

ALISO CANYON DISASTER HEALTH RESEARCH STUDY COMMUNITY MEETING #1 SUMMARY

MEETING PURPOSE

The University of California, Los Angeles (UCLA) held the first Aliso Canyon Disaster Health Research Study (Health Study or Study) community meeting to introduce lead researchers, provide an overview of the Study's overarching goals and approach, inform the community of upcoming air monitoring activities, and provide an opportunity for the community to ask questions and receive answers.

MEETING FORMAT, AGENDA, AND ATTENDANCE

Two meetings with the same content were held, one online and one in-person to accommodate most community members. The meetings were held on:

- Tuesday, September 12, 2023, 11:30 am – 1:30 pm, via Zoom Webinar, and
- Thursday, September 14, 2023, 6:00 pm – 9:00 pm, at Los Angeles Pierce College in Woodland Hills, California.

The agenda for both meetings included:

- Introduction to the UCLA Team
- Health Study Overview
- Air Monitoring
- Community Engagement Plan

A Questions and Answers (Q&A) period followed each presentation, and an additional Q&A period was held at the end of the meeting.

Approximately 29 community members attended the online meeting and 14 attended the in-person meeting.

SUMMARY OF QUESTIONS AND ANSWERS

A recording for the online meeting and the PowerPoint presentation for both meetings is available at <https://alisostudy.ucla.edu/events/meeting-1/>.

This document provides a summary of questions and comments by community members during the online and in-person meetings, along with UCLA project team (Team) responses. Additional responses are provided to questions that were not answered during the meetings along with additional information and/or clarification to responses provided during the meeting.

This summary is organized by the following topics:

- Exposure and Risk Assessment
- Health and Well Being Assessment
- Study Outcomes
- Community Engagement
- UCLA Scientific Independence

- Other Comments and Questions

DISCLAIMER

The UCLA Team responses to community questions and comments are preliminary and reflective of the Team's current Study plans and understanding of the evidence available to date. New evidence and further discussions could lead to changes in Study methodology or responses provided in this summary.

EXPOSURE AND RISK ASSESSMENT

DATA COLLECTION - GAS COMPONENTS

Community members expressed significant interest and concern about the availability of data necessary to conduct a thorough health risk assessment. Of particular concern is the ability to obtain a comprehensive list of chemicals in the gas that was emitted during the incident (as well as fracking ingredients, cleaning agents, crude oil constituents, well kill attempt fluid, etc.). The community has long sought but been unable to obtain this data.

RESPONSE: UCLA understands the importance of obtaining comprehensive chemical composition data on emissions from the facility and the frustration the community has experienced in this regard. We will actively collect all available data related to the blowout. We have initiated a process of requesting data from the County that was previously obtained from Southern California Gas (SCG) from legal proceedings. UCLA has requested comprehensive chemical composition data on emissions from their facility through agencies who have regulatory oversight over SCG. UCLA is actively seeking permission from the gas company's legal counsel to access the relevant chemical data.

Additionally, UCLA is proactively reviewing other studies related to natural gas composition that have been shared with the County. To further our efforts, we are leveraging self-reported emissions data, as required by South Coast Air Quality Management District (AQMD) regulations and California Air Resources Board (CARB) regulations. We are diligently working through this data, including submitting public records requests, to acquire information that is not readily accessible to the public. Furthermore, we are examining various reports from agencies, like Office of Environmental Health Hazard Assessment (OEHHA), and consultants, such as Blade Energy, that have characterized the well kill fluids and muds. We are particularly interested in connecting the findings of indoor air sampling, which revealed unusual heavy metal signatures like barium, strontium, and manganese in certain homes downwind, to the composition of these muds. UCLA is also exploring archived soil samples provided by the County to detect potential contaminants near the wellhead site.

We have designed the Study with a multifaceted approach to assure that the analysis will comprehensively identify and assess potential exposure impacts regardless of whether we are able to obtain the full list. Elements of this approach include:

- Clinical Exams: UCLA is using clinical exams to identify biomarkers of inflammation and immune response that could be affected by a wide range of chemicals.
- Untargeted Metabolomics: UCLA is conducting untargeted metabolomics to identify unusual metabolites in the affected community, comparing them quantitatively with other communities outside the impact zone using rigorous statistical methods.
- Blood Stick Draws: The Study involves 2,400 blood stick draws for in utero exposures, allowing us to track changes before, during, and after the event, using the pre-event data as a baseline.

