil and gas wells and drill sites;
2. Whether, what kind, and what distance a setback and potential mitigation measures from sensitive receptors should be established;
3. An evaluation of the various types of materials used at oil and gas sites that can have health impacts, how those materials are used, and what authority the City has over regulating their use;
4. An evaluation of the various types of drill sites, including active oil fields, abandoned oil fields, and gas storage fields;

5. What agencies currently govern or regulate oil and gas sites, including a matrix of energy, oil, and gas operators and their respective regulatory agencies, related to health impacts in the City and what authority does the City have to regulate those health impacts;
6. The upcoming LACDPH Interim Guidance on Urban Oil and Gas Operations;
7. Any recommendations from the LACDPH on whether a Health Impact or Health Risk Assessment Report on oil and gas drill site operations within the City is recommended, including the necessary resources and time to complete each type of study;
8. Any recommendation to enhance public health collaboration regarding oil and gas drill site oversight between the City, County and other related health agencies;
9. A draft Memorandum of Agreement between the City and the LACDPH, and/or other regulatory agencies, with suggested terms, including emergency protocols, communication strategy, and clear delineation of public health roles and responsibilities;
10. An analysis of the economic, employment, and fiscal impacts of establishing a distance setback around oil and gas wells; and
11. Analysis of the human rights standards and environmental standards of the countries exporting oil used by the Los Angeles residents;

The Petroleum Administrator and the Office of Petroleum and Natural Gas Administration and Safety conducted an extensive inventory of oil and gas facilities within the City of Los Angeles, participated in public hearing on the report at the Los Angeles City Health Commission, collected historical records from multiple private and public databases, synthesized thousands of pages of technical reports, and retained a consultants to study the potential health impacts at oil and gas wells and drill sites within the City of Los Angeles.

The attached report identifies oil and gas infrastructure within the City of Los Angeles, evaluated materials used at such sites, studied the peer reviewed scientific literature on human health and oil & gas development, assessments of chemicals used at City oil & gas drill sites, and includes hundreds of appendices of referenced documents.

RECOMMENDATIONS
It is recommended that the Los Angeles City Council, subject to the Mayor's approval:

1. Instruct the City Planning Department with the assistance of the Petroleum Administrator and the City Attorney's Office to prepare a report outlining the feasibility of establishing in the zoning code a physical surface setback distance of 600 feet from sensitive receptors on existing oil and gas wells, associated production facilities, and drill sites. The report shall address the discontinuance of non-conforming land uses resulting from the new requirements. The report shall also address a requirement to provide relief and an administrative remedy to comply with state and federal due process and takings law for any oil and gas operators or stakeholders in an oil and gas production that are affected by the new zoning requirements. The estimated cost to the City is at least $724 million in anticipated litigation, lost oil production, well abandonment, environmental remediation and cleanup, and surface land value;

2. Instruct the City Planning Department with the assistance of the Petroleum Administrator and the City Attorney's Office to prepare a report outlining the feasibility of establishing in the zoning code a physical surface setback distance of 1,500 feet from sensitive receptors on future oil and gas development. The report shall also address a requirement to provide relief and an

administrative remedy to comply with state and federal due process and takings law for any oil and gas operators or stakeholders in an oil and gas production that are affected by the new zoning requirements. The potential cost to the City could range from $1.2 billion to $97.6 billion in constitutional taking by mineral rights owners of the remaining 1.6 billion barrels of recoverable oil and gas reserves. The estimated cost of litigation over the anticipated property takings claims to the City is expected to be at least $1 million per year for several years to defend the City;

3. Request that the City Attorney report back with legal analysis on the possible implementation of changes to the City's Zoning Code relative to establishing new setback requirements, as well as pursuing takings compensation for oil and gas operators;

4. Instruct the City Planning Department, with the assistance of the City Attorney and Petroleum Administrator, to report back on options on how to amend the Zoning Code relative to oil and gas facilities (LAMC Section 13.01) to better reflect alignment with surrounding sensitive land uses, align with Los Angeles County's code, enhanced operating conditions, and regulatory best practices; include the required funding, staffing, and environmental consultants cost estimates;

5. Instruct the Petroleum Administrator and the Los Angeles County Department of Public Health to report back on costs and coordination on conducting Health Risk Assessments (HRA) at each oil and gas drill site adjacent to residential and industrial zoned areas within the City of Los Angeles;

6. Instruct the Petroleum Administrator and other relevant City Staff to report back on possible measures to establish Community Emergency Preparedness and Comprehensive Safety Plans at oil and gas drills sites across the City;

7. Instruct the Petroleum Administrator and other relevant City staff to participate in California Air Resources Board Study of Neighborhood Air Near Petroleum Sources (SNAPS) and the Assembly Bill 617 studies to incorporated the findings into the development of citywide continuous fenceline air monitoring and community notification program;

8. Instruct the LAFD with the assistance of the City Attorney to negotiate with Los Angeles County to designate Health Officer Authority to Los Angeles City Fire Department through an MOU for enhanced local oversight and improved health coordination;

9. Instruct LAFD and the City Attorney to negotiate with Los Angeles County to transfer the Hazardous Waste Generator Program to Los Angeles City Fire Department for enhanced local oversight and improved health coordination;

10. Instruct CLA to add to the City's Legislative Agenda the funding for additional oil and gas health studies to be conducted by State, SCAQMD, and Los Angeles County Department of Public Health; and

11. Instruct the Petroleum Administrator, Office of Finance, CAO, and other relevant City Staff to establish Oil and Gas Restricted Funds for drill site abandonment, environmental remediation, consultant studies, clean up assessment, strengthening current oversight, as outlined in this report. Additionally, explore re-establishing a barrel tax to support these new funds and provide revenue to support enhanced oil and gas oversight.

Section 3. Evaluation of Drill Sites and Oil Fields

Oil and natural gas production is also known as upstream, because it includes the extraction and initial separation of oil, water and natural gas from hydrocarbon formations, but not the subsequent transportation, processing and storage (midstream), or the refining of petroleum or marketing and use of petroleum products (downstream). An upstream oil and natural gas producer sells the oil from the field where it is produced to a midstream pipeline company, which transports oil and natural gas to downstream companies that operate refineries or natural gas to utilities to operate power plants, and to natural gas storage and distribution facilities. These different activities are conducted by specialized companies and governed by sector-specific regulations. Upstream oil and natural gas production is thus distinct in terms of both operations and regulations from midstream pipeline companies, downstream refining and marketing companies, and utilities that operate natural gas storage facilities and power plants and sell natural gas and electricity. This report is primarily focused on upstream operations within the City of Los Angeles.

The Los Angeles geological basin has one of the highest concentrations of crude oil per acre in the world. There are thousands of feet of oil-bearing sandstone rock formations underlying the City and the surrounding areas in Orange and Los Angeles Counties that comprise the Los Angeles Basin. In 1892, Edward Doheny and Charles Canfield drilled the first successful oil well in the Los Angeles City Oil Field (modern day Echo Park). Their discovery set off a series of major oil discoveries in the early 1900's and led to the City's first major population boom. Even after more than century of prolific production, the US Geological Survey estimates 1.6 billion barrels of recoverable oil remain in place beneath the City, rivaling the reserves in the Middle Eastern countries, like Saudi Arabia, Iraq, and Kuwait 14,000 miles away.

Petroleum production in most fields in the City and most of the Los Angeles Basin has several natural characteristics that are distinct to each field's specific geochemistry, depth, sulfur content, and production volumes. Oil and natural gas wells in the City are distinguished by their low pressures and low flow rates. Associated production facilities in the City also typically hold small fluid volumes, since the oil is generally sent directly by pipeline to local refineries. In addition, there are two key attributes of the produced fluids that comes from wells in the City – the gas-to-oil (GOR) ratio and the water-to-oil (WOR) ratio. The gas-to-oil ratio, a measure of the natural gas content in the produced fluid from the formation, is very low in the Los Angeles Basin, which means that it is typically less volatile and generates lower air emissions of methane and volatile organic compounds. The water-to-oil ratio, a measure of the water content in the production fluid, is very high in the Los Angeles Basin, which means that the vast majority of the fluid produced is water, rather than oil or gas. After the oil is separated, the water is either disposed of via a local sanitation district or re-injected into the subsurface formation in a closed loop.

F. Implementation of Setback Distance

The establishment of physical surface setback distance from oil and gas wells from sensitive receptors would need to be based on the City's land use zoning codes. City Council may consider adopting an ordinance that requires a specific setback from sensitive land uses that applies to existing wells, future wells, or both. Any future ordinance will be subject to legal challenges by landowners and operators as a "taking" under the federal and state Constitutions. The City does have a prescribed method for the termination of nonconforming oil and gas wells within the City's Zoning Code. Establishing a setback distance on existing oil and gas wells may be declared as a non-conforming land use. The land use decision would be required by the City Council to instruct the City Planning Department to prepare an ordinance. LAMC 12.23-C.4, is the pertinent code section:

> *(a) No well for the production of oil, gas or other hydrocarbon substances, which is a nonconforming use, shall be re-drilled or deepened.*
>
> *(b) All such wells, including any incidental storage tanks and drilling or production equipment, shall be completely removed within 20 years from June 1, 1946, or within 20 years from date such use became nonconforming, if said date was subsequent to June 1, 1946; provided, however, a Zoning Administrator may, upon individual application, allow such wells to continue to operate after said removal date, if he determines that such continued operation would be reasonably compatible with the surrounding area and in connection therewith may impose such conditions, including time limitations, as he deems necessary to achieve such compatibility.*

The City Planning Department is prepared to provide a follow up summary of the outreach and adoption process with an approximate timeline for completion, an estimate of funding needs for anticipated contractual services, such as preparation of appropriate environmental review and other technical studies, and necessary staff resources to research, prepare, and process the ordinance through adoption and implementation.

Section 11. Economic and Fiscal Impacts of Establishing Setbacks

In 2015, the Los Angeles Economic Development Corporation produced a report on the economic impacts of the Oil and Gas Industry in California. The report estimated that the industry's statewide direct output of more than $111 billion generates more than $148 billion in direct economic activity, contributing 2.7 percent of the state's gross domestic product (GDP) and supporting 368,100 total jobs in 2015, or 1.6 percent of California's employment. Additionally, the oil and gas industry generates $26.4 billion in state and local tax revenues and $28.5 billion in sales and excise taxes. For Los Angeles County, it found the direct output of more than $5.2 billion in direct economic activity, contributing $133 million in tax revenue, and supported 31,236 total jobs in 2015. The report covered employment, economic activity, and jobs of all sections of the industry, not just the upstream sector.

A. Community Economic Report

"The Oil and Gas Extraction Sector in the City of Los Angeles," by David Rigby, Ph.D. and Michael Shin, Ph.D. and Geografio LLC (2017) (Report is Appendix A2-4)

This report estimates the economic impact of potential oil and gas well closures within the City. Analysis focuses on 2015, the most recent year for which input-output data were available when the project started. Data from DOGGR, supplemented where possible by the U.S. Energy Information Administration, along with benchmark oil and gas well-price data valued economic output in the oil and gas extraction industry for the state of California in 2015 at approximately $9.7 billion. This represents approximately half of 1% of the state's overall output, its gross product. Within the City, the oil and gas extraction sector generated output valued at $182 million in 2015, accounting for about one-tenth of 1% of the City's gross product.

According to data from the California Employment Development Department (EDD) and the U.S. Bureau of the Census Non-Employer Survey, the oil and gas extraction industry (North American Industrial Classification 211) employed 345 workers in the City of Los Angeles in 2015 out of a total city-wide workforce of just under 2 million. CA DOGGR data identified 508 active wells within the City in 2015 with positive levels of production. A geographic information system fixed the location of these well sites and then mapped protective buffers, setback distances of 1,500 feet and 2,500 feet, around sensitive land uses as identified by CARB. The GIS analysis established that 429 of the active 508 wells in the City were located within 2,500 feet of sensitive land uses. These 429 wells were responsible for approximately 78% of the value of output in the oil and gas extraction sector of the City in 2015. Input-output analysis of the Los Angeles economy reveals that closing 429 oil and gas wells and eliminating 78% of production within the oil and gas extraction industry (consistent with the 2,500 feet setback distance) would have the following impacts:

- 269 jobs would be lost within the oil and gas extraction industry
- 266 jobs would be lost within other sectors of the economy
- 535 total jobs would be lost across the City.

The report noted that use of the 1,500 feet setback distance would result in the overall loss of approximately 532 jobs citywide. They do not believe that the loss of local oil and gas extraction capacity would have a significant impact on local energy prices. However, they believe that there could be additional employment loss in local parts of the oil and gas transportation system associated with well closures.

Table 17: Private non-farm employment in California, Los Angeles County and the City of Los Angeles, 2015 (Wage and salary employment and self-employment: EDD+NES)

NAICS	Industry name	California	Los Angeles County	City of Los Angeles
21	Mining, Quarrying, Oil & Gas	29,758	5,051	577 (0.03%)
211	- Oil & Gas Extraction	14,175	3,201	345(0.02%)
22	Utilities	58,757	12,229	2,833(0.17%)
23	Construction	948,370	188,155	59,208(3.46%)
31-33	Manufacturing	1,332,133	370, 694	94, 481(5.53%)
42	Wholesale	777,742	246,213	75,494(4.41%)
44-45	Retail	1,890,618	447,935	164,770(9.64%)
48-49	Transportation & Warehousing	720,142	198,544	81,657(4.78%)
51	Information	543,425	233,992	74,911(4.38%)
52	Finance & Insurance	610,496	147,087	70,676(4.13%)
53	Real Estate, Renting & Leasing	594,401	197,494	64,838(3.79%)
54	Professional, Scientific & Technical Services	1,748,815	431,917	183,392(10.72%)
55	Management of Companies	229,682	57,365	17,819(1.04%)
56	Waste Management	1,303,984	341,548	116,050(6.79%)
61	Educational Services	388,039	120,311	59,151(3.46%)
62	Health Care & Social Assistance	2,352,714	718,366	291,769(17.06%)
71	Arts, Entertainment & Recreation	497,317	178,458	73,858(4.32%)
72	Accommodation & Food Services	1,575,749	416,088	158,371(9.26%)
81	Other Services (except Public Administration)	1,000,805	295,717	120,112(7.02%)
	Total	16,602,947	4,607,164	1,709,967

A second way that the report proposed city ordinance might generate benefits to the city that offset some of the anticipated employment losses, noted in Section 4 of this report, is through job creation related to remediation activities at oil and gas well sites that are shut down. Once a decision has been made to halt production at an oil well, a process of remediation can begin. Remediation is undertaken to ensure that underground reserves of oil and gas, and any saline or fresh water aquifers penetrated by the well, remain isolated from one another over time. Well remediation requirements vary with local and state regulations, but typically involve the "plugging and abandonment" of a well site. The California Code of Regulations, Section 1723 outlines the requirements for well plugging and abandonment in California. The process of plugging typically involves the filling of the well hole with drilling mud and the placement of cement plugs across all oil or gas zones, any water interfaces and at the surface. Additional cement plugs may be required depending on the condition of the well. Plugs placed into the well-bore prevent communication between subsurface rock layers (Testa and Jacobs, 2014).

The process of remediation involves use of a drilling rig to remove equipment inside the well and to ensure that the well is unobstructed so that isolation plugs can be effectively installed.

Additional work involves removal of the well-head, sampling and testing for soil, and possibly water, contamination surrounding the well site. Older wells might have above surface or underground tanks that require further clean up, removal and additional testing for subsurface leakage and contamination. Contaminated soils require careful disposal, before the well site can be brought back to the required standards for commercial or even residential use. It is important for the city and oil producers to ensure timely remediation at oil and gas wells for idle wells pose significant concerns. Indeed, the California Department of Conservation's Division of Oil, Gas, & Geothermal Resources (DOGGR), estimated more than 23,000 idle wells in the state pose risks of desertion and contamination. State Assembly Bill 2729 (2016) is aimed at reducing such risk.

However, remediation work, calculated over the year, for each of these sites was estimated to involve 0.5 workers. Thus, 215 full-year jobs would be generated in the city if all wells in the proposed setback zone were remediated at once. These jobs would generate additional employment across the city as a result of multiplier effects associated with the purchase of inputs and consumption from wages; an additional 141 jobs would be generated elsewhere in the Los Angeles economy. These figures are based on the closure of 429 active wells and assume an average well site remediation cost of approximately $109,000. Pollution savings summary also included the removal of 199,000 metric tons of carbon dioxide equivalents released each year in the City of Los Angeles as a result of oil and gas extraction and supporting industrial activities.

B. Industry Economic Reports

Economic and Fiscal Effects of Set-Back Requirements on the Oil and Gas Industry in Los Angeles, by Capital Matrix Consulting, March 2018 (Appendix A2-8)

According to the Capital Matrix Consulting (CMC) report, oil production within Los Angeles City comes primarily from six fields located fully or partly within its boundaries. About forty percent (40%) of the total is from onshore portions of the Wilmington Field, pumped by wells located in and around the Port of Los Angeles. Other significant sources of oil are the Las Cienegas, San Vincente, and Cascade fields, as well as portions of the Beverly Hills and Torrance fields.

They found that there were about thirty (30) producers operating in Los Angeles City in 2016. About eighty-five percent (85%) of total oil production came from the top six (6) companies. These include: Sentinel Peak Resources (with production in Beverly Hills, Las Cienegas, and San Vincente fields), Warren E&P (Wilmington Field), California Resources (primarily its Tidelands operations in Wilmington Field), DCOR (Cascade Field), and Pacific Coast Energy Company (Beverly Hills Field).

Los Angeles City: Of the County-wide totals, $430 million in economic output, $270 million in gross regional product, 1,480 jobs, $155 million in labor income, and $35 million in state and local tax payments are related to oil and gas production in the City. The effects on Los Angeles City production would be even more pronounced. A 500-foot setback would eliminate sixty-three percent (63%) of production, and a 2,500-foot setback would eliminate eighty-seven percent (87%) of oil production in the City in the CMC report.

Corresponding economic and fiscal impacts: As shown in Table 18, a 500-foot setback imposed by Los Angeles City would result in losses of $255 million in economic output, 890 high paying jobs, $88 million in labor income, and $22 million in state and local taxes. Adoption of a 2,500-foot setback would result in job losses of 1,221, labor income losses of $122 million, and state and local tax reductions of $29 million.

Table 18. Economic and Fiscal Impacts of Setback Ordinances Imposed By Los Angeles City - Direct and Multiplier Effects (Annual Average Reductions - 2020 to 2025); CMC Report

	Setback Distance		
Loss In:	**500 foot**	**1,500 Foot**	**2,500 Foot**
Oil production (%)	63%	86%	87%
Economic Output ($ Millions)	$255	$340	$344
Employment	890	1,210	1,221
Labor Income ($ Millions)	$88	$120	$122
State/Local Taxes ($ Millions)	$22	$28	$29

Los Angeles City oil and gas operations: The CMC report showed that there were 541 workers oil and gas industry establishments operating in the City in 2016. These employees were paid a combined total of $77 million, which works out to an average annual wage of $143,000. The high rate partly reflects the presence of the California Resources Corporation and Breitburn Energy Partners headquarters within the City. An additional 112 employees were employed in pipeline construction industries in the City. In the City average wages in the oil production industry are quite high compared to other private sector jobs.

Table 19. Economic and Fiscal Impacts of Setback Ordinances Imposed By Los Angeles City - Direct and Multiplier Effects (Annual Average Reductions - 2020 to 2025); CMC report

Type of Impact	Economic Output	Gross Regional Product	Number of Jobs	Labor Income
Direct	$175	$110	530	$76
Indirect	29	18	122	14
Induced	71	43	471	25
Total	$275	$171	1,123	$115
Multiplier	1.6	1.6	2.1	1.5

The combined countywide average for all oil and gas-related jobs is over $100,000, and the oil and gas extraction segment has an average wage of over $160,000. The high average wage in this segment partly reflects high wages paid by oil producers generally, but also is due to the significant number of well-paid jobs in headquarter, centralized purchasing, and logistical operations in the County (**See Figure 19**).

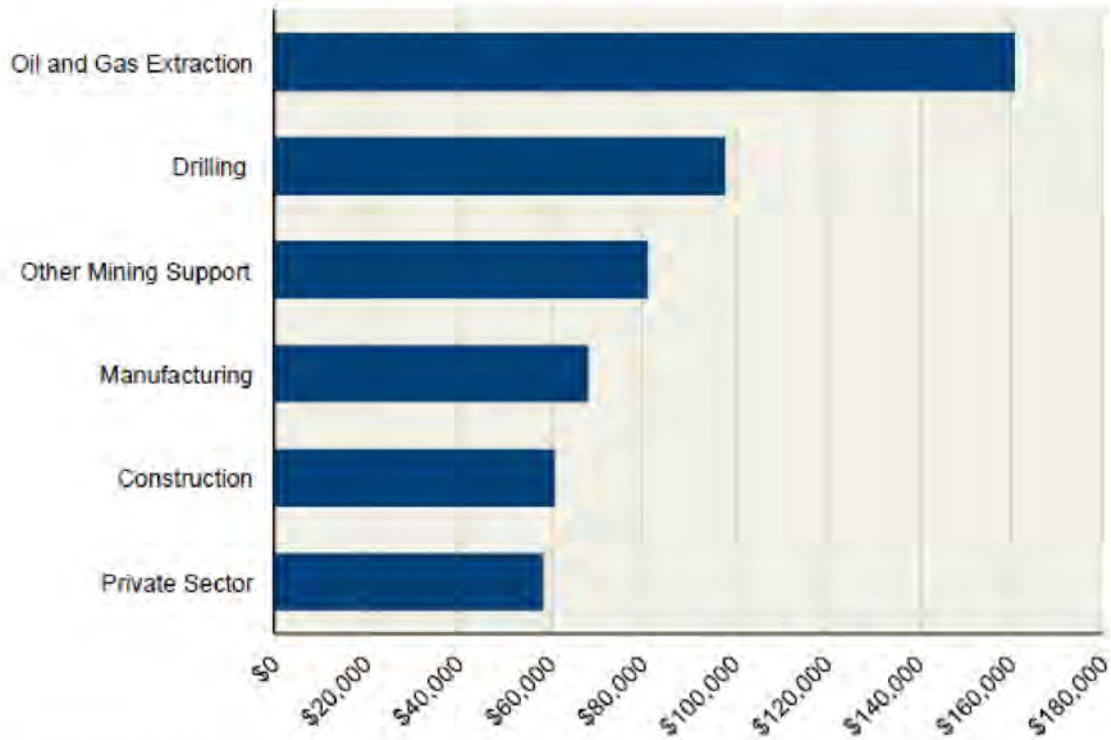


Figure 19. Los Angeles County Average Annual Wage by Industry in 2016, CMC report

Potential City Tax Impacts

State and local taxes generated by oil and gas production within City boundaries total $25.9 million, of which $15 million is state taxes and $10.8 million is local taxes. Most of the local taxes are from sales and property taxes. The City does not have a barrel tax, but Table 20 shows the County has a 40 cents per barrel tax that generates approximately $8.7 million per year.

The CMC report also evaluated tax revenues from: property taxes on oil reserves and equipment; state corporate taxes on company profits; personal income taxes on wages and royalties; state and local sales taxes on oil producers' purchases of materials, fuels, and equipment; severance taxes imposed by about a dozen cities; and the DOGGR administrative fee used to support a variety of its regulatory activities. The multiplier effects include (1) personal income taxes paid on employees' wages, and (2) state and local taxes paid on subsequent rounds of income and expenditures generated by supplying businesses and their employees.

Table 20. State and Local Taxes Generated by Oil and Gas Production in Los Angeles County and Los Angeles City in 2018 (Dollars in Thousands), CMC report

Tax Source	Los Angeles County		Los Angeles City	
	Total Amount	Per Barrel Amount	Total Amount	Per Barrel Amount
On producers & royalty owners:				
State:				
Corporation Tax	$25,000	$1.15	$3,200	$1.15
Personal income	10,270	0.47	1,320	0.47
Sales	14,110	0.65	2,010	0.72
DOGGR	12,550	0.58	1,610	0.58
Total, state	**$61,930**	**$2.85**	**$8,140**	**$2.91**
Local:				
Property	$44,140	$2.03	$5,880	$2.11
Sales	9,140	0.42	$1,170	0.42
Severance	8,710	0.40	0	-
Other	3,270	0.15	420	0.15
Total, local	**$65,260**	**$3.00**	**$7,470**	**$2.81**
Multiplier impacts:				
State	$54,500	$2.50	$6,920	$2.48
Local	23,600	1.09	3,400	1.21
Total, multiplier impacts	**$72,970**	**$3.59**	**$8,680**	**$3.69**
Combined, Direct and Multiplier:				
State	$116,430	$5.36	$15,060	$4.94
Local	88,860	4.09	10.870	3.61
Total, combined	**$205,290**	**$9.45**	**$25,930**	**$8.55**

Separate from the income, jobs, and tax revenue, there is additional financial value identified by the CMC report. The economic value of the oil and gas reserves can be measured by estimating the present discounted value of after-tax cash flows (i.e. annual revenues minus operational and investment costs) generated from all future extraction of oil from these reserves. The actual value depends on several factors, one of the most important of which is the future price of crude oil. They projected a valuation based on low, moderate, and high assumptions, they estimate that the economic value of the oil reserves in LA County would be worth $1.2 billion under the lower-end oil price forecast, $2.3 billion under the moderate price forecast, and $3.4 billion under the high-end price forecast. The lost value could also result in a major liability if mineral rights property owners and producers were to prevail in "takings" lawsuits under the United States and California Constitutions.

At a minimum, it would cost millions of dollars in litigation expenses to defend against such lawsuits. If the plaintiffs were to prevail, the City would be required to pay the present value of the lost profits from the oil and gas that would no longer be recovered in these fields to the oil companies and owners of the mineral rights affected by the ordinance.

C. Setback Implementation Potential Fiscal Impact to the City

Oil and natural gas production values within the City are not publically available for six months to year. The most recent full year production data is from 2017. The average daily crude oil production rate for the City has ranged from approximately 7,600 - 8,000 barrels of oil per day (BOPD). The annual total cumulative oil and gas production in the City for 2017 was 2.5 million barrels (bbl) of oil and more than 4.9 million cubic feet (MCF) of natural gas.

Local governments and industry typically use the Midway Sunset Oil Field in Central California as a proxy for a State oil price. The American Petroleum Institute gravity (API gravity) is a measure of crude oil by density which dictates the price per barrel. Midway Sunset crude oil is set at 13 API gravity which is similar to most types of crude oil produced in California. In 2017, the Midway Sunset Oil Price ranged from $44.33/bbl to $59.24/bbl, with an annual average oil price of $48.19/bbl. While in 2018, its daily price fluctuated higher from $53.03/bbl to $71.58/bbl, with an average annual oil price of $68.02/bbl. The December 2018 Deloitte Advisory Firm Resource Evaluation Report projected the 2019 Average Midway Sunset crude oil price at $59.00.

