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VIA OVERNIGHT MAIL

November 6, 2025

Barbara Ferrer, PhD, MPH, MEd
Director
Christine De Rosa, PhD
Director Office of Environmental Justice
and Climate Health (OEJCH)
Los Angeles County Department of Public Health
313 N Figueroa Street
Los Angeles, CA 90012

RE: Baldwin Hills 2nd Health Assessment and Environmental Justice Study – Final Report

Dear Drs. Ferrer and De Rosa:

On behalf of Sentinel Peak Resources California LLC, we submit the attached comments to the Baldwin Hills 2nd Health Assessment and Environmental Justice Study – Final Report prepared by a research team at the University of California, Los Angeles (Liu et al., 2024, or the UCLA Study). These comments were prepared by Deborah Proctor, Managing Principal Scientist at ToxStrategies, LLC. Ms. Proctor has more than 30 years of experience in environmental and occupational health risk assessment, specializing in applied toxicology, mode-of-action evaluations for chemical carcinogens, air toxics and air pollution risk assessment, exposure reconstruction, and quantitative dose-response analysis for the purpose of developing toxicity criteria.

As discussed in Ms. Proctor's attached report, the UCLA Study does not adequately demonstrate that operations at the Inglewood Oil Field are associated with a higher risk of adverse health outcomes in the surrounding area. Instead, this report is consistent with decades of prior studies showing a lack of health impacts from the operations being conducted at the Inglewood Oil Field. However, the Executive Summary for the UCLA Study makes several overly broad statements that lack the clarifications provided later in the Study. These broad statements have resulted in the UCLA Study being inappropriately put forward as a justification for regulatory action.

Based on the attached report, Sentinel Peak requests that the County have the UCLA Study revised to correct these issues.

Sincerely,

Matt Wickersham

Enclosures

BlueRidge LIFE SCIENCES

ToxStrategies A BlueRidge Life Sciences Company

Critique of Baldwin Hills 2nd Health Assessment and Environmental Justice Study: Final Report

OCTOBER 31, 2025

Critique of Baldwin Hills 2nd Health Assessment and Environmental Justice Study: Final Report

OCTOBER 31, 2025

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Acronyms

AML	acute myelogenous leukemia
BMI	body mass index
BOE	barrels of oil equivalent
CSD	Community Standards District
DBP	diastolic blood pressure
EJ	environmental justice
FEV1	forced expiratory volume
FVC	forced vital capacity
GRADE	grading of recommendations assessment, development, and evaluation
IOF	Inglewood Oil Field
OGD	oil and gas development
ORs	odds ratios
SBP	systolic blood pressure
SES	socioeconomic status
SDOH	social determinants of health
SGA	small for gestational age
SNAPS	Study of Neighborhood Air Near Petroleum Sources

Executive Summary

On behalf of Sentinel Peak Resources California LLC, the owner of Inglewood Oil Field (IOF) in Los Angeles (LA) County, ToxStrategies LLC (ToxStrategies) has reviewed the Baldwin Hills 2nd Health Assessment and Environmental Justice Study – Final Report prepared by a research team at the University of California, Los Angeles (Liu et al., 2024, or the UCLA Study). Our purpose is to clarify the significance of the UCLA Study's findings relative to public health in the community surrounding the IOF, defined as an oval approximately 1.5 miles from the IOF property boundary (the IOF Study Area).

ToxStrategies is a multidisciplinary scientific consulting firm providing toxicology, industrial hygiene, epidemiology, and risk assessment research and evaluation to address public health, occupational health, and environmental challenges. We have offices across the United States, including two offices in California, and staff with in-depth knowledge of, and experience with, air toxics in LA County.

The UCLA Study summarizes several independent evaluations for the community surrounding the IOF. The scope of each is briefly summarized below:

- **Birth Outcome Analysis** – The researchers reviewed birth records from 2000 to 2019 for persons living within a 1.5-mile radius of the IOF to evaluate associations between IOF-related exposure metrics and risk of preterm births, small for gestational age (SGA) births, gestational age, and birth weight.
- **Resident Health Survey (Self-Reported)** – The researchers surveyed a population of 590 adults living within a 1.5-mile radius of the IOF, who were identified through random and supplemental convenience sampling. Participants were asked to self-report health symptoms experienced within the past two weeks, including high cholesterol, cancer, sore throats, miscarriage, allergies, chronic respiratory disease, fatigue, and headaches. Demographic information, including race and ethnicity, were also reported by the survey participants. The UCLA Study evaluated associations between these self-reported symptoms and exposure metrics related to the IOF and its operations.
- **Biometric Data Analysis** – 540 adults recruited in the Resident Health Survey completed biometric measures, consisting of measures of hypertension and lung function. The UCLA Study evaluated associations between exposure metrics and the average of three blood pressure measurements, maximum of forced vital capacity (FVC), and forced expiratory volume (FEV1) collected on a single day.

In summary, ToxStrategies finds:

- The UCLA Study does not support that conditions or exposures associated with the IOF are the cause of adverse birth outcomes, changes in biometric measures, or self-reported health symptoms. Additionally, estimates of population attributable fraction for birth outcomes, which were estimated "if these associations are causal" are not justified or appropriate. The inclusion of such statements in the Study report may cause misplaced alarm among LA County residents.

- The exposure metrics, which include distance (0.05-1.5 miles from the IOF) and location of residence in relation to prevailing wind direction (e.g., up and downwind), are inadequate exposure measures. Predominant winds from the west/southwest (blowing toward the east/northeast) only occurs 53% of the time, while wind comes from the east/northeast 25% of the time, and crosswinds relative to these directions blow 21% of the time (Sonoma Technology, Inc (STI), 2015). So, while west/southwest is the prevailing wind direction, winds do not blow in that direction almost as frequently, and upwind/downwind as a binomial variable is not definitively specific to exposure conditions associated with the IOF.
- When the Study authors evaluated outcomes against better metrics of potential airborne exposures associated with activities at the IOF (e.g., oil and gas field activity, increased drill rig activity, high chemical use, and high air toxics), there was no increase in the odds of preterm birth, and in several analyses, a statistically significant decreased association was reported (Liu et al., 2024, p. 8). The UCLA Study should have considered relying on the available air quality data to quantitatively characterize exposures, rather than relying on prevailing wind direction and distance from the IOF.
- The UCLA Study conclusions emphasize findings based on crude association rates, which have not been adjusted for known and measured confounding variables. These rates, without context, are not meaningful, and may be misunderstood as adverse. In many cases, the reported associations are attenuated and not statistically significant when adjusted for confounding factors in the UCLA Study results. The results from odds ratios (ORs) adjusted for known confounders and bias, as well as findings of statistical significance, should be emphasized in the Executive Summary.
- Environmental Justice (EJ) considerations were a required component of the Settlement Agreement to assess community health. Although the researchers included consideration of some EJ-related demographic and socioeconomic factors, many critical social determinants of health (SDOH) are absent or inadequately characterized and analyzed. An EJ assessment should analyze the factors that affect community vulnerability to cumulative health impacts, including exposure to all chemical stressors (not just the IOF-related exposures) and non-chemical stressors (including SDOH) and their influence on community health effects. The results, as reported, should not be considered meaningful from the perspective of an EJ assessment without further consideration of cumulative impacts.

1 General Overview of Comments

Statements of general findings in the UCLA Study's Executive Summary may mislead the reader by omitting clarifications provided later in the Study. This issue is particularly demonstrated in the Study's Conclusion statements from the Executive Summary, which prioritize preterm birth findings based on crude rates, and do not describe the adjustment impact of important confounding factors. The conclusions fail to discuss the weak associations and lack of statistical significance identified from adjusted models, and do not acknowledge the potential significant residual confounding on birth outcomes attributable to failure to control for key confounding variables, such as smoking during pregnancy and maternal body mass index (BMI). Additionally, the exposure metrics used are insufficient to demonstrate a causal relationship between the associations reported in the Study and exposures related to the IOF. The UCLA Study's limited reporting on the impact of residual biases and exposure uncertainties may mislead readers into assuming confidence exists in the observed associations. To better inform reviewers, the paragraph on limitations at the end of the Executive Summary's Conclusions section could ideally include an expanded statement of limitations to address each aspect of the Study's conclusions.