- Chemical Signatures: UCLA is utilizing methods to identify chemical signatures, even for chemicals that may not be definitively linked to the facility emissions.

STUDY AREA/IMPACT ZONE

A community member questioned whether the five-mile study radius is sufficient, noting personally collected data that implies the health effects extend far outside that range.

RESPONSE: UCLA has taken several comprehensive steps to assess the reach of impacts. First, UCLA utilized remote sensing satellite retrievals of methane as an indicator for air toxins associated with natural gas. These retrievals revealed a maximal influence distance of approximately 3.5 miles from the well. Additionally, UCLA analyzed complaint data and found that a substantial percentage of complaints, approximately 78%, were reported within the initial five-mile radius. This observation indicates that health concerns were prevalent within this radius. Furthermore, UCLA employs a sophisticated chemical transport model that accounts for emissions from the facility and potential transformations in the atmosphere. This model estimates that key contaminants, such as Benzene, are likely to have an impact radius of about 3.5 to 4 miles. To complement these findings, UCLA has methane monitors and data from locations close to the five-mile radius. Monitoring data did not reveal significant readings above background levels in these areas, indicating that certain pollutants may not extend far beyond the immediate vicinity. The Study includes assessing health data beyond the five-mile radius to investigate potential variations in medical conditions and symptoms at greater distances from the facility (distance decay gradients). However, based on our extensive analysis of biophysical data, we currently consider the five-mile radius as the primary characterization for the impact zone. We are confident that the impacted area is well within the five-mile area. Expanding the impacted zone to five miles was done as a conservative measure. Including a larger geographic area may dilute the population of residents impacted by the leak.

INDOOR AIR MONITORING

Community members asked if the Study will monitor locations used for indoor air monitoring conducted by the County after the blowout, and if humidity will affect air monitoring data. They asked about the purpose of the in-home gas sample collection (from of gas stoves) and whether the Study will use the October 2022 PSE Healthy Energy gas stove study. A concern was expressed that by including the gas stove monitoring, there may be some attribution of illness in the community to leaky stoves.

RESPONSE: The Study includes indoor air quality monitoring of emissions that occur during typical daily activities, including cooking with gas stoves. In addition to air monitoring, the Study will include gas sample collection directly from gas sources to gain insight into gas composition before it undergoes combustion in stoves. By doing so, we aim to identify any potentially harmful chemicals present in the gas supply. The primary focus of the Study is related to the health and environmental impacts of the Aliso Canyon incident. Nonetheless, we are taking proactive steps to investigate potential emissions associated with gas stoves and their potential implications for indoor air quality as part of our comprehensive assessment.

PSE Energy did a previous study (*Composition, Emissions, and Air Quality Impacts of Hazardous Air Pollutants in Unburned Natural Gas from Residential Stoves in California*, October 2022) that looked at the gas composition from homes throughout California and included participants from the Aliso Canyon area. The previous study found that this region had the highest concentrations of chemicals in unburned gases delivered to homes. It is not clear why this is the case. The gas stove monitoring in this Health Study, which will also be conducted by PSE Energy, aims to obtain a larger sample size to help answer

some of these questions about the gas composition in this community. The monitoring will include seasonal measurements at various times throughout the year to assess seasonal variability in gas composition.

UCLA has analyzed the data from the prior indoor air monitoring conducted by the County and would like to build on that. Monitoring those locations again as part of this Study would be beneficial; UCLA is planning to recruit volunteers in the same neighborhoods that were previously measured.

Monitoring will occur during different seasons to capture different background conditions. Most of the measurements will not be affected by humidity. Monitoring of very small particles may be affected by humidity. However, given the Team's extensive experience working with data calibration, humidity is not expected to create an issue.