The present value of the current oil production (2.5 million barrels) within the City at the Midway Sunset oil price of $59/barrel is conservatively estimated at least $148 million per year. However, any change in oil price can significantly increase or decrease this value. The United State Energy Information Administration (US EIA) estimates oil price will be $72/barrel in 2020, which would increase the value at $185 million.

This estimate does not reflect the higher API gravity crude oil produced within the City or a valuation of the produced natural gas that would increase the net present value of the city wide petroleum production. The actual current value of oil and gas production will be greater due to expected higher oil prices in the future and the additional value of the natural gas produced. The following is the City's Petroleum Administrator's cost estimate for each potential fiscal impact.

<u>Value of Future Crude Oil Production</u>:

In 2012, as the U.S. Geological Survey (USGS) estimated that between 1.4 and 5.6 billion barrels of recoverable oil remain in just ten (10) of the Los Angeles basin oil fields; three (3) of them (Inglewood, Torrance, and Wilmington/Belmont) lie partially within the City boundaries. In an updated 2018 geological evaluation, done by USGS geologist Don Gautier, concluded that approximately 1.6 billion barrels of additional volume of recoverable crude oil exist within the City that could be produced using existing technology. Applying the Midway-Sunset projected oil price of $59/bbl to the 1.6 billion barrels of remaining recoverable reserves provides $94.4 billion in present value. Price Water House Cooper (PWC) projects a 6% rate of return for the oil industry in 2019. The projected future value of the remaining oil reserves belonging to mineral rights owners in the City calculated for a 20 year period at 6% interest rate is $97.6 billion.

Estimated future value of recoverable petroleum reserves is $97.6 billion.

Land Value:

Land values in the City vary by location according to a 2017 study of metropolitan land values across the United States. Economists David Albouy and Minchul Shin of the University of Illinois, and Gabriel Ehrlich of the University of Michigan, relied on data from CoStar, a national real-estate database, covering land transactions from 2005 through 2010. The study estimated the total land value of the Los Angeles-Long Beach, CA area at $2.3 trillion. The average land value per acre city wide was estimated at $2.6 million and the value of central downtown land was $16 million per acre.

The sixteen remaining oil drilling sites are spread across the City of Los Angeles equate to 24 acres of surface land. The drill sites in non-central areas are estimated land value of $85 million. The drill sites in central areas are estimated land value of $15 million. The costs vary from location to location and would likely be higher than this estimate due to the regional housing crisis. In an imminent domain proceeding or litigation over the deprivation a surface owner's property rights, then the land owner would need to be compensated at a fair market price.

The estimated current surface land value of the drill sites in the City is $100 million.

Well Abandonment:

Oil and gas well abandonments must meet standards required by CA DOGGR to be abandoned when operators end operations. There are approximately 1,100 active and idle oil wells within the City. As of 2018, there are 819 active wells and 296 idle wells, of which, the inactive wells can be reactivated at any time.

The abandonment of an oil well in the Los Angeles Region can cost anywhere from $50,000 to $500,000 per well according to news reports from CIPA. The two (2) wells recently abandoned on Firmin Street in the Echo Park area of the City cost the state about $375,000. Sixty-Five percent (65%) of active and idle wells are located within drill sites which should be on the lower end of the cost scale. The remaining wells will likely require higher abandonment costs due to their locations in difficult to access urban settings. Drill site well abandonments are estimated to cost $250,000 per well for seven hundred twenty-five (725) wells at a projected cost of $181 million. Non-drill site wells are estimated to cost $375,000 per well for the three hundred seventy-five (375) wells, which would total approximately $140 million. The cost would likely be greater than this amount because many of the wells have old broken equipment inside them and damaged casing which takes longer and is more expensive to abandon. In a property taking's litigation, these costs would be an item of dispute or if a company declared bankruptcy the City would need to identify the funding to abandon the wells.

Total Well Abandonment Cost Estimate - $321 million

Environmental Remediation and Cleanup:

After each drill site's wells are abandoned, the environmental cleanup process must begin to restore the site to its prior natural state to allow for an alternative land use. The site cleanup is typically regulated by DTSC or the LARWQCB. Drill site cleanup will likely include tank removal, pipeline abandonment, building demolition, concrete removal, soil testing, soil removal, health risk assessments, and both Phase 1 & 2 environmental site assessments. Depending on the desired level of cleanup, residential or industrial levels, the costs can vary significantly.

In 2011, the Beverly Hills City Council voted to ban all oil drilling within the city limits by December 31, 2016. After implementation of this law and cancellation of the oil operating lease, the operator of the one active drill site within the City of Beverly Hills, Venoco Incorporated, declared bankruptcy. Venoco was discharged of its well abandonment and environmental remediation responsibilities in Federal Court, even though they were in listed in their lease agreement. The City of Beverly Hills is now managing the project on behalf of the Beverly Hills Unified School District (BHUSD) to properly secure and plug nineteen (19) oil wells located on School District property (0.73 acres) adjacent to the Beverly Hills High School. Prior to bankruptcy, Venoco said the task would be "expensive and complicated" and that it could take "several years" at an estimated cost of $10 - $15 million to cleanup. Well abandonment was estimated to be half of the total project cost. In December 5, 2017, the City of Beverly Hills and the Beverly Hills School District entered into an agreement whereby the City of Beverly Hills would take on project management responsibilities to monitor and plug the wells. The City of Beverly Hills advanced $8 million in costs for site monitoring and plugging. This amount is subject to 50% reimbursement by the Beverly Hills School District. The city and school district only received $760,000 from the bankruptcy court proceedings. The Beverly Hills example is the basis of an anticipated estimated environmental remediation and cleanup cost estimate of $6.25 million per acre. The City of Los Angeles has twenty-four (24) acres of active oil and gas drill sites that will eventually need to be abandoned and remediated.

Total Environmental Remediation and Cleanup Cost Estimate - $ 150 million

Expected Litigation Costs:

In 2019, Assemblymember Muratsuchi introduced Assembly Bill 345 (See Appendix A2-19) to establish a statewide 2,500 foot setback from oil and gas wells. The Assembly Appropriations Committee summarized the fiscal effects of expanded setbacks proposed under Assembly Bill 345. The Committee's analysis (Appendices A2-20 & A2-A21), noted total lost revenues from oil production of up to $3.5 billion, annual lost production revenue of up to $350 million per year, annual lost tax revenue in the range of $100 million per year, and additional state regulatory costs of $4 million per year. These cost burdens would be felt most acutely in the Los Angeles area because it would have impacted 87% of oil production in the City. The analysis concluded that the bill would give rise to litigation over takings "at significant cost to the state." The bill analysis indicated implementation of the law would require at least $1 million per year in litigation costs. The City Attorney's Office agrees that the City can expect to spend a similar amount per year to defend the implementation of a setback distance within the City.

Estimated Annual Litigation Cost = $1 million per year

<u>**Total Potential Fiscal Impact to the City of Setback Implementation:**</u>

- Current Oil Production - **$148 - $185 million**
- Future Oil Production - **$97.6 billion**
- Land Value - **$100 million**
- Well Abandonment - **$321 million**
- Environmental Clean Up - **$150 million**
- Litigation - **$1 million per year**

The estimated potential cost to the City of establishing a setback distance on existing operation is $724 million, which includes the minimum value of the current oil production, land value costs, well abandonment costs, environmental clean-up costs, and five years of litigation expenses. It may be lower if the sites are not cleaned up, wells stay unplugged, and the City is successful in the court systems. The estimated potential cost to the City of establishing a future setback distance could be as high as $97.6 billion in compensation for the future value of mineral rights owed from takings litigation.

D. Establishment of Oil and Gas Restricted Funds

In 2018, Los Angeles City Controller Ron Galperin published a report titled, "Review of the City of Los Angeles' Oil and Gas Drilling Sites" (Appendix A2-2). The review was initiated for several reasons, but two (2) that are directly related to this report. First, the review wanted to determine if appropriate coverage existed to protect the City and its residents from financial risks associated with oil and gas wells. Secondly, it sought to implement effective processes to collect revenues and recover costs. In order to successfully implement the recommendations in his report, he confirmed that it will require additional financial resources. The report also noted that as the City enhances its local oil and gas oversight framework, it should prioritize cost recovery.

The report highlighted the City's large real estate portfolio (almost 9,000 distinct parcels) that includes parks, libraries, municipal facilities, buildings, and vacant land. The value of the City's properties are not limited to surface structures, but it also has recoverable deposits of oil and gas may be found in subsurface locations beneath these parcels. The City's ability to generate revenue by using its real estate assets for oil and gas extraction activity depends on the extent to

This report should not lead to any public panic or belief in a widespread public health crisis. There is a lack empirical evidence correlating oil and gas operations within the City of Los Angeles to widespread negative health impacts. The lack of evidence of public health impacts from oil and natural gas operations has been demonstrated locally in multiple studies by the Los Angeles County Department of Public Health, the Los Angeles County Oil & Gas Strike Team, the South Coast Air Quality Management District and the comprehensive Kern County Environmental Impact Report and Health Risk Assessment. Both CA DOGGR and SCAQMD – as well as the dozens of other regulatory agencies – have specific environmental legal authority, including the ability to order a shutdown of operations which constitute an imminent threat to public health and/or safety.

Establishing a Setback Distance on Existing Operations

If City policy makers decide to establish a setback distance, there are several options to consider. A physical surface setback can be established in the zoning code for existing oil and gas wells. The precise setback distance for the City of Los Angeles to adopt is unclear from the literature review or approaches by other jurisdictions. The Los Angeles County Department of Public Health recommended expanding the minimum setback distance beyond 300 feet for both the citing of new wells and the development of sensitive land uses near existing operations. CA DOGGR has a "critical wells" designation for wells that are 300 feet from the centerline of the well to any building intended for human occupancy or any airport runway. The CA DOGGR distance is not a physical setback distance, but the threshold for additional safety measures, such as additional requirements for well blowout prevention equipment, emergency backup systems, and additional control valves.

While the State of California has no established statewide setback for oil and gas development, some local jurisdictions have established setbacks for residences and sites of sensitive receptors. In 2018, the City of Arvin adopted an ordinance (Appendix A2-31) that establishes setback distances of 300 feet for new development and 600 feet for new drilling operations near sensitive sites, such as parks, hospitals, and schools. However, neither setback distance impacted any existing or future oil and gas development. The California Attorney General's Office issued a letter (Appendix A2-32) prior to the adoption of their ordinance stating that the proposed prohibited zones and setbacks are within the City's power to regulate land use and within the City's police powers, as long as it does not contradict state law. The Attorney General's letter stated the following, "the Ordinance will not prevent the operation of oil and gas wells currently existing within the prohibited zones and/or setbacks if these sites can demonstrate vested rights and will not eliminate future access to subsurface oil and gas resources located in the restricted areas." In the Arvin setback ordinance, if the setbacks had impacted existing oil and gas operations, then the Attorney General's Office believed the action to be pre-empted by state law as interfering with the state's goals to develop and utilize oil and gas resources.

Texas, Pennsylvania, Colorado, New Mexico and other major oil and gas producing states do have regulations that set a minimum surface setback requirement from sensitive receptors to where oil and gas can be produced. Those surface setback requirements are larger than those that exist in the State of California more generally. Those states produce mainly natural gas from deep low permeability shale geological formations that are located in rural, typically unpopulated, areas. Oil fields in the City of Los Angeles and across Southern California are different, being they are high permeability, low pressure sandstone geological formations.

However, nearly all the setback distances were for future oil and gas development and did not impact existing oil and gas operations. For example the State of Maryland has a 2,000 foot setback distance, but they only have ten (10) active natural gas wells in the whole state. In Texas, the 1,500 foot setback distances in Dallas and Flower Mound are the only mitigation that is required for oil and gas sites.

The City's PSE consultants stated, "the science is relatively clear that the development of oil and gas immediately adjacent to places where people live, work and play poses hazards and risks to public health and that some minimum distance from sensitive receptors should be considered." As such, they advised that a setback greater than 500 feet and up to 5,290 feet should be considered. The studies that evaluated health impacts at 2,500 feet or greater were nearly all from unconventional natural gas operations outside of California. They evaluated noise, perinatal, cancer, and non-cancer health effects in Pennsylvania, Oklahoma, and Colorado.

Of all 131 events reported within the City of Los Angeles by the SCAQMD chemical database, eighty-one (81) events or sixty-two percent (62%) of all events were within 600 feet of the sensitive receptor. Of all chemicals reported to the SCAQMD dataset, 22 were identified as hazardous air pollutants (HAPs) under the Clean Air Act, half of which were reported as used in the City of Los Angeles. The chemical inventory assessment does show chemicals of concern and HAPs are present, but again the City does not have empirical evidence that they have become airborne above observable unhealthy thresholds. If a surface setback distance alone is established from sensitive receptors, it should be at least 600 feet due to the uncertainty of airborne chemicals of concern and at least 500 feet which was the minimum threshold evaluated in the multiple epidemiological literature studies. Kern County setback distances ranged from 210 to 367 feet for deeper wells than City of Los Angeles oil and gas wells. A setback distance of 600 feet would be further than both Kern County's and meet the LADPH recommendations.

The best available emission control technologies and operational management approaches should be deployed on all oil and gas wells and ancillary infrastructure to limit emissions of toxic air pollutants. The stronger the regulatory environment, the more enhanced operating conditions, required engineering controls, annual inspections, and utilization of the best available technology can significantly reduce the need for potential setback distances.

If a surface setback distance is established, it could conservatively cost the City of Los Angeles at least a $148 million for existing oil and gas production and up to $97.6 billion in lost property values by mineral rights owners from the remaining 1.6 billion of recoverable oil and gas reserves beneath the City boundaries.

Establishing a Setback Distance on Future Development

A physical surface setback for future oil and gas development can be established by ordinance. In the review of other jurisdictions, nearly all, except for the City of Arvin, established setback distances for future development. Our consultants did recommend limiting the density of wells and other oil and gas development infrastructure at oil and gas producing areas within and near the City of Los Angeles.

In one general health study (Lewis et al. 2018), a group of health care providers, public health practitioners, environmental advocates, and researchers were surveyed about the safe distances from unconventional oil and gas development from vulnerable groups. The group reached consensus (defined as agreement among 70% of participants) that the minimum safe distance from unconventional oil and gas development is ¼ mile (1,320 feet) and additional setbacks should be established near sensitive receptors. There was a lack of consensus by the group around setback distances between ¼ - 2 miles (1,320 – 10,560 feet), due to limited health and exposure studies. It should be noted that this study did not expressly assess health effects.

The furthest distance considered by the Los Angeles County Department of Public Health was 1,500 feet. The County noted that additional mitigation is not likely to be needed at this distance and that some uncertainty remains due to gaps in long term health and exposure data. Fires, Explosions, and Other Emergencies were listed, but no defined mitigations were itemized and there was no evaluation of the fire code requirements for drill sites, nor fire suppression systems. The two out-of-state examples of 1,500 feet are the cities of Dallas and Flower Mound. Both distances are the only mitigation associated with that setback requirement, and those regulations are still being litigated in the Texas state court system. Additionally, 1,500 feet is the furthest jurisdictional distance limit that the City could set before potentially conflicting with other jurisdictional authorities, like the Ports of Long Beach and Los Angeles, Los Angeles World Airports, Unincorporated Los Angeles County, and adjacent municipalities.

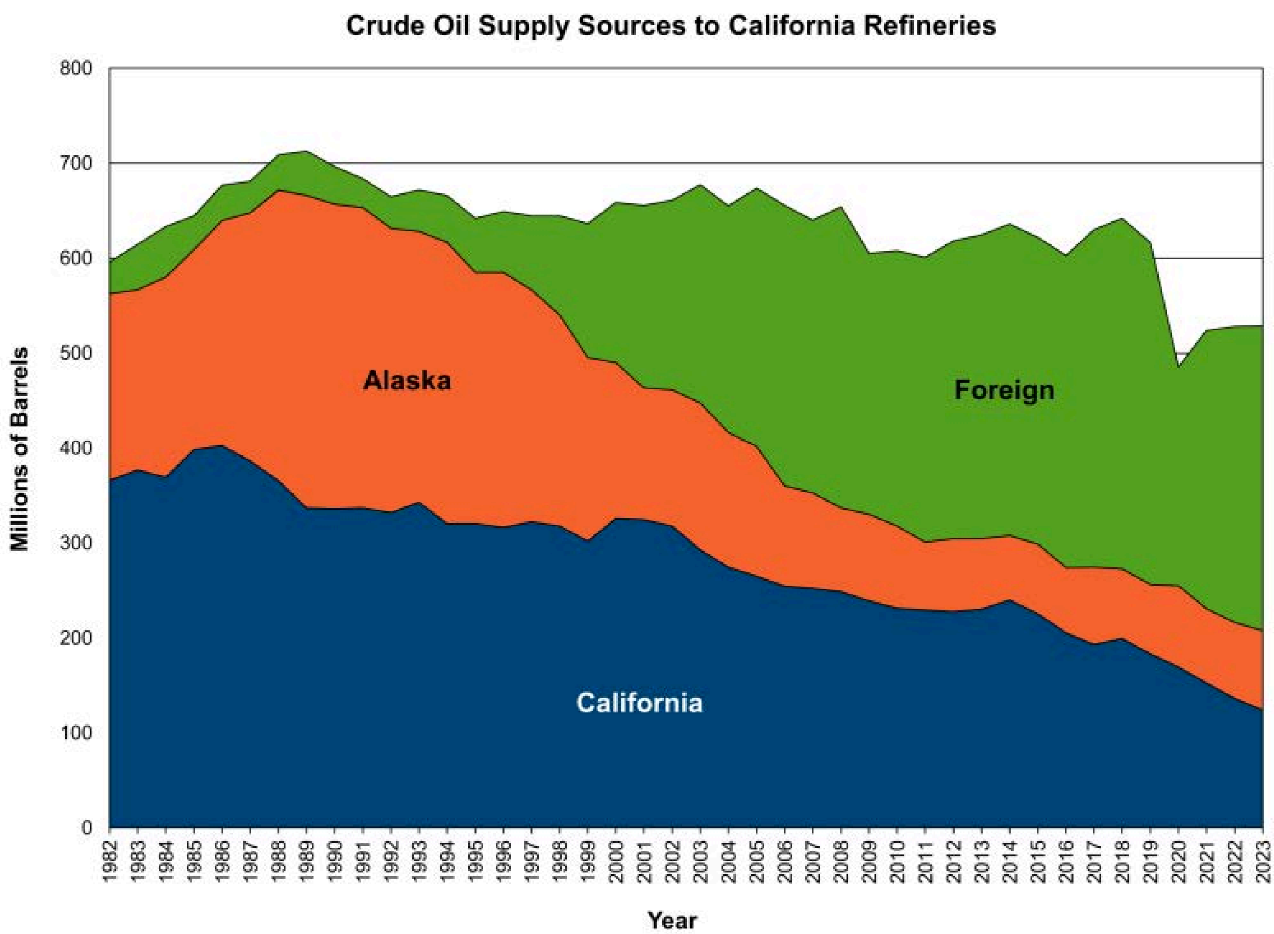
If a surface setback distance is established on future oil and gas development, it could potentially cost the City of Los Angeles between $1.2 billion in present value to $97.6 billion in future value in a constitutional takings claim by mineral rights owners of the remaining 1.6 billion barrels of recoverable oil and gas reserves beneath the City.

Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california

Annual Oil Supply Sources To California Refineries

Annual Oil Supply Sources To California Refineries



Annual Oil Supply Sources to California Refineries (In Thousands of Barrels)

Year	California**	%	Alaska	%	Foreign	%	Total
2023	123,947	23.4%	83,842	15.9%	320,793	60.7%	528,582
2022	136,052	25.8%	80,257	15.2%	311,530	59.0%	527,839
2021	152,473	29.1%	78,145	14.9%	293,417	56.0%	524,035
2020	169,211	34.9%	85,662	17.6%	230,581	47.5%	485,454
2019	183,158	29.7%	73,252	11.9%	359,712	58.4%	616,122
2018	199,658	31.1%	72,945	11.4%	369,386	57.5%	641,989
2017	197,008	31.3%	77,740	12.3%	355,150	56.4%	629,898
2016	205,528	34.1%	68,765	11.4%	328,513	54.5%	602,806
2015	225,435	36.2%	73,182	11.8%	323,336	52.0%	621,953
2014	240,095	37.7%	67,702	10.6%	328,245	51.6%	636,042
2013	230,357	36.9%	74,382	11.9%	319,677	51.2%	624,416
2012	227,626	36.8%	77,150	12.5%	313,530	50.7%	618,306
2011	229,556	38.2%	71,138	11.8%	300,016	49.9%	600,710
2010	231,339	38.1%	86,382	14.2%	289,797	47.7%	607,518
2009	239,070	39.5%	91,148	15.1%	274,883	45.4%	605,101

Year	California**	%	Alaska	%	Foreign	%	Total
2008	248,490	38.0%	88,362	13.5%	317,136	48.5%	653,988
2007	252,125	39.4%	100,899	15.8%	286,849	44.8%	639,873
2006	254,498	38.8%	105,684	16.1%	295,306	45.1%	655,488
2005	265,050	39.4%	136,237	20.2%	272,187	40.4%	673,474
2004	274,396	41.9%	141,967	21.7%	238,484	36.4%	654,847
2003	292,899	43.2%	154,524	22.8%	230,041	34.0%	677,464
2002	317,573	48.0%	143,463	21.7%	199,964	30.3%	661,000
2001	324,723	49.6%	138,693	21.2%	191,843	29.3%	655,259
2000	325,816	49.5%	163,789	24.9%	169,105	25.7%	658,710
1999	301,966	47.5%	193,327	30.4%	140,905	22.1%	636,198
1998	317,816	49.3%	221,984	34.4%	104,650	16.2%	644,450
1997	322,242	50.0%	244,623	38.0%	77,628	12.0%	644,493
1996	316,201	48.7%	268,806	41.4%	63,996	9.9%	649,003
1995	320,372	49.9%	264,530	41.2%	56,864	8.9%	641,766
1994	320,369	48.1%	296,508	44.5%	49,192	7.4%	666,069
1993	342,762	51.0%	285,565	42.5%	43,359	6.5%	671,686
1992	331,638	49.9%	299,652	45.1%	33,056	5.0%	664,346

Year	California**	%	Alaska	%	Foreign	%	Total
1991	336,931	49.3%	316,115	46.2%	30,723	4.5%	683,769
1990	336,154	48.3%	320,829	46.1%	39,454	5.7%	696,437
1989	336,876	47.3%	329,020	46.2%	46,708	6.6%	712,604
1988	365,354	51.5%	306,247	43.2%	37,217	5.3%	708,818
1987	386,676	56.8%	260,843	38.3%	33,395	4.9%	680,914
1986	402,230	59.4%	237,508	35.1%	36,877	5.5%	676,615
1985	398,280	61.8%	210,647	32.7%	35,408	5.5%	644,335
1984	369,225	58.3%	210,450	33.2%	53,262	8.4%	632,937
1983	377,125	61.4%	189,538	30.8%	47,991	7.8%	614,654
1982	365,962	61.4%	196,462	33.0%	33,553	5.6%	595,977

** California totals may also include minor amounts from North Dakota and Gulf Coast States.

Source: California Energy Commission, aggregated from Petroleum Industry Information Reporting Act data. Please note that total of foreign oil receipts to refineries will not match that shown on other pages. The Petroleum Industry Information Reporting Act (PIIRA) data gives the breakdown by foreign, California and Alaska but not the foreign countries. The PIERS data includes the foreign breakdown by country but no domestic receipts. U.S. Dept. of Commerce, U.S. Dept. of Energy, Army Corps of Engineers, and State Lands Commission all give different totals by different breakdowns.