The methods used to conduct the UCLA Study have distinct limitations that contribute to bias and uncertainty in the reported results. Examples include a lack of control for key confounding and modifying variables, and the potential for selection and reporting bias in the Resident Health Survey because convenience sampling was used and outcomes were self-reported. Notably, Liu et al. (2024) used convenience sampling to supplement the "insufficient response level of random selection mailing recruitment" (p. 36) with "response rates of 1.5%, 1.7%, and 0.8%" across batches (p. 43). Biases from convenience sampling, and more specifically self-selection (or volunteering), may arise when the participants know about the study objective before recruitment and are motivated to participate (see Lash et al. [2021] for additional information on selection bias). Liu et al. (2024) state that convenience sampling "resulted in a well-distributed study sample across radius distance from IOF fence line" (p. 79), but no clear evidence is provided to support the generalizability or lack of bias in the recruited sample. There is also a lack of statistical adjustment to account for multiple comparisons, lack of direct exposure measurements related to the IOF, and lack of synthesis and interpretation of findings in the context of other analyses. The UCLA Study does not clearly discuss these limitations, nor properly contextualize the strength of its findings for informing causality. For example, while the biometric analysis identified minor differences in diastolic blood pressure (DBP) between upwind and downwind groups, the differences in measured blood pressure are not clinically relevant (i.e., DBP is measured within the normal range among surveyed participants both up and down wind). We recommend additional evaluation of the uncertainties in reported findings attributable to chance, bias, and/or confounding and contextualization of the findings.

The previous studies of this specific site prepared for LA County are not discussed nor referenced. These include the 2011 Inglewood Oil Field Communities Health Study (LACDH, 2011), 2015 Baldwin Hills Air Quality Study (STI, 2015), and 2020 Inglewood Oil Fields Health Risk Assessment Report (MRS Environmental, 2020). The results of these earlier studies should be discussed in reference to findings of the current UCLA

Study. Discussion of the relevance of these earlier Baldwin Hills and the IOF studies is provided in Section 4 below.

2 Misleading or Conflicting Statements of Findings

Throughout the UCLA Study, initial statements of findings are often based on crude (unadjusted) comparisons, even when subsequent adjustment for confounding factors eliminates or reduces the observed association. Failure to address or report on the bias- and confounding-adjusted findings may result in misinterpreting the results.

For example, concluding the Executive Summary with this single statement is misleading:

> "Looking historically among residents within 1.5 miles of the IOF, living downwind of the oil field was associated with a higher likelihood of a baby being born preterm, particularly for those within half a mile, suggesting a possible impact of historical oil field operations on pregnancy outcomes" (Liu et al., 2024, p. iii).

The results of this analysis (see Figure 1a, which is a copy of Figure 4 from the UCLA Study) show that only the residents within <0.5 mi of the IOF had a statistically significant increase in odds of preterm birth; however, these findings are not associated with increases in the IOF activity (Figure 1c). Therefore, the statement in the Executive Summary that "the preterm birth rate was higher in the community living downwind of the oil field as compared to upwind" (Liu et al., 2024, p. ii) is a limited interpretation of the Study's findings, and any associations are likely to be related to factors other than the IOF.

Furthermore, the Executive Summary does not mention the findings in Table 9 or Figure 8(a) of the UCLA Study (reproduced below in Figure 2), which show a statistically-significant *decrease* in odds of preterm birth associated with air toxics and the number of operating drill rigs. The authors state that:

> "The number of drill rigs and quantity of air toxics and total chemicals applied on the oil field were not strongly associated with any of our outcomes, in unadjusted analyses or adjusted analyses controlling for sex, age, parity, nativity, race/ethnicity, education, insurance, season, year, green space, traffic and neighborhood poverty rate" (Liu et al., 2024, p. 8).

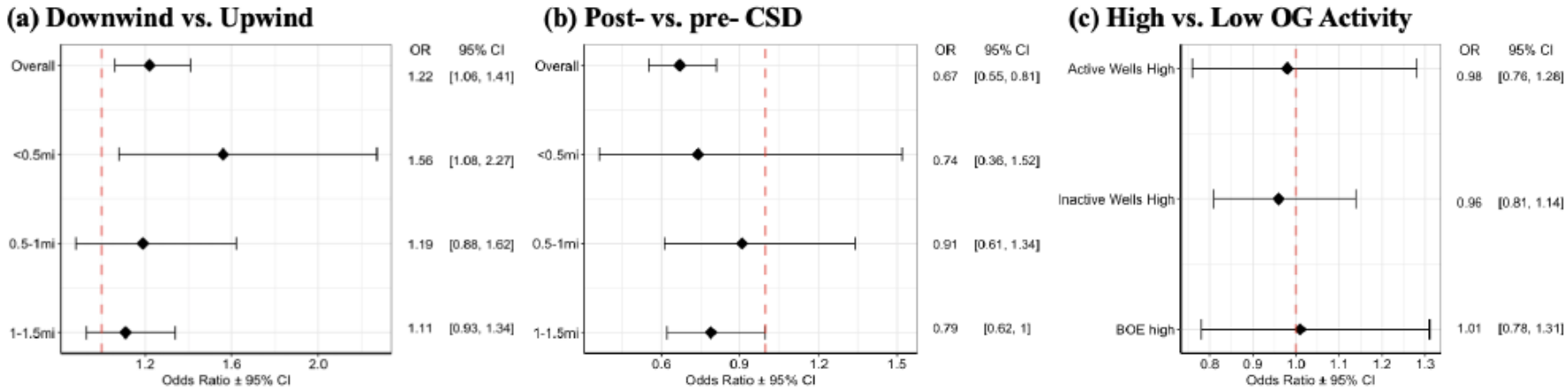

Figure 1: Figures 4(a) through 4(c) from the UCLA Study. These figures indicate that a) statistically significant odds of preterm birth are identified among persons living within < 0.5 mi downwind of the IOF, with b) a non-significant decrease in odds following implementation of the Community Standards District (CSD), which also corresponds to the same trend in LA County as a whole after 2008, and is not reflective of specific IOF activity. However, c) these findings are not consistent with the lack of observed association between IOF well activity, a surrogate metric for the IOF-specific exposures, and preterm birth. (High Active and Inactive wells are based on a count of wells within 0.5 mi, with high and low being categorized based on the approximate median values, and BOE is mean barrels of oil equivalent per day in [c]).

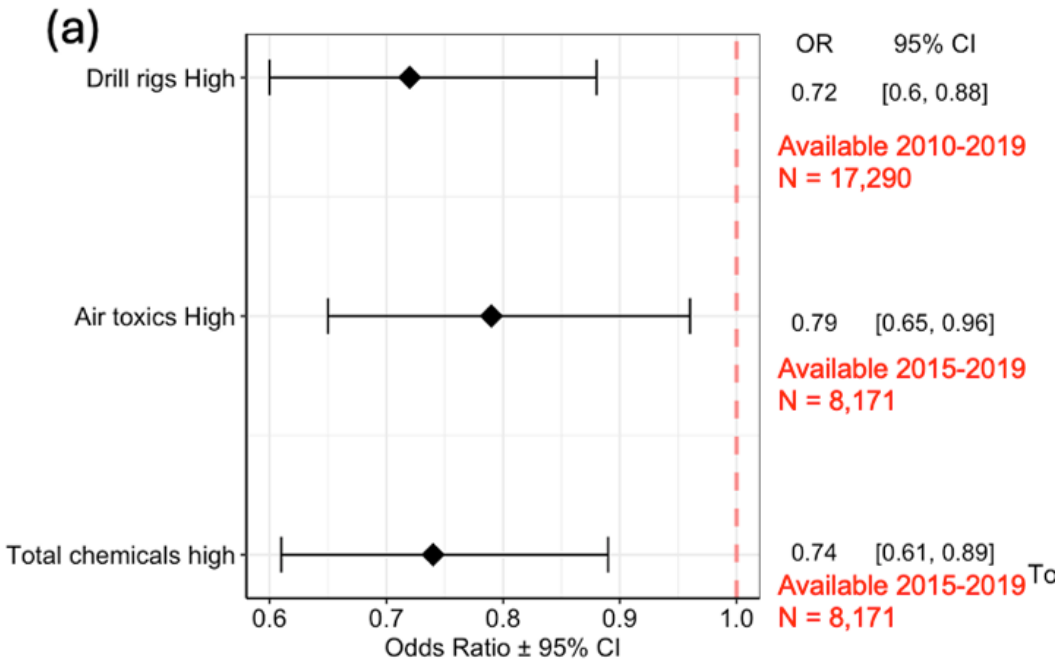

Figure 2: Figure 8(a) from the UCLA Study. High exposures to drill rig activity and air toxics concentrations were statistically significantly associated with a *decrease* in odds of preterm birth (Drill rigs are based on number of drill rigs operating on site during pregnancy; Air Toxics and total chemicals are based on the total mass of air toxics and total chemicals applied in oil field operations during pregnancy as reported to the SCAQMD; and high and low were distinguished based roughly on the median value for each metric.)