CANYON EFFECTS

Community members noted that exposure from the blowout varied greatly from one canyon to another, and in some cases within a few blocks. They expressed concern that a randomized study will not capture all people who were exposed and could miss those who were most directly exposed. They recommended that the Study assess people in the community who live in the canyons that were affected by the gas release compared to a control group, rather than a random group of people within a certain radius of the well.

RESPONSE: UCLA recognizes the need to assure that the Study captures the areas that were most affected by the disaster. The exposure models and atmospheric chemistry and transport models that will be used in the Study take into account the presence of canyons and other topographical variations and will identify the exposure locations. In addition to using comparison communities as the basis for some of the analyses, parts of the Study will use "distance decay models," which will identify the areas of highest exposure and assess whether health effects are more severe in those areas.

UCLA will position air pollution monitors and collect additional air samples in areas affected by winds that flow through canyons because these winds could influence the dispersion of chemicals emitted from the facility.

CORRELATION BETWEEN METHANE AND OTHER CHEMICALS

The correlation between the methane and levels of hazardous chemicals (e.g., benzene and formaldehyde) was questioned.

RESPONSE: UCLA has observed strong correlations between levels of methane and levels of hazardous chemicals (e.g., benzene and formaldehyde). Our detailed analysis, published in the journal "Environment International," involved examining trigger samples with methane concentrations exceeding 5 parts per million, significantly higher than background levels. Through gas chromatograph analysis, we identified substantial correlations between methane and various air toxins that are likely part of the natural gas matrix. To enhance our understanding, we plan to collect samples of unburned or raw natural gas. Analyzing these samples will provide valuable insights into the strength of correlations between trace constituents like benzene and methane in the natural gas used in households.

BALANCE BETWEEN ENVIRONMENTAL ASSESSMENT AND CLINICAL EXAMINATIONS

Community members asked about the portion of the Study devoted to collecting and assessing environmental data versus directly examining residents, and some noted a disproportionate focus on the environmental assessment.

RESPONSE: UCLA developed the scope of work for the Study to be responsive to the community's expressed desire for clinical evaluations of residents affected by the blowout and to assure that the Study would uncover any potential health effects from the disaster. The exposure and clinical assessments will complement each other in achieving this aim. The physical exam alone will not provide the information needed to identify potential exposure sources. The physical exams will help inform us on potential exposures, which then need to be examined separately. Health conditions could be from multiple different causes and exposures; in order to differentiate what is specific to this disaster, we need to the exposure data to rule out those other exposure sources. For example, a physical exam may show that a person has developed asthma but that may be the result of exposure to local wildfires and not the natural gas storage facility. To differentiate potential causes of these health outcomes, we need to collect and examine environmental exposure data to rule out potential local sources that are not from the Aliso Canyon gas storage facility (in addition to personal behaviors like diet that may impact health outcomes).

The Study maintains a balance between direct resident examinations and environmental data collection, with a significant emphasis on the health and well-being assessment, which represents a substantial portion of the overall budget due to the complexity and cost associated with various analytical processes and data collection methods involved in assessing health and wellbeing.

SHORT- AND LONG-TERM EXPOSURES

Community members asked if and how the Study will assess and differentiate impacts from the blowout with impacts from long term exposure due to facility operations before and after the blowout.

RESPONSE: UCLA has designed the Study to assess long-term exposures associated with ongoing facility operations in addition to acute exposures linked to the blowout. We plan to differentiate between these effects through statistical methods. Here's how we plan to approach the acute effects of the blowout versus the chronic effects of exposure:

- **Acute Effects During the Disaster:** For the acute effects during the blowout disaster, UCLA plans to examine various aspects, including birth outcomes for pregnancies that intersected with the approximately 3.5-month period when the leak occurred. We will also assess acute effects on hospital utilization and physician consultations. Additionally, we intend to analyze neonatal blood samples before, during, and after the disaster using metabolomic analyses.
- **Chronic Exposures:** Much of the Study will focus on chronic exposures. There is evidence of ongoing methane releases from the facility, although these releases are considerably smaller than during the blowout disaster. However, we do not have comprehensive information on emissions before the disaster because this event spurred the development of new remote sensing techniques to monitor methane. Clinical assessments conducted about eight years after the event will represent long-term and potentially acute exposures from the disaster. UCLA will use statistical methods to distinguish between acute and long-term effects, particularly when assessing clinical outcomes.