CONTACT

Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

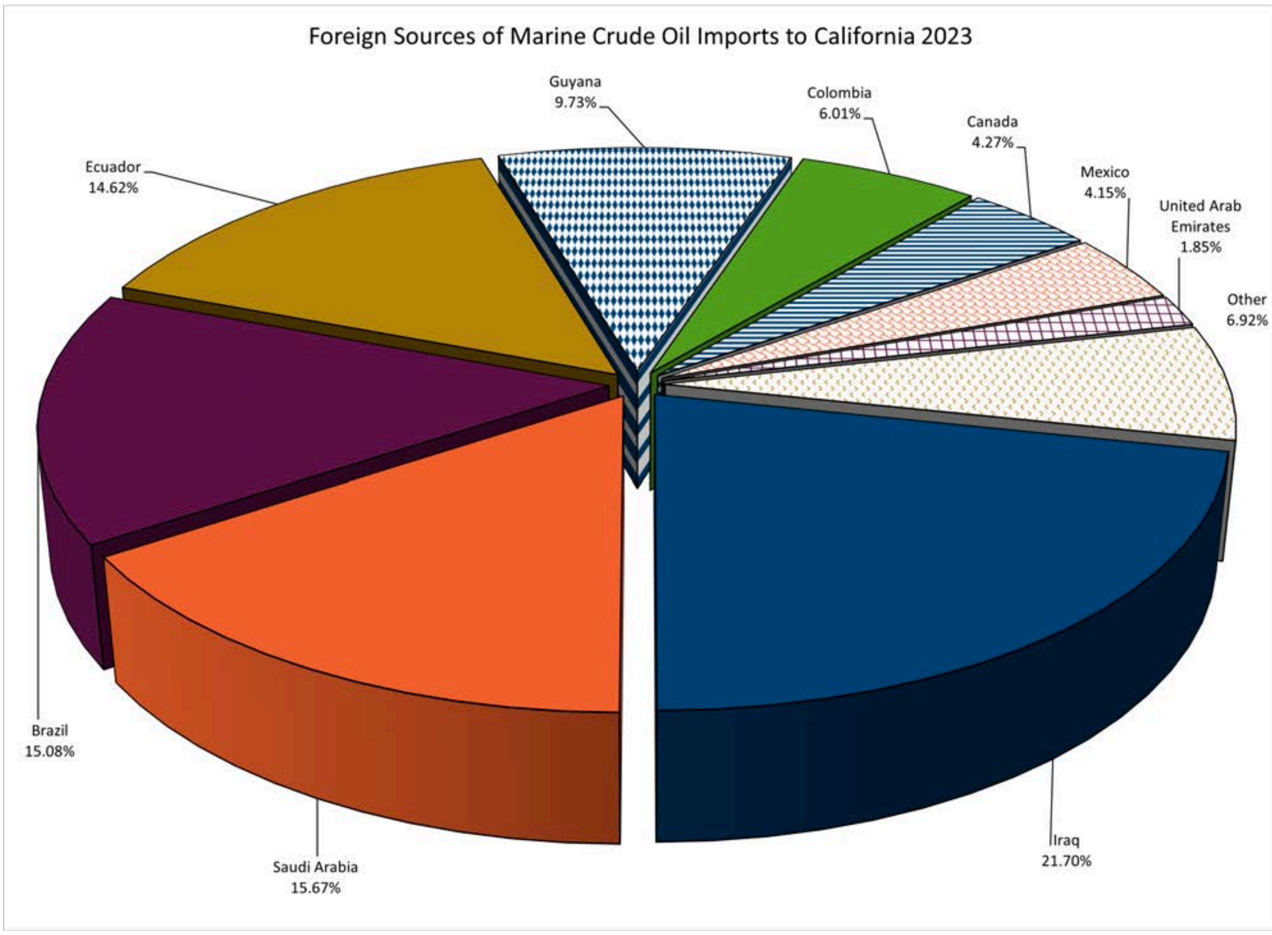
Full version available at https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/foreign-sources-crude-oil-imports

California's Petroleum Market

Foreign Sources of Crude Oil Imports to California

Foreign Sources of Crude Oil Imports to California

Foreign Sources of Crude Oil Imports to California 2023



Country	Thousands of Barrels	Percentage
IRAQ	69,589	21.70%
SAUDI ARABIA	50,253	15.67%
BRAZIL	48,367	15.08%
ECUADOR	46,882	14.62%
GUYANA	31,201	9.73%
COLOMBIA	19,276	6.01%
CANADA	13,709	4.27%
MEXICO	13,315	4.15%
UNITED ARAB EMITRATES	5,944	1.85%
Other	22,206	6.92%
Total	320,742	100.0%

Expand All

2022 Foreign Sources of Crude Oil Imports to California

2021 Foreign Sources of Crude Oil Imports to California

2020 Foreign Sources of Crude Oil Imports to California

Previous Years Data

Excerpt of reference cited at footnote 5 to Alston & Bird's January 29, 2024 Letter

Full version available at https://www.eia.gov/state/print.php?sid=CA

U.S. Energy Information Administration

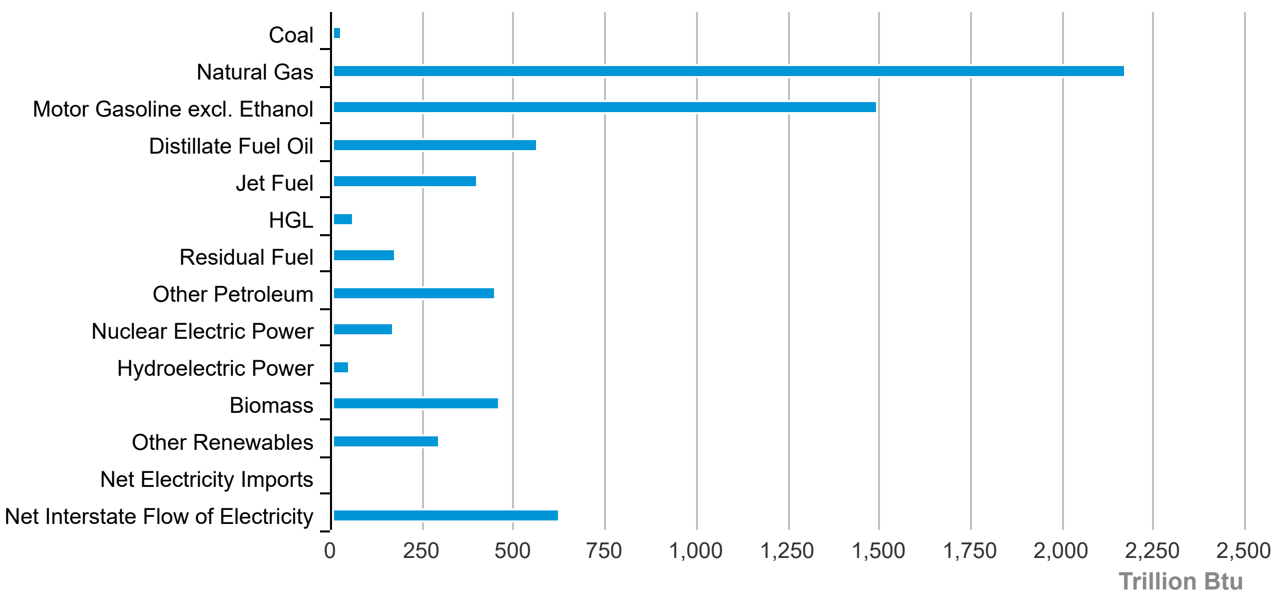
California State Energy Profile

California Quick Facts

- In 2022, California was the seventh-largest producer of crude oil among the 50 states, and, as of January 2022, the state ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states.
- In 2020, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than in all but three other states.
- In 2022, renewable resources, including hydroelectric power and small-scale, customer-sited solar power, accounted for 49% of California's in-state electricity generation. Natural gas fueled another 42%. Nuclear power supplied almost all the rest.
- In 2022, California was the fourth-largest electricity producer in the nation. The state was also the nation's third-largest electricity consumer, and additional needed electricity supplies came from out-of-state generators.

Last Updated: April 20, 2023

California Energy Consumption Estimates, 2021



Source: Energy Information Administration, State Energy Data System

Environment				
Utility-Scale Hydroelectric Net Electricity Generation	1,593 thousand MWh	7.5%	Jan-24	
Utility-Scale Solar, Wind, and Geothermal Net Electricity Generation	4,117 thousand MWh	9.0%	Jan-24	
Utility-Scale Biomass Net Electricity Generation	422 thousand MWh	10.2%	Jan-24	
Small-Scale Solar Photovoltaic Generation	1,802 thousand MWh	37.7%	Jan-24	
Fuel Ethanol Production	2,293 thousand barrels	0.6%	2021	
Renewable Energy Consumption	**California**	**U.S. Rank**	**Period**	find more
Renewable Energy Consumption as a Share of State Total	18.1 %	16	2021	
Fuel Ethanol Consumption	34,113 thousand barrels	2	2021	
Total Emissions	**California**	**Share of U.S.**	**Period**	find more
Carbon Dioxide	324.0 million metric tons	6.6%	2021	
Electric Power Industry Emissions	**California**	**Share of U.S.**	**Period**	find more
Carbon Dioxide	44,448 thousand metric tons	2.7%	2022	
Sulfur Dioxide	1 thousand metric tons	0.1%	2022	
Nitrogen Oxide	63 thousand metric tons	5.1%	2022	

Analysis

Last Updated: April 20, 2023

Overview

California has the largest economy in the nation and the fifth-largest in the world.[1,2] More than one in nine U.S. residents live in California, and it is the most populous state in the nation.[3] California also uses more energy than all other states except Texas.[4] However, energy efficiency efforts have helped make California's per capita energy use less than in almost all other states.[5,6] California has abundant renewable energy resources, including solar energy, hydroelectric power, geothermal energy, and biomass, and the state produces more electricity using renewable energy than every other state but Texas.[7] California is also rich in mineral resources. Long known for gold and other precious minerals, the state produces strategic elements at the nation's only rare earths mine.[8] Additionally, California has significant crude oil reserves, and the state's petroleum refineries have one-tenth of the nation's total crude oil refining capacity.[9,10]

California stretches two-thirds of the way up the U.S. West Coast. At its greatest distances, it is more than 1,000 miles long and 500 miles wide.[11] With such great distances to travel, transportation accounts for the largest share of the state's

Per capita residential and

energy consumption.[12] Californian's have more registered motor vehicles and travel more vehicle miles than residents in any other state.[13,14] California accounts for one-tenth of U.S. motor gasoline consumption and about one-seventh of the nation's jet fuel consumption.[15,16] Overall, the state's transportation sector accounts for about one-third of California's total energy consumption. The industrial sector uses one-fourth of the state's total energy, the residential sector accounts for about one-fifth, and the commercial sector uses one-fifth.[17] However, per capita energy consumption in both the residential and commercial sectors is lower than in all other states except Hawaii.[18] Although California has a varied climate, most of the state's more densely populated areas are relatively mild for much of the year.[19,20] Changes in weather patterns and climate have resulted in an increased use of cooling and almost three-fourths of California households have air conditioning.[21,22]

commercial sector energy use in California is lower than in all other states except Hawaii.

Electricity

In 2022, California was the nation's fourth-largest electricity producer and accounted for about 5% of all U.S. utility-scale (1-megawatt and larger) power generation.[23] Renewable resources, including hydropower and small-scale (less than 1-megawatt) customer-sited solar photovoltaic (PV) systems, supplied about half of California's total in-state electricity generation. In 2022, natural gas-fired power plants provided 42% of the state's total net generation.[24] Nuclear power's share of California's total electricity generation was about 8%, which was less than half the power nuclear supplied in 2011. The decrease resulted from the shutdown of the San Onofre nuclear power plant in January 2012. The state now has only one operating commercial nuclear power plant—the two-reactor Diablo Canyon facility.[25,26,27]

California has the nation's second-largest conventional hydroelectric generating capacity, after Washington, and it is consistently among the nation's top four hydropower producers.[28,29] Hydropower's contribution is highly variable and is dependent on rain and snowfall. Even though California is prone to drought, 2021 was the driest year in nearly a century and in-state hydroelectric power supplied about 7% to California's utility-scale net generation that year. Hydroelectric power's contribution increased slightly in 2022, supplying 8% of California's total in-state generation.[30,31,32] Nonhydroelectric renewable generation, especially solar and wind energy, offset declines in the state's hydroelectric and nuclear generation. In 2022, nonhydroelectric renewable resources provided 42% of California's total in-state electricity generation. Coal fuels only a small amount of California's in-state net generation, all of it from one industrial cogeneration plant.[33,34] A California law, enacted in 2006, limits new long-term financial investments in electricity generation based on greenhouse gas emissions. As a result, essentially all imports of coal-fired generation from other states are expected to end by 2026.[35]

California imports more electricity than any other state and typically receives between one-fifth and one-third of its electricity supply from outside of the state.[36] In 2022, in-state utility-scale electricity generation equaled about four-fifths of California's electricity sales, and the rest of the state's supply came from out of state.[37] In 2021, renewable energy generated 31% of California's imported electricity and large hydroelectric sources supplied another 16%. Nuclear energy accounted for 11% of imports and natural gas and coal each supplied almost 10%. Another 23% of imports came from unspecified sources.[38] Wildfires in California and surrounding states threaten both imports of electricity and transmission within the state.[39]

California imports more electricity than any other state.

Although California consumes more electricity than all other states except Texas and Florida, it uses less per capita than any other state, but Hawaii.[40,41] In 2022, California had the nation's second-highest average price of electricity, after Hawaii.[42] The commercial sector accounted for 46% of California's electricity sales in 2022. The residential sector, where almost one in three California households use electricity for home heating, accounted for 36% of sales.[43] About 18% of the state's electricity sales went to the industrial sector. The railroads, subways, electric buses, and iconic cable cars in California's transportation sector accounted for less than 0.3% of electricity use. [44]

California is part of the West Coast Green Highway, an extensive network of electric vehicle DC fast charging stations located along Interstate 5, and the state has more than 14,000 public electric vehicle charging stations.[45,46] As of December 31, 2021, California had more than 563,000 registered all-electric vehicles, the most of any state.[47] California also requires all public transit agencies to gradually transition to 100% zero-emission bus (ZEB) fleets. Beginning in 2029, all transit agency new bus purchases must be ZEBs.[48]

Renewable energy

California is second in the nation, after Texas, in total electricity generation from renewable resources. The state is the nation's top producer of electricity from solar energy and geothermal resources. In 2022, California was also the nation's second-largest producer of electricity from biomass, after Georgia, and the fourth-largest producer of conventional hydroelectric power, after Washington, Oregon, and New York.[49]

Solar energy is the largest source of California's renewable electricity generation.[50] The state's greatest solar resources are in California's southeastern deserts, where all of its solar thermal facilities and several of its largest solar PV plants are located. However, there are solar PV facilities throughout the state.[51] In 2022, solar energy supplied 19% of the state's utility-scale electricity net generation. When small-scale solar generation is included, solar energy provided 27% of the state's total electricity net generation.[52] In 2022, California produced 31% of the nation's total utility-scale and small-scale solar PV electricity generation and 69% of the nation's utility-scale solar thermal electricity generation.[53] At the beginning of 2023, California had more than 17,500 megawatts of utility-scale solar power capacity, more than any other state. When small-scale facilities are included, the state had almost 32,000 megawatts of total solar capacity.[54]

California is the nation's top producer of electricity from solar and geothermal energy.

In 2022, wind accounted for 7% of California's total in-state electricity generation, and the state ranked eighth in the nation in wind-powered generation.[55,56] California wind power potential exists at several areas around the state, both onshore and offshore.[57] However, the majority of the state's wind turbines are in six major wind resource areas: Altamont, East San Diego County, Pacheco, Solano, San Gorgonio, and Tehachapi.[58] At the beginning of 2023, California had more than 6,200 megawatts of wind capacity.[59]

California is the nation's top producer of electricity from geothermal resources. In 2022, the state produced 69% of the nation's utility-scale geothermal-sourced electricity, and geothermal power accounted for about 6% of California's utility-scale generation and 5% of the state's total in-state generation.[60,61] The state's operating geothermal power plants have a combined total capacity of 1,867 megawatts.[62] Four areas in California have substantial geothermal resources—the coastal mountain ranges north of San Francisco, volcanic areas of north-central California, areas near the Salton Sea in southern California, and areas along the state's eastern border with Nevada. The Geysers, located in the Mayacamas Mountains north of San Francisco, is the largest complex of geothermal power plants in the world and has about 725 megawatts of installed capacity.[63,64]

Superheated geothermal brines in the Salton Sea Known Geothermal Resource Area in southern California contain lithium, a critical mineral used to manufacture rechargeable batteries.[65,66] The state also has the only rare earth mine in North America. The Mountain Pass mine in southern California's Mojave Desert is the largest deposit of rare earth elements in the nation. Rare earths are used in the manufacture of electric vehicles, wind turbines, and batteries, among other applications.[67] In 2020, the Mountain Pass mine produced more than 38,500 metric tons of rare earth concentrate, the largest amount in the mine's history and more than 15% of global consumption.[68]

California is second in the nation, after Georgia, in utility-scale electricity generation from biomass.[69] In 2022, biomass fueled 2% of the state's total net generation, and more than half of that was from wood and wood-derived fuels.[70] Nearly three-fifths of the state's utility-scale biomass generating capacity is at 28 power plants fueled by wood and wood waste. Landfill gas, municipal solid waste, and other biomass sources fuel 77 other biomass power plants.[71] California also has two wood pellet manufacturing facilities. Those plants can produce about 168,000 tons of pellets per year. Wood pellets are used for heating but can also be used for electricity generation.[72] About 170,000 California households use wood as their primary fuel for space heating.[73]

California consumes one-tenth of the nation's fuel ethanol supply, which is almost eight times more than the state's four fuel ethanol plants can produce.[74,75] Midwestern states provide most of the additional fuel ethanol California uses.[76] California can produce a combined total of about 72 million gallons of biodiesel annually from 4 production plants, which is about one-fourth the amount of biodiesel consumed in the state each year.[77,78] Several California petroleum refineries have added renewable diesel, derived from biomass, manufacturing capacity.[79,80] In 2021, California accounted for 99% of the nation's renewable diesel consumption.[81]

California's renewable portfolio standard (RPS), enacted in 2002 and revised several times since then, required that 33% of electricity retail sales in California come from eligible renewable resources by 2020. The state met that goal three years before the target date.[82] The RPS also requires that 60% of electricity sales come from renewables by 2030, and 100% by 2045.[83] By 2020, 59% of California's electricity already came from carbon-free sources.[84] In 2022, the state legislature set intermediate targets of 90% renewable energy and zero-carbon electricity by the end of 2035 and 95% by the end of 2040 on the way to the eventual target of 100% by 2045.[85]

Petroleum

California was the sixth-largest crude oil producer among the states in 2022 and accounted for about 3% of the nation's total onshore and offshore oil production.[86] Although California's annual crude oil production has steadily declined from its peak of 394 million barrels in 1985, the state still produced more than 122 million barrels of crude oil in 2022.[87] Reservoirs along California's Pacific Coast, including in the Los Angeles basin, and those in the state's Central Valley contain major crude oil reserves, and the state holds 4% of the nation's total proved crude oil reserves.[88,89]

> *Foreign suppliers provide almost half of the crude oil refined in California.*

Assessments of California's offshore areas indicate the potential for large, undiscovered recoverable crude oil resources in the federally administered Outer Continental Shelf (OCS).[90] However, in 1994, concerns about the risks of offshore crude oil and natural gas development resulted in a permanent moratorium on new offshore oil and natural gas leasing in state waters.[91] Congress imposed a federal moratorium on oil and natural gas leasing in California federal waters in 1982, but it expired in 2008.[92] No new California offshore federal lease sales have occurred since then, although there are 22 older crude oil and natural gas production platforms that remain active in federal waters and 11 in state waters off the coast of California.[93,94,95]

California has about one-tenth of the nation's total crude oil refining capacity and ranks third after Texas and Louisiana.[96] A network of pipelines connects California crude oil production to the state's 13 operating petroleum refineries, which are located primarily in the Los Angeles area, the San Francisco Bay area, and the San Joaquin Valley.[97,98,99] As crude oil production in California and Alaska declined, the state's refineries increased their supply from foreign imports.[100,101] Led by Ecuador, Saudi Arabia, and Iraq, foreign suppliers provided almost half of the crude oil refined in California in 2021.[102,103]

California requires that motorists use, at a minimum, a specific blend of motor gasoline called CaRFG (California Reformulated Gasoline) to reduce emissions from motor vehicles. California refineries produce cleaner fuels in order to meet state environmental regulations. Refineries in the state often operate at or near maximum capacity because of the high demand for those petroleum products and the lack of interstate pipelines that can deliver those cleaner fuels into the state. When unplanned refinery outages occur, the lack of CaRFG deliveries available from interstate pipelines means replacement supplies of CaRFG come in by marine tanker from out-of-state U.S. refineries or from other countries. It can take several weeks to find and bring replacement motor gasoline from overseas that meets California's unique specifications.[104,105]

California is the nation's second-largest consumer of refined petroleum products, after Texas, and accounts for about 8% of U.S. total consumption.[106] In 2021, California was the nation's largest consumer of jet fuel and the second-largest consumer of motor gasoline, after Texas.[107,108] The transportation sector used about 83% of the petroleum consumed in the state. The industrial sector accounted for about 13% of state petroleum use, and the commercial sector consumed about 3%. The residential sector, where about 1 in 27 California households heat with petroleum products, mostly propane, used about 1%.[109] A minimal amount of petroleum is used for electricity generation.[110]

Natural gas

Most of California's natural gas reserves and production are in fields in the northern portion of the state's Central Valley.[111] California's natural gas output has declined steadily since 1985, and the state now accounts for less than 1% of the nation's total natural gas reserves and production.[112,113] California's natural gas production is less than one-tenth of the state's total consumption.[114,115] Several interstate natural gas pipelines enter California from Arizona, Nevada, and Oregon and bring natural gas into California from the Southwest, the Rocky Mountain region, and western Canada.[116] Although a small amount of natural gas is exported to Mexico, California consumes almost nine-tenths of the natural gas delivered to the state.[117] Some natural gas that enters the state is placed in California's 14 underground natural gas storage reservoirs in its 12 storage fields.[118] Together those fields have a natural gas storage capacity of about 600 billion cubic feet.[119]

California is the nation's second-largest natural gas consumer. Only Texas uses more.[120] In 2021, about 33% of the natural gas delivered to California consumers went to the state's industrial sector, and about 31% went to the electric power sector, where it fuels more than two-fifths of the state's total electricity generation.[121,122] The residential sector, where three in five California households use natural gas for home heating, accounted for 22% of natural gas use, and the commercial sector consumed about 12%. The transportation sector used about 1% as compressed natural gas vehicle fuel.[123,124]

California is the nation’s second-largest natural gas consumer.

Coal

California does not have any coal reserves or production and has very little coal-fired electricity generation. All the generation is from one industrial facility in Trona, California.[125,126] Almost all the coal consumed in California arrives by rail and truck from mines in Utah and Colorado. A small amount comes from Pennsylvania.[127] In 2021, some coal produced in other states was exported to other countries from California ports.[128]

Energy on tribal lands

California has the largest Native American population in the nation, and the state is home to more than 100 federally recognized tribal groups.[129,130] Although tribal areas exist throughout California, they account for less than 1% of the state's land area.[131,132] Many of the tribal lands are small, including the nation's smallest reservation, the 1.32-acre parcel that contains the Pit River Tribe cemetery.[133] The largest is the forested Hoopa Valley Reservation, home of the Hupa people, in northern California's Humboldt County. More than three-fourths of that reservation's more than 85,000 acres is commercial timberland.[134]

Excerpt of reference cited at footnote 6 to Alston & Bird's January 29, 2024 Letter

Full version available at https://epi.yale.edu/epi-results/2022/component/epi

Environmental Performance Index

2022 EPI Results

View country details

COUNTRY

View category details

CATEGORY

Results Overview

The 2022 EPI provides a quantitative basis for comparing, analyzing, and understanding environmental performance for 180 countries. We score and rank these countries on their environmental performance using the most recent year of data available and calculate how these scores have changed over the previous decade.

COUNTRY	RANK	EPI SCORE
FILTER BY REGION: ALL REGIONS		
Denmark (/epi-results/2022/country/dnk)	1	77.90
United Kingdom (/epi-results/2022/country/gbr)	2	77.70
Finland (/epi-results/2022/country/fin)	3	76.50
Malta (/epi-results/2022/country/mlt)	4	75.20
Sweden (/epi-results/2022/country/swe)	5	72.70
Luxembourg (/epi-results/2022/country/lux)	6	72.30

COUNTRY	RANK	EPI SCORE
FILTER BY REGION:		
Uzbekistan (/epi-results/2022/country/uzb)	107	38.20
Thailand (/epi-results/2022/country/tha)	108	38.10
Saudi Arabia (/epi-results/2022/country/sau)	109	37.90
Nicaragua (/epi-results/2022/country/nic)	110	37.70
Niger (/epi-results/2022/country/ner)	110	37.70
Russia (/epi-results/2022/country/rus)	112	37.50
Maldives (/epi-results/2022/country/mdv)	113	37.40
Micronesia (/epi-results/2022/country/fsm)	113	37.40
Uruguay (/epi-results/2022/country/ury)	113	37.40
South Africa (/epi-results/2022/country/zaf)	116	37.20
Tajikistan (/epi-results/2022/country/tjk)	117	37.10
Turkmenistan (/epi-results/2022/country/tkm)	118	37.00
Dem. Rep. Congo (/epi-results/2022/country/cod)	119	36.90
Vanuatu (/epi-results/2022/country/vut)	119	36.90
Honduras (/epi-results/2022/country/hnd)	121	36.50
Gambia (/epi-results/2022/country/gmb)	122	36.40
Samoa (/epi-results/2022/country/wsm)	122	36.40
Marshall Islands (/epi-results/2022/country/mhl)	124	36.20
Uganda (/epi-results/2022/country/uga)	125	35.80
Kyrgyzstan (/epi-results/2022/country/kgz)	126	35.70

COUNTRY	RANK	EPI SCORE
FILTER BY REGION:		
Guatemala (/epi-results/2022/country/gtm)	167	28.00
Madagascar (/epi-results/2022/country/mdg)	167	28.00
Iraq (/epi-results/2022/country/irq)	169	27.80
Ghana (/epi-results/2022/country/gha)	170	27.70
Sudan (/epi-results/2022/country/sdn)	171	27.60
Turkey (/epi-results/2022/country/tur)	172	26.30
Haiti (/epi-results/2022/country/hti)	173	26.10
Liberia (/epi-results/2022/country/lbr)	174	24.90
Papua New Guinea (/epi-results/2022/country/png)	175	24.80
Pakistan (/epi-results/2022/country/pak)	176	24.60
Bangladesh (/epi-results/2022/country/bgd)	177	23.10
Viet Nam (/epi-results/2022/country/vnm)	178	20.10
Myanmar (/epi-results/2022/country/mmr)	179	19.40
India (/epi-results/2022/country/ind)	180	18.90

Showing 1 to 180 of 180 entries

Excerpt of reference cited at footnote 7 to Alston & Bird's January 29, 2024 Letter

Full version available at https://freedomhouse.org/countries/freedom-world/scores

Freedom House

Countries and Territories

Freedom House rates people's access to political rights and civil liberties in 210 countries and territories through its annual Freedom in the World report. Individual freedoms—ranging from the right to vote to freedom of expression and equality before the law—can be affected by state or nonstate actors. Click on a country name below to access the full country narrative report.