Factors associated with the IOF activity (including air toxics, barrels of oil produced, and operating drill rigs) are more likely indicators of potential exposure to chemicals related to the oil field, but there is no observable increase in odds of preterm birth with these factors (and in some analyses, a statistically significant decrease in odds). This finding is notable (~75% decrease in preterm births associated with increased drill rig activity, high chemical use, and high air toxics), and each of these associations is a statistically-significant decrease (Figure 2). While we are not suggesting that this finding is evidence of a protective effect, it is important to emphasize in the Executive Summary that the observation with distance is inconsistent with other metrics of exposure related to the IOF activity levels, and, as such, likely due to unaccounted confounding.

The summary of Birth Outcome Analysis results predominantly presents statements of preterm birth rate disparities based on crude (unadjusted) rates, while not clarifying that: (1) crude rates do not include consideration of confounders, effect modifiers, or other explanatory variables; and (2) adjustments for the most-documented and likely confounding factors for preterm birth (maternal smoking and BMI) were not included in the birth outcomes analysis. The reported unadjusted and inadequately adjusted ORs—

specifically the reported statistically-significant increase in preterm birth among residents within <0.5 miles downwind of the IOF (see Figure 1, which is a copy of Figure 4 of the UCLA Study)—are not of large magnitude (i.e., OR ≤ 2). The exposure assessment approach in the UCLA Study therefore significantly limits confidence in the findings. The UCLA Study primarily uses proximity to the oil field and wind direction as proxy for exposure, rather than using available air quality data. Thus, comparisons do not account for actual exposures specifically related to oil field activities. Pounds of chemicals used is not proportional to amount of chemicals released to air. Interestingly, when a better metric (oil and gas field activity) was used, the association with preterm birth was not increased (Liu et al., 2024) (Figure 2). In any case, available air quality data would be more representative of exposure levels. The quote that "the cross-sectional nature of the survey and lack of personal measures of exposure to potential oil field related pollutants limits causal interpretations" is an understatement of these important limitations (Liu et al., 2024, p. 80). Because the exposure and outcome are measured concurrently, temporality of the exposure-response and the etiological relevance of estimated exposure metrics cannot be established. Recognizing that biological plausibility and causality are not assessed is crucial for interpreting the findings. A striking example is the discussion of preterm births that "would have" been prevented by removing the IOF. The UCLA Study states, "If these associations are causal, we estimated that the removal of the IOF would have resulted in 175 cases of preterm birth being prevented over a 20-year period [emphasis added]" (Liu et al., 2024, p. 9). As the finding do not demonstrate causality, this statement is unfounded and should be stricken from the report.

The UCLA Study does not provide any direct evidence to support a causal relationship. The analysis does not apply formal causal analysis tools, such as Bradford Hill or Grading of Recommendations Assessment, Development, and Evaluation (GRADE)-based considerations, which support transparent judgements regarding the confidence in the reported findings (Hill, 1965; Morgan et al., 2016). Such causal analyses should include, at minimum, considerations of biological plausibility, temporality, and exposure-response gradient. While not all considerations must be met to determine causality, multiple key considerations are not met by Liu et al. (2024). Temporality cannot be established because of the cross-sectional study design (exposure and outcome are measured concurrently) and considerations of trends pre- and post- implementation of the CSD are not specific to the IOF and reflect broader trends across LA county (Figure 1b) (Liu et al., 2024). Exposure information specific to the IOF is lacking, and exposure-response is not supported when considering metrics of air quality, such as air toxics (Figure 2). The evidence for supporting a causal assumption based on this study alone is weak. Therefore, assumed causal relationships should not be used as the basis for misleading statements of impact, as they may be taken out of context and create significant unsupported concerns.

3 Problems with Study Design and Reporting

The UCLA Study did not adjust or account for key confounders or effect modifiers, nor did it address potential limitations attributable to selection bias (i.e., reliance on convenience sampling and volunteer participation for the biometric analysis and health survey). Most notably, the Birth Outcome Analysis did not include adjustments for

maternal exposure to smoking (direct or second-hand), alcohol or drug use, BMI, or maternal health conditions. Confounding biases for birth outcomes are well documented, and some (e.g., smoking during pregnancy) have been shown to have causal relationships with birth outcomes, such as SGA and preterm birth. Failure to account for smoking and additional risk factors is a significant limitation that should be discussed, and the potential impacts (direction and magnitude) of confounding bias should be considered. The Biometric Data Analysis would also benefit from more discussion of the study limitations, including statements that other factors, "such as sex, BMI, and previous hypertension diagnosis, **had stronger and statistically significant associations with blood pressure across all models**" (emphasis added, Liu et al., 2024, p. 60). The findings of the survey and biometric data analysis need clear summary statements to better communicate study limitations and uncertainties with the public and decision-makers. Clearer conclusory statements could be:

- In the survey, high cholesterol, sore throat, headache, and cancer were more commonly reported among residents living closer to the oil field; however, after accounting for other relevant factors (age, sex, race/ethnicity, education, smoking history, BMI, gas stove, traffic, outdoor hours, years of residence), the associations between proximity to the oil field and these conditions were no longer statistically significant.
- A higher rate of abnormal lung function was observed among downwind participants living 1–1.5 miles from the oil field; however, we could not rule out that these differences might be due to chance for abnormal lung function rates, and the evidence is not definitive enough to dismiss the role of random variation. After adjusting for confounders, there is no statistical mean difference in lung function parameters for participants at different distances and wind directions.
- Living downwind of the IOF was associated with increased odds of higher blood pressure; however, the downwind and upwind groups both had diastolic blood pressure (DBP) within the healthy range. Proximity to the IOF showed no significant association with blood pressure outcomes. Neither systolic blood pressure (SBP) nor DBP levels varied meaningfully based on how close participants lived to the IOF.

4 Comparison to Past IOF Studies

The UCLA Study contains no comparison, nor discussion of, three past related studies specifically prepared to evaluate public health risks potentially associated with the IOF. These include:

- 2011 Inglewood Oil Field Community Health Assessment [LACDPH, 2011]
- 2015 Baldwin Hills Air Quality Study [STI, 2015] - Prepared for LA County per Settlement Agreement
- 2020 Inglewood Oil Fields Health Risk Assessment Report [MRS Environmental, 2020]

The 2011 study analyzed data for mortality, low birth weight, birth defects, and blood-related cancer incidence in communities surrounding the IOF. After adjusting for race/ethnicity, the study found no statistically significant differences in the mortality rates for any of the leading causes of death or premature death or in the rates of low-birth-weight births in the IOF communities compared to Los Angeles County. The study also 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" (LACDPH, 2011, p. iv).

The 2015 study measured air quality near the IOF and found "concentrations observed at the oil field are generally consistent with other parts of the Los Angeles Air Basin" and that "any possible contributions of the Oil Field are incremental or marginal, rather than a dominant local source" (STI, 2015, p. ES-5).

The 2020 study used mobile and stationary source emissions and modeling, and predicted that risk levels at the IOF fence line and nearest residence were acceptably low based on 2019 operations data, and assumed worst-case future operations. In the 2020 study, the predicted cancer risks (max of 13.8 in one million) and chronic hazard index (0.18) are at least an order of magnitude lower than background conditions (local predicted risk [~500 in one million] and nearest monitoring location where hazard index was predicted [~5] [SCAQMD, n.d.]).