We will employ statistical methods to differentiate between these effects and leverage various data sources to analyze a wide range of health outcomes, including birth outcomes, hospital utilization,

physician consultations, clinical assessments, and cancer outcomes, while considering the latencies associated with cancer.

DEFINITION OF SHORT- AND LONG-TERM EFFECTS

Community members asked how short- and long-term effects are defined in the Study.

RESPONSE: Short-term (acute) effects occur within a week, resulting in the need for timely medical attention. Long-term (chronic) effects develop over a year or more, while sub-chronic effects fall in between, lasting from a week to a year.

HEALTH AND WELL-BEING ASSESSMENT

DATA COLLECTION – HEALTH RECORDS

Community members asked how the Study will address the impacts of the blowout that occurred eight years ago, considering challenges such as DPH's letter to physicians at the time (community members stated this was a directive to not collect blood samples or discuss issues related to the blowout), and associated potential missing medical information from emergency room and hospital visits. They asked if UCLA could obtain medical records from legal settlements related to the disaster to fill gaps in private medical records.

RESPONSE: UCLA is using various methods and sources, including neonatal blood samples, hospital records, satellite imagery, the California Health Interview Survey, and current clinical assessments, to provide data from before, during, and after the disaster. Although UCLA is not able to obtain private physician medical records, we plan to use emergency room and hospital data, mandatory reporting of patient visits, and data from UCLA providers to assess symptoms and health effects potentially linked to the blowout. Additionally, UCLA is actively working to obtain data from legal settlements and welcomes any community information that might assist in securing this data for the Study.

COMPARISON COMMUNITIES (CONTROL GROUPS)

Community members were interested in the control groups that will be used in the Study and how they will be selected. A commenter noted that the control group should be outside Los Angeles County because of the high number of oil and gas facilities in the county which could skew the information.

RESPONSE: UCLA acknowledges the concern about establishing comparison communities (control groups) in Los Angeles County due to the prevalence of oil and gas facilities in county. However, using comparison communities in locations such as the Central Valley or the Bay Area could introduce significant variations that may not make them comparable, including environmental, social, and contextual factors that are not quantifiable. These factors could lead to differences between populations that are unrelated to the Aliso Canyon incident and, therefore, could skew the Study results. To address this challenge, UCLA aims to select control groups close to or within Los Angeles County but removed from direct oil and gas facility influence. We identified areas in Orange County and Ventura County that are entirely devoid of oil and gas operations. The primary concern is to avoid introducing excessive differences by moving too far from the Study area, as this could lead to confounding factors that make it challenging to draw meaningful conclusions. UCLA plans to have a separate community meeting to further discuss the selection of comparison communities.

STUDY PARTICIPATION

Community members asked how the Study will identify and select participants for the health survey and clinical evaluations, and if all Porter Ranch residents will be invited to participate in the health survey.

RESPONSE: The Study will select 1,400 individuals from the impacted community to participate in the survey. In order to achieve a representative sample of the affected community, survey participants will be selected utilizing a rigorous address-based approach that takes into account factors such as race, ethnicity, socioeconomic status, and proximity to the wellhead within a 5-mile radius.

The selected individuals will receive a letter requesting their participation in the survey. From the pool of 1,400 survey participants, UCLA plans to select 600 individuals for the Study's clinical exams and medical testing. These 600 individuals will also be chosen with the goal of achieving a representative sample of the community. UCLA understands that some community members are interested in volunteering to participate in the Study. While there's a desire to include everyone, representativeness of the sample must be prioritized, which could mean not all volunteers can be included.

MEDICAL TESTING

Community members asked UCLA to explain the medical testing offered to public participants in the Study and address the absence of published data on the health effects of chemicals the public was exposed to during the blowout.