Viewing:

Global Freedom Scores

Internet Freedom Scores

Democracy Scores

Quick Find:

Country Name

Country	Total Score and Status	Political Rights	Civil Liberties
Abkhazia*	39 Partly Free	17	22

TOP

Country	Total Score and Status		Political Rights	Civil Liberties
Haiti	30	Not Free	11	19
Honduras	48	Partly Free	22	26
Hong Kong*	41	Partly Free	9	32
Hungary	65	Partly Free	24	41
Iceland	94	Free	37	57
India	66	Partly Free	33	33
Indian Kashmir*	26	Not Free	6	20
Indonesia	57	Partly Free	29	28
Iran	11	Not Free	4	7
Iraq	30	Not Free	16	14
Ireland	97	Free	39	58
Israel	74	Free	34	40
Italy	90	Free	36	54
Jamaica	80	Free	33	47
Japan	96	Free	40	56
Jordan	33	Not Free	11	22
Kazakhstan	23	Not Free	5	18
Kenya	52	Partly Free	22	30

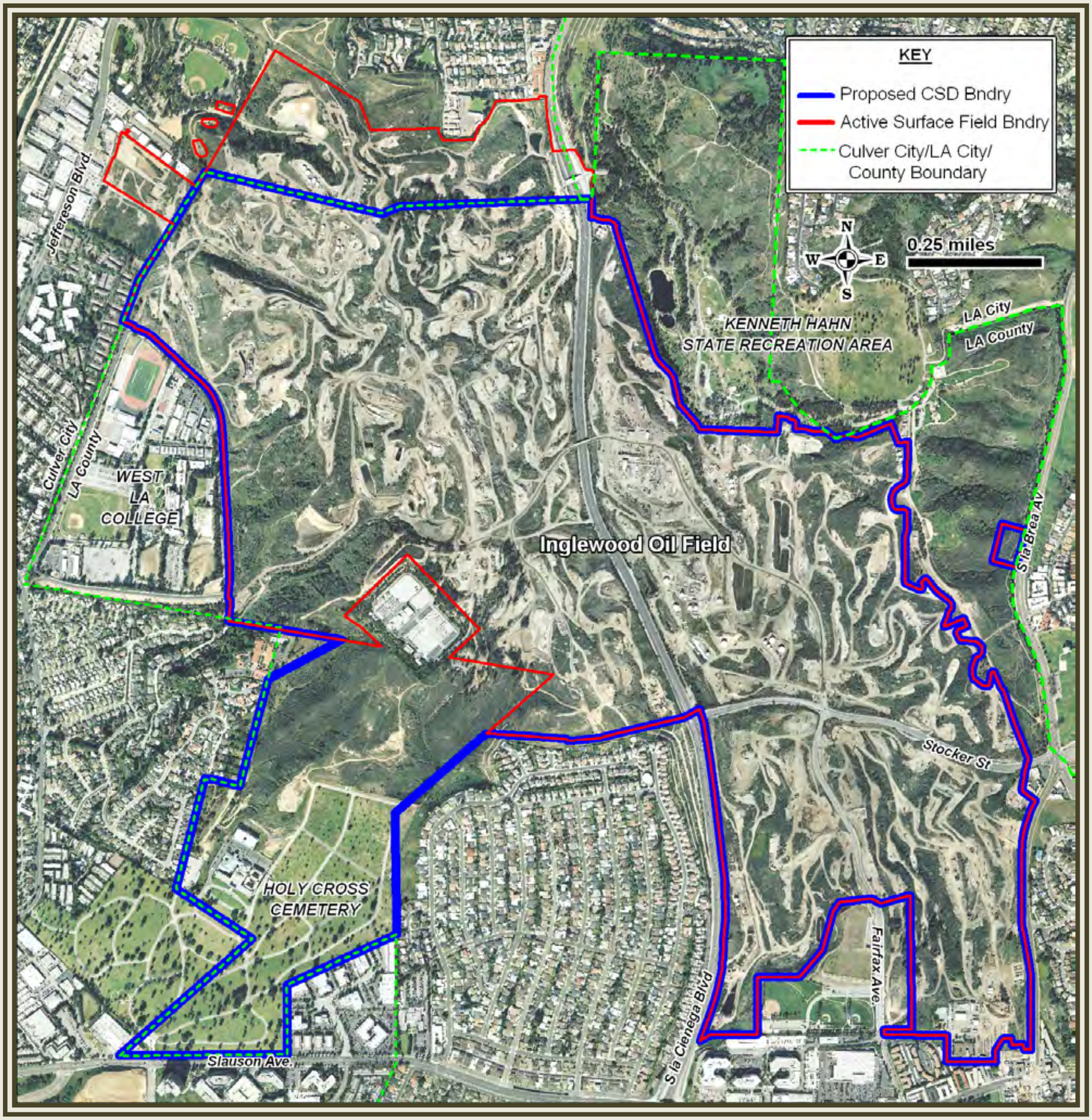
Country	Total Score and Status	Political Rights	Civil Liberties
Portugal	96 ▢ Free	39	57
Qatar	25 ▢ Not Free	7	18
Republic of the Congo	17 ▢ Not Free	2	15
Romania	83 ▢ Free	35	48
Russia	13 ▢ Not Free	4	9
Rwanda	23 ▢ Not Free	8	15
Samoa	84 ▢ Free	32	52
San Marino	97 ▢ Free	39	58
Saudi Arabia	8 ▢ Not Free	1	7
Senegal	67 ▢ Partly Free	28	39
Serbia	57 ▢ Partly Free	18	39
Seychelles	79 ▢ Free	34	45
Sierra Leone	60 ▢ Partly Free	24	36
Singapore	48 ▢ Partly Free	19	29
Slovakia	90 ▢ Free	37	53
Slovenia	96 ▢ Free	39	57
Solomon Islands	75 ▢ Free	28	47
Somalia	8 ▢ Not Free	2	6

Excerpt of reference cited at footnote 8 to Alston & Bird's January 29, 2024 Letter

Full version available at https://inglewoodoilfield.com/wp-content/uploads/2017/10/baldwin_hills_community_standards_district_final_eir-.pdf

Final Environmental Impact Report

Baldwin Hills Community Standards District



October 2008

SCH# 2007061133
County Project # R2007-00570
Environmental Case # RENVT2007-00048

Prepared For:
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Prepared By:
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Marine Research Specialists

Executive Summary

Plains Exploration & Production Company (PXP), the operator of the Inglewood Oil Field and the Applicant, has submitted an application to the County of Los Angeles to establish a Community Standards District (CSD). As part of this application, PXP submitted a draft of the CSD, which served as the proposed project for this Environmental Impact Report (EIR). The location of the Inglewood Oil Field is shown in Figure ES-1.

A CSD is a supplemental district used to address special issues that are unique to certain geographic areas within the unincorporated areas of Los Angeles County. The CSD would establish permanent development standards, operating requirements and procedures for the portions of the Inglewood Oil Field that is within Los Angeles County (note that the northern most areas of the field are within Culver City). The CSD would provide a means for implementing enhanced regulations to address the unique compatibility concerns associated with operating an oil field in the midst of urban development.

For the purposes of this EIR, the CSD is the proposed project as defined by CEQA. The proposed CSD boundary is shown in Figure ES-2 and is defined as areas within the County of Los Angeles located adjacent to the active Inglewood Oil Field that are zoned to allow for oil development and designated in the Los Angeles County General Plan as a "Mineral Resource Area". A typical EIR would evaluate the environmental impacts of the proposed project. In this case the proposed project is a CSD, which is a set of development standards. The CSD by itself would not result in any physical change to the environment. The purpose of the CSD is to reduce environmental impacts of future development at the Inglewood Oil Field through the establishment of permanent development standards, operating requirements and procedures.

There were three main goals associated with the development of this EIR, which included:

1. To provide the public and decision makers with detailed information about the current and future operations at the Inglewood Oil Field.
2. To determine what types of environmental impacts could result from future oil field development activities.
3. To determine if the CSD as proposed by PXP had the necessary development standards, operating requirements and procedures to mitigate the potential environmental impacts of future oil field development activities.

In order to accomplish these goals an environmental impact analysis was conducted on a Potential Future Oil Field Development Scenario. This scenario was developed with assistance from PXP, and looked at the maximum development that could occur at the Inglewood Oil Field over the next twenty years. It should be noted that PXP has not applied for any of this future development, and it is unknown at this time what portion of this development might occur.

Based upon the environmental impact analysis of the potential future oil field development, a number of measures were developed to mitigate the identified impacts. The development standards, operating requirements and procedures in the PXP-proposed CSD were then compared with the identified measures to determine areas where the CSD proposed by PXP was deficient.

This EIR is an informational document that is being used by the general public and Los Angeles County as one element in the decision making process for adoption of a CSD for the Inglewood Oil Field. The reader should not rely exclusively on the Executive Summary as the sole basis for judgment. The EIR should be consulted for information about the proposed project, environmental analysis and recommended measures for inclusion in the CSD.

The remainder of the Executive Summary consists of the following sections:

- Background information on the Inglewood Oil Field;
- A brief description of the proposed CSD;
- A brief description of potential future oil field development;
- A summary of key impacts and mitigation measures identified for the potential future oil field development; and
- A summary of the proposed CSD analysis

The purpose of the Executive Summary is to provide the reader with a brief overview of the proposed project, the anticipated environmental effects, and the potential mitigation measures that could reduce the severity of the impacts associated with the proposed project.

This EIR was prepared in accordance with State and Los Angeles County administrative guidelines established to comply with the California Environmental Quality Act (CEQA). In compliance with CEQA Guidelines, the County, as the Lead Agency, prepared a Scoping Document for the proposed project and solicited comments through distribution of a Notice of Preparation (NOP) (issued June, 28, 2007) for a 30-day comment period. The Scoping Document and comments received in response to the NOP were used to help direct the scope of the analysis and the technical studies in the EIR. A copy of the Final Scoping Document, the NOP, and the comments received can be found in Appendix K (This appendix is available in electronic format only on the CD attached to the inside cover of the notebook).

The Draft EIR was issued on June 19, 2008 for a 60-day public comment period. During this period, six community meeting, two public workshops, and two planning commission hearings were held to discuss the Draft EIR and take comments on the document. Based upon the comments received, changes have been made to the Final EIR. Areas where the Final EIR has been changed are marked on the side of the page with a vertical line. All comments received on the Draft EIR and their corresponding responses are provided in electronic format on the CD attached to inside cover of the notebook.

Figure ES-1 Location of the Inglewood Oil Field

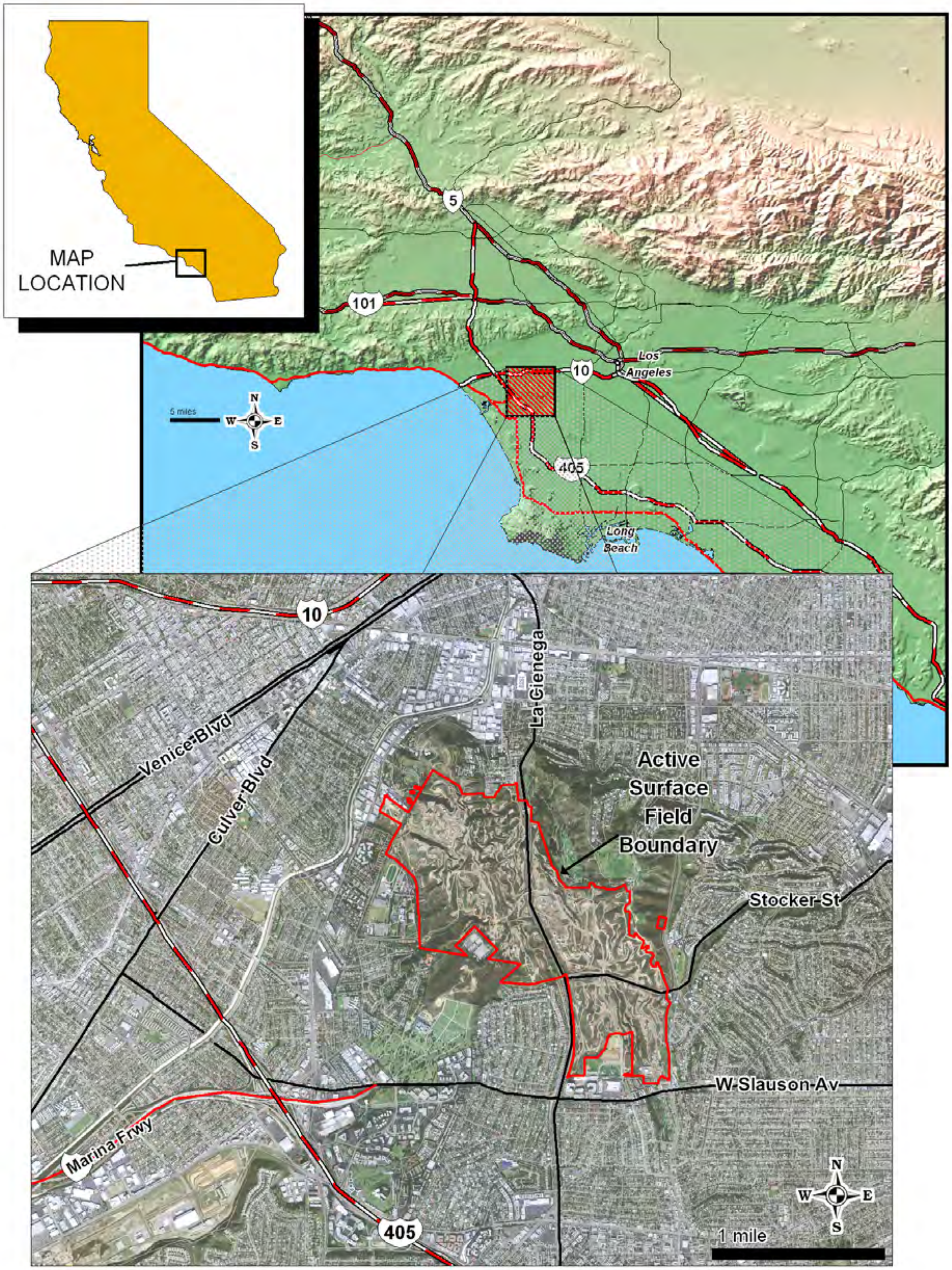
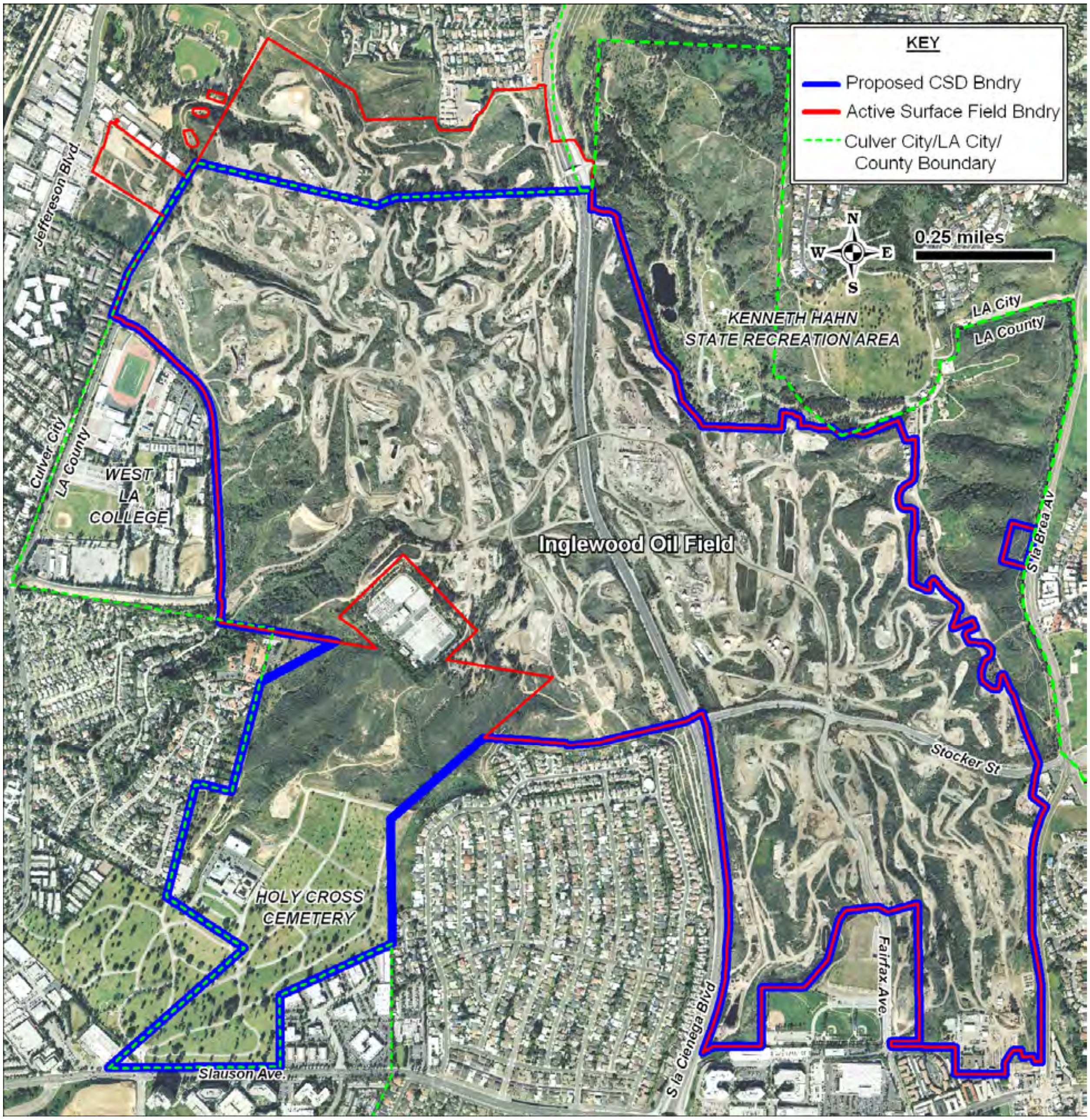


Figure ES-2 Proposed CSD Boundary



B. Background on the Inglewood Oil Field

Oil drilling in the Los Angeles Basin has a long history. According to the California Division of Oil, Gas and Geothermal Resources (DOGGR) database, almost 30,000 wells have been drilled in the Los Angeles Basin over the last 100-150 years.

The Inglewood Oil Field occupies an irregularly shaped area (Active Surface Boundary) that extends diagonally across the trend of the hills along the axis of the faulted Inglewood anticline and covers approximately 1,000 acres. Figure ES-1shows the location of the Inglewood Oil Field. Oil was first discovered in the Inglewood Field in 1924 as the result of a well drilled by Standard Oil. It was explored and developed rapidly such that its peak oil production occurred only a year later at a rate of over 90,000 barrels of oil per day (bopd). Production and development, mainly by "in-fill" drilling between wells, continued steadily to the present. Altogether, some 368 million barrels of oil and 269 billion cubic feet of natural gas have been produced from the field.

The Inglewood Oil Field has been in operation for over 82 years with over 1,600 wells being drilled during that time throughout the historical boundaries of the oil field, which has reduced over time. There are currently 1,463 wells (active, idle and abandoned) within the current surface lease boundary of the oil field (as of 2006).The terrain is gently rolling hills with native and non-native vegetation. There is heavy development of the active surface of the field with private roads, wells, pipelines, tankage and associated ancillary equipment required to operate the field. Adjacent development includes single-family homes, multiple family dwellings, and recreational, institutional, commercial and industrial uses.

The demographics of the area surrounding the Inglewood Oil Field within 1 mile are about 50% African American, 32% white, 6% Asian Pacific Islander and 12% other. About 25% of the persons are children under the age of 18 years. The mean household income is $46,000 and about 11% live in poverty.

As an added measure to ensure that study area minority populations are adequately identified, census data were gathered for Hispanic origin. Hispanic is considered an origin, not a race, by the U.S. Census Bureau. An origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person’s parents or ancestors before their arrival in the United States (U.S. Census Bureau 2005a). People who identify their origin as Spanish, Hispanic, or Latino may be of any race. Therefore, those who are counted as Hispanic are also counted under one or more race categories. Approximately 15 percent of the study area population was Hispanic in origin.

The Inglewood Oil Field is composed of various surface land and mineral rights. Activities at the Inglewood Oil Field involve the use of surface land for the establishment of well drilling, production, fluids processing, storage, etc. The area where PXP has surface land rights is shown in Figure ES-3. The surface land is the area where surface facilities can be placed, and it is typically considered the boundary of the Inglewood Oil Field. The rights to use the land “surface” for these activities are governed by applicable laws and regulations and the agreements that PXP (or previous owners) have established with various landowners.

The oil and gas reservoirs that are developed from the Inglewood Oil Field are subsurface reservoirs located between 800 and 10,000 feet deep. There are eight major oil and gas productions zones at the Inglewood Oil Field. Over 70 percent of the production wells and 90 percent of the injection wells are located in the Vickers-Rindge zone, which is at a depth of 3,500 to 4,300 feet. The majority of the production zones are made up of subzones where oil and gas is produced. The subzones are separated by layers of rock and represent distinct production area. These subzones vary in thickness and height throughout the production zone. Over the life of the oil field, 112 wells have been drilled into the Sentous zone, which is the deepest production zone. The reservoir areas that can be developed from the Inglewood Oil Field are governed by where PXP holds the mineral rights. A mineral right is part of the property rights of a parcel and may be sold, transferred, or leased. Mineral rights are distinct from “surface rights,” or the right to the use of the surface of the land for residential, agricultural, recreational, commercial, or other purposes. Mineral rights include the rights to use surface to develop minerals.

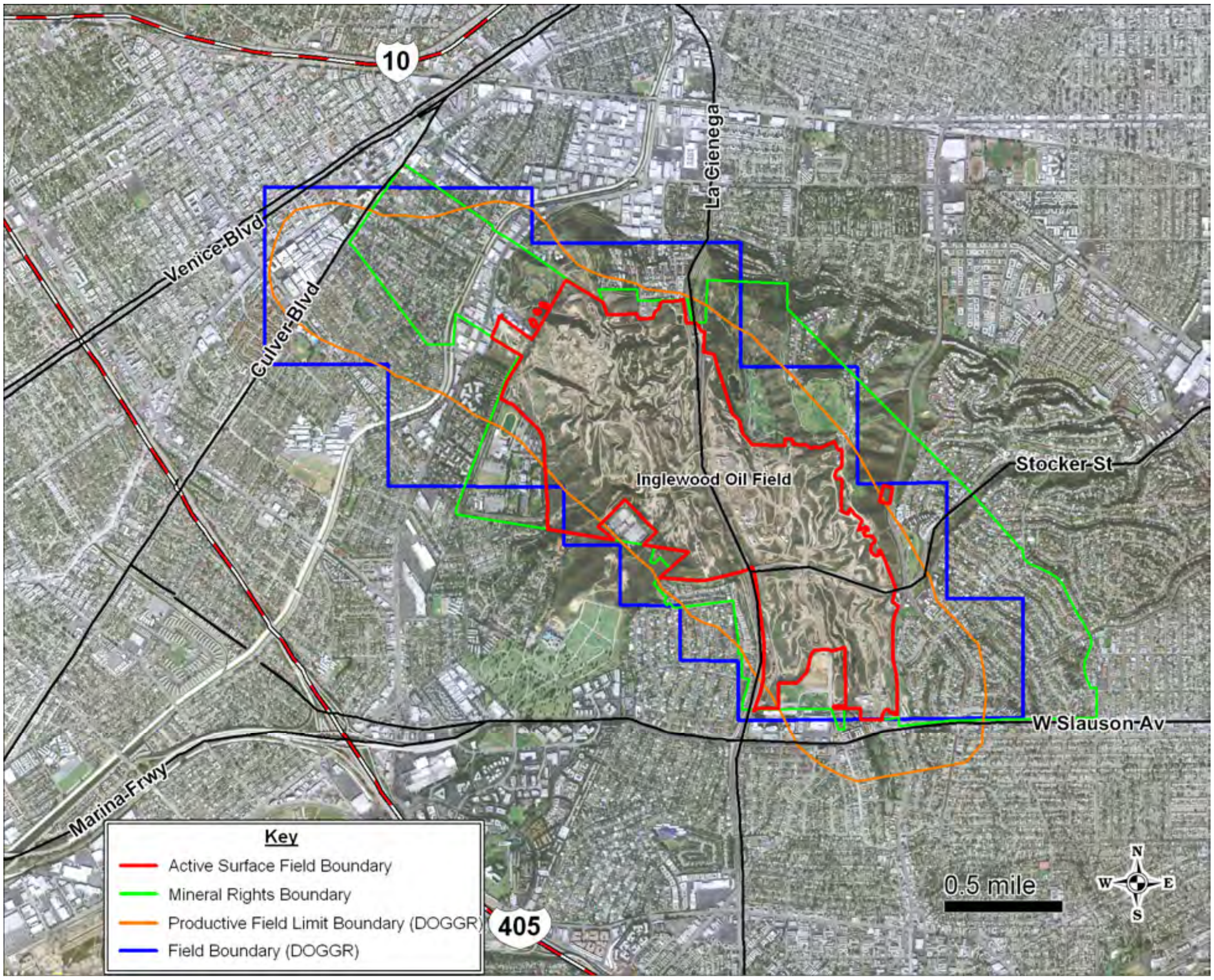
Mineral rights may be sold or retained separately from the surface rights, in which case the mineral rights are said to be “severed.” A person may own all of the mineral rights for a parcel or any fraction of the rights. A person may also own rights to only one kind of mineral, such as oil and gas, or to only one formation or depth interval. The ownership of the mineral rights in a parcel can usually be determined by examining the deed abstract for the property. There are generally restrictions on the mineral interest owner's right to use the surface if the surface rights are owned by someone else.

Figure ES-3 shows the mineral rights areas that PXP (or previous owners of the Inglewood Oil Field) have negotiated for extraction of the oil and gas resources. These are the areas where the oil field operator currently has rights to develop oil and gas resources. In a few areas of Los Angeles County, the surface and mineral rights are owned by different people. The owners of the mineral rights for these producing leases receive a royalty from the oil and gas extracted from the respective leases. The areas were the oil field operator has mineral rights access changes over time.

Also shown in Figure ES-3 is the active surface field boundary. This is the area where the oil field operator currently has access to use the land surface for the installation of surface facilities to support the oil and gas production.

DOGGR specifies the delineated extent of "productive field limit boundary" and the "field boundary", both of which are shown in Figure ES-3. The "productive field limit boundary" is the sub-surface area where oil and gas production is known to have occurred or is currently occurring. The "field boundary" is the surface area which overlies one or more common underground reservoirs where DOGGR believes oil and gas exist. Both the “productive field limit boundary” and the “field boundary” are changed by DOGGR when new geological data warrants a change.

Figure ES-3 Surface and Mineral Rights Boundaries for the Inglewood Oil Field

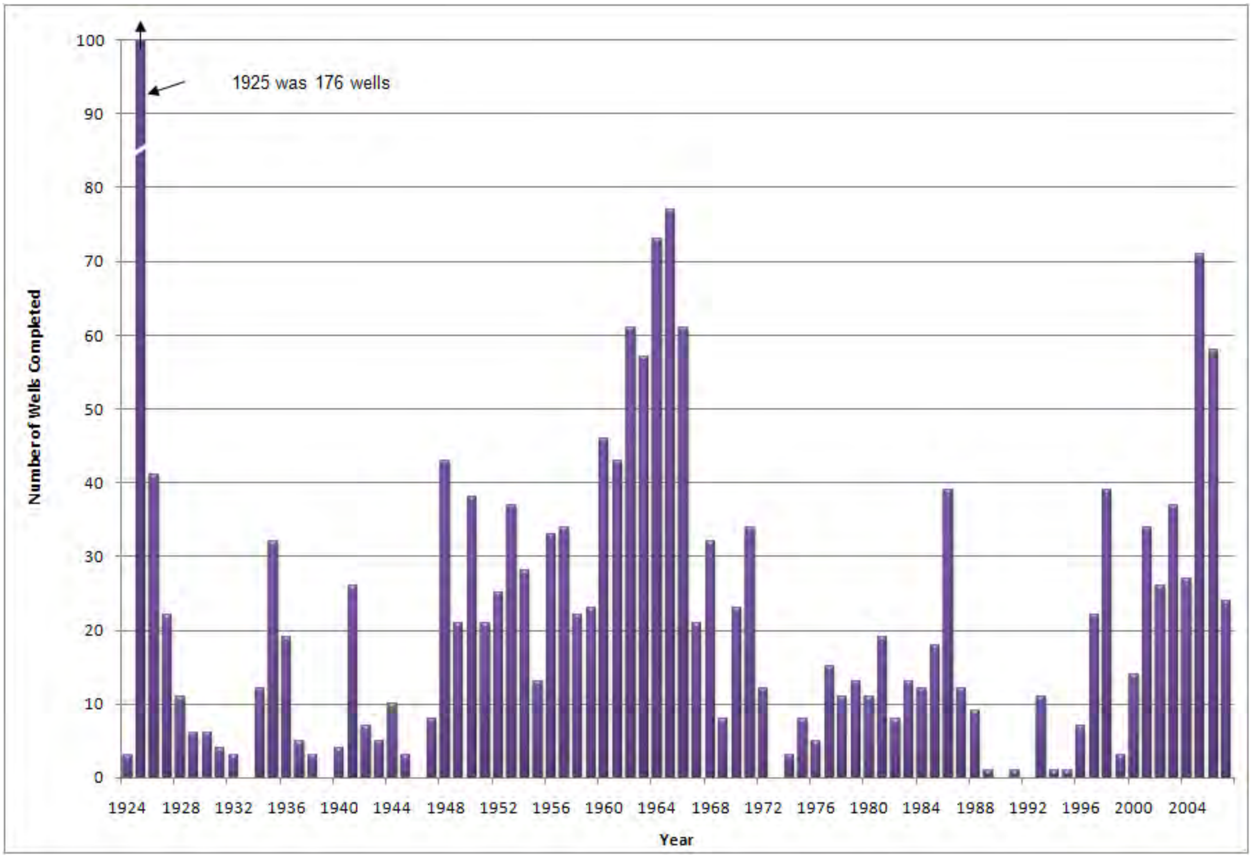


There are currently 436 active producing wells drilled from within the active surface boundary at the Inglewood Oil Field, 207 active water injection wells, 177 shut-in wells, 643 abandoned wells for a total of 1,463 wells within the current surface lease boundary of the oil field (as of 2006). .