Comparing the UCLA Study findings with findings from these past related studies is important, as these past studies inform the UCLA Study, and the findings from these previous studies are consistent with the lack of a causal relationship between the IOF operations and health outcomes reported in the UCLA Study. Collectively, the four studies consistently show evidence of low contribution from the IOF operations to health impacts in nearby communities.

Broader studies also support that the IOF operations in Los Angeles do not measurably contribute to adverse health effects, such as pre-term birth. A peer-reviewed study similar to the UCLA study indicated that the influence of oil and gas development (OGD) on adverse birth outcomes in urban areas were "close to null" (Tran et al., 2020). The area of Los Angeles surrounding the IOF is highly urbanized. Lastly, in a study of pre-term births in the San Joaquin Valley from 1998 to 2011, the relationship between spontaneous pre-term births and oil and gas production demonstrated a low adjusted OR (1.08 to 1.14), which, in stratified analyses, were confined to births to Hispanic and non-Hispanic Black women and to women with fewer than 12 years of educational attainment (Gonzalez et al., 2020). These results suggest that social determinants of health may play a greater role in birth outcome results than oil and gas production activities.

5 Problems with Scope of EJ Assessment

While the title of the UCLA Study indicates that it includes an "environmental justice study," the scope of its evaluation is highly limited. For example, the results section titled "Comparison Among Different Race/Ethnicity and Socioeconomic Groups" uses data from the household surveys to compare lung function and blood pressure measures across self-reported races/ethnicities and college attendance (as a proxy for socioeconomic status) at different distances and wind directions from the IOF (as a proxy for chemical exposure). Race/ethnicity and education level are insufficient and inadequate indicators on which to base an evaluation of health or social inequity in a community. An inherent assumption exists in the comparisons that socioeconomic status (SES) is indicated by whether a resident did or did not attend college. This attribute is an inadequate SES metric. While college attendance may reflect family resources and better job opportunities, several other important factors influence SES. For example, income and employment status were included in the survey, but why these factors were not included in the Study is unclear.

Regarding race/ethnicity, the Baldwin Hills household survey accommodated eight race/ethnicity category choices, but the EJ assessment comparison was limited to "Black/African American," "White," and "Other." Whether "Other" in the comparison includes data from when this box (Other) was checked, or combined data from the other five categories (i.e., Asian, Hispanic/Latinx, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Middle Eastern or North African), is unclear. Clarity about categorizing data is important when evaluating situations in which health impacts may be inequitably associated with race- or ethnicity-related stressors.

Racial differences in community-level health impacts have been found to be more likely attributable to differences in local non-chemical stressors (e.g., poverty, housing conditions, lack of affordable/accessible medical services) than to a direct causal relationship with race (Anderson et al., 2004). An EJ assessment should include identifying and quantifying exposures to these important non-chemical (and chemical) stressors compared to an appropriately selected baseline community. Additionally, different ethnic groups may have differences in diet, lifestyle, or genetic predisposition that can lead to differences in health impacts. A robust EJ assessment needs to consider prevalence in the community of ethnic differences in lifestyle and diet, and how these differences may influence stressor exposures and health impacts.

In summary, the Baldwin Hills EJ assessment does not evaluate numerous important exposure and social equity factors. Assessing potentially disproportionate community health impacts associated with EJ concerns should include an evaluation of the influence of multiple stressors and risk factors from multiple domains (e.g., chemical, socioeconomic, built and natural environment, behavior/lifestyle, biology). Limiting the EJ assessment to comparisons of only two health metrics across race/ethnicity and college attendance is inadequate. Such limitation provides no meaningful information regarding the influence of non-chemical stressors that may be a priority for understanding the community's health conditions, and, more importantly, for improving those conditions.

Given these significant limitations, then, the statements of findings on racial/ethnic disparities have the potential to mislead readers to conclude that these differences are associated with oil field impacts, which has not been determined.

Examining the results from CalEnviroScreen for the UCLA Study location (i.e., near the IOF) is informative. CalEnviroScreen scores are based on a combination of scores for two factors—pollution burden and population characteristics—each of which is based on several metrics. Pollution burden considers two categories: exposure (e.g., traffic) and environmental effects (e.g., proximity to cleanup sites). Population characteristics include two categories: sensitive populations (e.g., rates of asthma) and socioeconomic conditions (e.g., poverty). Each metric is converted to a percentile, the percentiles are combined for each category, and the categories are combined to yield the pollution burden and population characteristics scores. Scores are generated for individual census tracts. All scores are in the form of percentiles from 0 to 100%, with higher scores indicating census tracts with higher combined impacts.

Figure 3 below presents the CalEnviroScreen map in the proximity of the IOF. CalEnviroScreen 4.0 (OEHHA, 2021) identifies approximately 40 census tracts in the IOF Study Area. As shown in Figure 3, CalEnviroScreen EJ scores within 1.5 miles of the IOF are largely less than the 70th percentile and similar to the surrounding LA County area. Notably, the area to the northeast and downwind, indicated on Figure 3 by dark orange and red shading, have higher scores, >80th percentile, and the areas upwind of the IOF, indicted on Figure 3 by green shading, have scores, <40th percentile. While the pollution burden percentiles in CalEnviroScreen fall within 80th to 99th percentile both upwind and downwind of the IOF, the population characteristics vary more widely (8th to 98th percentile) up and downwind of the IOF, with upwind (green) tracts having lower population characteristics scores. The downwind orange/red census tracts have higher population characteristic scores, as documented in CalEnviroScreen, based on demographic factors of poverty, housing burden (high housing costs relative to income), and linguistic isolation. Thus, the data in CalEnviroScreen indicate that multiple stressors and factors unrelated to the IOF could contribute to potential health impacts downwind of the IOF, and therefore are likely to confound any associations between living upwind vs. downwind of the IOF.

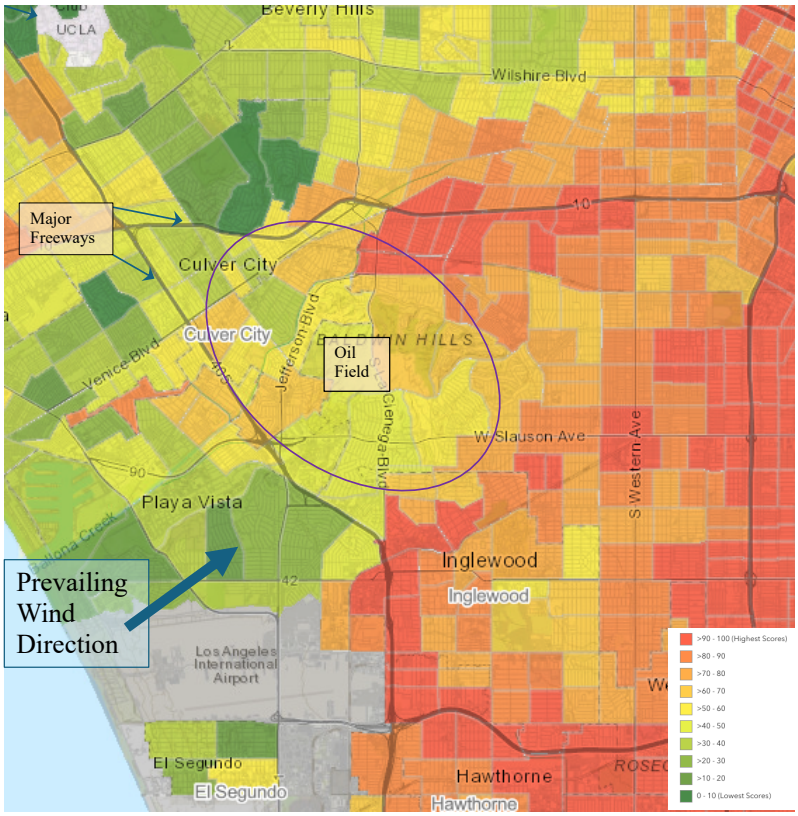

Figure 3. Location of study area overlaid on a basemap from CalEnviroScreen 4.0 (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40). The IOF study boundary area is approximately 1.5 miles from the boundary of the IOF.