RESPONSE: Clinical exams and medical testing will be comprehensive. The Study involves the use of metabolomics, an approach that allows the identification of thousands of chemicals and metabolites in participants' blood, encompassing various pollutants beyond a single exposure such as benzene. We will also examine health status, lung function, hematologic (i.e., blood) impact, and inflammation markers. In addition, data from the disaster period and a symptoms survey will be incorporated to address the lack of published medical data on chemical exposure effects.

CANCER ANALYSIS

Community members asked a number of questions about the cancer analysis methodology (e.g., which cancers will be studied and how, the control group used for comparison, how those who have been diagnosed with cancer will be included in the Study). A comment was made that the cancer analysis should be based on clinical examinations and timely reporting from the County Cancer Registry, rather than theoretical estimates of chemical exposures used to determine cancer risk.

RESPONSE: The UCLA Study encompasses a comprehensive cancer assessment. UCLA is diligently reviewing the California Health Map and seeking access to Cancer Registry data. This data will offer detailed insights into cancer diagnoses within the Study area, spanning periods before, during, and after the disaster. Analyzing cancers can be particularly challenging due to their long latency periods, which is the time between exposure to a potential carcinogen and the manifestation of the disease. Therefore, our approach focuses on cancers with shorter latency periods, including various blood cancers. We also direct our attention to cancers known to have associations with contaminants emitted from the facility, such as blood cancers due to their known connection to benzene exposure and nasopharyngeal cancers linked to formaldehyde exposures.

We are meticulously evaluating Cancer Registry data for a duration extending approximately five years before the blowout and up to 2022 (the latest year of available data). This dataset provides

comprehensive statewide coverage for comparison purposes, with the exception of the Bay Area due to variations in exposure backgrounds. Our approach combines both risk assessment and an examination of actual cancer data. This dual approach is paramount for comprehensive analysis and the ability to provide meaningful and plausible explanations for any elevated cancer rates we may encounter. The California Health Map will provide additional data.

We are studying if health care use patterns change, increased use of services for chronic conditions, and concluding if changes “may have been” due to exposure. Cancer can be one of the conditions we will examine.

STUDYING THE PEOPLE MOST AFFECTED BY THE DISASTER

Community members asked how the Study will assess the impacts on people who suffered greatly due to exposure from the blowout but may not be captured in the survey. They noted the need for answers about what happened to these people. They further noted that people in the community know they were affected by the blowout and have been smelling oil and gas in their yards for years before the blowout.

RESPONSE: UCLA shares the community's concerns about gas exposure impacts and associated traumatic effects of the disaster. The Study will identify affected individuals who may have left the area through multiple data sources and methods including mobility tracking, hospital records and health utilization data.

While the Study is primarily a population-based study, designed to determine if people living in the community closest to the natural gas facility experienced a higher level of health impacts that can be attributed to the blowout or ongoing operations of the facility, it will also help to answer questions about whether people in the community are at higher risk of developing certain medical conditions or disease in the future, so that people can take measures to screen for and take any available preventative measures.

In addition, as part of the Study, UCLA is developing a comprehensive list of the types of medical tests to apply in a community that faces these exposures. UCLA will look into making that list available for the community so that people who are concerned can seek out these tests through their own physicians.

The Study will also document people's experiences through focus groups and other efforts. The Study includes interviews by anthropologists who study disaster loss and recovery to document people's experiences, especially those who have suffered losses. Participating in community meetings is another way community members can become involved in the study and have their experiences taken into account. In response to comments heard at the community meeting, UCLA will explore the possibility of additional ways to document community members' experiences and the suffering that has and continues to occur.

STUDYING PEOPLE WHO MOVED FROM THE AREA OR PASSED AWAY SINCE THE DISASTER

Community members asked how the Study will account for residents who have passed away or moved out of the area since the disaster.

RESPONSE: UCLA has a tracking system in place to monitor residential mobility, including those who have relocated or passed away due to illness. We are actively seeking legal settlement information and welcome the community's input to comprehensively account for these changes. The Community

Engagement Support and Advice Network (CESAN), described below, could potentially assist in reaching affected community members who moved away.

UCLA will examine the available data from the California Health Interview Survey and hospitalization and other health care utilization data during the blowout. These data will include individuals who resided in the area at the time of the blowout.