The current production volumes from the Inglewood field are 8,700 barrels per day (bpd) oil, 300,000 bpd water, and 5,700 thousand standard cubic feet per day (mscfd) gas (as of February, 2007). Historical crude oil production volumes have ranged up to 90,000 bpd (in the 1920s) with gas production as high as 25,000 mscfd (in the 1960s).

The historical number of wells drilled per year has ranged from zero to 176 wells completed in 1925. Recently the number of wells drilled has averaged 36 per year between 2000 and 2007. See Figure ES-4 for information on number of wells drilled since 1924.

Figure ES-4 Historical Well Drilling Activity (Well Completions) Since 1924



Current activities at the Inglewood Oil Field involve extracting oil and gas from subsurface reservoirs located between 1,000 and 10,000 feet deep, processing the crude oil to remove water and processing the gas to remove water and gas liquids (e.g., propane and butane). Drilling is conducted 24 hours per day as stopping the drilling before casing is set could cause the wellbore to collapse around the drilling bit and make the restarting of the drilling operation difficult if not impossible. Crude oil is then shipped by pipeline to area refineries to be processed into gasoline and other products. The gas is shipped by pipeline to The Gas Company for end use by consumers and industry or is shipped to area refineries for use in the refining processes. The Gas Company has specifications related to the levels of H_2S, ethane, propane, and the BTU content of the gas that the gas Company will accept.

More information on the current Inglewood Oil Field operations can be found in Chapter 2 of the EIR.

C. Proposed Project- CSD

As part of their application to Los Angeles County to establish a CSD, PXP prepared a draft CSD. The PXP proposed CSD is divided into eight major parts that include the following.

A. Intent and Purpose;
B. Description of Boundary;
C. Definitions;
D. Community Wide Development Standards;
E. Community Relations;
F. Permits Required; and
G. Procedures for Obtaining Approval From Department of Regional Planning,

Section D of the CSD provides the development standards, operating requirements and procedures proposed for the Inglewood Oil Field. This section addresses issues covering drilling operations, production operations, maintenance operations, landscaping, grading, operation of oil field recovery heaters (steam generators), non-producing and idle wells, as well as some general conditions. A copy of the PXP proposed CSD is attached at the end of the Executive Summary.

D. Potential Future Inglewood Oil Field Development

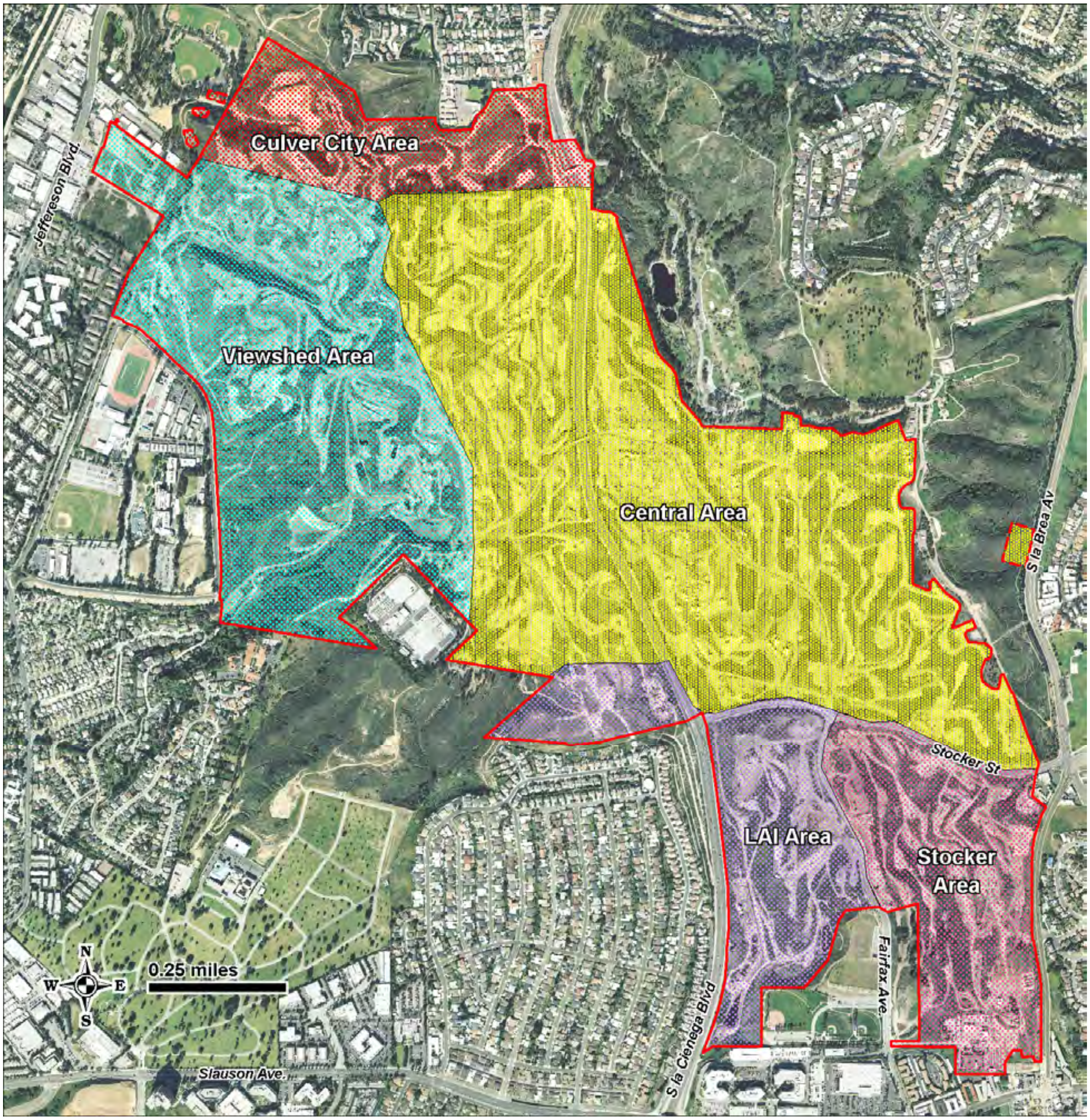
This section of the executive summary provides a potential future development scenario for the Inglewood Oil Field. The scenario was developed with input from PXP and covers a 20 year period. PXP has not applied to any agency for permits to conduct this development, and it is unknown what if any of this development will occur in the next 20 years.

Over the next 20 years, an average of approximately 53 wells per year could be drilled in the Inglewood Oil Field, for an average of 742 rig-days per year. While it is not possible to identify the exact location of each of these future wells, the well locations have been grouped into 5 drilling areas; Culver City area, located within Culver City; the Viewshed area where some of the areas are viewable from Culver City; the Central area located in the center of the field north of Stocker St. and east of La Cienega; the South LAI area located west of Fairfax Blvd. and south of Stocker St.; and the Stocker area located south of Stocker St. and east of Fairfax Blvd. Figure ES-5 shows the location of these five drilling areas.

During the peak year, as many as 85 wells could be drilled for a peak annual activity of 1,190 rig-days, and up to three new-well drill rigs could be operating at the oil field at any one time. The average number of drilling rigs at the site would be between one and two per year over the 20 year period.

Future drilling could increase the production of oil and gas from the field. Potential crude oil production is estimated to peak at about 21,000 bpd and gas production is estimated to peak at about 15,000 mscfd. Water produced and then re-injected is estimated to peak at about 720,000 bpd.

Figure ES-5 Drilling Areas



Source: PXP

The produced oil and gas from the future wells would be handled in much the same way as the current production at the oil field. Production from the wells would be separated into gas, oil and water streams. The oil would be processed to remove any remaining water, and then the dry oil would be stored in tanks and shipped via pipeline to local Los Angeles area refineries.

The produced water would be treated and then sent to injection wells, where the water would be injected back into the producing formation.

The produced gas would be sent to the existing gas plant where water, gas liquids (e.g., propane, butane, etc) and impurities would be removed. The gas would then be compressed, odorized and sold to the Southern California Gas Company or to a Los Angeles area refinery. The gas liquids would be fractionated into propane and butane+ (butane plus heavier gas liquids). The propane would be stored on site and then loaded into trucks for distribution throughout the Los Angeles basin. The butane+ would be blended back into the crude oil stream and shipped, along with the crude oil, to area refineries.

It is possible that the increase in oil production could require the construction and operation of a number of new facilities or modification of existing facilities, including:

- Well slot manifolds and automatic well test units;
- Oil cleaning plant;
- Water treating facility;
- Water injection wells; and a
- Vapor recovery skid.

PXP is considering implementing a steam drive development project in the future for a portion of the Inglewood Oil Field. The steam drive development project would involve the use of steam injected into portions of the field to enhance oil recovery. This would involve the installation of approximately 63 wells within the Stocker and South LAI areas of the field (see Figure ES-5). Forty-eight of these wells would be for the production of oil and gas, and the remaining 15 wells would be used for steam injection.

Equipment installations associated with the Steam Drive facilities would include the following:

- New wells and oil treatment plant;
- New gas treatment plant;
- New water treatment plant and water softening plant; and a
- New steam generation plant.

More information on the potential future oil field development can be found in Chapter 3 of the EIR.

E. Impacts Associated with Potential Future Oil Field Development

A majority of the Environmental Analysis is focused on identifying the possible environmental impacts associated with the potential future oil field development. The impact analysis looked at 16 different environmental issue areas such as noise, health risk, safety, geology, visual, etc.

Where needed, mitigation measures were developed that, if included as standards or requirements in the CSD, would serve to reduce the severity or eliminate the impact. The impact summary table (Table ES.1 located right after the Executive Summary) provides a list of all of the impacts that were identified in the EIR as well as the proposed mitigation measures. The remainder of this section of the Executive Summary provides a summary of some of the key impacts and associated mitigation measures.

The reader is referred to Chapter 4 of the EIR for a more detailed discussion of the impacts and mitigation measures.

Drilling Noise - During drilling of new wells, potential impacts are exacerbated because drilling continues day and night, 24-hours per day. Major noise sources associated with new well drilling include: internal combustion engines, metal-to-metal contact, electric motors, pumps, brakes on the drawworks, personnel voices (yelling instructions) and warning devices such as backup alarms on equipment.

A number of mitigation measures are included to mitigate the noise impacts to less than significant; they include not elevating noise levels at the property line of a neighboring use by more than 5 dBA of the existing baseline. This limit on noise will require the use of noise barriers that address specific sources including: the mast board and rig floor, mud works, drill rig motors, coil tubing unit, cutting conveyor and openings to the generator enclosure. In addition to noise barriers a number of other possible techniques that could be used by the oilfield operator to reduce noise from the drilling rig include: use of “critical” grade exhaust mufflers on all internal combustion engines; acoustical enclosure of the diesel generator; resilient pads on the drill floor, pipe storage area and V-door to reduce metal-to-metal noise; sound covers on the drawworks to reduce brake noise and use of visual signals and radios instead of back-up alarms, annunciators and shouted instructions. The noise output of new drilling rigs could be substantially reduced by use of a remote power generator, situated at the center of the oilfield and away from the sensitive uses at the perimeter, with electrical cables running out to the drill sites. Another possible solution to noise from drilling is the oilfield operator should provide sufficient distance between new well drilling sites and the oilfield perimeter. In addition, the oil field operator could implement a quiet mode of operation during night-time hours when background noise levels are at their lowest.

Other noise mitigation measures that have been identified in the EIR include, but are not limited to the following.

- Noise produced by oilfield operations shall include no pure tones when measured at a neighboring property.
- Deliveries to the oilfield shall be limited to between the hours of 7:00 A.M and 8:00 P.M., and 9:00 AM to 8:00 PM on Sundays and legal holidays.
- Deliveries to a site within 500 feet of a sensitive receptor shall be limited to between the hours of 7:00 A.M and 5:00 P.M., and 9:00 AM and 5:00 PM on Sundays and legal holidays.

- Backup alarms on all vehicles operating within the oil field shall be disabled between the hours of 8:00 P.M. and 8:00 AM. During periods when the backup alarms are disabled the oil field operator shall employ alternate, low-noise methods for ensuring worker safety during vehicle backup, such as the use of spotters.

- All drilling equipment shall be regularly serviced, maintained and repaired to minimize increases in noise output with time and to ensure that tonal noise from worn bearings, metal-on-metal contact, valves etc does not cause significant tonal noise at the oilfield perimeter.

- Existing and future Gas Plant well pumps shall be regularly serviced and repaired to ensure that tonal noise from worn bearings; metal-on-metal contact, etc. does not cause significant tonal noise at the oilfield perimeter.

- Locate all stationary noise-generating construction equipment as far as possible from sensitive land uses at the perimeter of the oilfield.

- The oil field operator shall install a new flare that is capable of handling the full volume of gas from the gas plant without elevating vibration levels or low-frequency ambient noise levels at the oil field perimeter. The oil field operator shall implement operating procedures that limits the amount of gas going to the flare to below that which causes vibration or low level airborne noise at offsite locations. These operating procedures shall be implemented until such time as the new flare is installed.

With the proper implementation of the above mentioned mitigation measures and others included within the Noise Section, 4.9, the impacts would be considered to be less than significant.

Air Toxics – Toxic emissions associated with future construction and operations would increase over the current emissions due to an increase in drilling, well workovers, crude oil throughput, fugitive emissions associated with new equipment, an increase in combustion associated with existing heaters and new heaters associated with steam generators. In addition, more construction would be taking place at the field, including grading, and new equipment installation. All of these construction activities utilize diesel engine power construction equipment, which emit toxic pollutants.

As per AB2588, health risk assessments are required for facilities that emit toxic pollutants above a threshold criteria level. Based on the annual emission reporting requirements of the SCAQMD, future operations at the Inglewood Oil Field would exceed the reporting threshold for a number of toxic pollutants. Overall, worst-case health risk associated with future operations exceeded applicable health risk criteria for individual cancer risk and acute non-cancer risk.

Several mitigation measures have been identified as part of the Air Quality Analysis and the health risk analysis that would serve to mitigate the air toxics emissions. The EIR provides for the installation of second generation heavy duty diesel catalysts Tier II diesel engines on all drill rigs. Finally, an additional mitigation was added requiring that when drilling new wells, a distance of at least 400 feet be maintained from all areas where public exposure could occur. This would generally equate to maintaining a buffer of 400 feet from all adjacent property boundaries where sensitive receptors could be located, or 300 feet if the rig generator can be placed at least 500 feet from the drill rig. Alternatively, new health risk assessment would have to be performed to determine if additional changes to the buffer zones are merited. A mitigation measure is provided to require the use of Tier II engines for all off road construction equipment. With the adoption of the above mentioned mitigation measures, health risk impacts would be considered to be less than significant.

Subsidence/Uplift – The maximum cumulative subsidence of any of the areas along the Newport-Inglewood Fault Zone is centered over the Inglewood Oil Field. Subsidence is often accompanied by large-scale earth cracking, and in some cases the earth cracking includes vertical movement, creating incipient or actual faulting. Surveying indicated that greater than two feet of subsidence-related, horizontal earth movement had occurred in the Baldwin Hills from 1934 to 1961, in the vicinity of the southeast active surface field boundary. By 1957, up to 10 feet of subsidence had occurred in other localized areas of the Baldwin Hills.

Surveying by the Los Angeles County, Department of Public Works indicated that subsidence had been abated, at least temporarily, by 1974. No survey data was available subsequent to 1974. However, more recently, researchers from the U.S. Geological Survey have indicated that portions of the Baldwin Hills are actually uplifting at a rate of 5 to 9 millimeters per year, as a result of secondary recovery-related, water injection operations. Since 1993, fluid injection has exceeded withdrawal in the Inglewood Oil Field, consistent with the observed uplift.

Therefore, the potential for subsidence/uplift related damage to overlying structures and/or infrastructure, as a result of continued oil withdrawal, is low but the impacts are still considered potentially significant. Given the fact that injection pressures are maintained below the fracture pressures of the injection zones the potential for induced earthquakes is low and impacts are considered less than significant.

A number of mitigation measures are provided in the EIR that require subsidence and uplift monitoring to be completed annually in the vicinity of the Inglewood Oil Field. Surveying for both vertical and horizontal ground movement should be completed in the vicinity of the Inglewood Oil Field, utilizing Global Positioning System technology. Accumulated subsidence or uplift (since post-Baldwin Hills Reservoir failure studies) should be measured in the vicinity of the Inglewood Oil Field, using repeat pass Differentially Interferometric Synthetic Aperture Radar technology.

In the event that Global Positioning System monitoring indicates that on-going subsidence or uplift is occurring in the Inglewood Oil Field, and is determined to be caused by the oil field operations, then adjustments would be made to the water injection and production rates at the oil field to stop the subsidence or uplift.

Oil Spill Risk – The potential development would increase the throughput of crude oil throughout the field including piping and tanks. There would also be additional piping from the added well heads and additional separation equipment associated with the oil cleaning plant and the water treatment plant that would be handling crude oil or emulsion.

These increased throughputs and additional equipment would increase the volume of spills if equipment were to leak or rupture, and would increase the frequency of spills at the field due to the increased amount of equipment. The maximum single-tank crude oil storage volumes at the field would not increase over current maximum single-tank volumes, although there could be an increase in the number of tanks. The new tanks would have lower failure rates than the existing crude oil storage tanks due to the new installation. However, most areas at the field are contained within secondary containment (berms) and retention basins and discharges to the environment are controlled with closed drain valves.

The retention basin drain valves could be left open during a draining and not closed during subsequent inspections. This would allow a spill to reach the areas outside the retention basins and potentially impact area creeks. Because of the use of drain valves and the inspections, the frequency of a release impacting the areas outside the field is low. With the added equipment, the frequency of rupture spills would increase to once every 5.7 years (from once every 6.0 years) and the frequency of spills that could affect the areas outside the field would increase to once about every 4,900 years (from once every 5,200 years). This assumes that all areas drain to a retention basin. A pipeline spill that occurred in March, 2008 entered a storm drain, thereby indicating that some areas of the field may not be protected by the retention basins or containment berms.

In order to mitigate this impact, the EIR includes mitigation measures requiring that all existing tank areas at the field and all new tank areas have secondary containment (berms and walls) that can contain at least 110% of the largest tank volume to prevent spills from entering the retention basin areas. In addition, the retention basins shall be adequately sited, inspected, maintained and operated to handle a 100-year storm event plus a potential spill of the volume of the largest tank that would drain into each basin. A survey would be conducted to ensure that all above ground pipelines at the field drains to a basin or a containment area.

Vibration – The major source of vibration at the oil field is associated with the gas plant flare. Under normal operating conditions, gas from the gas plant is shipped via pipeline into a Southern California Gas transmission pipeline. There are times when this transmission pipeline is shut-down without prior knowledge of the oil field operator. When this happens, the gas from the gas plant must be routed to the flare. This places a large volume of gas through the flare which produces low tonal vibrations that affect offsite areas, particularly in the Ladera Heights area. Given that these events are unplanned, it was not possible to measure the level of vibration. However, the vibration associated with flaring large volumes of gas would be considered significant, but mitigable.

In order to mitigate vibration impacts, the EIR recommends that mitigation measures be added that reduce vibration levels from drilling and operations to not exceed a velocity of 0.25 mm/s over the frequency range 1 to 100 Hz at the property line. In addition, the oil field operator shall install a new flare that is capable of handling the full volume of gas from the gas plant without producing low level vibration.

Odors – Odor events could increase due to the addition of equipment, increased operations at existing equipment and increased drilling. Added equipment would increase the number of components that could leak causing odors. Increased operations would increase the use of tanks, potentially leading to odor events. Increased drilling would increase the frequency of emissions from drilling muds during drilling operations. Some of these types of releases have caused Notice of Violations historically. These would be considered a significant impact.

A number of mitigation measures are provided in the EIR to reduce odor impacts and they include the following.

- The use of a portable flare as part of drilling operations for wells where there exists a potential for gas releases during drilling.
- The installation of a pressure monitoring system in the vapor space of all crude oil tanks. Possible upgrades to the tank vapor recovery system if hatches on the crude oil tanks are determined to lift and vent to atmosphere on a regular basis (more than once per quarter on any tank).
- Use of an odor suppressant when loading material into the bioremediation farms.
- Ensuring that all produced water and crude oil are contained within closed systems during production, processing, and storage.
- The installation of a meteorological monitoring station at the Inglewood Oil Field that meets the requirements of the U.S. EPA guidelines.

In addition, the air monitoring program has been included as a mitigation that would require for drilling operations and the gas plant. At all drill sites air would be monitored for total hydrocarbon vapors and hydrogen sulfide. If the total hydrocarbon vapors or hydrogen sulfide exceeded prescribed levels the operator would be required to take specific action up to and including shutting down the drilling operation. At the gas plant air would be monitored for total hydrocarbon vapors. If the total hydrocarbon vapors exceeded prescribed levels the operator would be required to take specific action up to and including shutting down the gas plant.

F. Analysis of the Proposed CSD

Section D of the PXP-proposed CSD provides the community-wide development standards. (A copy of the Applicant-proposed CSD is provided at the end of the Executive Summary). Table ES.2 provides a comparison of the community-wide standards in the Applicant-proposed CSD and the mitigation measures identified in the analysis of the Potential Inglewood Oil Field Development Scenario. Recommended modifications to the proposed CSD based on the analysis of the Applicant proposed CSD and the mitigation measures are discussed in Table ES.2.

Table 4.2.13 Electricity Generation Resource Mix and Greenhouse Gas Emissions

Area	United States	Western States (WECC)	California ISO	So Cal Edison Service Area*
Resource Mix, %				
Coal	50.2	34.2	1.2	1.7
Oil	3.0	0.5	1.2	0.9
Gas	17.4	26.3	51.1	41.9
Nuclear	20.0	9.9	16.8	38.0
Hydro	6.6	24.3	17.3	4.7
Biomass	1.4	1.3	3.2	2.9
Wind	0.3	0.9	2.4	3.8
Solar	0.0	0.1	0.3	0.8
Geo	0.3	2.0	5.5	4.1
Other Fossil	0.5	0.3	0.9	1.2
Other	0.1	0.0	0.0	0.0
Non-renewables	91.3	71.3	71.3	83.7
Renewables	8.7	28.7	28.7	16.3
Non-hydro Renewables	2.1	4.3	11.4	11.6
CO2 Rate, lb/MWh	1363	1107	687	613

Notes: Source is eGRID database with modifications and updates. *SCE Service area includes 75% of San Onofre, Geothermal in Nevada and hydro in Sierra Nevada, San Bernardino & LA. Mojave Coal Fired Power Plant not included in CalISO or So Cal Edison service area as it was shut down in 2005. Resource mix is the percentage of total mega-watt hours. Renewables are defined as hydro, biomass, wind, solar, geo and other.

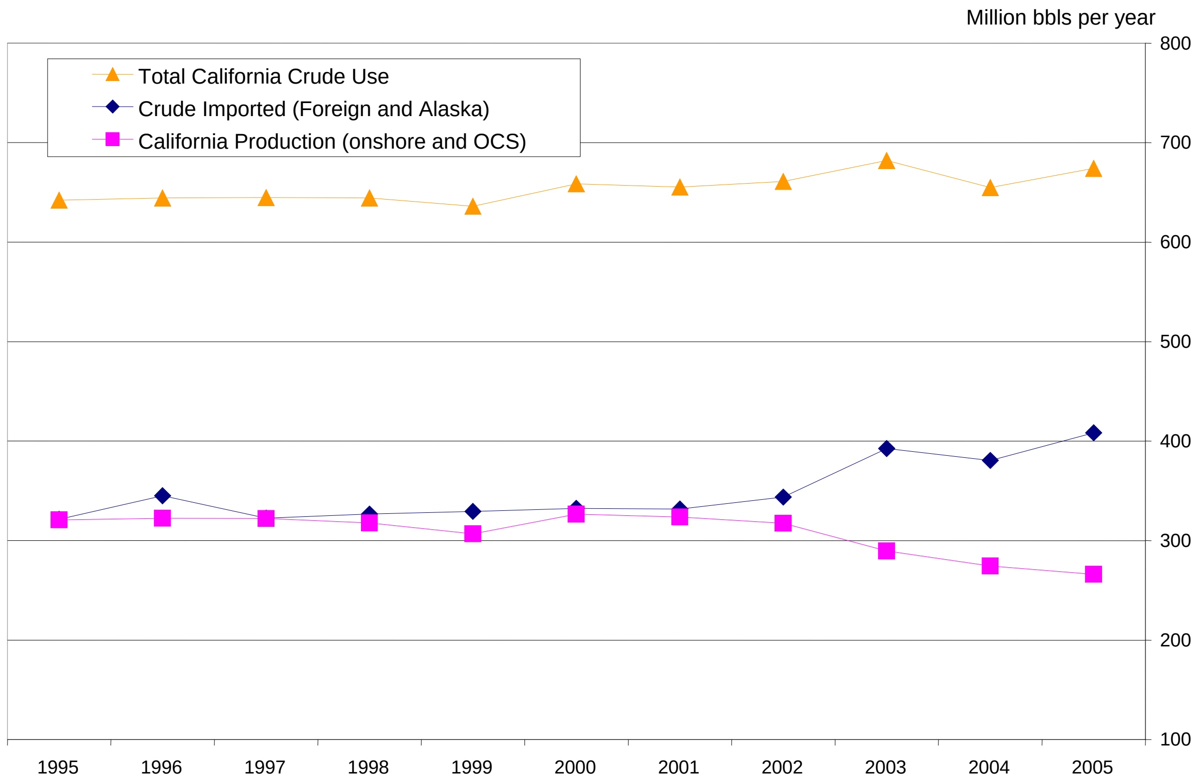
Crude Oil Transportation/Refining Lifecycle and Greenhouse Gas Emissions

One aspect of the "lifecycle" analysis of greenhouse gas emissions associated with the baseline and potential development is the dynamics of the crude oil markets in California. The supply of crude oil is driven by the demand for refined products (gasoline, diesel and jet fuel). Currently, the demand for refined products is met through supply to California refineries of crude oil from California domestic production, foreign imports of crude oil, imports of crude oil from Alaska, and imports of refined products. There are no crude oil pipelines which bring crude oil into California.