6 Conclusion

In general, a need exists to directly and clearly explain the significance of the UCLA Study findings and its limitations with respect to the overarching question: Is residing near or downwind of the IOF meaningfully associated with a higher risk of adverse health outcomes? Such clarification is important for the UCLA Study to be useful for decision-making and not unintentionally misleading or subject to misinterpretation by its users.

In our opinion, the results of this study, and the additional evidence in previous studies, do not adequately demonstrate that operations at the IOF are associated with a higher risk of adverse health outcomes in the surrounding area.

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PROFESSIONAL PROFILE

Ms. Deborah Proctor has more than 30 years of experience in environmental and occupational health risk assessment, specializing in applied toxicology, mode-of-action evaluations for chemical carcinogens, air toxics and air pollution risk assessment, exposure reconstruction, and quantitative dose-response analysis for the purpose of developing toxicity criteria.

Ms. Proctor has technical expertise for assessing the potential human health risk associated with contaminated air, soil, sediments, groundwater, biota, and consumer products; evaluating failure-to-warn litigation claims pursuant to California Proposition 65, including determination of Safe Harbor Levels; designing risk-based site investigations; assessing the environmental fate and toxicity of metals in the environment; determining the bioavailability of metals in soil and solid media; and risk/hazard communications. Ms. Proctor has conducted studies of oral and inhalation bioaccessibility for metals in alloys, slags, and affected soil, dust, and baghouse dust, and has designed and conducted relative bioavailability studies for cobalt, nickel, and manganese. Ms. Proctor uses state-of-the-art scientific approaches to evaluate potential hazards and develop health-protective and science-driven remediation goals. She provides technical comments to regulatory agencies on policy and guidance documents, and technical support for public communication. Ms. Proctor has designed studies involving human volunteers and is experienced with the use of Internal Review Boards (IRBs) and the ethical requirements and considerations associated with research involving humans.

Ms. Proctor is a nationally recognized expert regarding the potential health risks associated with occupational and environmental exposure to chromium. She has published extensively in this field and managed research projects that have been used to develop federal and state regulatory health criteria. Additionally, she has extensive experience in metals risk assessment and specific expertise for evaluating nickel, cobalt, titanium, manganese, lead, vanadium, beryllium, and arsenic.

Ms. Proctor is a subject matter expert regarding human health and environmental applications of steel slag and heavy metals in the environment. She has experience using physiologically based pharmacokinetic (PBPK) modeling in risk assessment for chromium, lead, manganese, and perchlorate.

Ms. Proctor's research has been applied to support regulatory decisions and inform health-based criteria. Specific examples include the US Environmental Protection Agency (EPA) Inhalation Reference Concentration for hexavalent chromium using Malsh et al. (1994), the OSHA risk assessment for the 2006 Hexavalent Chromium Rule and revised Permissible Exposure Limit using Luippold et al. (2003); Crump et al. (2003), and Proctor et al. (2003; 2004), EPA Office of Prevention, Pesticides and Toxic Substances 2008 Reregistration Eligibility Decision (RED) for Chromated Arsenicals using Technical Study Reports FPRL #012506 and FPRL #012406; and the New Jersey Department of Environmental Protection Soil Cleanup Criteria for dermal contact with hexavalent chromium using Fowler et al. (1999). She has published an adverse outcome pathway (AOP) analysis for rodent forestomach tumors by nongenotoxic initiating events (Proctor et al., 2018), and an AOP framework for small intestinal tumors in mice (Bhat et al. 2020).

Ms. Proctor is a regular science peer reviewer for the *Journal of Applied Toxicology*, *Toxicology*, *Regulatory Toxicology and Pharmacology*, *Chemico-Biological Interactions*, *Journal of Occupational and Environmental Medicine,* and *PLOS One,*

ACADEMIC CREDENTIALS

1988	B.S., Environmental Toxicology, University of California, Davis
1996-1998	Graduate Studies, Epidemiology, University of Pittsburgh

PROFESSIONAL AFFILIATIONS

Society for Risk Analysis (member)

Association for Environmental Health Sciences (Scientific Review Board member)

International Society of Exposure Assessment (member)

International Society of Environmental Epidemiology (member)

Society of Toxicology (Councilor, Risk Assessment Specialty Section [RASS])

PUBLICATION AND PRESENTATION AWARDS

Society of Toxicology (SOT) 2025
Awarded Second Place for Best Risk Assessment Abstract at the Society of Toxicology Annual Meeting (Proctor DM, Thompson C) by the Risk Assessment Specialty Section (RASS), Orlando, FL.

SOT 2014
Awarded Top 10 Risk Assessment Presentations at the Society of Toxicology Annual Meeting (Proctor DM, Suh M, Tachovsky JA, Abraham L, Hixon JG, Brorby GP, Campleman SL) by the RASS, Phoenix, AZ.

SOT 2013
Awarded for three of the Top Ten Risk Assessment Presentations at the Society of Toxicology Annual Meeting (Kirman et al., Thompson et al., Kopec et al.) by the RASS, San Antonio, TX.

SOT 2012
Awarded Top Nine Published Papers Advancing the Science of Risk Assessment (Thompson CM, Haws LC, Harris MA, Gatto NM, Proctor DM) by the RASS, San Francisco, CA.

SOT 2004
Awarded Top Five Risk Assessment Presentations at the Society of Toxicology Annual Meeting (Leung H, Madl A, Proctor D, Hays S, Cohen E) by the RASS, Baltimore, MD.

SOT 2002
Awarded Top Five Risk Assessment Presentations at the Society of Toxicology Annual Meeting (Crump K and Proctor D) by the RASS, Nashville, TN.

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Thompson CM, **Proctor DM**, Harris MA. 2023. Letter to "Chepelev et al. Establishing a quantitative framework for regulatory interpretation of genetic toxicity dose-response data: Margin of exposure case study of 48 compounds with both in vivo mutagenicity and carcinogenicity dose-response data." Environ Mol Mutagen 64(4):259–260; doi: 10.1002/em.22537.

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BOOK CHAPTERS

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Proctor DM, Harris M, Rabbe D. 2002. Risk assessment of chromium-contaminated soils: Twelve years of research to characterize the health hazards. In: Human and Ecological Risk Assessment: Theory and Practice. Paustenbach DJ (eds). pp. 513–582.

CONFERENCE SYMPOSIA SESSION CHAIR

2018 ASSOCIATION OF ENVIRONMENTAL HEALTH SCIENCES: Session 5b: The Evolving Risk Assessment Landscape in California.

2017 AMERICAN INDUSTRIAL HYGIENE ASSOCIATION CONFERENCE: Challenges in Protecting Worker Health and Achieving Compliance in the World of Low Submicrogram Concentrations: A Case Study of Beryllium.

2016 SOCIETY OF TOXCIOLOGY: The Cancer Risk Assessment for Ingested Hexavalent Chromium: Challenges and Controversies

2015 SOCIETY OF TOXICOLOGY: Advanced Approaches for Quantitative Risk Assessment Using Human Data with Applications Across Disciplines

2014 TOXICOLOGY AND RISK ASSESSMENT: Using New Data and Methods to Improve the Risk Assessment of Environmental Perchlorate Exposure

2011 SOCIETY OF TOXICOLOGY: Using Mode of Action Data to Guide Quantitative Cancer Risk Assessment: A Case Study of Hexavalent Chromium in Drinking Water

2003 SOCIETY OF TOXICOLOGY: Health Risk Assessment of Hexavalent Chromium in Drinking Water: Carcinogenicity, Research and Regulation.

1996 ASSOCIATION FOR THE ENVIROMENTAL HEALTH OF SOIL: Chromium in Soil: Perspectives in Chemistry, Health and Environmental Regulation.

ABSTRACTS AND PRESENTATIONS

Proctor D, Thompson C. Why oral cavity tumors should not be the basis of the hexavalent chromium oral cancer slope factor-weight of evidence review. Abstract 3136, Society of Toxicology 64th Annual Meeting, Orlando, FL, March 2025.

Suh M, Mittal L, Brorby G, Pastula S, Vincent M, **Proctor D**. Epidemiology is critical in advancing cumulative impact assessment (CIA) research: A pilot study in San Antonio, Texas. International Society of Exposure Science Annual Meeting, Montreal, Canada, October 2024.