STUDY OUTCOMES

Questions and comments on Study outcomes pertained to: the schedule for completion of the UCLA Study; whether the Study report will include specific recommendations for future mitigation of health impacts and provide to regulators and other communities sufficient information to establish standards/limits about the natural gas health hazards from exposure; and the influence the Study will have on the entities that are keeping the gas storage facility open. A comment was made that if the Study does not find any impact, it will be a huge failure.

RESPONSE: If the Study's Scientific Oversight Committee (SOC) determines that the Study should continue beyond the end of the Study's third and fourth year, the Study will proceed for a total of five years and come to completion at the end of October 2027. However, specific research components will be completed sooner. UCLA will share those findings with the community as they become available and will publish them in scientific journals which will also become public.

UCLA's objective is to provide a comprehensive assessment of health impacts and the most robust and scientifically sound information possible to inform public health decisions. It is intended to be used by regulatory agencies, policymakers, healthcare providers, and community organizations to inform local responses and/or actions that support the recovery and the health of the impacted communities. While we aim to supply valuable insights that can assist regulators and communities in establishing standards or limits related to natural gas health hazards, it is not within our purview to identify standards or regulations. Similarly, while the UCLA Team excels in studying emissions and their potential health impacts, we may not possess the expertise needed to manage natural gas storage fields comprehensively. Therefore, while we can offer general guidance, we acknowledge that the specifics of implementation may require the involvement of regulatory authorities with the necessary expertise to ensure the safety and well-being of the community.

UCLA will conduct the Study objectively without any desired outcome. Our aim is to provide very convincing science that can be used by regulatory and decision-making bodies.

UCLA cannot predetermine the outcome of the Study. However, given the extensive and advanced methodologies that will be used in this Study, UCLA is confident that if the natural gas facility has caused a measurable impact on the health of the nearby population, the Study will find it.

COMMUNITY ENGAGEMENT

Community members noted that there is apathy in the community about the impact of the disaster, inquired about community engagement methods that will be used to overcome this apathy, stated that future in-person meetings should be held at locations in the community, and requested more in-depth discussions about specific aspects of the Study methodology.

RESPONSE: Effective community engagement is crucial to the success of the Study, and we appreciate suggestions for improving our efforts. We have developed a Community Stakeholder Communications Plan (CSCP) that provides a comprehensive guide to community engagement efforts during implementation of the Study. A draft CSCP is posted on the website at: <https://alisostudy.ucla.edu/community-engagement/>.

We plan to hold general community meetings to provide overall Study information and updates as well as focused meetings to address more specific topics. These focused meetings will allow for deeper discussion of those topics that are of greatest interest to the community. UCLA seeks to hold in person meetings at venues within the community as feasible.

The CSCP also calls for the development of a Community Engagement Support and Advice Network (CESAN). This network aims to tap into the expertise of individuals who understand the community's unique dynamics and preferences. It will include a diverse range of organizations and community groups to ensure that the advisory network encompasses a broad cross-section of community demographics and interests. We are committed to working closely with the CESAN to effectively engage and motivate residents to participate.

UCLA SCIENTIFIC INDEPENDENCE

Community members expressed concern about how UCLA will ensure its scientific independence while addressing community concerns about its connection with DPH, resolving disagreements with the Scientific Oversight Committee (SOC), and ensuring the transparency and independence of the Study's methods, findings, and conclusions.

RESPONSE: UCLA is committed to maintaining its scientific independence throughout the Study. While the funding for the Study was secured through a consent decree, UCLA was awarded the contract to conduct the Study independently. DPH has an administrative oversight role, tracking progress and reviewing materials prior to public distribution, but it does not dictate UCLA's scientific decisions. An independent Scientific Oversight Committee (SOC) comprising 15 experts oversees the study, providing valuable input, but the ultimate responsibility for scientific rigor lies with UCLA. UCLA maintains open communication with DPH and a structured process for addressing disagreements with the SOC's recommendations. While DPH may handle the final report publication, UCLA is actively exploring options for independent dissemination of methods, findings, and conclusions to ensure transparency and scientific integrity.