This means that the only sources of crude oil to meet refinery crude oil demand are from California production, Alaska production, or from foreign sources brought into ports by tanker ships.

California production of crude oil per year has been in decline since 1986, when production peaked at slightly over 400 million barrels. The decline has averaged about 1.7% per year since 1995. More recently, the decline has averaged over 3% annually since the year 2000. Figure 4.2-6 shows the total California crude oil use, California production, and the associated imports through California ports.

Figure 4.2-6 California Crude Oil Use, Production and Imports



Source: CEC and DOGGR databases online

The production of Alaska North Slope crude oil has experienced decline due to the age of the reservoirs. Alaska North Slope production has declined since its peak in 1989 of about 328 million barrels annually. The average rate of decline since 1995 has been above 4%.

At the same time that there has been declining California production and declining Alaska North Slope production, demand for crude oil in California has remained relatively flat, with an annual average increase since 1995 of only about 0.5%.

The combination of declining California and Alaska North Slope production along with a relatively constant, flat demand for crude oil in California equates to an increase in foreign crude oil imports. Foreign crude oil imports since 1995 have increased by an average of almost 38%. As seen in Figure 4.2-6, the increase in imports closely mirrors the decline in California production since about 2000.

The California Energy Commission (CEC) has produced a number of reports on the state of the California crude oil markets. They conclude the following:

- "Declining California production will be replaced with crude oil delivered by marine vessel" (CEC 2003);

- A "reduction in [gasoline] use with alternative fuels and efficiency improvements will reduce imports of [refined] products, not imports of crude oil" (CEC 2007);
- "Without increasing the fuel supply by importing additional crude oil and transportation fuels, California will not only continue to experience supply disruptions and price spikes, but also supply shortages and prolonged and elevated prices, for gasoline fuels"; (CEC 2003b); and
- "Supplies of crude oil from within California and from Alaska have been declining, requiring California to import an increasing proportion of its crude oil from foreign sources" (CEC 2003b).
- The CEC estimates that increases in imports of crude oil to California translates into "an additional 150 shipments of crude oil [into ports] received per year [by] 2015" (CEC 2005).

A component of the crude oil markets involve Los Angeles area refineries and their associated ability to process a range of different crude types, from the relatively sweet/light Alaska North Slope crude to the heavy San Joaquin Valley crudes. Increased installation of cracking units at refineries, which allow for the refining of heavier crude oils into gasoline and lighter products, in the last 5-10 years has increased the ability of refineries to process heavier crude oils as the supply of ANS crude and San Joaquin Valley light crude has diminished (SCAQMD CEQA Documents).

The three major regions of California crude oil production are Kern County, the Los Angeles Basin, and the Outer Continental Shelf. Oil from Kern County accounts for two-thirds of California's total crude oil production. Approximately 58 percent of the Kern County crude oil has an API of 18 degrees or less (heavy crude). The Los Angeles Basin's largest fields are the Wilmington and the Huntington Beach fields with average APIs of 17 to 19 degrees, respectively (heavy crude). The Outer Continental Shelf accounts for about 10 percent of the total California production. The quality of Outer Continental Shelf crude oil varies by field with API gravities ranging from 14 to 38 degrees (heavy to light crude). (CEC 2006). Alaska North Slope crude oil ranges from an API gravity of 22 to 40 degrees (light crude).

Oil imports delivered to California from foreign sources by ocean going tankers come from Saudi Arabia (35%), Ecuador (25%), Iraq (12%), Mexico (7%) and others. The Saudi crude oil API gravity ranges from 28 to 34 degrees (light crude) (CEC 2006).

The use of foreign crude oil is associated with substantial emissions associated with transportation as foreign crude oil needs to be transported from between 4,000 miles (Ecuador) and 13,000 miles (Saudi Arabia) one-way to get to California. Alaska North Slope crude travels about 2,500 miles from Alaska. This causes the greenhouse gas lifecycle emissions associated with foreign crude oil to be substantially higher than California crude oil.

Transportation of the majority of California crude oil is via pipeline, which requires energy to pump the crude oil to the refineries. This energy is generally a function of the type of crude oil, if heating is required, and the distance and terrain between the wells and the refinery.

Very little, if any, crude oil is exported from California. Since the beginning of 2001 through the end of November 2007, 1,367,000 barrels of crude has been exported from PADD 5 (California, Arizona, Nevada, Oregon, Washington, Alaska, and Hawaii). The majority of the exports were a shipment to China of 805,000 barrels in April 2004, 401,000 barrels to Canada in January 2006, and 57,000 barrels to Canada in October 2004 (EIA 2008). The remaining exports from PADD 5 (17 shipments) were to Canada and Mexico, and averaged approximately 6,000 barrels per shipment. Given the small size of most of these shipments, it is likely they were via truck and not marine tanker.

Therefore, if one assumes that all of the PADD 5 exports originated from California, which is highly unlikely, but the most conservative assumption, then at best there would have been two to four marine tanker trips for exporting crude over a seven year period. This compares with over 1,000 tanker trips that imported crude oil into California over the same seven year period.

Refining of crude oil into end-use products such as gasoline, diesel and jet fuel requires energy. Refinery energy requirements are a function of the refinery arrangements, the type of crude oil, the type of gasoline being produced (winter or summer blends), the level of sulfur removal required, etc. Efficiencies of refineries have been shown to range from 83 to 87% (GM, 2001), meaning that 13 to 17% of the product energy content is required to refine the product.

4.2.7.2 Affected Environment

National Greenhouse Gas Emissions

Fossil fuel combustion represents the vast majority of the nation's greenhouse gas emissions, with CO_2 being the primary greenhouse gas. The total U.S. greenhouse gas emissions were 7,260 million metric tons of carbon equivalents (MMTCE) in 2005, of which 84% was CO_2 emissions (EPA 2007). Figure 4.2-7 shows the breakdown of U.S. greenhouse gas emissions since 1990. Approximately 33% of greenhouse gas emissions were associated with transportation in 2005 and about 41% was associated with electricity generation.

Statewide Greenhouse Gas Emissions

California's greenhouse gas emissions are large in a world-scale context and growing over time. If California were considered an independent country, its emissions would rank at least 16th largest. In 2004, California produced 492 million metric tons of CO2 equivalent greenhouse gas emissions (CEC 2006). The transportation sector is the single largest category of California's greenhouse gas emissions, producing 41% of the state's total greenhouse gas emissions in 2004. Electrical generation produced 22% of greenhouse gas emissions. Most of California's emissions, 81%, are carbon dioxide produced from fossil fuel combustion (CEC 2006).

Excerpt of reference cited at footnote 10 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/6.0_gp_final-general-plan-ch6.pdf

Chapter 6: Land Use Element

I. Introduction

The Land Use Element provides strategies and planning tools to facilitate and guide future development and revitalization efforts. In accordance with the California Government Code, the Land Use Element designates the proposed general distribution and general location and extent of uses. The General Plan Land Use Policy Map and Land Use Legend serve as the "blueprint" for how land will be used to accommodate growth and change in the unincorporated areas.

II. Background

Land Uses

As shown in Table 6.1, more than half of the unincorporated area is designated for natural resources. The next largest is rural, which accounts for approximately 39 percent of the unincorporated areas, followed by residential, which accounts for approximately three percent of the unincorporated areas.

Table 6.1: General Land Use Categories, by Acreage

General Land Use Categories	Acres
Residential	51,480
Rural	641,321
Commercial	5,268
Industrial	7,304
Natural Resources*	844,224
Public and Semi-Public	79,920
Mixed Use	291
Specific Plan**	13,556
Other***	1,080
Total:	1,644,444

*Natural Resources includes all natural resource and categories (including natural areas, developed parks, waterways, golf courses, etc.), and military areas (San Clemente Island and Edwards AFB).

** Specific Plans include a combination of land uses.

** Some area and community plans have special categories that do not fit into the scheme of the Land Use Legend categories (such as "special use sites," parking areas, senior citizen density bonus areas, etc.)

General Plan Amendments and Implementation Tools

As the constitution for local development, the General Plan guides all activities that affect the physical environment.

The costs and liability associated with remediating brownfield sites, however, is a deterrent to redevelopment. The availability of technical assistance, financing and other programs is necessary to promote brownfields redevelopment.

Adaptive Reuse

Adaptive reuse can play a key role in revitalizing older, economically-distressed neighborhoods. Older and often historically significant buildings can be recycled and converted into other uses, such as multifamily residential developments, live and work units, mixed use developments, or commercial uses. However, preexisting conditions, such as building location, lack of onsite parking, footprint and size can add to the difficulty in meet current zoning regulations and development standards. Regulatory incentives, such as flexibility in zoning, are needed to encourage the adaptive reuse of older buildings.

2. The Impacts of Suburban Sprawl

Suburban sprawl is a land use pattern that extends urban infrastructure and residential development into undeveloped areas with limited or no infrastructure, such as roads, public utilities, and public transit. While well-designed development may occur in isolation, the impacts of suburban sprawl can be seen when there are no clear and defined growth boundaries and strong development restrictions, which results, over time, in the spread of the initial developed area into surrounding undeveloped areas. A suburban sprawl land use pattern puts the unincorporated areas at risk of losing resources, such as agricultural lands, and will contribute to the fragmentation and isolation of open space areas. Suburban sprawl also can potentially contribute to traffic congestion, air pollution, and greenhouse gas emissions.

3. Protecting Rural Communities

“Rural” is defined as a way of life characterized by living in a non-urban or agricultural environment at low densities without typical urban services. Urban services and facilities not normally found in rural areas, unless determined to be necessary for public safety, include curbs, gutters and sidewalks; street lighting, landscaping and traffic signalization; public solid waste disposal, integrated water and sewerage system; mass transit; and commercial facilities dependent upon large consumer volumes, such as regional shopping centers, sports stadiums and theaters.

4. Land Use Compatibility and Distribution

Land Use Compatibility

The placement, configuration, and distribution of land uses have a significant impact on a community’s quality of life. For example, in some cases, a residential use could be impacted by noise, traffic and odor from adjacent commercial or heavy industrial uses. The General Plan addresses land use compatibility by mapping and regulating uses and intensities, and including policies and programs that mitigate land use conflicts through design, such as the use of landscaping, walls, building orientation, and performance standards. The General Plan also encourages developments that are compatible with community identity and character and existing conditions, such as rural and natural environmental settings.

The General Plan encourages the protection of major facilities, such as landfills, solid waste disposal sites, energy facilities, natural gas storage facilities, oil and gas production and processing facilities, military installations, and airports from the encroachment of incompatible uses. For example, the County’s Airport Land Use Plan, which was adopted by the ALUC in 1991, addresses compatibility between airports and surrounding land uses by addressing noise, overflight, safety, and airspace

Employment Generating Uses	Policy LU 5.10: Encourage employment opportunities and housing to be developed in proximity to one another.
Goal LU 6: Protected rural communities characterized by living in a non-urban or agricultural environment at low densities without typical urban services.	
Topic	**Policy**
Rural Character	Policy LU 6.1: Protect rural communities from the encroachment of incompatible development that conflict with existing land use patterns and service standards.
	Policy LU 6.2: Encourage land uses and developments that are compatible with the natural environment and landscape.
	Policy LU 6.3: Encourage low density and low intensity development in rural areas that is compatible with rural community character, preserves open space, and conserves agricultural land.
Goal LU 7: Compatible land uses that complement neighborhood character and the natural environment.	
Topic	**Policy**
Land Use Compatibility	Policy LU 7.1: Reduce and mitigate the impacts of incompatible land uses, where feasible, using buffers, appropriate technology, building enclosure, and other design techniques.
	Policy LU 7.2: Protect industrial parks and districts from incompatible uses.
	Policy LU 7.3: Protect public and semi-public facilities, including but not limited to major landfills, natural gas storage facilities, and solid waste disposal sites from incompatible uses.
	Policy LU 7.4: Ensure land use compatibility in areas adjacent to military installations and where military operations, testing, and training activities occur.
	Policy LU 7.5: Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.
	Policy LU 7.6: Ensure that proposed land uses located within Airport Influence Areas are compatible with airport operations through compliance with airport land use compatibility plans.
	Policy LU 7.7: Review all proposed projects located within Airport Influence Areas for consistency with policies of the applicable airport land use compatibility plan.
	Policy LU 7.8: Promote environmental justice in the areas bearing disproportionate impacts from stationary pollution sources.
Goal LU 8: Land uses that are compatible with military operations and military readiness, and enhance safety for military personnel and persons on the ground.	
Topic	**Policy**
Military Compatible Uses	Policy LU 8.1: Facilitate the early exchange of project-related information that is pertinent to military operations with the military for proposed actions within MOAs, HRAIZs, and within 1,000 ft. of a military installation.

Excerpt of reference cited at footnote 11 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/9.0_gp_final-general-plan-ch9.pdf

Chapter 9: Conservation and Natural Resources Element

I. Introduction

The County's role in the protection, conservation and preservation of natural resources and open space areas is vital as most of the natural resources and open space areas in Los Angeles County are located within the unincorporated areas. The County must act as the steward for Los Angeles County's natural resources and available open space areas, and conserve and protect these lands and resources from inappropriate development patterns.

The Conservation and Natural Resources Element guides the long-term conservation of natural resources and preservation of available open space areas. The Conservation and Natural Resources Element addresses the following conservation areas: Open Space Resources; Biological Resources; Local Water Resources; Agricultural Resources; Mineral and Energy Resources; Scenic Resources; and Historic, Cultural and Paleontological Resources.

II. Open Space Resources

This section addresses open space and natural area resources, and provides policies for preserving and managing dedicated open space areas through preservation, acquisition, and easements.

Background

Open space resources consist of public and private lands and waters that are preserved in perpetuity or for long-term open space and recreational uses. Existing open spaces in the unincorporated areas include County parks and beaches, conservancy lands, state parklands, and federal lands, such as national forests. Open space resources include private lands, such as deed-restricted open space parcels and easements. Various stakeholders share a responsibility to manage and preserve the available open space resources in the unincorporated areas.

Open Space Resources

Table 9.1 shows a summary of open space resources areas, by acreage and category.

Table 9.1: Unincorporated Los Angeles County Open Space Resources, in Acres

Open Space Resource Category	Acres
Conservancy Lands	48,271.79
County Lands	16,834.24
Federal Lands	679,629.58
Private Open Space Lands	9,181.03
State Lands	50,893.72

Mineral Resource Zone Regulation and Conservation

The California Department of Conservation protects mineral resources to ensure adequate supplies for future production. The California Surface Mining and Reclamation Act of 1975 (SMARA) was adopted to encourage the production and conservation of mineral resources, prevent or minimize adverse effects to the environment, and protect public health and safety. An important component of SMARA requires that all surface mines be reclaimed to a productive second use upon the completion of mining (Public Resources Code, sub-sections 2712 (a), (b), and (c)).

In a joint regulatory effort, SMARA authorizes local governments to assist the State in issuing mining permits and monitoring site reclamation efforts. To manage mining resources, the County has incorporated mineral resource policies into the Conservation and Natural Resources Element. In addition to these policies, Title 22 of the County Code (Part 9 of Chapter 22.56) requires that applicants of surface mining projects submit a reclamation plan prior to receiving a permit to mine, which must describe how the excavated site will ultimately be reclaimed and transformed into another use.

Oil and Natural Gas

Mineral Resources include areas that are appropriate for the drilling for and production of oil and natural gas. Oil production still occurs in many parts of the unincorporated areas, including the Baldwin Hills and the Santa Clarita Valley and is regulated by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR). DOGGR retains exclusive jurisdiction over all subsurface oil and gas activities in California including well stimulation techniques such as hydraulic fracturing (“fracking”). The County may regulate zoning and land use to mitigate impacts from surface operations on surrounding communities. Jurisdiction for offshore oil and gas production falls to the State Lands Commission and the DOGGR for near-shore facilities on state leases and to the federal government for facilities farther offshore on federal leases. Adherence to the standards for the installation, operation, and abandonment of oil and gas production and storage facilities is important to protect public health and safety.

Energy Resources

Energy in California is produced from a variety of non-renewable and renewable natural resources, including oil, natural gas, and hydrologic, wind, and solar power. Although non-renewable energy resources (oil and natural gas) generate a majority of its energy, California has one of the most diverse portfolios of renewable energy resources in the country. Renewable energy is derived from resources that are regenerative and cannot be depleted, such as wind and solar power. For this reason, renewable energy sources are fundamentally different from fossil fuels, such as coal, oil, and natural gas, which are finite and also produce greenhouse gases and other pollutants. Aside from existing oil and natural gas deposits, California’s topography and climate lend themselves to the production of energy from wind, solar, and tidal power. There are significant opportunities for the County to produce energy from renewable sources. Information about solar energy can be found on the County’s web site at http://lacounty.solarmap.org.

Issues

1. Development of Mineral Resources

Mineral Resources include existing surface mining activities and known deposits of commercially-viable minerals and aggregate resources, as well as areas suitable for the drilling for and production of energy resources, including crude oil and natural gas. Many issues arise from the incompatible development of land near Mineral Resources. Mineral resource extraction and production, and activities related to the drilling for and production of oil and gas, can often garner community complaints due to perceived environmental threats and surface operations. The General Plan protects Mineral Resources, as well as the conservation and production of these resources, by encouraging compatible land uses in surrounding and adjacent areas.

It is also important to work with the State Mining and Geology Board and State Geologist in the permitting process, as well as to coordinate with different agencies to address mineral resources within regional efforts. This includes the prioritization of Mineral Land Classifications efforts of MRZ-3 and MRZ-4 lands adjacent to planned new or existing freight routes, or addressing mineral resources in the Sustainable Communities Strategy, per SB 375.

2. Energy Conservation

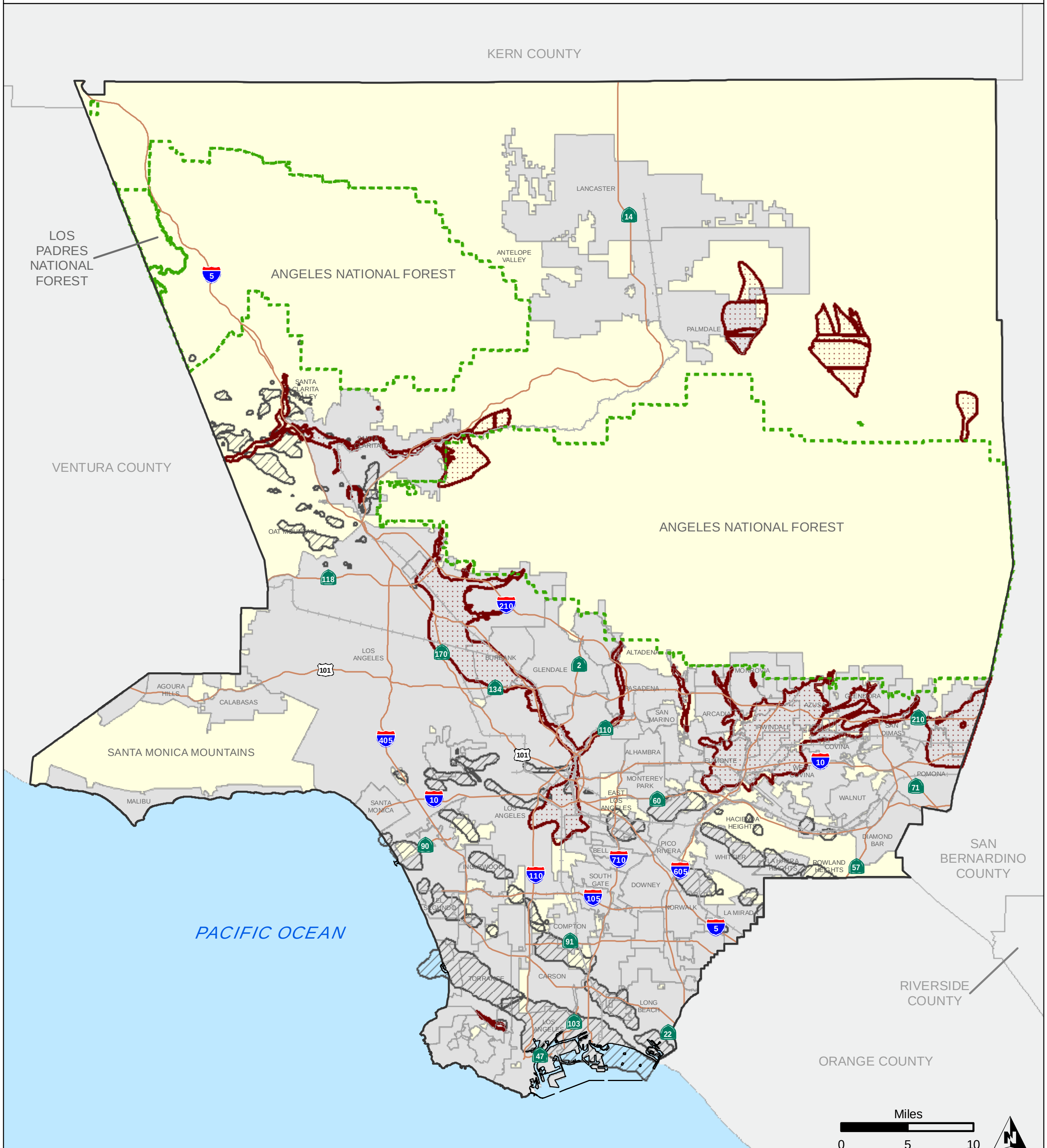
Energy demand for transportation and non-transportation uses, including gasoline, electricity, heating, and cooling will continue to increase as Los Angeles County grows. Energy consumption patterns demonstrate that residents consume proportionally more energy for transportation than the rest of California. Low-density, automobile-dependent communities place high demands on declining energy resources. The Mobility Element promotes rail, bus, carpool, bicycle, and pedestrian modes of transportation as alternatives to the single-occupant automobile, and the Land Use Element promotes the efficient development and use of land to reduce consumptive land use patterns.

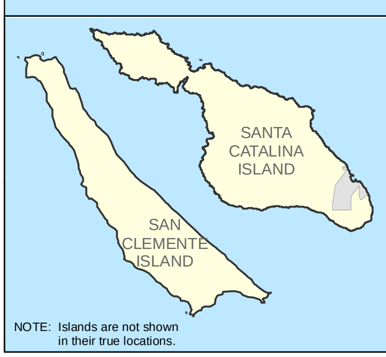
In addition, state and county building codes determine energy efficiency requirements for building construction. Changes to building codes over the years have resulted in substantial improvements in energy efficiency. This has translated into less energy required to light, cool, and heat buildings. In addition, green building techniques, such as the use of passive solar orientation, recycled building materials, improved insulation, energy star appliances, and onsite small-scale renewable energy generation have contributed to energy conservation. The Air Quality Element includes policies on energy conservation and promoting renewable energy to help the County meet its climate change goals.

Excerpt of reference cited at footnote 12 to Alston & Bird's January 29, 2024 Letter

Full version available at https://planning.lacounty.gov/wp-content/uploads/2022/11/9.1_Chapter9_Figures.pdf

Mineral Resources | *Figure 9.6*





- Mineral Resource Zones
- Oil and Gas Resources
- National Forest
- Unincorporated Areas
- Cities

Source: Department of Regional Planning, May, 2014. Additional Sources: California Energy Commission, California Department of Conservation

CONE FEE, LLC

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May 13, 2024

ELECTRONIC MAIL

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Supervisor Holly J. Mitchell
Supervisor Janice Hahn
Supervisor Kathryn Barger
Los Angeles County Board of Supervisors
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Los Angeles, CA 90012

Re: **Project No. PRJ2023-001628-(2): Advance Planning Project No. RPPL2023002314-(2), Baldwin Hills Community Standards District (CSD) Scheduled for Hearing before the Board of Supervisors on May 14, 2024**
Public Hearing Agenda Item 3. Hearing on the Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2)

Dear Board of Supervisors:

On behalf of Cone Fee, LLC (Cone LLC), I am writing to supply the Board of Supervisors (the "Board") with updated materials to supplement the detailed submissions by our counsel, Scott A. Sommer, Esq. of Larson LLP, transmitted on January 23, 2024 to the Board in anticipation of the then-scheduled meeting of January 30, 2024. A link to Mr. Sommer's cover letter dated May 13, 2024 with the submitted letter dated January 23, 2024 letter and appendix of reports, etc. is included with the email of this letter for your ease of reference. In accordance with the Board of Supervisors' commitment to transparency, with the continuation of the January 30, 2024 hearing on the above listed matter to this new date of May 14, 2024, all the submittal letters from the cancelled 1/30/24 should be included in the county public comments and correspondence in the this May 14, 2024 agenda for this hearing so they are in the record and easily acceptable to the public (link https://acrobat.adobe.com/id/urn:aaid:sc:US:ee987416-fd73-4f21-9e50-d58c9fc3f415).

In addition to the prior submittal, Cone LLC supplements same with the following additional information which we request be reviewed by the Board in advance of the May 14, 2024 meeting:

1) Catalyst Environmental Solutions additional details (originally dated January 18, 2024) updated as of April 26, 2024 (Attachment 1) addressing therein:
    a. The lack of disadvantaged communities directly adjacent to the Inglewood Oil Field, which demonstrates that the environmental justice rationale for the proposed action is untethered to the facts on the ground; and
    b. In contrast to the lack of any environmental justice issue surrounding the IOF, the net effect of the Board's proposed action is to exacerbate the pre-existing and significant environmental impacts on the ***actual*** disadvantaged communities surrounding the Ports of Los Angeles and Long Beach which communities will sustain all of the burdens of increased energy (oil) imports into those Ports and transported through same and therefrom all as a result of the Board's plan to end of production in the Inglewood Oil Field.
2) Capitol Matrix Consulting's May 13, 2024, Analysis of the proposed amendment and its dilatory impacts on energy security and environmental justice as relates to the low income and other communities surrounding the Ports of Long Beach and Los Angeles (Attachment 2). Another very problematic by-product of any approval of the measure before the Board will be that Disadvantaged Communities' residents all over Los Angeles County will be affected by Los Angeles County's inability to control rising fuel prices when all fuel comes from foreign countries many of which are unstable, must be transported by oil tanker ships across the world and refined in Los Angeles for California. Domestically produced energy allows the County and California to mitigate the impacts of otherwise relying on foreign oil sources and the environmental impacts overall and on the communities based in and around the Ports.
3) Finally, there has been no substantive and legally-based rebuttal from the County to the State Supreme Court's decision in *Chevron v County of Monterey* which wholly disposes of the County's authority to adopt the measure and proceed with the action therein and to follow therefrom. Mr. Sommer's January 2024 letter provides a detailed discussion regarding the Chevron decision and a preview that the Board's adoption of the pending measure is prohibited as a matter of law.