Allen B, Vincent M, Lipworth L, Panko J, Suh M, Jiang X, Mumma, **Proctor D**. Lung cancer risk and exposure to hexavalent chromium: Results of extended mortality study of workers with low level exposures and quantitative risk assessment using pooled analysis of three cohorts. Society of Toxicology 63rd Annual Meeting, Salt Lake City, UT, March 2024.

Perry CS, Vivanco SN, Verwiel AH, **Proctor DM**. Derivation of manganese 24-hour acute inhalation guideline protective of respiratory and neurological effects. Abstract 4751, Society of Toxicology 63rd Annual Meeting, Salt Lake City, UT, March 2024.

Racz L, Mittal L, Perry CS, Blanchette A, **Proctor D**. Assessing sustainable applications of electric arc furnace steel slag as construction aggregate: Applications of probabilistic risk assessment and physiologically-based pharmacokinetic modeling. Poster presented at Society of Environmental Toxicology and Chemistry North America 44th Annual Meeting, Louisville, KY, November 2023.

Proctor DM, Vivanco S, Blanchette A. Relative oral bioavailability of manganese in electric arc furnace steel slag is influenced by high iron content and low bioaccessibility. Poster presented at Society of Toxicology 62nd Annual Meeting, Nashville, TN, March 2023.

Thompson CM, Wikoff DS, **Proctor DM**, Harris MA. An evaluation of risk assessments on hexavalent chromium [Cr(VI)]: The past, present, and future of mode of action research. Poster presented at Society of Toxicology 62nd Annual Meeting, Nashville, TN, March 2023.

Perry C, **Proctor D**. Short-term environmental inhalation toxicity criteria for airborne manganese protective of neurological and respiratory effects for use in air toxics risk assessment. Presentation 5-15.t-04 to Society of Environmental Toxicology and Chemistry, Pittsburgh PA, November 2022.

Proctor D, Mittal L, Vivanco S, Perry C, Blanchette A. Probabilistic health risk assessment for residential exposures to metals in electric arc furnace (EAF) steel slag. Presentation 5.15.P-Th123 to Society of Environmental Toxicology and Chemistry, Pittsburgh PA, November 2022.

Proctor DM, Mittal L, Vivanco S, Antonijevic T. Probabilistic health risk assessment for residential exposures to metals in electric arc furnace (EAF) steel slag. Poster at Society of Environmental Toxicology and Chemistry (SETAC), Philadelphia, PA, November 2022.

Proctor DM, Antonijevic T. Refined health risk assessment for residential exposures to manganese in EAF steel slag. Poster presented at Society of Toxicology 61st Annual Meeting, San Diego, CA, March 2022.

Thompson CM, Chappell GA, Mittal L, Gorman B, **Proctor DM**, Haws LC, Harris MA. Use of targeted mode-of-action research to inform human health risk assessment of hexavalent chromium. Poster presented at Society of Toxicology 61st Annual Meeting, San Diego, CA, March 2022.

Suh M, Verwiel A, **Proctor D**. Oral and inhalation bioaccessibility of cobalt and nickel in metal alloys: A critical consideration for site-specific human health risk assessments and read across. Poster for Society of Toxicology 59th Annual Meeting, Virtual, 2020, https://eventpilotadmin.com/web/page.php?page=Session&project=SOT20&id=P3190.

Proctor D. Use of the latest science in cancer risk assessment for hexavalent chromium: Is it time to step away from the default regulatory approaches? Invited presentation to the International Union of Toxicology (IUTOX) / International Congress of Toxicology (ICT) meeting, Honolulu, HI, June 17, 2019.

Ring CL, Suh M, Casteel S, Dunsmore M, Verwiel A, **Proctor D**. Relative oral bioavailability of cobalt and nickel in residential soil and dust affected by metal grinding operations. Presented at Joint Annual Meeting of International Society of Exposure Science and International Society for Environmental Epidemiology (ISES-ISEE 2018), Ottawa, Canada, August 2018.

Suh M, Wikoff D, Harvey S, Mittal L, Lipworth L, Goodman M, Goodmanson A, Ring C, Rohr A, **Proctor D**. Hexavalent chromium and stomach cancer: A systematic review and meta-analysis. Presented at Joint Annual Meeting of International Society of Exposure Science and International Society for Environmental Epidemiology (ISES-ISEE 2018), Ottawa, Canada, August 2018.

Proctor, DM. Hexavalent chromium in drinking water: When is the science sufficient to deviate from defaults? Invited Speaker, Genetic and Environmental Toxicology Association (GETA). Thresholds in Toxicology and Risk Assessment Fall Symposium, Oakland, CA, November 14, 2018.

Proctor, DM. Updating the regulatory risk assessment for hexavalent chromium in California: Implications for regulatory standards. Association of Environmental Health Sciences, San Diego, CA, March 20, 2018.

Thompson CM, Suh M, **Proctor DM**, Harris MA. Ten factors for considering the mode of action of Cr(VI)-induced intestinal tumors in rodents. Society of Toxicology 57th Annual Meeting, San Antonio, TX, March 11-15, 2018.

Thompson CM, Wolf JC, Suh M, **Proctor DM**, Haws LC, Harris MA. Toxicity and recovery in the duodenum of B6C3F1mice following treatment with intestinal carcinogens; captan, folpet, and hexavalent chromium: Evidence for an adverse outcome pathway. Society of Toxicology 57th Annual Meeting, San Antonio, TX, March 11-15, 2018.

Proctor DM, Corbett ME. The world of low submicrogram beryllium concentrations. Session F5, American Industrial Hygiene Conference and Exhibition (AIHce), Seattle, WA, June 6, 2017.

Thompson C, Rager J, Suh M, **Proctor D**, Haws L, Harris M. Mechanistic support for nonlinear risk assessment of rat oral cavity tumors induced by exposure to Cr(VI) in drinking water. Poster presented at Society of Toxicology 56th Annual Meeting, Baltimore, MD, March 15, 2017.

Proctor DM, Suh M, Dunsmore D, Verwiel A, Casteel S. Bioaccessibility and relative oral bioavailability of cobalt and nickel from metal alloys in soil and dust. Poster presented at Society of Toxicology 56th Annual Meeting, Baltimore, MD, March 15, 2017.

Kirman CR, **Proctor D**, Suh M, Haws L, Harris M, Thompson C, Hays S. Using physiologically-based pharmacokinetic modeling to address potentially sensitive subpopulations exposure to hexavalent chromium. Poster presented at Society of Toxicology 5^{6th} Annual Meeting. Baltimore, MD, March 15, 2017.

Thompson C, Kirman C, Suh M, **Proctor D**, Haws L, Harris M, Hays S. Risk assessment of oral exposure to Cr(VI): Integration of mode of action, pharmacokinetics, and dose-response modeling. Poster presented at Society of Toxicology Annual Meeting, Baltimore, MD, March 14, 2017.

Suh M, Harvey S, Wikoff D, Mittal L, Ring C, Goodmanson A, **Proctor D**. Meta-analysis of hexavalent chromium and stomach cancer. Poster presented at Society of Toxicology 56th Annual Meeting, Baltimore, MD, March 13, 2017.

Verwiel A, **Proctor D**, Tachovsky A. Principal component analysis of metals in soil and dust to distinguish background and anthropogenic sources in an urban area. Association for Environmental Health and Sciences Foundation Annual Meeting, San Diego, CA, March 14, 2016.

Verwiel A, **Proctor DM**. Oral bioaccessibility of nickel and cobalt from metal alloy emissions in soil and dust. Society for Risk Analysis Annual Meeting, Arlington, VA, December 7, 2015.

Proctor, DM. Overview of hexavalent chromium mode of action (MOA) and implications for determining safe drinking water concentrations. Naturally occurring compounds of regulatory concern. Groundwater Resources Association Symposium, Garden Grove, CA, November 18, 2015.

Brorby G, Suh M, Bichteler A, **Proctor D**. Use of cluster analysis and homogeneity testing to characterize distributions of exposures among beryllium workers: Tools for developing occupational exposure limits from quantitative risk assessment. 2015 International Society for Exposure Science Annual Meeting, Henderson, NV, October 22, 2015.

Kirman CR, **Proctor DM**, Suh M, Hays S. Reduction of hexavalent chromium by gastric fluids from fed and fasted individuals with applications to toxicokinetic modeling. Presented at Society of Toxicology 54th Annual Meeting, San Diego, CA, March 22-26, 2015.

Suh M, Mittal L, Hirsch S, Valdes R, Bartlett C, Rohr A, **Proctor D**. Lung cancer risk in chromate production workers exposed to hexavalent chromium. Presented at Society of Toxicology 54th Annual Meeting, San Diego, CA, March 22-26, 2015.

Proctor D, Suh M, Thompson C, Hixon G. Inhalation Cancer Risk Assessment of Titanium Dioxide. Presented at the Society of Toxicology 54th Annual Meeting, San Diego, CA, March 22-26, 2015.

Harris MA, Thompson CM, **Proctor DM**, Suh M, Wolf JC, Seiter JM, Chappell MA, Haws LC. Analysis of duodenal crypt health following exposure to Cr(VI) in drinking water. Presented at Society of Toxicology 54th Annual Meeting, San Diego, CA, March 22-26, 2015.

Thompson CM, Young RR, Suh M, Dinesdurage H, Elbekai R, Harris, MA, Rohr AC, **Proctor DM**. Hexavalent chromium does not induce mutations in the oral mucosa of transgenic Big Blue® rats following drinking water exposures at a carcinogenic dose. Presented at Society of Toxicology 54th Annual Meeting, San Diego, CA, March 22-26, 2015.

Crump KS, Suh M, Bichteler A, Brorby GP, Hixon JG, and **Proctor DM**. Chronic beryllium disease risk assessment for occupational beryllium exposure. Presented at Society of Toxicology 53rd Annual Meeting, Phoenix, AZ, March 23-27, 2014.

Proctor DM, Suh M, Tachovsky JA, Abraham L, Hixon JG, Brorby GP, Campleman SL. Cumulative risk assessment of urban air toxics: A pilot study in San Antonio, TX. Presented at the Society of Toxicology 53rd Annual Meeting, Phoenix, AZ, March 23-27, 2014.

Suh M, Yzenas JJ, **Proctor DM**. Evaluation of electric arc furnace-processed steel slag for dermal corrosion, irritation, and sensitization. Presented at Society of Toxicology 53rd Annual Meeting, Phoenix, AZ, March 23-27, 2014.

Hays SM, Kirman CR, Suh M, **Proctor DM**. Gastric reduction of hexavalent chromium [Cr(VI)] in fed and fasted human stomach samples. Presented at Society of Toxicology 53rd Annual Meeting, Phoenix, AZ, March 23-27, 2014.

Thompson CM, **Proctor DM**, Suh M, Wolf JC, Haws LC, Seiter JM, Chappell MA, Harris MA. X-ray Fluorescence microspectroscopic analysis of duodenal mucosae following Cr(VI) exposure in drinking water. Presented at Society of Toxicology 53rd Annual Meeting, Phoenix, AZ, March 23-27, 2014.

Suh M, Thompson CM, Hixon JG, Harris MA, Kirman C, Hays S, Haws L, **Proctor D**. Potential involvement in the development of oral cavity tumors in rats exposed to hexavalent chromium. Presented at Society of Toxicology 52nd Annual Meeting, San Antonio, TX, March 10-14, 2013.

Kirman C, Thompson C, **Proctor D**, Suh M, Haws L, Harris MA, Hays S. Using PBPK modeling to address diurnal variation and age differences in hexavalent chromium toxicokinetics in humans. Presented at Society of Toxicology 52nd Annual Meeting, San Antonio, TX March 10-14, 2013.

Thompson C, Kirman C, **Proctor D**, Suh M, Hays S, Haws L, Harris MA. A chronic oral reference dose for hexavalent chromium. Presented at Society of Toxicology 52nd Annual Meeting, San Antonio, TX, March 10-14, 2013.

Proctor D, Suh M, Thompson, C., Harris, M.A. Mode of action evaluation for hexavalent-induced lung cancer. A chronic oral reference dose for hexavalent chromium. Presented at Society of Toxicology 52nd Annual Meeting, San Antonio, TX, March 10-14, 2013.

Brorby G, **Proctor D**, Perry C, Fitzgerald L, Tachovsky A. Probabilistic risk assessment of human exposure to iron and steel slag. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Harris MA, Thompson CM, Wolf JC, Fedorov Y, Hixon JG, **Proctor DM**, Suh M, Haws LC. Assessment of genotoxic potential of Cr(VI) in the intestine via in vivo intestinal micronucleus assay and in vitro high content analysis in differentiated and undifferentiated caco-2. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Hays SM, Kirman C, Aylward L, Suh M, **Proctor D**. Gastric reduction of Cr(VI) in mice, rats and humans. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Hixon JG, **Proctor D**. Use of constrained logistic regression models for the dose-response analysis of beryllium sensitization and chronic beryllium disease with mean exposure. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Kirman CR, Hays SM, Aylward LL, Suh M, **Proctor D**. Physiologically-based pharmacokinetic model for mice, rats and humans orally exposed to chromium. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

O'Brien TJ, Hao D, Suh M, **Proctor D**, Thompson CM, Harris MA, Parsons BL, Meyers MB. K-ras codon 12 GGT to GAT mutation is not elevated in the duodenum of mice subchronically exposed to hexavalent chromium in drinking water. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Proctor DM, Thompson CM, Suh M, Haws LC, Harris MA. Mode of action for intestinal carcinogenesis of ingested hexavalent chromium in mice. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA. March 11-15, 2012.

Thompson CM, Hixon JG, Kopec AK, Harris MA, **Proctor DM**, Haws LC. Assessment of genotoxic potential of Cr(VI) in the mouse duodenum via toxicogenomic profiling. Presented at Society of Toxicology 51st Annual Meeting, San Francisco, CA, March 11-15, 2012.

Haws L, **Proctor D**, Thompson C, Harris M. Research plan to fill data gaps in the mode of action for cancer risk assessment of hexavalent chromium in drinking water. Presented at Society of Toxicology 50th Annual Meeting, Washington, DC, March 6-10, 2011.

Proctor D, Thompson C, Haws L, Harris M. Use of mode of action and pharmacokinetic findings to inform the cancer risk assessment of ingested Cr(VI): A case study. Presented at Society of Toxicology 50th Annual Meeting, Washington, DC, March 6-10, 2011.

Proctor D, Meek B. Using mode of action data to guide quantitative cancer risk assessment: A case study of hexavalent chromium in drinking water. Presented at Society of Toxicology 50th Annual Meeting, Washington, DC, March 6-10, 2011.

Thompson C, **Proctor D**, Haws L, Harris M. Mode-of-action for the cancer risk assessment of ingested hexavalent chromium: Identifying and resolving data gaps. Abstract 1937, Society of Toxicology 49th Annual Meeting, Salt Lake City, UT, March 2010.

Proctor D, Haws L, Tachovsky A, Harris M. Critical Evaluation of the data underlying the USA Today rankings of air quality at schools. Toxicologist. Abstract 1909. Presented at Society of Toxicology 49th Annual Meeting, Salt Lake City, UT, March 2010.

Gatto N, Kelsh M, HaMa D, Shu M, **Proctor D**. A meta-analysis of the relationship between occupational exposure to hexavalent chromium and cancers of the gastrointestinal tract. Abstract, Society of Toxicology 48th Annual Meeting, Baltimore, MD, March 2009.

Proctor D, HaMai D. Human health risk assessment for environmental applications of steel slag: Differences between material-specific and default approaches. Poster Presentation, Society of Toxicology 48th Annual Meeting, Baltimore, MD, March 2009.

Gujral JS, **Proctor DM**, Su SH, Fedoruk MJ. Water adherence factors for human skin. Poster, International Society for Exposure Analysis and International Society for Environmental Epidemiology, Pasadena, CA, October 13–16, 2008.

Gujral JS, Fowler JF Jr, Su SH, Morgan D, **Proctor DM**. Repeated open application tests for allergic contact dermatitis due to hexavalent chromium [Cr(VI)]: Risk assessment for dermal contact with Cr(VI). 3rd Conference of Occupational and Environmental Exposure of Skin to Chemicals, Golden, CO, June 17–20, 2007.