Further Discussion;

Per the updated technical memorandum from Catalyst Environmental Solutions, the Environmental Justice Impacts on the immediate area surrounding the Inglewood Oil Field are analyzed as follows (see issue beginning on page 2 of attached memo and on page 3 using the CalEnviroScreen 4.0):

> "This approach may be applied to the Inglewood Oil Field. The first step of the approach is to identify the presence of an environmental justice population in the vicinity of the Project site. In California, environmental justice populations are defined according to Senate Bill 535, which designates these populations are "disadvantaged communities." In the final designation description of disadvantaged communities published by CalEPA in May 2022 it is stated "CalEPA generally defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes."[1] Accordingly, Catalyst reviewed the CalEnviroScreen 4.0 to identify the presence or absence of disadvantaged communities in the vicinity of the Inglewood Oil Field. A screenshot of the CalEnviroScreen map is shown in figure 1 below. As depicted, the immediate residential areas surrounding the oil field are not designated as disadvantaged communities, but disadvantaged communities are mapped in the census tracts approximately 1 mile south and east of the field." (Emphasis added.)

With the zeal to close the Inglewood Oil Field, the Board of Supervisors advised the Los Angeles team conducting the study (used as a springboard to attempt to justify amending the Community Standards District) to disregard the effects of this closure on other 'disadvantaged communities" in Los Angeles County. Such a directive reveals the "environmental justice" moniker to be a reasoning for the measure in name only when, in fact, the threatened action will serve to further harm the disadvantaged communities surrounding the Ports (and increase the likelihood of environmental accidents and worse in the Ports and on the highways serving them). Moreover, the premise that the communities immediately adjacent to the Inglewood Oil Field are "disadvantaged" is not supported by any economic data; instead, all economic data demonstrates just the opposite to be the case as property owners in the area abutting the Inglewood Oil Field have experienced a consistently significant upward trajectory in home values for decades.

Further, no consideration was included for how the current 1.8 million barrels of crude oil consumed daily in California would be supplied. One of the Board of Supervisors' purported cornerstones for the demand for closing the IOF was Social and Environmental Justice. There is no regard for the Social or Environmental Justice Impacts on the existing "disadvantaged communities" already burdened with the highest pollution rates in Los Angeles County - the Ports of Los Angeles and Long Beach. If the Inglewood Oil Field is closed, all crude for California will have to come in through these Ports. Additionally, with the State's efforts to stop all production, even more crude will come through these Ports, exacerbating a burden on the

[1] https://calepa.ca.gov/wp-content/uploads/sites/6/2022/05/Updated-Disadvantaged-Communities-Designation-DAC-May-2022-Eng.a.hp_-1.pdf

communities in this County surrounding the Ports that already exists and which will otherwise have been compounded by the Board's adoption of this measure.

Also not included in this study is the Social and Environmental impact on all members of all the disadvantaged communities in Los Angeles County who have to buy gas for their cars. Once we remove our ability to add the production of gasoline from the Inglewood Oil Field to the State of California's fuel supply and reserves, the Board will have created the foundation for an economic recession for Los Angeles County and California consumers. Production of crude and the purchase of oil by the US will be out of our hands. Additionally, the rest of the world generally does not have the stringent requirements for the production of crude to control the emissions of greenhouse gases from production.

It was alarming to hear in the last meeting, with the review of *Chevron v County of Monterey*, County Counsel's Elaine Lemke only acknowledged concession to this case was the need to allow "redrilling" to not be deleted in the amendment but chose to disregarded the preemption arising from State of California laws and regulation on oil and gas production was codified in the California Supreme Court case of Chevron v County of Monterey; see discussion in our letter of January 23, 2024, Executive Summary point no. 2 (p. 3) and section V (p.11-12).

Among the effects of preemption, an attempt by Los Angeles County, a local agency, to phase out or restrict producing wells regulated by the State of California through its agency, CalGEM, in accordance with the California Public Resource Code, would be void.

Very Truly Yours,

CONE FEE, LLC

Liz K. Gosnell

Liz K. Gosnell, Company Agent
Enclosures

Cone Fee, LLC May 13, 2024 letter

Attachment 1.

Catalyst Environmental Solutions 4/26/24

Project No. PRJ2023-001628-(2): Advance Planning Project No. RPPL2023002314-

(2), Baldwin Hills Community Standards District (CSD) Scheduled for Hearing before the Board of Supervisors on May 14, 2024

Public Hearing Agenda Item 3. Hearing on the Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2)

Thursday, January 18, 2024, updated April 26, 2024

Technical Memorandum

To:	Liz Gosnell, Cone Fee, LLC
From:	Megan Schwartz, Director of Regulatory Compliance and Permitting
RE:	Baldwin Hills Community Standards District Amendment Proposal

Introduction

At your request, this technical memorandum provides supplemental data and analysis to further support the technical memorandum submitted to you on September 25, 2023, related to CEQA review of the proposed amendment to the Baldwin Hills Community Standards District, as well as potential environmental justice effects of approving or denying the proposed motion.

Analysis of CEQA Review of Modifications to the Baldwin Hills Community Standards District

The Inglewood Oil Field has operated in accordance with the CSD and the adopted EIR and Mitigation Monitoring and Reporting Plan since 2008 without violation or incident. The CSD established a geographic area (the Baldwin Hills) and with site-specific conditions adopted by the County. While Conditional Use Permit approvals are conditional and subject to discretionary review with some established frequency, which allows a local jurisdiction to end a land use or revoke a permit, a CSD is an adopted ordinance and land use regulation.

Five-year reviews were built in a part of the CSD Ordinance and subsequent Settlement Agreements, as well as requirements for additional studies such as the Inglewood Oil Field Hydraulic Fracturing Study and Health Risk Assessment, in order to provide the County an opportunity to determine if any additional environmental protection measures were necessary. These reviews resulted in suggested revisions to CSD Conditions by the County which the operator voluntarily implemented. Because these suggested revisions to the CSD Conditions that have occurred since 2008 to date have been minor and within the scope of the analysis and findings of the Baldwin Hills CSD EIR, no formal Amendment to the CSD was required and additional CEQA review was necessary. The minor modifications were prepared as a result of the reviews that were built into the CSD framework and therefore did not result in any new impacts or more severe impacts than what was analyzed in the certified EIR.

In contrast, the County Department of Regional Planning is now proposing to formally amend the CSD. This change is not being considered as part of the 5-year review cycle, but as a stand-alone action of the Board of Supervisors. For CEQA compliance, the proposed amendment must be compared to the 2008 certified EIR for the CSD to evaluate if the amendment would result in a new or more severe impact compared to what was analyzed in that documents. The proposed change in the amendment that requires analysis is "no new wells, and nonconforming use allowed to continue for 20 years".

The CSD EIR Energy and Mineral Resources chapter clearly states that "The potential future development would not result in the loss of availability of a known energy or mineral resource as the mineral resource located at the oil field would be developed as part of the potential future development." In contrast, the proposed amendment to the CSD would not allow new drilling, and would put a sunset on all existing operations of 20 years. Therefore, the proposed amendment would directly result in the loss of availability of a known mineral resource. This is a significant and unmitigable impact.

This new, significant, and unmitigable impact means that the County cannot rely upon the analysis in the 2008 CSD EIR for this action. Rather, a supplemental EIR to the 2008 CSD EIR would be required for this significant impact of the amendment.

In addition, the County could not rely on a Categorical Exemption to CEQA because one exception provision is that a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances (CEQA Guidelines § 15300.2 (c)). The County could not rely on an addendum, because the proposed amendment would result in a new significant impact, or a substantial increase in the severity of previously identified significant impacts (CEQA Guidelines §§ 15162, 15163, 15164).

Consideration of Environmental Justice Impacts

Los Angeles County Board of Supervisors has voted unanimously to establish environmental justice as an official Board priority for Los Angeles County. While the CEQA guidelines do not include a requirement to evaluate for environmental justice impacts as of yet, the such effects are required under the National Environmental Policy Act in accordance with the 1993 Executive Order 12898 signed by President Clinton, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,* which directs federal agencies to: 1)identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law; 2) develop a strategy for implementing environmental justice; 3) promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation.[1] The U.S. Environmental Protection Agency defines environmental justice[2] as "the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:

- are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
- have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices."

This approach may be applied to the Inglewood Oil Field. The first step of the approach is to identify the presence of an environmental justice population in the vicinity of the Project site. In California, environmental justice populations are defined according to Senate Bill 535, which designates these populations are

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[1] https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

[2] Note that the definition of environmental justice is distinct and different from the definition of social justice, which is defined as "the idea that everyone in society deserves equal rights, privileges, and opportunities, and that a country's wealth resources should benefit everyone." (Cambridge Dictionary). Social justice is not a term defined by regulation or legislation, although President Biden did sign *Executive Order on Advancing Racial Equity and Support for Underserved Communities through the Federal Government* in January 2021, which defines both the term "equity" and "underserved communities" and focuses on providing equitable access to economic opportunities and access to federal government services and programs.

"disadvantaged communities." In the final designation description of disadvantaged communities published by CalEPA in May 2022 it is stated "CalEPA generally defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes."[3] Accordingly, Catalyst reviewed the CalEnviroScreen 4.0 to identify the presence or absence of disadvantaged communities in the vicinity of the Inglewood Oil Field. A screenshot of the CalEnviroScreen map is shown in figure 1 below. As depicted, the immediate residential areas surrounding the oil field are not designated as disadvantaged communities, but disadvantaged communities are mapped in the census tracts approximately 1 mile south and east of the field.

In addition to reviewing the CalEnviroScreen data, Catalyst also reviewed data for current home prices in the neighborhoods surrounding the Inglewood Oil Field to identify any areas that may not meet the definition of disadvantaged communities via EnviroScreen, but could still be considered economically disadvantaged. The neighborhoods immediately adjacent to the oil field include Baldwin Hills/Leimart Park to the north and northeast, View Park/Windsor Hills to the east, Ladera Heights to the south, Studio Village/Fox Hills/Carlson Park to the west. As shown in the table below, based on this review, the home prices in the neighborhoods surrounding the Inglewood Oil Field are on par with Los Angeles County overall. While the median sale price in Fox Hills is noticeably lower than the other neighborhoods, the average price per square foot indicates that this difference may be attributed to difference in home size rather than value. Therefore, the results of this analysis are in line with the results of our review of CalEnviroscreen 4.0 data.

Neighborhood	Median Sale Price (last 12 months)	Average Price per Square Foot
Baldwin Hills/Leimart Park[4]	$1,055,000	$639
Windsor Park[5]	$880,500	$626
Ladera Heights[6]	$1,833,500	$568
Fox Hills[7]	$646,000	$595
Los Angeles County overall[8]	$878,000	$583

The next step in environmental justice impact analysis the determination of whether disadvantaged communities are *disproportionately* adversely affected by impacts of the Project (in this case, the continued operation of oil and gas production at the Inglewood Oil Field, and potential future drilling of new wells). As

[3] https://calepa.ca.gov/wp-content/uploads/sites/6/2022/05/Updated-Disadvantaged-Communities-Designation-DAC-May-2022-Eng.a.hp_-1.pdf

[4] https://www.homes.com/leimert-park-ca/neighborhood/baldwin-hills/#:~:text=The%20average%20sale%20price%20for%20homes%20in%20Baldwin,home%20sale%20price%20over%20the%20previous%2012%20months.

[5] https://www.realtor.com/realestateandhomes-search/Windsor-Hills_CA/overview

[6] https://www.redfin.com/city/23650/CA/Ladera-Heights/housing-market

[7] https://www.redfin.com/neighborhood/10009/CA/Culver-City/Fox-Hills/housing-market

[8] https://www.redfin.com/county/321/CA/Los-Angeles-County/housing-market

described above and in the September 25, 2023 technical memorandum prepared by Catalyst Environmental Solutions, the Inglewood Oil Field has operated in accordance with the Baldwin Hills Community Standards District since 2008. According to the EIR prepared for the Community Standards District, no significant and unavoidable impacts were identified. Further, in our review of the monitoring reports and data published in accordance with the Community Standards District since 2008, no adverse impacts to any of the resource categories considered under CEQA have occurred. Finally, in our review of both the Los Angeles County Department of Public Health study related to the field published in 2008 and the subsequent Human Health Risk Analysis prepared by MRS on behalf of the County for the Inglewood Oil Field, no adverse health impacts were identified related to operations at the field, up to a limit of 25 new wells drilled per year. Catalyst has also reviewed the data of emissions posted by the California Air Resources Board in accordance with the current ongoing Study of Air Pollution in Neighborhoods Near Petroleum Sources (SNAPS) program. In order review of the real-time emissions data posted, no exceedances of air emissions thresholds have occurred at either the upwind or downwind monitoring locations around the field.

Therefore, based on this data, it is unlikely that the identified disadvantaged communities east of the field would be disproportionately adversely affected by continued operations of the field.

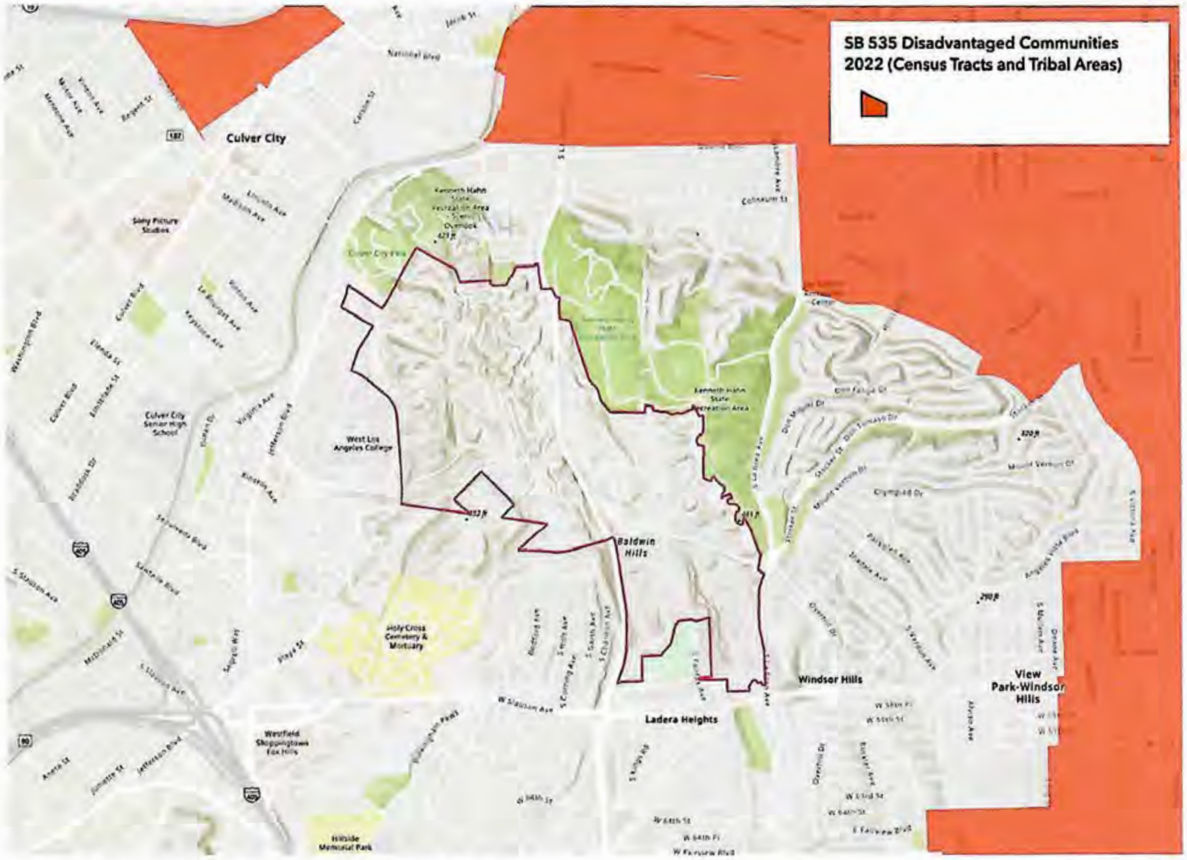

Figure 1. Screenshot of CalEnviroScreen 4.0 Map of Disadvantaged Communities Focused on the Inglewood Oil Field

In contrast, while domestic oil production in California has seen a decline, because of regulatory and legislative efforts, there has been an increase in oil imports. While Gov. Newsom announced that 25.5% of all new cars sold in California second quarter 2023 were zero-emission vehicles (ZEV), and since 2011, 1.6 million ZEVs have been sold in the State. However, even with the increased number of ZEV sales, the total number of ZEVs driving on California roads is miniscule compared to non-ZEV vehicles. In 2022, there were 31% more vehicles registered in California than in 2010 and year over year that increase consisted primarily of non-ZEV vehicles. Even if the current trend in ZEV car sales continues to increase at the same rate as it has since 2010 through to 2035 (when it will no longer be allowed to purchase a non-ZEV vehicle in California), only 6% of vehicles registered in California are expected to be ZEV. Therefore, demand for oil is not likely to decrease significantly in the coming years (Chart 1).

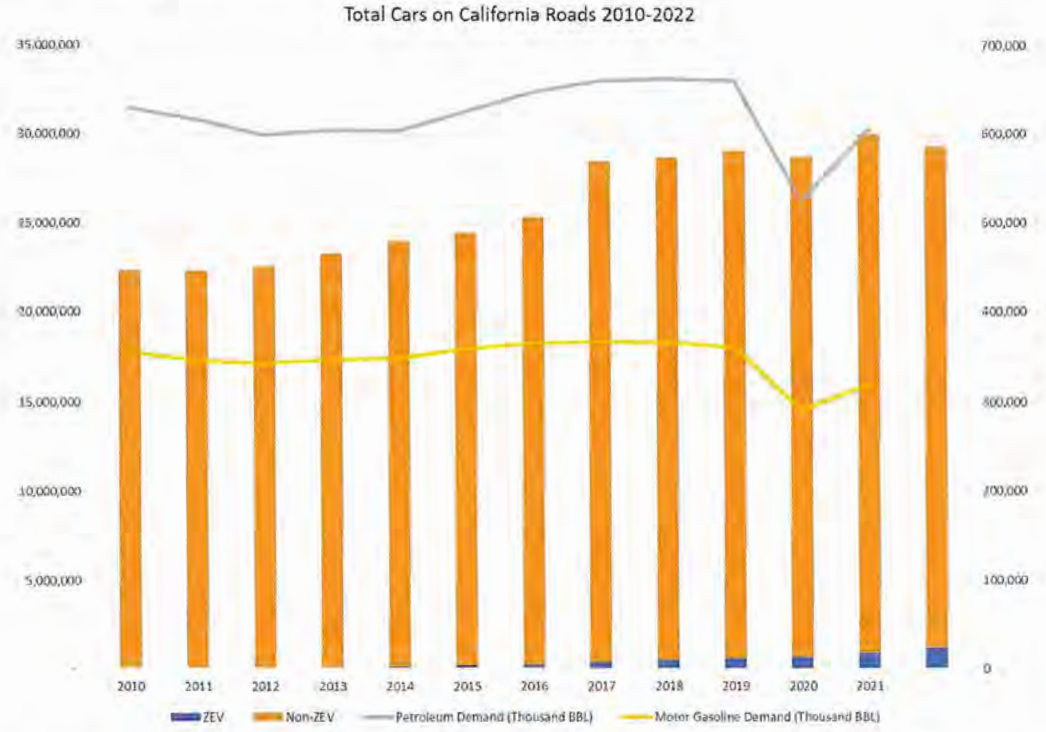

Chart 1. Total Cars on California Roads ZEV vs. Non-ZEV compared to Petroleum Deman 2010-2022

Every barrel of oil not produced in-state must be tankered into California to the Ports of Los Angeles and Long Beach to meet demand. There are no interstate pipelines that carry crude oil and railing and trucking oil is expensive and impractical. As a result, increased tankering of foreign oil is the inevitable result of any curtailment of in-state production. Californians consume over 1.8 million barrels of crude a day. Despite the state's efforts to transition to alternative fuels, oil consumption in California has not decreased[9]. Accordingly, since the data shows that demand is not decreasing, oil produced at the Inglewood Oil Field currently sent to the local refineries will need to be made up for by either production at other California fields, or imported via tanker to the Ports. According to the CalGEM WellSTAR data dashboard, average monthly production of crude oil at the Inglewood Oil Field in 2022 was 134,935 barrels.[10] According to the documentation associated with the Stanford produced OPGEE model which is used by the California Air Resources Board to calculate the carbon intensity of oil produced in California and imported into California from elsewhere, the standard tanker

[9] Energy Information Administration. 2023. State Energy Data System: Table CT3. Total End-Use Sector Energy Consumption Estimates, Selected Years, 1960-2021, California. Available online: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tx/use_tx_CA.html&sid=CA

[10] California Geologic Energy Management Division. 2024. WellSTAR data dashboard. Well Production. Available online at: Microsoft Power BI (powerbigov.us). Accessed January 17, 2024.

which delivers crude to California has a capacity of 22,500 tons.[11] This equates to 153,926 barrels of oil (1 ton equals 6.08 barrels of oil equivalent). Accordingly, if production of oil from Inglewood Oil Field is eliminated, it is reasonably foreseeable that this would result in an additional tanker of crude oil coming into the local ports each month.

The census tracts at the Ports and along the freeways which are used to transport products from the Ports to their ultimate destinations have been identified by CalEnviroscreen 4.0 as Senate Bill 535 Disadvantaged Communities as shown in the figure below. This is in direct contrast to the areas immediately surrounding the Inglewood Oil Field which are not identified as Senate Bill 535 Disadvantaged communities (Figure 2). Thus, it is reasonably foreseeable that an increase in tanker traffic at either Port as a result of decreased local production of oil, would disproportionately adversely affect a known disadvantaged community through increased emissions of criteria pollutants, which would be an environmental justice impact.

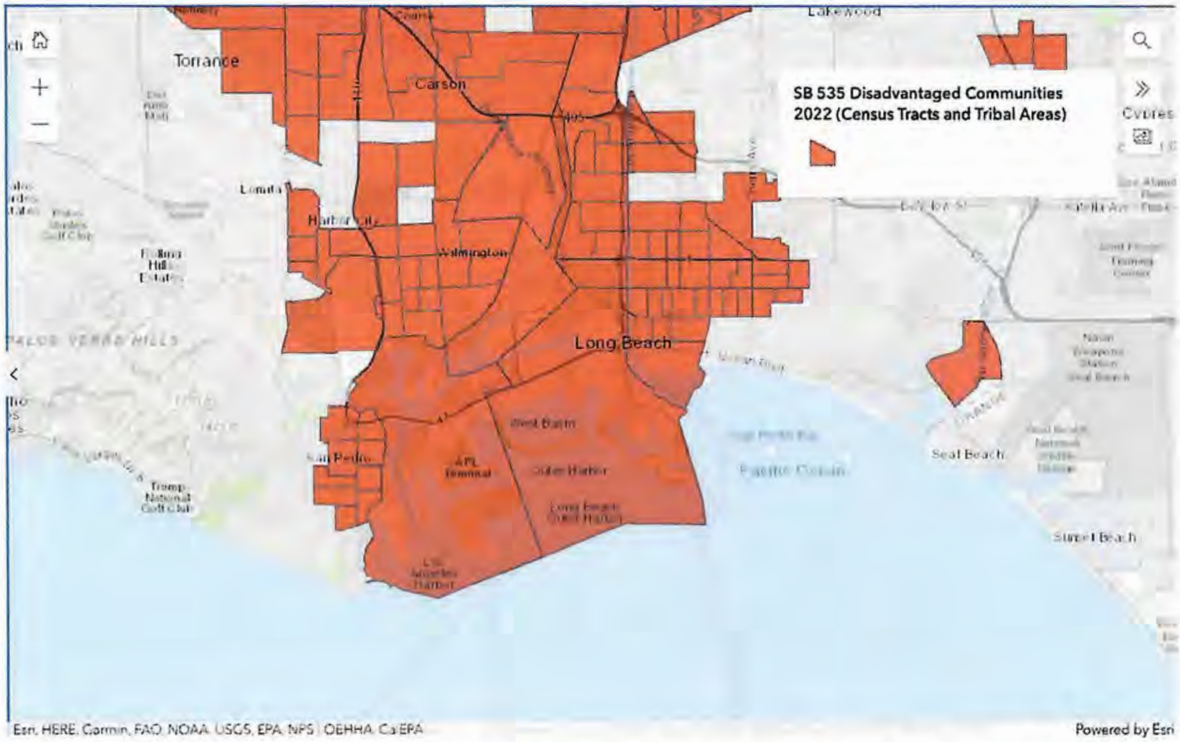

Figure 2. Screenshot of CalEnviroScreen 4.0 Map of Disadvantaged Communities Focused on the Ports of Long Beach and Los Angeles

Health Indicator Data

Note that the three most commonly referred to health issues evaluated with regard to oil and gas operations in California are cancer, low-birth weight, and respiratory ailments (e.g., asthma). For point of reference, Catalyst reviewed the current statistics for each of these issues in Los Angeles County. To determine cancer rates, Catalyst reviewed the Center for Disease Control, National Cancer Institute's State Cancer profiles[12]. As

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[11] opgee_v3.0_methodology-3.pdf (stanford.edu)

[12] State Cancer Profiles > Incidence Rates Table (https://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=06&areatype=county&cancer=001&race=00&sex=0&age=001&stage=999&year=0&type=incd&sortVariableName=rate&sortOrder=default&output=0#results)

described on its website, the State Cancer profiles provide a table of incidence statistics for use in assessing the burden and risk for a major cancer site for the US overall and for states with cancer registries whose data have met the criteria required for inclusion in the US Cancer Statistics. The 95% Confidence Intervals for the rates provide a measure of how certain or uncertain the point estimate is and can be used to generally assess how different one rate is from another. The incidence rates tables provide data at a County level, and provide the latest 5-year average. Based on this table, the average cancer incidence rate (all cancers) in Los Angeles County between 2017 and 2022 is 376 people per 100,000 population, or a rate of 0.00376. CalEnviroScreen does not present any data related to cancer incidence at the census tract level, therefore, it is not possible to compare the county rates to the scoring statistics on the CalEnviroScreen database.