Hong S, **Proctor D**, Finley B. Assessment of LA sewage spills on Santa Monica Bay beaches. Society of Toxicology 45th Annual Meeting, San Diego, CA, March 2006.

Hong SJ, **Proctor DM**, Finley BL. Exposure to sewage spill-related pathogens at Santa Monica Bay beaches. 4th Society of Environmental Toxicology and Chemistry World Congress and 25th Annual Meeting, Portland, OR, November 2004.

Proctor D. Exposure assessment for perchlorate in milk. Abstract 421, Society of Toxicology 45th Annual Meeting, New Orleans, LA, 2005.

Proctor D, Hong S. Relevance of rodent forestomach tumors in cancer risk assessment. Abstract 382, Society of Toxicology 45th Annual Meeting, New Orleans, LA, 2005.

Proctor D, Cohen E, Leung H, Hays S, Barraj L, Madl A. Exposure assessment for perchlorate in drinking water. Abstract 1754, Society of Toxicology 44th Annual Meeting, Baltimore, MD, 2004.

Madl A, **Proctor D**, Leung H, Goswami E, Hays S, Cohen E. Derivation of an RfD for perchlorate: Identifying a Critical Health Endpoint and Most Sensitive Subpopulation. Abstract 1755, Society of Toxicology 44th Annual Meeting, Baltimore, MD, 2004.

Leung H Madl A, **Proctor D**, Hays S, Cohen E. Scientific rational for the derivation of an RfD for perchlorate. Abstract 1756, Society of Toxicology 44th Annual Meeting, Baltimore, MD, 2004.

Proctor D, Ohanian E. Health risk assessment of hexavalent chromium in drinking water: Carcinogenicity, research and regulation. Symposium Chairman. Abstract 277, Society of Toxicology 42nd Annual Meeting, Salt Lake City, UT, 2003.

Proctor D, Lau E, Cahill J, Kelsh M. Alternative reference population sensitivity analysis for the morality assessment of a hexavalent chromium exposed worker cohort. Abstract 2008, International Society of Environmental Epidemiology, 2002.

Proctor D, Hays S, et al. Rate of hexavalent chromium reduction by human gastric fluid. Abstract 1700, Society of Toxicology 41st Annual Meeting, Nashville, TN, March 2002.

Proctor D, Williams P. Costs and benefits of compliance with alternative remediation standards at hexavalent chromium-contaminated sites. Abstract 1073, Society of Toxicology 41st Annual Meeting, Nashville, TN, March 2002.

Proctor D, Luippold R, et al. Lung cancer mortality among workers exposed to airborne hexavalent chromium. Abstract 773, Society of Toxicology 41st Annual Meeting, Nashville, TN, March 2002.

Crump C, **Proctor D**, et al. Dose-response assessment for lung cancer mortality of an occupational cohort exposed to airborne hexavalent chromium. Abstract 774, Society of Toxicology 41st Annual Meeting, Nashville, TN, March 2002. *Awarded top five Risk Assessment Presentations at the conference*.

Proctor D, Kelsh M, Lau E, Exuzides A, Cahill J. Analysis beyond publication: Further evaluation of an occupational study of chromium workers. Abstract 318, Society of Epidemiological Research, 2003.

Proctor DM, Su S, Finley BL. Multi-media exposure scenario survey for defining the conceptual site model of a human health risk assessment for a highly urbanized area. Society of Risk Analysis Conference, December 8, 2002.

Shay E, **Proctor D**, Long T. Community response and health risk assessment of a PCB release from a natural gas pipeline rupture. Association for the Environmental Health of Soils, San Diego, CA, March 2000.

Proctor DM. Use of bench top laboratory studies to quantify potential health risks due to mercury vapors: A case study. Society for Risk Analysis, 1998.

Proctor DM, et al. Methods for refining health-based remediation goals for PAHs in soil. Association for the Environmental Health of Soil, March 12, 1998.

Proctor DM, et al. Prevalence of chromium allergy in the United States and it implications for setting soil cleanup levels: A cost-benefit case study. Society of Risk Analysis, December 1997.

Proctor D, Nethercott J, Fredrick M, Finley B, Paustenbach D. Assessing the potential for elicitation of allergic contact dermatitis in Cr(VI)-sensitized subjects following prolonged contact with Cr(VI) in solution. Society of Toxicology 36th Annual Meeting, Cincinnati, OH, March 1997.

Scott P, **Proctor D**, Paustenbach D. Evaluating the 10% elicitation threshold for Cr(VI) in terms of mass per surface area using benchmark dose methods. Society of Toxicology 36th Annual Meeting, Cincinnati, OH, March 1997.

Proctor DM. Strategies for approaching liability using risk based corrective action (RBCA). Industrial Site Recycling Conference (ISRC), Pittsburgh, PA, April 8, 1997.

Proctor D, Shay E, Scott P. Health-based soil action levels for trivalent and hexavalent chromium: A comparison to state and federal standards. Association for the Environmental Health of Soils (AEHS), Newport Beach, CA, March 13, 1996.

Proctor D, Fehling KA, Scott PK. Use of health risk assessment to facilitate redevelopment of a former steel production site. Society for Risk Analysis Annual Conference and Exposition, December 7, 1995.

Proctor DM, Scott PK, Finley BL. Approach for determining generic health based soil action levels for trivalent and hexavalent chromium at residential and industrial sites. Abstract F4.16, Society for Risk Analysis Annual Conference and Exposition, December 6, 1994.

Proctor DM, Malsch PA, Gargas ML. Considerations for determining appropriate reference doses for soluble and insoluble trivalent chromium compounds. Abstract P1.26, Society for Risk Analysis Annual Conference and Exposition, December 5, 1994.

Proctor DM. Chromium speciation and risk assessment issues. Ohio Chapter Society for Risk Analysis, June 29, 1994.

Malsch PA, **Proctor DM**, Finley BL. Estimation of chromium inhalation RfC by the benchmark dose method. Society of Toxicology 33rd Annual Meeting, Dallas, TX, March 1994.

Gargas ML, Finley BL, Norton RL, **Proctor DM**, Paustenbach DJ. Biomonitoring of chromium (Cr) exposure by urinary excretion: Bioavailability and sampling design. Society of Toxicology 33rd Annual Meeting, Dallas, TX, March 1994.

Proctor DM, Finley BL. A methodology for setting soil cleanup goals based on protection of allergic contact dermatitis. Society for Risk Analysis Annual Meeting, December 5–8, 1993.

Proctor DM, Finley BL. Using real human sweat to extract chromium from chromite ore processing residue: Implications for setting standards based on allergic contact dermatitis. Society for Risk Analysis Annual Meeting, December 5–8, 1993.

Proctor DM, Scott PK, Fehling KA. Comparison of exposure estimates obtained using conservative state-mandated methodology, refined point estimate approach, and Monte Carlo analyses. Society for Risk Analysis Annual Meeting, December 5–8, 1993.

Proctor DM, Ulrich GA, Agnew WW. Application of human health risk assessment in oil and gas production. No 26362, Society of Petroleum Engineers International Annual Technical Conference and Exhibition, October 3–6, 1993.

Proctor DM, Finley BL, Paustenbach DJ. An alternative to the USEPA's proposed inhalation reference concentration for hexavalent and trivalent chromium. Society of Toxicology 32nd Annual Meeting, New Orleans, LA, March 1993.

Proctor DM, Trowbridge KR. An analysis of risk driven site investigation and remediation. Abstract 9970, Society of Environmental Toxicology and Chemistry 13th Annual Meeting, October 8-12, 1992.

PUBLISHED TECHNICAL STUDY REPORTS

Proctor DM, Gujral J, Su S, Fowler Jr. JF. Repeated open application test for allergic contact dermatitis due to hexavalent chromium [Cr(VI)] as CopperShield®: Risk assessment for dermal contact with Cr(VI). FPRL #012506. Environmental Protection Agency. Washington, DC, July 2006.

Proctor DM, Gujral J, Su S, Fowler Jr. JF. Repeated open application test for allergic contact dermatitis due to hexavalent chromium [Cr(VI)] as potassium dichromate: Risk assessment for dermal contact with Cr(VI). FPRL #012406. Environmental Protection Agency Washington, DC, September 2006.