For information on birth statistics, Catalyst reviewed the March of Dimes, Peristats, State Summary for California, which provides data at the County level.[13] The data shows that in 2021 (the most recent year with data available), of the 96,216 babies born in Los Angeles County, 9,033 were pre-term (either moderately pre-term or very pre-term). This equates to an incidence rate of pre-term birth of 9.38%. We compared this statistic to the low-birth weight data provided at the census tract level in CalEnviroScreen 4.0 for the census tracts containing and immediately surrounding the Inglewood Oil Field. Note that the CalEnviroScreen data evaluates total live births between 2009 and 2015, so this is a rough comparison between the two data sources. However, the incidence rate of low-birth weight babies for all four census tracts during the period examined was lower than the incidence rate of Los Angeles County as a whole: census tract 6037703001 had an incidence rate of 5.61%, census tract 6037236000 had an incidence rate of 8.57%, census tract 6037702502 had an incidence rate of 4.55% and census tract 6037702600 had an incidence rate of 4.64%.

Finally, for information on respiratory ailments, Catalyst reviewed the California Department of Public Health, Environmental Health Investigations Branch, California Asthma Dashboard to view county-level data on asthma prevalence in Los Angeles County.[14] This provides the percentage of people in Los Angeles County ever diagnosed with asthma, by age group, as of 2020 (the most recent year with data available). Based on this, 12.8% of children (0-17 years of age) and 14.1% of seniors (over 65 years old) in Los Angeles County have been diagnosed with asthma at some point in their life. CalEnviroScreen data presented for asthma provides information at the census tract level for emergency room visits for asthma within the subject years (and does not indicate the number of people within the census tract who have been diagnosed with asthma), therefore it is not possible to directly compare the two data sets and reach a conclusion of relevance.

About Catalyst Environmental Solutions

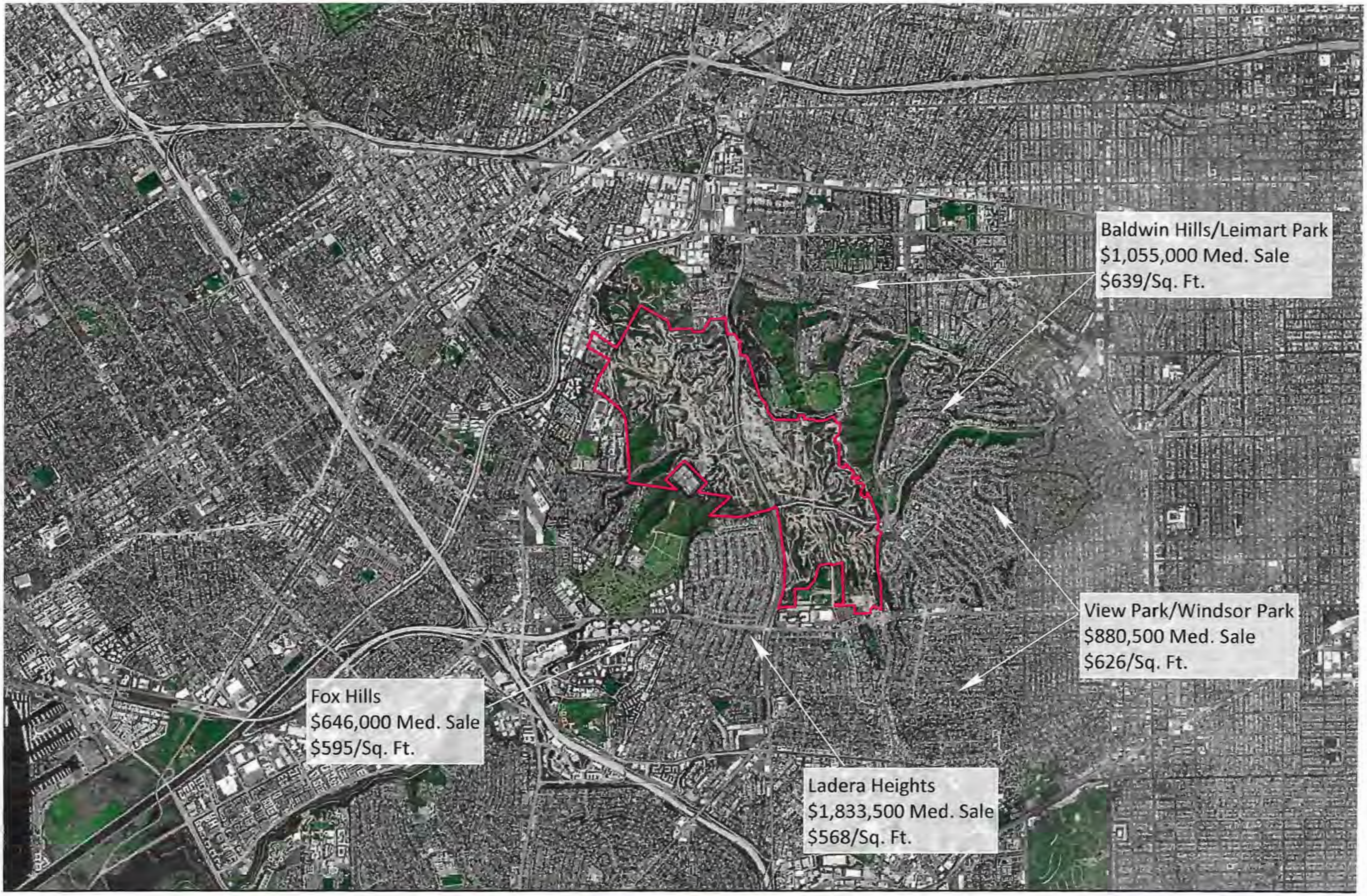
Catalyst Environmental Solutions Corporation is full-service environmental consulting firm with extensive experience in the oil and gas industry, with staff experience dating back to 1994. We have worked extensively for oil and gas developers and with public agencies regulating oil and gas development, including Ventura County Planning Division.

[13] Distribution of gestational age categories: Los Angeles county, 2021 | PeriStats | March of Dimes (https://www.marchofdimes.org/peristats/state-summaries/california?top=3&lev=1&stop=55&reg=99&sreg=06&creg=06037&obj=8&slev=6)

[14] California Breathing County Asthma Data Tool(https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHIB/CPE/Pages/CaliforniaBreathingCountyAsthmaProfiles.aspx)

Catalyst's President, Dr. Dan Tormey, advises all levels of government in California on concerns related to oil and gas issues, including the Governor and California Legislature, the Coastal Commission, and local governments. He was on the Steering Committee for the California Council on Science and Technology (CCST) study on hydraulic fracturing in California; he was appointed by the Department of Conservation to the recently formed Underground Injection Control Independent Review Panel (CalEPA SB 83); and he was selected as a peer reviewer for the CCST study on water use in oil and gas operations in California. Catalyst's Director of Regulatory Compliance and Permitting, Ms. Megan Schwartz, works through industry groups to support federal, state, and local government and oil producers as they navigate the evolving regulatory and transparency landscape in the oil and gas industry.

In addition, our staff supported Plains Exploration and Production as the applicant's consultant preparing technical resource studies to support the Baldwin Hills CSD EIR through Los Angeles County. We also supported Plains Exploration and Production in development of technical studies and compliance plans for the Montebello Hills Specific Plan EIR, a plan to restructure the oil field into 6 concentrated oil islands at the edges of the field, and redevelopment the center of the field into mixed use residential and commercial area. Our staff prepared the Remedial Action Plan that is currently being implemented at the field, concurrent with development of a residential community on the former oil field property.



Legend

Inglewood Oil Field (Active Boundary)

N S W E

0 0.2 0.4 0.8

Miles

Catalyst

INGLEWOOD OIL FIELD
NEIGHBORING HOME PRICES

MEDIAN HOME PRICE &
AVG. PRICE PER SQUARE FOOT
LAST 12 MONTHS

Cone Fee, LLC May 13, 2024 letter

Attachment 2.

Capital Matrix Consulting May 13, 2024

Project No. PRJ2023-001628-(2): Advance Planning Project No. RPPL2023002314-

(2), Baldwin Hills Community Standards District (CSD) Scheduled for Hearing before the Board of Supervisors on May 14, 2024

Public Hearing Agenda Item 3. Hearing on the Baldwin Hills Community Standards District Amendment, Project No. 2023-001628-(2)

Capitol Matrix
Consulting
Analysis. Advice. Advocacy

May 13, 2024

Mr. Patrick McGarrigle
McGarrigle Kenney and Zampiello, AAPC
9600 Topanga Canyon, Suite 200
Chatsworth, CA 91311

Dear Mr. McGarrigle,

The letter updates my January 19 response to your request that I evaluate the environmental and economic impacts of the proposed amendment to the Baldwin Hills Community Standards District (CSD). This amendment would prohibit the location of new oil wells and production facilities in the Baldwin Hills CSD area, and it would make existing oil wells and production facilities a non-conforming land use, thereby triggering a phase-out in existing production within 20 years. The amendment would make CSD regulations consistent with the Los Angeles County Oil and Gas Well Ordinance adopted by the Board of Supervisors in January 2023, which bans the drilling of new oil and gas wells in the unincorporated County and phases out existing wells over a 20-year period.

Specifically, you asked me to address the question of whether the categorical exemption of the proposed amendment from environment impact report (EIR) requirements otherwise mandated under the California Environmental Quality Act's (CEQA) for significant projects or project revisions is appropriate.

As noted in a legal brief prepared by the Larson LLP law firm (dated August 14, 2023) and a Technical Memorandum prepared by Megan Schwartz, Director of Regulatory Compliance and Permitting for Catalyst Environmental Solutions (dated September 25, 2023), such an exemption is inappropriate on legal grounds, given the substantive nature of the proposed revisions to the CSD that were not contemplated in the original EIR that was produced when the CSD was formed in 2008. Among other provisions, CEQA guidelines require an EIR review in cases where a project revision results in the "loss of a known mineral resource that would be of value to the region and residents of the state."

I believe that the phase-out of oil and gas production in Inglewood Field would represent a significant loss of a mineral resource in California, and that the real-world environmental and economic consequences of this loss would be substantial. For these reasons, a full EIR is clearly warranted. My conclusions are based on the following factors:

1. Inglewood Oil Field supplies 2 million barrels of oil per year to Southern California.

Over the past decade, annual production from the Inglewood Oil Field has averaged 2 million barrels of crude oil and 1 million Mcf (or 167 thousand barrels of oil equivalent) of natural gas production. Oil extracted from the field is shipped by pipeline from the field to local refiners, where it is processed and sold to consumers of gasoline, diesel, jet fuel and other petroleum products in the Southern California region. Natural gas is sold to Southern California Gas, which distributes the product to 21.8 million customers in the Southern California region.[1]

2. The field has high production potential for decades to come.

According to a U.S. Geological Survey (USGS) conducted in 2012, the Inglewood Oil Field had known recoverable reserves (equal to total production-to-date plus remaining reserves) of 430 million barrels. The USGS's mean estimate for remaining recoverable reserves was 230 million barrels. Even after taking into account the depletion that occurred due to extraction between 2012 and early 2024, the field still has over 200 million in recoverable reserves, or nearly one-half of its original total. This implies that the field will continue to provide oil (and associated gas) to the Southern California regions for decades to come, assuming that operators are allowed to make investments in replacement wells and other field operations needed to sustain production over time.

3. These supplies will be needed in California for many years.

According to the California Energy Commission (CEC), California refiners purchased 528 million barrels of crude oil in 2023, which was up about 1 million barrels from 2022. These crudes were mostly refined into gasoline, diesel, and jet fuel, which combined accounted for over 99 percent of energy used in California's transportation sector during the year.[2] California is currently one of the largest consumers of gasoline, diesel and jet fuel on earth. About 23 percent of crude oil consumption in 2023 was supplied by in-state production and the remaining 77 percent was from waterborne imports from Alaska and foreign countries. As discussed in more detail below, in-state oil production plays a major role in ensuring an adequate amount of refined petroleum products are available for Californians.

The share of total transportation energy supplied by petroleum will likely decline over time as California transitions to a carbon-neutral economy. Even under optimistic assumptions about the speed of the energy transition, however, the state will remain a major consumer of crude oil for many years into the future. The California Energy Commission's most recent Transportation Energy Demand Forecast, released in December 2022, shows that combined demand for gasoline, diesel and jet fuel will decline only modestly over the next 12 years – from 21 million gallons in 2022 to 19 million by 2035.[3] While gasoline and diesel consumption is expected to fall moderately during this period, jet fuel consumption is projected to rise. Consumption of

[1] Most of my comments in subsequent sections refer to oil production because it is the main resource extracted from Inglewood Oil Field. However, it is important to note that many of the same issues raised with respect to oil also apply to natural gas produced in the field, albeit on a smaller scale.

[2] Source: *Transportation Energy Demand Forecast. 2022 Integrated Energy Policy Report*. Aniss Bahreinian, Ph.D. California Energy Commission, December 7, 2022. https://www.energy.ca.gov/event/workshop/2022-12/iepr-commissioner-workshop-updates-california-energy-demand-2022-2035

[3] Ibid.

gasoline, diesel, and jet fuel for years beyond 2035 (the final year of CEC's forecast) will depend on the rate of uptake of zero emission vehicles, growth in the state's population and economy, future changes in per-capita vehicle miles traveled, and numerous other difficult-to-predict factors. However, the slow decline rate over the next decade makes it highly likely that California demand for crude oil will remain in the range of several hundred million barrels per year for decades to come.

The bottom line is that the great majority of oil produced in California is refined locally and consumed within the state, and that this will remain the case for many years to come. The corollary is that any loss in local production will need to be replaced with more imports from Alaska and foreign countries in order to fulfill demand for refined petroleum products in the state. As discussed in the following section, the shift to more imports would come at a significant environmental and economic cost to Californians.

4. Loss of local supplies will have substantial negative environmental and economic impacts.

These impacts would occur in three key areas: (1) increased CO_2 and other emissions related to shipments and offloading of crude from Alaska and foreign sources; (2) loss of jobs, income, and taxes related to local production; and (3) higher retail fuel prices and greater supply risk to California consumers.

CO_2 emissions and other pollution associated with replacement imports.

The increase in waterborne imports would require additional tankers, some traveling up to 15,000 miles, and each offloading crude through Southern California's already-crowded ports. As noted above, crude oil production from the Inglewood oil field is collected on-site and sent via pipeline to local refineries in Southern California. This efficient process is partly responsible for the relatively low carbon intensity of oil produced by this oil field.[4,5] Because of this relatively low intensity, replacement of oil extracted from the Inglewood field with offshore sources may significantly raise the net level of CO_2 emissions attributable to oil refined in California.

In addition to CO_2 emissions, the offloading of additional foreign crude would result in increases in other pollutants – including particulate matter, nitrogen oxides, carbon monoxide, and sulfur oxides – in and around the Southern California ports. Increased imports will also likely increase the number of tanker trucks traveling in already congested corridors, further adding to local pollution. These developments would have important environmental justice implications, in that people living in low-income communities near the ports and marine terminals would face more pollution and associated risks of cancer, respiratory diseases, and other health-related ailments.

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[4] Source: *Calculation of 2022 Crude Average Carbon Intensity Value, Low carbon Fuel Standard Crude Oil Cycle Assessment. August 3, 2023.* https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2022_Crude_Average_CI_Calculation_initial.pdf.

[5] Crude oil carbon intensity measures emissions associated with the production and transport of crude oil supplied to California refiners. Carbon intensity (measured as grams of CO_2 per megajoule of energy) was 10.06 for Inglewood, or 26 percent less than the 12.69 average from all California refinery sources. It is also 37 percent lower than the carbon intensity of Alaska crude and nearly 20 percent lower than crude oil from Iraq, which was the leading non-U.S. source of imports during 2022.

More generally, California oil and gas operators are subject to the strictest health, safety, and environmental regulations in the world. They are regulated by more than two-dozen federal and state agencies, including the U.S. Environmental Protection Agency, the Geologic Energy Management Division of the California Department of Conservation (CalGEM), and numerous state and regional air and water districts. Production in the Inglewood oil field is additionally subject to the CSD, which regulates nearly every aspect of the oil field's daily operations, ranging from drilling and flaring to protocols for handling community complaints. Given these multiple levels of regulation, Inglewood oil field is one of the most highly regulated fields in the world. It is unlikely that replacement oil from non-California sources would be produced under the same rigid environmental, health, and safety standards.

Loss of local jobs, income, and state and government tax revenues.

Direct impacts. According to Sentinel Peak Resources' (the current operator in the Inglewood oil field), about 80 workers are directly employed by the company to work in the oil field, along with an additional 100 to 150 contractors who support Sentinel Peak's operations.[6] According to data from the California Employment Development Department, the oil and gas extraction and support industries in Los Angeles County had a combined average annual wage of $110,000 in 2022.[7] This was 43 percent higher than the $77,000 average wage for all private sector employees during the year. The above average pay rate for oil and gas production is even more impressive given that many field service jobs are available to workers with high-school and technical degrees.

The Inglewood oil field is also the source of millions of dollars in royalty payments, with most royalty owners living in the surrounding local community. It is also a major source of ad-valorem property taxes paid to the county, as well as income taxes, sales taxes, and a variety of other taxes and fees paid to state and local governments.

Total impacts, including multipliers. In addition to the elimination of jobs, wages, royalty income, and taxes directly related to field operations, a production phase-out would have indirect impacts on the Southern California communities surrounding the field, as the lost wages and royalty payments translate into less expenditures on goods and services in the local economy. Taking into account these multiplier effects, *the total impact of a phase-out of the Inglewood oil field would likely be losses of 600 jobs, $100 million in income, and over $20 million in state and local taxes.*

Reduced energy reliability and increased petroleum prices to consumers.

Local crude oil production is particularly important to Californians because unlike most states, which are interconnected to petroleum supplies through networks of pipelines, rail, and short-distance vessel shipments, California is an "energy island." California refiners rely almost exclusively on in-state production and waterborne imports from Alaska and foreign countries to meet petroleum demand. Some of the largest foreign sources, such as Iraq and Saudi Arabia, are up to 15,000 nautical miles away from Southern California ports, meaning that it can take weeks, or even months to access new foreign supplies in the event of unexpected changes in

[6] Source: *Inglewood Oil Field – Economic Benefits*. https://inglewoodoilfield.com/benefits/economic-benefits/
[7] Source: *Quarterly Census of Employment and Wages*. Labor Market Information Division, California Employment Development Department. https://labormarketinfo.edd.ca.gov/qcew/cew-select.asp

supply or demand in California markets. California receives almost no oil from the other "lower-48" states due to the lack of interstate crude oil pipelines from North Dakota and Texas to California, and the high costs, safety concerns, and strong public resistance to rail shipments.[8,9]

Given California's isolation from other U.S. markets, production from the Inglewood oil field and other in-state sources plays a crucial role in ensuring a steady and reliable supply of crude oil to help refiners meet California's energy needs. A loss of in-state oil supplies would have a variety of deleterious effects, including:

- **Higher costs for imported crude.** According to the California Energy Commission's 2022 Integrated Energy Policy Report Update, one key reason for California's higher-than-average gasoline prices is higher dependence on "more expensive foreign and Alaskan crude oil."[10] The implication is that a loss of in-state production and corresponding increased reliance on Alaska and foreign crude will likely result in further retail price increases.

- **Higher refinery costs.** If a phase-out of Inglewood oil production were combined with losses of other sources of California crude oil, refiners would likely face significant capital costs to maintain efficient operations. This is because California refiners currently rely on a steady flow of California crude to optimize fuel inputs and minimize foreign supply disruptions. In a study we conducted for the Western States Petroleum Association in 2019, we found that refiners do not have adequate port-related capacity of accommodate the increased imports that would be required to replace a shutdown of California production.[11] Hence, a significant loss of California crude production would require increased expenditures for additional dock capacity, coastal storage and pipelines, and potentially for reconfiguration of the refineries themselves to optimally process foreign slates of crudes.[12] The costs associated with increased reliance on imports are acknowledged in the California Air Resources Board (CARB) 2022 California Air Resources Board Scoping Plan, which specifically states that if a phase-out of California crude oil were to occur, "activity at the ports would increase, and new infrastructure would be needed to store and deliver crude to in-state refineries."[13] In

[8] Total shipments into California by rail were 862,000 barrels in 2022, representing less than 0.2 percent of total crude oil demand in the state. See "Oil Imports by Rail, 2022," California Energy Commission. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california-0.

[9] Similarly, California imports only small amounts of refined motor vehicle fuel from other states. This reflects (1) the lack of interstate refined petroleum pipelines extending from mid-continent or the Gulf Coast to California, and (2) the lack of out-of-state refineries that produce sufficient quantities of motor vehicle fuels that meet California's special fuel formulation requirements.

[10] Source: *Final 2022 Integrated Energy Policy Report Update.* California Energy Commission, May 10, 2023. See page 9. https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update.

[11] See "Impact of a Statewide Oil Production Ban on Downstream Petroleum Markets," Capitol Matrix Consulting, August 2019. Prepared for the Western States Petroleum Association.

[12] Petroleum refineries are complex industrial facilities that are designed to handle specific slates of crude oil. Replicating the chemical characteristics of California crudes with foreign-sourced oil would pose a significant challenge to refineries, who would need to either find foreign oil matching characteristics of California crude or incur major costs to reconfigure their refining processes.

[13] Source: *2022 Scoping Plan for Achieving Carbon Neutrality*, California Air Resources Board, December 2022, See page 105. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.The 2022 Scoping Plan also acknowledges that a full phase-out of local oil and gas would result in "leakages," stating that "while GHG emissions from this sector would go to zero in our AB 32

California's isolated petroleum markets, these additional costs would likely be passed along to consumers.

- **Potential capacity constraints and supply shortages.** This would occur if California refiners were unable to secure the permits from multiple agencies needed to move forward on the infrastructure investments.[14] It would also occur if refiners found such investments to be uneconomic due to their long lead times, the state's planed phase-out of petroleum fuels, and uncertainties about future regulations and taxes affecting refineries. The resulting supply shortfalls would boost retail prices for refined fuels.

- **Full exposure to foreign supply disruptions.** Near 100 percent dependence on imports would put California at great risk from foreign supply disruptions due to regional skirmishes, oil embargos, and other global factors. Global markets have been in turmoil for much of the past three years due to Russia's invasion of Ukraine in 2022 and OPEC production cuts in 2023, and the targeting of tankers in the Red Sea by Yemen's Houthis and Iran's attack on Israel in 2024. Fortunately, the more recent conflicts have not, thus far, resulted in major supply disruptions. However, they do serve as a warning of the risks inherent in full dependence on foreign oil supplies over which Californians have no control. Absent any cushion from local supplies, a disruption of foreign oil supplies would quickly translate into shortages on California fuel markets. Given the inelastic demand for gasoline, such shortages would quickly translate into major price increases at the pump. The increases would potentially be much greater than the price spikes that occurred in 2015 following the Torrance Refinery fire and in 2022 following a surge in demand and unplanned refinery outages that occurred in the summer and early fall of that year. Retail gasoline price increases have a regressive impact on low- and moderate-income households in the state.

Conclusion

The proposed CSD amendment would result in a major change to land use in the Inglewood oil field, which will have far-reaching environmental and economic impacts. The amendment will result in a significant loss of a mineral resource that is highly valued to Californians and will remain so for many years. Reduced local oil production may significantly raise CO_2 emissions related to production and transport of crudes sourced from Alaska and foreign countries. Increased imports will also have negative effects on local air quality in and around California ports, thereby increasing health-related risks in adjacent communities.

GHG inventory with a full phase-out, emissions related to the production and transport of crude to California might increase elsewhere, resulting in emissions leakage."

[14] Our 2019 report, referenced in footnote 11, also highlights California's long history of major delays, revisions, and permit denials for oil-related capital projects in and around California ports, which bodes poorly for future expansions.

The phase-out of Inglewood oil field operations would also reduce jobs, income, and tax revenues to the region surrounding Inglewood oil field. And the loss of in-state crude oil production may raise prices and reduce the reliability of California petroleum supplies, thereby negatively impacting households and businesses throughout the state. It is important that these potential impacts be thoroughly vetted in an updated EIR.

Sincerely,

Brad Williams

Brad Williams
Senior Partner and Chief Economist
Capitol Matrix Consulting

Enclosure: Author Biography

Author Biography

Brad Williams joined Capitol Matrix Consulting (CMC) in 2011 as its senior partner and chief economist after a nearly 33-year career in state government. During the 12 years at CMC, Mr. Williams has advised clients on development of statewide ballot initiatives; prepared numerous economic studies; and represented clients in public hearings, editorial board meetings, press conferences, and other public and private venues. His work has involved projects in numerous areas, including oil and gas, renewable energy, education, taxation, state and local government finances, pensions, agriculture, and health care.

During this period, Mr. Williams has prepared dozens of statewide and regional studies for the California oil and gas industry. These have included the industry's direct and indirect impacts on statewide and regional economies, as well as evaluation of the impacts of laws, regulations, and general plan updates on oil production, gasoline prices and availability, and jobs in the industry. Mr. Williams has also presented testimony before regional boards and commissions on oil-inbdustry related impacts of proposed regulatory changes.

During his career in state government, Mr. Williams served in the non-partisan California Legislative Analyst's Office as its chief economist and Director of Economic and Fiscal Forecasting, where he was responsible for: the office's economic and budget-related forecasts; financial modeling of budget scenarios for legislative leaders; analyses of ballot and legislative budget proposals; and preparation of studies relating to revenue volatility, the impacts of the state's spending limit, and fiscal challenges facing local governments. He was also a key spokesman for the office, frequently providing testimony to the legislature, presenting at state and national conferences, and appearing on CNBC and other television and radio programs. In his government career, Mr. Williams also served as consultant in the Assembly Appropriations committee; as an advisor to State Treasurer Kathleen Brown and State Controller Kathleen Connell; and as the executive director of the Commission on State Finance – an agency responsible for preparing short- and long- term forecasts of the state's economy and financial situation.

Based on a detailed Wall Street Journal comparison of economic projections made by banks, universities, and other forecasters over the full decade of the 1990s, Mr. Williams was recognized by the Journal as the most accurate forecaster of California's economy for that period. He was also recognized by the Journal as one of the first economists in the U.S. to recognize and measure growing volatility in state government revenues starting in the late 1990s, reflecting shifting income distributions and state governments' rising dependence on income taxes on capital gains.

Mr. Williams received his BA and MA in economics from the University of California, Davis.